FOR CONTRACT NO.: 04-264144

INFORMATION HANDOUT

WATER QUALITY

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY SECTION

DEPARTMENT PROJECT NO. EA 04-26411
SITE NO. 02-28-C0350 (BT)
CIWQS PLACE NO. 742494

PERMITS

STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME

NOTIFICATION NO. 1600-2009-0271-R3

UNITED STATES ARMY CORPS OF ENGINEERS

NON-REPORTING NATIONWIDE 404 PERMIT

AGREEMENTS

UNITED STATES FISH AND WILDLIFE SERVICE (Biological Opinion)

MATERIALS INFORMATION

SITE INVESTIGATION REPORT

LIMITED SITE INVESTIGATION REPORT

FOUNDATION REPORT

GEOTECHNICAL DESIGN AND MATERIALS REPORT

MATERIALS SOURCES FOR SONOMA FIELD STONE

WATER POLLUTION CONTROL

STORM WATER INFORMATION HANDOUT

ROUTE: 04-Nap, Sol-12-2.8/3.3, 0.0/2.6

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
1455 MARKET STREET
SAN FRANCISCO, CALIFORNIA 94103-1398

MAR 29 2010

Regulatory Division (1145b)

SUBJECT: File Number 2008 00429N

Mr. Jeffrey G. Jensen
California Department of Transportation
Office of Biological Sciences & Permit
PO Box 23660
Oakland, California 94623-0660

Dear Mr. Jensen:

This letter is written in response to your submittal of July 21, 2009 concerning Department of the Army authorization to widen State Route 12 (Jameson Canyon Road), permanently fill approximately 0.2 acre of waters of the U.S. wetland, permanently impact approximately 0.12 acre of waters of the U.S. other waters, temporarily impacting approximately 0.1 acre of waters of the U.S. wetland, and temporarily impacting approximately 0.08 acre of waters of the U.S. other waters. The project is located on Highway 12, Post Mile (PM) 0.0 - 3.314 in Napa County and on State Route 12 PM 0.0 – 2.48 in Solano County. This State highway connects Interstate 80 near Cordelia to State Route 29 near the Napa County Airport.

Based on a review of the information you submitted and an inspection of the project site conducted by Corps personnel on December 8 and 9, 2010 , your project qualifies for authorization under Department of the Army Nationwide Permit 14 – Linear Transportation Project (72 Fed. Reg. 11092, March 12, 2007), pursuant to (choose) Section 404 of the Clean Water Act (33 U.S.C. Section 1344). See Enclosure 1. All work in Napa County shall be completed in accordance with the plans and drawings titled "*Department of Transportation Project Plans for Construction on State Highway in Napa County Near Napa on Route 12 From Route 29 to 0.1 Miles West of Solano County Line, Layout L-1 through L-14 and Typical Cross Sections X-1 through X-12*", dated12/31/2009. All work in Solano County shall be completed in accordance with the plans and drawings titled "*Department of Transportation Project Plans for Construction on State Highway in Solano County on Route 12 From 0.5 Miles West of Napa County Line to Red Top Road, Layout L-1 through L-12 and Typical Cross Sections X-1 through X-15*", dated 12/31/2009.

The project must be in compliance with the General Conditions cited in Enclosure 2 for this Nationwide Permit authorization to remain valid. Non-compliance with any condition could result in the suspension, modification or revocation of the authorization for your project, thereby requiring you to obtain an Individual Permit from the Corps. This Nationwide Permit authorization does not obviate the need to obtain other State or local approvals required by law.

This authorization is valid until the NWP is modified, reissued, or revoked. All of the existing NWPs are scheduled to be modified, reissued, or revoked prior to March 18, 2012. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant nationwide permit is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit.

Upon completion of the project and all associated mitigation requirements, you shall sign and return the Certification of Compliance, Enclosure 3, verifying that you have complied with the terms and conditions of the permit.

This authorization will not be effective until you have obtained a Section 401 water quality certification from the San Francisco Bay Regional Water Quality Control Board (RWQCB). If the RWQCB fails to act on a valid request for certification within two months after receipt of a complete application, the Corps will presume a waiver of water quality certification has been obtained. You shall submit a copy of the certification to the Corps prior to the commencement of work.

To ensure compliance with this Nationwide Permit authorization, the following special conditions shall be implemented:

1. This Corps permit does not authorize you to take an endangered species. In order to legally take a listed species, you must have a separate authorization under the Endangered Species Act (ESA) (e.g., an ESA Section 10 permit or a Biological Opinion (BO) under ESA Section 7 with "incidental take" provisions with which you must comply). The enclosed U.S. Fish and Wildlife Service (FWS) BO dated January 31, 2008 (# 81420-2008-F-0827) contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the BO. Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take authorized by the attached BO, whose terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the BO, where a take of the listed species occurs, would constitute an unauthorized take and it would also constitute non-compliance with this Corps permit. The FWS is the appropriate authority to determine compliance with the terms and conditions of its BO and with the ESA.

2. Caltrans shall adhere to the conditions of the 401 certification from the RWQCB.

3. Caltrans shall mitigate for wetland loss by purchasing a minimum of 0.22 acre of wetland creation credit at either Elsie Gridley Mitigation Bank or the North Suisun Mitigation

Bank. For this authorization to be effective, prior to construction, Caltrans shall provide to the Corps of Engineers legal documentation indicating that Caltrans has purchased a minimum of 0.22 acres of wetland creation credits. The legal documentation Caltrans is required to present to the Corps is a copy of the sales or purchase agreement which indicates the type and amount of credits purchased and a copy of the signed check used to purchase the credits.

4. Caltrans shall restore all wetlands and other waters of the US that sustained temporary impacts during construction of this project. All sites that sustained temporary impacts must be restored back to their pre-construction conditions or better. Restoration will occur as described in a Caltrans document entitled "*Draft Mitigation and Monitoring Plan for On-Site Restoration Activities, dated March 2010*".

5. Caltrans shall compensate for permanent loss of approximately 376 linear feet of waters of the U.S. by restoring a minimum of 752 linear feet of a degraded creek channel on the South Fork Lynch Creek or within the Benicia Hydrologic Sub-Area. Caltrans' partner in the restoration project, Solano County Resource Conservation District, will complete a Final Mitigation and Monitoring Plan for the off-site mitigation by October 31, 2011. Caltrans will submit this mitigation plan to the Corps for approval by November 25, 2011.

Should you have any questions regarding this matter, please call Hal Durio of our Regulatory Division at 415 503 6785. Please address all correspondence to the Regulatory Division and refer to the File Number at the head of this letter. If you would like to provide comments on our permit review process, please complete the Customer Survey Form available online at http://per2.nwp.usace.army.mil/survey.html.

Sincerely,

ORIGINAL SIGNED
BY Laurie Monarres
CHIEF, REG. BR., NORTH SECTION
FOR

Jane M. Hicks
Chief, Regulatory Division

Enclosures

Copy furnished:

Copy furnished (w/o enclosures):

US FWS, Sacramento, CA
CA RWQCB, Oakland, CA

California Natural Resources Agency
DEPARTMENT OF FISH AND GAME
Bay Delta Region
Post Office Box 47
Yountville, California 94599
(707) 944-5520
www.dfg.ca.gov

ARNOLD SCHWARZENEGGER, Governor

February 3, 2010

Jeffrey G. Jensen
California Department of Transportation
111 Grand Avenue
Oakland, CA 94623

Subject: Final Lake or Streambed Alteration Agreement
Notification No. 1600-2009-0271-R3
STATE ROUTE 12 JAMESON CANYON WIDENING PROJECT

Dear Mr. Jensen:

Enclosed is the final Streambed Alteration Agreement ("Agreement") for the State Route 12 Jameson Canyon Widening Project ("Project"). Before the Department of Fish and Game (Department) may issue an Agreement, it must comply with the California Environmental Quality Act ("CEQA"). In this case, the Department, acting as a responsible agency, filed a notice of determination ("NOD") on the same date it signed the Agreement. The NOD was based on information contained in Mitigated Negative Declaration the lead agency prepared for the Project.

Under CEQA, filing a NOD starts a 30-day period within which a party may challenge the filing agency's approval of the project. You may begin your project before the 30-day period expires if you have obtained all necessary local, state, and federal permits or other authorizations. However, if you elect to do so, it will be at your own risk.

If you have any questions regarding this matter, please contact Staff Environmental Scientist, Melissa Escaron at (707)339-0334 or mescaron@dfg.ca.gov.

Sincerely,

for

Scott Wilson
Habitat Conservation Program Manager

cc: Melissa Escaron, Staff Environmental Scientist

California Natural Resources Agency
DEPARTMENT OF FISH AND GAME
BAY DELTA REGION
(707) 944-5520
Mailing address:
POST OFFICE BOX 47
YOUNTVILLE CALIFORNIA 94599
Street address:
7329 SILVERADO TRAIL
NAPA CALIFORNIA 94558

ARNOLD SCHWARZENEGGER, GOVERNOR

February 3, 2010

Notification Number: 1600-2009-0271-3

Mr. Jeffrey G. Jensen
California Department of Transportation, District 4
111 Grand Avenue
Oakland, CA 94623

1602 STREAMBED ALTERATION AGREEMENT

This agreement is issued by the Department of Fish and Game pursuant to Division 2, Chapter 6 of the California Fish and Game Code:

WHEREAS, the Applicant Mr. Jeffrey G. Jensen/California Department of Transportation (Caltrans) submitted a signed NOTIFICATION proposing to substantially divert or obstruct the natural flow of, or substantially change the bed, channel, or bank of, or use material from the streambed of the following water: tributaries to Fagan Creek, located in Napa county, State of California; and

WHEREAS, the Department has determined that such operations may substantially adversely affect existing fish and wildlife resources including water quality, hydrology, aquatic or terrestrial plant or animal species; and

WHEREAS, the project has undergone the appropriate review under the California Environmental Quality Act; and

WHEREAS, the Applicant shall undertake the project as proposed in the signed PROJECT DESCRIPTION and PROJECT CONDITIONS (attached). If the Applicant changes the project from that described in the PROJECT DESCRIPTION and does not include the PROJECT CONDITIONS, this agreement is no longer valid; and

WHEREAS, the agreement shall expire on December 31, 2014; with the work to occur between June 15 and October 31; and

WHEREAS, nothing in this agreement authorizes the Applicant to trespass on any land or property, nor does it relieve the Applicant of the responsibility for compliance with applicable Federal, State, or local laws or ordinances. Placement, or removal, of any material below the level of ordinary high water may come under the jurisdiction of the U. S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act;

THEREFORE, the Applicant may proceed with the project as described in the PROJECT DESCRIPTION and PROJECT CONDITIONS. A copy of this agreement, with attached PROJECT DESCRIPTION and PROJECT CONDITIONS, shall be provided to contractors and subcontractors and shall be in their possession at the work site.

Failure to comply with all conditions of this agreement may result in legal action.

This agreement is approved by:

Scott Wilson
Environmental Program Manager
Bay Delta Region

cc: Melissa Escaron
Warden Shelton
Lieutenant Riske
Warden Jones
Lieutenant Mason

California Natural Resources Agency
DEPARTMENT OF FISH AND GAME
BAY DELTA REGION
(707) 944-5520
Mailing address:
POST OFFICE BOX 47
YOUNTVILLE, CALIFORNIA 94599
Street address:
7329 SILVERADO TRAIL
NAPA, CALIFORNIA 94558

ARNOLD SCHWARZENEGGER, GOVERNOR

Fish & Game
JAN 21 2010
Yountville

Notification Number: 1600-2009-0271-3
Jameson Canyon Creek and Fagan Creek, Solano and Napa Counties

Mr. Jeffrey Jensen
California Department of Transportation District 4
111 Grand Ave.
Oakland, Ca
94623

PROJECT DESCRIPTION and PROJECT CONDITIONS

Description

The California Department of Transportation (Caltrans) proposes to widen State Route (SR) 12 along a 5.9 mile stretch between post mile (PM) 0.0 and PM 3.3 in Napa county, and PM 0.0 and PM 2.6 in Solano county (Project). East of Kelly Road, the Project will expand the existing two-lane highway to a four-lane highway. The Project will improve safety and reduce traffic congestion by increasing the capacity of SR 12. The Project will also minimize head-on accidents by adding a median barrier. The California Department of Fish and Game (Department) is issuing this Streambed Alteration Agreement #1600-2009-0271-3, for the project described herein.

To accommodate the Project, Caltrans will improve five major cross culverts greater than 36 inches in diameter. Fagan Creek and associated tributaries in Napa county, as well as tributaries to Jameson Canyon Creek in Solano county will be affected.

At PM .5 (Napa county) the 6x6-foot concrete box culvert crossing at Fagan Creek will be extended by 35 feet to the north. A new head wall will be required on the upstream side along with rock slope protection (RSP). Replacement and extension of RSP will also be installed on the outlet side of the culvert.

At PM 2.3 (Napa county) the corrugated steel pipe culvert and 4x4-foot concrete box culvert will be replaced with a 6x4-foot concrete box culvert at an improved angle to the stream. New headwalls and RSP will be placed both up and downstream of the new culvert.

At PM 2.5 (Napa county) where SR 12 crosses a tributary to Fagan Creek the 58x36-inch

corrugated metal pipe arch culvert will be extended by 85 feet to the north. A new head wall and RSP will be required. At the outfall a 48-inch culvert will be added to direct the flow away from an adjacent residence, a new headwall and RSP will be needed for this extension.

Runoff from a tributary to Fagan Creek located at PM 2.94 (Napa county) is collected and travels under SR 12 in a 10x6-foot concrete box culvert. This culvert also receives flow from another culvert. This existing concrete box culvert is going to be extended by 65 feet to the north and the contributing culvert will be replaced with a new pipe culvert.

At PM 1.02 (Solano county) a tributary to Jameson Canyon Creek is conveyed under SR 12 in a 4x4-foot concrete box culvert. This culvert will not be changed, however, a new 12x12-foot concrete box culvert will be installed next to the existing culvert to serve as a wildlife crossing.

At PM 1.31 (Solano county) runoff from the tributary to Jameson Canyon Creek is conveyed under SR 12 in a double 6x3-foot concrete box culvert. This culvert will be extended to the north by 35 feet and a third concrete box will be added to increase capacity.

Caltrans and/or its designee shall comply with the following conditions:

1. Caltrans and/or its Designees shall conduct all work according to the project description stated above as well as the plans submitted to the Department that are not in conflict with the above stated project description. Caltrans shall notify the Department of any modifications made to the plans submitted to the Department that pertain to impacts to the creek or the riparian corridor.

2. A Caltrans Designated On-site Biologist, approved by the Department, shall monitor weather forecasts for rain events in coordination with the Department. The Designated On-site Biologist and Caltrans Water Quality staff shall work together to ensure protection of aquatic resources before and during rain events. Storm Water Pollution Prevention Plan measures shall be monitored for proper installation and maintained to prevent sediment transport into the creek. The Resident Engineer shall make corrections suggested by the Designated On-site Biologist to ensure compliance with this Agreement.

3. Caltrans and/or its Designees shall only work within the stream zone between June 15 and October 15.

4. Caltrans shall submit an Off-site Riparian Mitigation Plan to the Department for approval including success criteria for percent cover and percent survival by October 31, 2011. All required mitigation planting shall be in place within 1 planting season following approval of the Offsite Riparian Mitigation Plan, mitigation area shall be increased by 15% for every year of delay. Compensation for permanent impacts shall be mitigated at a 3:1 ratio for loss of linear feet within the riparian zone. Compensation for permanent loss of native trees within the riparian zone shall be at a rate of 3:1, and 5:1 for riparian oaks. Off-site mitigation lands shall be

approved by the Department and shall be protected and managed in perpetuity.

5. Caltrans shall mitigate temporary riparian impacts at a 1:1 ratio through on-site restoration to achieve pre-construction habitat functions. On-site riparian mitigation design shall be informed by photos documenting pre-construction conditions.

6. Caltrans and/or its Designee shall be in compliance with Migratory Bird Treaty Act (MBTA) and Fish and Game Code 3503. To avoid potential impacts to nesting birds, Caltrans and/or its Designee shall remove vegetation or install exclusion measures during the time period of August 15 to February 15. If construction activities that have the potential to violate MBTA and Fish and Game Code 3503 are scheduled during the nesting season, focused surveys for active nests shall be conducted within 72 hours of said construction activities. If active nests are identified, a 50-foot no-work buffer for non-raptors and a 300-foot no-work buffer for raptors shall be established. If active nests are found, Caltrans shall consult with the Department and the United States Fish and Wildlife Service (USFWS) regarding appropriate action to comply with the MBTA of 1918 and the Fish & Game Code of California.

7. Within 48 hours prior to construction, the active work area, within the riparian zone, shall be surveyed by the Caltrans Designated On-site Biologist for California red-legged frog (CRLF). If any CRLF are found, work shall not start until the Department and USFWS have been contacted and have given their approval for work to continue. If any CRLF are found, the Department shall be contacted within two hours at (707) 944-5520. The results of the survey shall be emailed to Melissa Escaron, Staff Environmental Scientist, at mescaron@dfg.ca.gov. Refer to Notification Number 1600-2007-0217-3 when submitting the survey to the Department.

8. Within 48 hours prior to construction, the active work area, within the riparian zone, shall be surveyed by the Caltrans Designated On-site Biologist, at the appropriate time of day for presence of the western pond turtle (WPT), *Clemmys marmorata*. If any individuals are found, the biologist shall email Melissa Escaron, Staff Environmental Scientist, at mescaron@dfg.ca.gov, to incorporate protection measures into the project.

9. Caltrans and/or its Designee shall allow any wildlife encountered during the course of construction to leave the construction area unharmed.

10. If any state or federal listed species, or state species of special concern, are observed during project surveys, Caltrans shall submit California Natural Diversity Data Base (CNDDB) forms to the CNDDB for all preconstruction survey data within five working days of the sightings, and provide DFG Region 3 with copies of the CNDDB forms and survey maps.

11. Caltrans and/or its Designee shall install and maintain high-visibility Environmentally Sensitive Area fencing to protect sensitive resources. Caltrans and/or its Designee shall remove as little vegetation as is necessary to conduct construction activities.

12. Caltrans shall conduct an employee orientation program for all persons who will work

on-site during construction and landscape establishment activities. The program shall consist of a brief presentation from the Caltrans Designated On-site Biologist about the biology of the species listed in this agreement, their habitat needs, and their status.

13. The Designated On-site Biologist shall be present during initial ground disturbing activities within the riparian zone. The Resident Engineer shall stop work at the request of the Designated On-site Biologist to ensure protection of CRLF and WPT. Any individual handling CRLF and WPT shall hold valid State and Federal Scientific Collecting Permits.

14. Caltrans and/or it Designee shall have readily available plastic sheeting or visquine and will cover exposed spoil piles and exposed areas to prevent these areas from losing loose soil into the stream. These covering materials shall be applied when it is evident rainy conditions threaten to erode loose soils into the stream.

15. Caltrans and/or its Designee shall not commence construction within the riparian zone if the work and its associated erosion control measures cannot be completed prior to the onset of a storm event. 72-hour weather forecasts from the National Weather Service shall be consulted prior to start up of any phase of the project.

16. Caltrans and/or its Designee shall not operate equipment or vehicles in water-covered portions of the stream, or where wetland vegetation, riparian vegetation, or aquatic organisms may be destroyed, except as otherwise provided for in this Agreement and as necessary to complete authorized work.

17. Caltrans and/or its Designee shall locate staging and storage areas for equipment, materials, fuels, lubricants and solvents, outside of the stream channel and banks. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the stream will be positioned over drip pans. Any equipment or vehicles driven and/or operated within or adjacent to the stream will be checked and maintained daily, to prevent leaks of materials that if introduced to water could be deleterious to aquatic life. Vehicles will be moved away from the stream prior to refueling and lubrication.

18. Caltrans and/or its Designee shall prevent raw cement/concrete or washings thereof, asphalt, straw, paint or other coating material, oil or other petroleum products, or any other substances related to project activities which could be hazardous to aquatic life, wildlife, or riparian habitat from contaminating the soil and/or entering the waters of the State. Caltrans and/or its Designee may be subject to a citation for placing materials where they may enter a stream or lake.

19. Caltrans and/or its designee shall not dump any litter or construction debris within the riparian/stream zone. All such debris and waste shall be picked up daily and properly disposed of at an appropriate site.

20. Any materials placed in seasonally dry portions of a stream or lake, that could be washed

downstream or could be deleterious to aquatic life, wildlife, or riparian habitat shall be removed by Caltrans and/or its Designee prior to inundation by high flows.

21. Caltrans shall submit to the Department for approval, any stream diversion plans at least 3 weeks prior to installation.

22. A copy of this Agreement shall be provided to all contractors, subcontractors and all Resident Engineers. Copies of this Agreement shall be available at the project site during all periods of active work and must be presented to Department personnel upon demand. Department personnel shall be allowed onto the work site at any time during and after construction of the project for the purposes of establishing compliance with this Agreement.

23. Caltrans and/or its Designee are liable for compliance with the terms of this Agreement, including violations committed by the contractors and/or subcontractors. The Department reserves the right to suspend construction activity described in this Agreement if the Department determines any of the following has occurred:
A) Failure to comply with any of the conditions of this Agreement
B) Information provided in support of the Agreement is determined by the Department to be inaccurate
C) Information becomes available to the Department that was not known when preparing the original conditions of this Agreement (including, but not limited to, the occurrence of State or federally listed species in the area or risk to resources not previously observed)
D) The project as described in the Agreement has changed or conditions affecting fish and wildlife resources change.

To the extent that any provisions of this Agreement provide for activities that require Caltrans to traverse another owner's property, such provisions are agreed to with the understanding that Caltrans possesses the legal right to so traverse. In the absence of such right, any such provision is void.

In the event that the project scope, nature, or environmental impact is altered by the imposition of subsequent permit conditions by any local, state or federal regulatory authority, Caltrans shall notify the Department of any imposed project modifications that interfere with compliance to Department conditions.

If Caltrans needs more time to complete the authorized activity, the work period may be extended on a day-to-day basis by Melissa Escaron, Staff Environmental Scientist, at (707) 339-0334 or the Yountville office at (707) 944-5520.

A copy of this agreement must be provided to the contractor and all subcontractors who work within the stream zone and must be in their possession at the work site.

Amendments and Extensions

Caltrans shall notify the Department before any modifications are made in the project plans submitted to the Department. Project modifications may require an amendment or a new notification.

This Agreement is transferable to subsequent owners of the project property by requesting an amendment.

To extend the Agreement beyond the expiration date, a written request or completed "Request to Extend Lake or Streambed Alteration Agreement" form, with an appropriate fee, must be submitted to the Department (1600 Program, Post Office Box 47, Yountville, California 94599) for consideration at least 30 days before the Agreement expiration date. An extension requires a fee. The Fee Schedule and Extension form can be obtained at www.dfg.ca.gov/habcon/1600/Forms.html or by phone at (707) 944-5520. Extensions of the original Agreement are issued at the discretion of the Department.

To modify the project, a written request for an amendment or a completed "Request to Amend Lake or Streambed Alteration Agreement" form, with an appropriate fee, must be submitted to the Department (1600 Program, Post Office Box 47, Yountville, California 94599). An amendment requires a fee. The Fee Schedule and Amendment form can be obtained at www.dfg.ca.gov/habcon/1600/Forms.html or by phone at (707) 944-5520. Amendments to the original Agreement are issued at the discretion of the Department.

Please note that you may not proceed with construction until your proposed project has undergone CEQA review and the Department signs the Agreement.

I, the undersigned, state that the above is the final description of the project I am submitting to the Department for CEQA review, leading to an Agreement, and agree to implement the conditions above required by the Department as part of that project. I will not proceed with this project until the Department signs the Agreement. I also understand that the CEQA review may result in the addition of measures to the project to avoid, minimize, or compensate for significant environmental impacts:

Applicant's name (print): Jeffrey G Jensen

Applicant's signature: Jeffrey G Jensen

Signed the 19th **day of** January**, 2010**

Applicant's initials JGJ

State of California – The Natural Resources Agency **ARNOLD SCHWARZENEGGER**, *Governor*
DEPARTMENT OF FISH AND GAME
Bay Delta Region
Post Office Box 47
Yountville, California 94599
(707) 944-5520
www.dfg.ca.gov

April 14, 2010

Jeffrey G. Jensen
California Department of Transportation
Environmental Planning
111 Grand Avenue
Oakland, CA 94623

Subject: Amendment of Lake or Streambed Alteration Agreement
Notification No. 1600-2009-0271-R3
Jameson Canyon Creek and Fagan Creek

Dear Mr. Jensen:

The Department of Fish and Game ("Department") has received your request to amend Lake or Streambed Alteration Agreement 1600-2009-0271-3 ("Agreement") for a minor amendment. Your request to amend the Agreement includes:

The temporary placement of a railroad boxcar bridge spanning a small unnamed tributary at post mile 3.2. The abutments will be placed outside of the banks of the creek and the bridge will freespan the creek. The span of the bridge is approximately 37 feet. No trees will be removed to construct this temporary bridge.

Culverts will be constructed, replaced, or extended at the following post mile locations in Napa county: .25, .5, .7, 1.25, 1.35, 1.6, 1.75, 1.9

Culverts will be constructed, replaced, or extended at the following post mile locations in Solano county: 2.15, 2.25, 3.15

The Department hereby agrees to amend the agreement as requested. All other conditions in the Agreement remain in effect unless otherwise noted herein.

Please sign and return one copy of this letter to acknowledge the amendment. Copies of the Agreement and this amendment must be readily available at project worksites and must be presented when requested by a Department representative or agency with inspection authority.

If you have any questions regarding this matter, please contact Melissa Escaron, Staff Environmental Scientist at (707) 339-0334 or mescaron@dfg.ca.gov.

Sincerely,

Scott Wilson

Scott Wilson
Environmental Program Manager
Bay Delta Region

cc: Melissa Escaron
Warden Shelton
Lieutenant Riske
Warden Jones
Lieutenant Mason

ACKNOWLEDGEMENT

I hereby agree to the above-referenced amendment.

Print Name: Jeffrey G. Jensen Date: 4/20/10

Signature: _____

California Regional Water Quality Control Board
San Francisco Bay Region

Linda S. Adams
Secretary for Environmental Protection

1515 Clay Street, Suite 1400, Oakland, California 94612
(510) 622-2300 • Fax (510) 622-2460
http://www.waterboards.ca.gov/sanfranciscobay

Arnold Schwarzenegger
Governor

July 30, 2010
Site No. 02-28-C0350 (BT)
CIWQS Place No. 742494

California Department of Transportation
Attn: Ms. Kelly Hirschberg
Kelly_Hirschberg@dot.ca.gov
111 Grand Avenue
Oakland, CA 94612

Subject: Water Quality Certification for the Jameson Canyon State Route 12 Widening Project, unincorporated Napa and Solano Counties

Department Project No.: EA 04-26411

Dear Ms. Hirschberg:

San Francisco Bay Regional Water Quality Control Board (Water Board) staff have reviewed the 401 water quality certification application submitted by the California Department of Transportation (the Department) for the Jameson Canyon Roadway Widening Project (Project). The Department is seeking a permit for the Project from the U.S. Army Corps of Engineers (ACOE) pursuant to Clean Water Act (CWA) Section 404 Nationwide Permit No. 14 (*Maintenance*). You applied to this office under Section 401 of the CWA for water quality certification verifying that the Project does not violate State water quality standards.

Project: The Department proposes to widen an approximately six-mile segment of State Route 12 (SR 12) through Napa and Solano Counties. This segment will be converted from a 2-lane to a 4-lane highway with shoulders. The Project area extends between SR 12 post-miles 0.00 and 3.3 in Napa County, and between post-miles 0.00 and 2.6 in Solano County. Widening will occur primarily on the north side of the existing roadway.

Other Project activities include installation of eleven retaining walls, modifications to the intersections of SR 12 with Kelly, Kirkland Ranch, and Lynch Roads, and construction of a median opening with acceleration and deceleration lanes.

Impacts: Because the Project involves roadway widening and drainage modifications over an approximately 3.3-mile length, there are several, relatively small areas of impact. Refer to

Attachment A, Summary of Impacts, for a detailed inventory of impact locations, area, and linear footage.

The proposed Project will result in permanent impacts to approximately 0.10 acres of jurisdictional wetlands and approximately 1,489 linear feet (0.12 acres) of jurisdictional waters. All permanent impacts are the result of either cut and fill associated with roadway widening, placement of rock slope protection, or culvert extensions.

The proposed Project will result in temporary impacts to approximately 0.30 acres of jurisdictional wetlands and approximately 1,809 linear feet (0.11 acres) of jurisdictional waters due to use of construction access areas. Temporary impacts are defined as all jurisdictional areas not disturbed from more than one construction season and can be re-vegetated post-construction and within the next growing season.

The proposed Project will also result in permanent and temporary impacts to approximately 0.90 (376 linear feet) and 0.81 acres (737 linear feet), respectively, of riparian habitat at ten discrete locations.

Hydromodification impacts: Added impervious areas may result in alterations to existing hydrologic regimes, resulting in erosion and/or changes of sediment transport in receiving waters (hydromodification). Project implementation would result in approximately 28.0 acres of added impervious area and therefore the Department is required to evaluate and mitigate potential hydromodification impacts. As detailed in a Hydromodification Report dated April 2010, and as amended July 2010, the Department evaluated susceptibility for hydromodification impacts to all receiving waters within the Project limits. The Department has identified receiving waters susceptible to hydromodification impacts and has proposed mitigation as appropriate (see Hydromodification Mitigation, below).

Jurisdictional Wetlands and Waters Mitigation: To compensate for permanent impacts to approximately 0.1 acres of jurisdictional wetlands, the Department shall purchase 0.1 acres of seasonal wetland credits at the Elsie Gridley mitigation bank.

Mitigation of temporary impacts to jurisdictional waters, wetland, and riparian habitat shall be achieved on-site by, among other measures, implementation of permanent erosion control using native plants and seed. To address these temporary impacts, the Department has drafted a "Mitigation and Monitoring Plan for On-Site Restoration Activities" that shall be finalized and implemented. The Department shall restore functions and values to all areas of temporary impact (see certification condition no. 8).

To mitigate for 1,489 linear feet (0.12 acres) of permanent fill to jurisdictional waters, and for 0.90 acres (376 linear feet) of permanent impact to riparian habitat, the Department has proposed to partner with the Solano County Resource Conservation District to fund riparian restoration

activities along 4,460 linear feet of the South Fork of Lynch Creek, in unincorporated Solano County. Implementation shall include construction of rock vane and step-pool structures at two locations, construction of two floodplain insets, planting of native trees and shrub vegetation, invasive plant removal, removal of culverts, and restoral of a creek channel segment to its historical alignment.

Roadway Pollutant Mitigation: As mitigation for increased pollutant loads associated with impervious areas, the Department shall provide treatment of stormwater runoff from approximately 32.3 acres of impervious area using 30 compost-amended biofiltration strips and 21 bioswales and biofiltration swales.

The following biofiltration strips and corresponding locations will mitigate water quality impacts resulting from Project implementation:

Strip No.	County	Eastbound/ Westbound	From Post Mile	To Post Mile	Treated Impervious Area (ac)
1	Napa	EB	0.04	0.24	0.86
2	Napa	WB	0.29	0.37	0.31
3	Napa	WB	0.47	0.53	0.27
4	Napa	EB	0.83	0.86	0.03
5	Napa	EB	0.87	0.94	0.17
6	Napa	EB	1.05	1.22	1.00
7	Napa	EB	1.26	1.31	0.40
8	Napa	EB	1.33	1.43	0.60
9	Napa	WB	1.39	1.45	0.40
10	Napa	EB	1.53	1.58	0.26
11	Napa	EB	1.60	1.69	0.43
12	Napa	EB	1.79	1.85	0.27
13	Napa	EB	1.91	2.02	0.54
14	Napa	EB	2.21	2.27	0.28
15	Napa	EB	2.31	2.45	0.65
16	Napa	EB	2.45	2.55	0.47
17	Napa	EB	2.55	2.64	0.44
18	Solano	EB	0.46	0.53	0.40
19	Solano	EB	0.54	0.57	0.16
20	Solano	EB	0.83	0.86	0.16
21	Solano	EB	0.86	0.96	0.47
22	Solano	EB	0.97	0.98	0.10
23	Solano	EB	1.02	1.09	0.29
24	Solano	EB	1.10	1.15	0.23
25	Solano	EB	1.17	1.19	0.13
26	Solano	EB	1.20	1.30	0.48
27	Solano	EB	1.56	1.62	0.25
28	Solano	EB	1.75	1.82	0.32
29	Solano	EB	2.45	2.53	0.36
30	Solano	EB	2.53	2.56	0.13

Strip No.	County	Eastbound/ Westbound	From Post Mile	To Post Mile	Treated Impervious Area (ac)
				total:	10.86

The following biofiltration swales and corresponding locations will mitigate water quality impacts resulting from Project implementation:

Drainage Item No*.	County	Eastbound/ Westbound	From Post Mile	To Post Mile	Treated Impervious Area (ac)
3h	Napa	EB	0.50	0.53	0.82
4g	Napa	WB	0.55	0.56	1.67
9g	Napa	EB	0.72	0.75	1.39
12g*	Napa	EB	0.94	0.96	0.56
13l*	Napa	EB	0.96	0.99	0.39
22i*	Napa	EB	1.24	1.26	1.14
34e	Napa	WB	1.89	1.98	0.94
36h*	Napa	EB	2.05	2.11	1.07
43f	Napa	WB	2.30	2.35	0.84
52a	Napa	WB	2.55	2.62	1.40
56i*	Napa	EB	2.78	2.80	1.28
63e*	Napa	EB	3.12	3.12	0.18
63g*	Napa	EB	3.12	3.13	0.18
4c*	Solano	WB	0.28	0.29	0.29
14g*	Solano	EB	0.98	1.00	0.74
16k	Solano	EB	1.09	1.10	0.27
17c*	Solano	WB	1.17	1.18	0.38
20g	Solano	EB	1.30	1.33	0.47
23i*	Solano	EB	1.46	1.48	0.89
28a*	Solano	EB	1.64	1.66	0.56
37l*	Solano	EB	2.47	2.52	6.00
				total:	21.46
				Napa and Solano Mitigated Impervious Area, strips and swales:	32.3

Hydromodification Mitigation: To mitigate for catchments susceptible to hydromodification impacts, the Department shall implement the following mitigation measures:

Mitigation Measure	Swale No(s).†	Mitigated Impervious Area (ac)
Biofiltration swales	3h, 4g	0.12
Biofiltration swale	9g	0.04
Biofiltration swale with berm for detention	34e	0.32
Biofiltration swale with berm for detention	52a	0.58

* Denotes swale with underdrain
† Refer to *Roadway Pollutant Mitigation*, above, for swale information.

Mitigation Measure	Swale No(s).†	Mitigated Impervious Area (ac)
Underground Detention Pipe with weir at post-mile 2.96	n/a	0.73
Underground Detention Pipe with weir at post mile 0.11	n/a	0.16
Biofiltration swale	4c	0.02
Underground Detention Pipe with weir at post-mile 3.8	n/a	0.38
Underground Detention Pipe with weir at post-mile 0.86	n/a	0.68
Biofiltration swale	36h	0.61
Biofiltration swale with berm for detention, two Underground Detention Pipes with weirs between post-miles 2.30 and 2.35	43f	0.13
Biofiltration swale	14g	0.04
Biofiltration swale with berm for detention	16k	0.07
Biofiltration swale	17c	0.03
Biofiltration swale with berm for detention	20g	0.65
Underground Detention Pipe with weir between post-miles 1.26 and 1.33	n/a	
Biofiltration swale	23i	0.09
Biofiltration swale	28a	0.05
Biofiltration swale with berm for detention	37l	1.55
Underground Detention Pipe with weir between post-miles 2.10 and 2.19	n/a	
	total:	6.3

California Wetlands Portal. It has been determined through regional, state, and national studies that tracking of mitigation/restoration projects must be improved to better assess the performance of these projects, following monitoring periods that last several years. In addition, to effectively carry out the State's No Net Loss Policy for wetlands, the State needs to closely track wetland losses, gains, and mitigation/restoration project success. Therefore, we require that the Department use the California Wetlands Standard Form to provide Project information related to impacts and mitigation/restoration measures (see Condition No. 15 of this Certification). An electronic copy of the form and instructions can be downloaded at: http://www.waterboards.ca.gov/sanfranciscobay/certs.shtml. Project information concerning impacts and mitigation/restoration will be made available at the web link: http://www.californiawetlands.net.

CEQA Compliance: On January 31, 2008, the Department filed a Mitigated Negative Declaration for the Project.

Certification: I hereby issue an order certifying that any discharge from the referenced project will comply with the applicable provisions of sections 301 (Effluent Limitations), 302 (Water Quality

Related Effluent Limitations), 303 (Water Quality Standards and Implementation Plans), 306 (National Standards of Performance), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act, and with other applicable requirements of State law. This discharge is also regulated under State Water Resources Control Board Order No. 2003 - 0017 – DWQ, "General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received State Water Quality Certification" which requires compliance with all conditions of this Water Quality Certification. The following conditions are associated with this certification:

1. The Department shall adhere to the Standard and Regional conditions imposed by Nationwide Permit No. 14 (File No. 2008 00429N) and the 1602 Streambed Alteration Agreement, issued to the Department by the California Department of Fish and Game;

2. Erosion control measures shall be utilized throughout all phases of construction where sediment runoff from disturbed areas threatens to enter waters of the State, regardless of date. At no time shall silt-laden runoff be allowed to enter waters of the State;

3. Caltrans shall not commence Project construction within the riparian corridor if the work and its associated erosion control measures cannot be completed prior to the onset of a 72-hour storm event. 72-hour weather forecasts from the National Weather Service shall be consulted prior to beginning any Project phase;

4. The Department shall install thirty biofiltration strips and twenty-one biofiltration swales to treat stormwater contaminants from no less than 32.3 acres of impervious area. Swale and strips shall be installed and consistent with the information summarized above in "Roadway Pollutant Mitigation;"

5. No later than sixty days from issuance of this certification, the Department shall submit typical biofiltration swale cross-sections and soil mix details for all proposed swales. Project construction shall not commence until the cross-sections and soil mix have been found acceptable by Water Board staff;

6. The Department shall mitigate potential hydromodification impacts by implementation of the hydromodification measures inventoried above in the section, *Hydromodification Mitigation*;

7. Certification is conditioned upon submission to the Water Board of a Bill of Sale of 0.1 acres of seasonal freshwater wetland mitigation credits at the Elsie Gridley Mitigation Bank, to be submitted to the Water Board prior to Project construction;

8. The Department shall submit a final Mitigation and Monitoring Plan for On-Site Restoration Activities (On-Site Plan), to mitigate for temporary impacts to 0.30 acres of jurisdictional wetlands, 1,809 linear feet (0.11 acres) of jurisdictional waters, and 0.81 acres of riparian

habitat. The On-Site Plan shall be found acceptable by Water Board staff prior to initiation of Project construction. The On-Site Plan shall include:

a. A mitigation goal to restore all areas of temporary impact (noted above) to pre-construction habitat function and values;
b. A plan to provide permanent erosion control to all temporarily impacted areas, which includes native grass and forb seed, fertilizer, compost, and mulch;
c. A plan to provide 1.07 acres of on-site native riparian plantings, using a planting palette that includes, among other native plant species, hoary manzanita, toyon, big-leaf maple, basket rush, coast live oak, California sycamore and laurel, valley oak, white alder, and willow;
d. A commitment to conduct detailed pre-construction site assessments of each area where impacts to jurisdictional habitat are anticipated. The site assessments shall include documentation of the species present and percent cover of the herbaceous, shrub and tree canopy layers using the point-intercept method. The assessments shall be conducted before construction activities in these areas commence. Results of the assessments will be included in the Year 0 report to be submitted to the Water Board;
e. A planting plan and success criteria for willows planted within rock-slope protection. Success criteria for these willows shall include 35 and 70 percent cover after three and five years, respectively;
f. Success criteria for riparian trees, excluding willows planted in rock-slope protection. Success criteria for trees shall include 90, 80, and 70 percent survival after the 3rd, 5th, and 10th full growing seasons after planting;
g. Success criteria for shrubs shall include 75 percent survival, three years after planting, and 80 percent cover, of the original canopy cover, five full growing seasons after planting;
h. Success criteria for wetland plantings. Success criteria for wetland plantings shall include 51 and 80 percent total cover after the 2nd and 5th years, respectively;
i. A plan to stockpile and reuse all topsoil in areas of temporary impact;
j. An invasive plant control plan;
k. A plan to report percent cover, health, vigor, and mortality within each mitigation area;
l. A proposal to submit site maps with photo-documentation points. Prior to implementing the Project, the Department shall photographically document the condition of the Project site. Following installation of the mitigation, the immediate post-construction condition of the site shall be photo-documented and a report shall be submitted to the Water Board including the pre-construction photographs, the post-construction photographs, and the map with the locations of the photo-documentation points clearly marked (Year 0 report). The same photo-documentation points shall be used in future monitoring reports; and
m. A plan to submit, at a minimum, years 0, 1, 3, 5, 7, and 10, monitoring reports to the Water Board.

9. All temporarily disturbed areas shall be restored to pre-construction or enhanced conditions, using only native plant species, within the first growing season following cessation of construction activities in those areas;

10. The Department shall fund and implement a riparian restoration project in partnership with the Solano County Resource Conservation District (SCRCD). The restoration project shall be implemented in the South Fork of Lynch Creek or other location within the Benicia Hydraulic Sub Area. The riparian restoration project shall include the following:

    - Implementation of a restoration plan that shall restore riparian habitat and functions along no less than 4,400 linear feet of creek and be protected and managed in perpetuity;

    - A final off-site Mitigation and Monitoring Plan (Off-site MMP) shall be submitted and found acceptable to the Water Board Executive Officer no later than March 31, 2011. The accepted Off-site MMP shall be implemented. The Off-site MMP shall include:

        i. A detailed plan for restoration of riparian habitat and functions along 4,400 linear feet of creek, including:
            - Construction of rock vane and step-pool structures at two locations;
            - Construction of two floodplain insets;
            - Planting of native tree and shrub vegetation, with planting to be done between October 15 and March 31;
            - Invasive species management plan;
            - Establishment of a riparian buffer area;
            - A grazing management plan that is implemented in the context of a spatially-defined riparian buffer area;
            - An adaptive management plan;
            - Culvert removal; and
            - Restoration of the historical channel alignment at selected locations.

        ii. A monitoring plan. The monitoring plan shall include:
            - Performance standards and success criteria for the proposed work;
            - A proposal to submit annual monitoring reports for no less than 10 years. The Department may limit submittal of annual monitoring reports to years 0, 1, 2, 3, 5, 7, and 10; and
            - Site maps with photo-documentation points. Prior to implementing the Project, the Department shall photographically document the condition of the Project site. Following installation of the mitigation, the immediate post-construction condition of the site shall be photo-

documented and a report shall be submitted to the Water Board including the pre-construction photographs, the post-construction photographs, and the map with the locations of the photo-documentation points clearly marked (Year 0 report).

11. Any planting established as part of a Project on- or off-site mitigation plan shall not be considered successfully established until supplemental irrigation systems have been terminated for two or more full growing seasons;

12. All on- and off-site mitigation shall not be considered to satisfy the conditions of this certification until final mitigation success reports have been submitted to the Water Board and found acceptable by the Executive Officer;

13. Construction of all on- and off-site mitigation shall be completed prior to completion of Project construction. Failure to meet this deadline shall result in violation of this certification and the Department shall provide additional mitigation, subject to the acceptance of the Executive Officer;

14. Project construction within waters of the State shall occur only between June 15 and October 15. Regardless of date, Project construction within waters of the State is prohibited during rain events capable of mobilizing sediment;

15. Not later than 30 days prior to the beginning of construction of any Project component, the Department shall submit, acceptable to the Executive Officer, a final SWPPP to address the Project's expected construction stage impacts, prepared pursuant to the State Water Resources Control Board Water Quality Order No. 99-06-DWQ, the NPDES Statewide Permit for Storm Water Discharges From the State of California City of Transportation Properties, Facilities, and Activities;

16. Not later than 20 days prior to any dewatering and diversion activities, the Department shall submit a dewatering and/or diversion plan, subject to the acceptance of Water Board staff. The plan shall present a time schedule for dewatering activities and include a commitment to have all diversion structures removed from waters of the State, including final stabilization and restoration in areas where diversion occurred, prior to October 15;

17. This Certification applies to the Project as proposed in the application materials. Please be advised that failure to implement the Project as proposed is a violation of this water quality certification;

18. The Department shall maintain a copy of this water quality certification at the Project site so as to be available at all times to site operating personnel. It is the responsibility of the

Department to assure that all personnel (employees, contractors, and subcontractors) are adequately informed and trained regarding the conditions of this certification;

19. The Department is required to use the California Wetlands Standard Form to provide project information describing impacts and mitigation/restoration measures within 60 days from the date of this certification. An electronic copy of the form can be downloaded at: http://www.waterboards.ca.gov/sanfranciscobay/certs.shtml. The completed California Wetlands form shall be submitted electronically to habitatdata@waterboards.ca.gov or shall be submitted as a hard copy to both: 1) The Water Board (see the address on the letterhead), to the attention of California Wetlands Portal; and 2) San Francisco Estuary Institute, 7770 Pardee Lane, Oakland, CA 94621-1424, to the attention of Mike May;

20. This certification does not allow for the take, or incidental take, of any special status species. The City shall use the appropriate protocols, as approved by the California Department of Fish and Game and the U.S. Fish and Wildlife Service, to ensure that Project activities do not impact the Beneficial Use of the Preservation of Rare and Endangered Species;

21. No fueling, cleaning, or maintenance of vehicles or equipment shall take place within any areas where an accidental discharge to waters of the State may occur; construction materials and heavy equipment must be stored outside waters of the State;

22. Except as expressly allowed in this Certification, the discharge, or creation of the potential for discharge, of any soil materials including fresh concrete, cement, silts, clay, sand and other organic materials to waters of the State is prohibited;

23. This certification action is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to Section 13330 of the California Water Code (CWC) and Section 3867 of Title 23 of the California Code of Regulations(23 CCR);

24. This certification action does not apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license, unless the pertinent certification application was filed pursuant to California Code of Regulations (CCR) Title 23, Subsection 3855(b) and that application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought; and,

25. Certification is conditioned upon total payment of the full fee required in State regulations (23 CCR Section 3833). Water Board staff received full payment of $1,961.00 on July 20, 2009.

We anticipate your cooperation in implementing these conditions. However, please be advised that any violation of water quality certification conditions is a violation of State law and subject to

administrative civil liability pursuant to California Water Code (CWC) section 13350. Failure to respond, inadequate response, late response, or failure to meet any condition of this certification may subject you to civil liability imposed by the Water Board to a maximum of $5,000 per day per violation or $10 for each gallon of waste discharged in violation of this certification.

Conditions 5, 7, 8, 10, 15, 16, and 19 are requirements for information or reports. Any requirement for a report made as a condition to this action is a formal requirement pursuant to CWC section 13267, and failure or refusal to provide, or falsification of such required report is subject to civil liability as described in CWC section 13268.

Should new information come to our attention that indicates a water quality problem with this project, the Water Board may issue Waste Discharge Requirements pursuant to 23 CCR Section 3857.

If you have any questions, please contact Brendan Thompson at (510) 622-2506, or via e-mail to BThompson@waterboards.ca.gov.

Sincerely,

Shin-Roei Lee acting for

Bruce H. Wolfe
Executive Officer

cc (via e-mail):

Mr. Bill Orme SWRCB-DWQ
Mr. Hal Durio, USACE
Ms. Jane Hicks, USACE
Ms. Laurie Monarres, USACE
Mr. Jerry Roe, USFWS
Mr. Dale Bowyer, Water Board
Mr. Jason Brush, USEPA
Mr. Hardeep Takhar, Caltrans
Mr. Cyrus Vafai, Caltrans
Ms. Andrea Meier, USACE

Attachment A
Summary of Impacts

Summary of Impacts to Waters of the U.S. and Waters of the State (Including Wetlands)

Based on 100% Designs for Napa County and 95% Designs for Solano County

			Permanent Impacts						Temporary Impacts					
Feature Name	Map Number[1]	Stationing	Reason for Impact	Type of Material Discharged	Area (ft^2)	Area (ac)	Volume (ft^3)	Length (lf)[11]	Reason for Impact	Type of Material Discharged	Area (ft^2)	Area (ac)	Volume (ft^3)	Length (lf)[11]
Waters of the U.S. (Other Waters)[10]														
Point 6[4]	2	128	Cut/fill	Roadway fill	87	0.002	87	49	Work area	Equipment	57	0.0013	57	22
AW19[9]	6 & 7	248	Culvert	Culvert	74	0.0017	296	6	Work area	Equipment	4	0.0001	17	0
AW9[2]	6 & 7	225	RSP	RSP	61	0.0014	183	39	Work area	Equipment	379	0.0087	1,137	21
CT13[6]	6 & 7	246+50	Culvert	Culvert	388	0.0089	3,489	61	Work area	Equipment	370	0.0085	3,332	62
CT14[6]	6 & 7	246+50	Culvert	Culvert	139	0.0032	1,255	19	Work area	Equipment	179	0.0041	1,607	17
CT15 (Cattle Creek)[3]	10	328	Culvert and RSP	Culvert and RSP	362	0.0083	723	52	Work area	Equipment	305	0.007	610	43
CT2[4]	5	211	RSP	RSP	244	0.0056	244	30	Work area	Equipment	205	0.0047	205	11
CT21 (Fagan Creek)[3]	4 & 5	190	Culvert and RSP	Culvert and RSP	645	0.0148	1,289	58	Work area	Equipment	13	0.0003	26	1
ies2[2]	8	285	Culvert	Culvert	479	0.011	1,437	96	-	-	-	-	-	-
ies4[2]	11	160	-	-	-	-	-	-	Work area	Equipment	274	0.0063	823	29
Point 16[4]	6	225	Culvert	Culvert	152	0.0035	152	29	Work area	Equipment	105	0.0024	105	15
Point 23[3]	6	227	Culvert	Culvert	301	0.0069	601	89	Work area	Equipment	30	0.0007	61	6
Point 30[2]	8	285	RSP	RSP	187	0.0043	562	29	Work area	Equipment	9	0.0002	26	1
Point 33[7]	11 & 12	376+50	Culvert and RSP	Culvert and RSP	279	0.0064	139	74	-	-	-	-	-	-
Point 59[2]	5	212	RSP and cut/fill	RSP and roadway fill	227	0.0052	680	73	Work area	Equipment	17	0.0004	52	6
Point 64[3]	9	310	Culvert	Culvert	122	0.0028	244	16	Two work areas	Equipment	854	0.0196	1,708	86
Point 74 (Cattle Creek)[2]	10	328	RSP	RSP	35	0.0008	105	2	Work area	Equipment	87	0.002	261	5
Point 75[8]	10	335+50	Culvert and RSP	Culvert, RSP and boulders	601	0.0138	7,815	183	Work area	Equipment	39	0.0009	510	17
Point 76[5]	10	343	Culvert and RSP	Culvert, RSP and boulders	492	0.0113	1,969	148	Work area	Equipment	105	0.0024	418	27
s2 (Fagan Creek)[2]	4 & 5	190	RSP	RSP	240	0.0055	719	29	Work area	Equipment	392	0.009	1,176	48
Sub-Total	-	-	-	-	**5,114**	**0.1174**	**21,989**	**1,082**	-	-	**3,424**	**0.0786**	**12,131**	**417**
Waters of the State (Other Waters)														
CT19[9]	11	369+50	-	-	-	-	-	-	Work area	Equipment	4	0.0001	2	6
Point 1[9]	1	93 to 103	-	-	-	-	-	-	Bioswale	Bioswale	884	0.0203	442	950
Point 11&26[9]	4	173	Culvert	Culvert	91	0.0021	46	37	Work area	Equipment	13	0.0003	7	5
Point 12[9]	4	180+50 to 187+50	Cut/fill	Roadway fill	100	0.0023	50	331	Work area	Equipment	100	0.0023	50	336
Point 27[9]	3 & 4	159+50	Cut/fill	Roadway fill	39	0.0009	20	27	Work area	Equipment	122	0.0028	61	91
Point 4[9]	1	104+50	RSP	RSP	39	0.0009	20	12	Work area	Equipment	22	0.0005	11	4
Sub-Total	-	-	-	-	**270**	**0.0062**	**135**	**407**	-	-	**1,146**	**0.0263**	**573**	**1,392**
Waters of the U.S. (Wetlands)[10]														
Wet Meadow1[2]	8	286 to 289	Cut/fill	Roadway fill	-	-	-	-	Work area	Equipment	13,068	0.30	39,204	-
Point 6[4]	2	127+50	Culvert and roadway	Culvert and roadway fill	436	0.01	436	-	-	-	-	-	-	-
Point 48[3]	3	154	Cut/fill	Roadway fill	3,062	0.0703	6,125	-	-	-	-	-	-	-
Point 5[2]	2	117+50 to 119	Cut/fill	Roadway fill	540	0.0124	1,620	-	-	-	-	-	-	-
Point 53[4]	2	118+50	-	-	-	-	-	-	Work area	Equipment	17	0.0004	17	-
Point 7[4]	2	127+50	-	-	-	-	-	-	Work area	Equipment	9	0.0002	9	-
Point 8[2]	2	118+50	Culvert and RSP	Culvert and RSP	192	0.0044	575	-	-	-	-	-	-	-
Point 27[2]	3 & 4	163	Cut/fill	Roadway fill	144	0.0033	431	-	-	-	-	-	-	-
Point 83[2]	12	390	Culvert and RSP	Culvert and RSP	78	0.0018	235	-	Work area	Equipment	292	0.0067	876	-
Sub-Total	-	-	-	-	**4,452**	**0.1022**	**9,422**	**-**	-	-	**13,386**	**0.3073**	**40,106**	**-**
Totals					**9,836**	**0.2258**	**31,546**	**-**			**17,955**	**0.4122**	**52,810**	**-**

April 13, 2010

Table is based on the Impacts to Waters of the US and Waters of the State dated March 22, 2010.

ac = acres; ft^2 = square feet; ft^3 = cubic feet; lf = linear feet

[1] Map Number refers to the Impacts to Waters of the US and Waters of the State maps in Attachment C

[2] The volume of Wet Meadow1 was calculated with an estimated depth of three feet.

[3] Volume was calculated with an estimated depth of two feet.

[4] Volume was calculated with an estimated depth of one foot.

[5] Volume was calculated with an estimated depth of four feet.

[6] Volume was calculated with an estimated depth of nine feet

[7] Volume was calculated with an estimated depth of half a foot.

[8] Volume was calculated with an estimated depth of thirteen feet.

[9] Ditches were assumed to have a depth of half a foot.

[10] The acres of impacts to waters of the U.S. were received from Hal Durio / ACOE March 11, 2010.

[11] Linear feet of impacts are derived using the direction of flow

FOUNDATION REPORT
ROUTE 12/JAMESON CANYON ROAD WIDENING
RETAINING WALL RECOMMENDATIONS
SOLANO COUNTY, CALIFORNIA
04-Sol-12-0.0/2.6 EA 04-264141

For

MARK THOMAS & CO., INC.
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TABLE OF CONTENTS

PAGE

INTRODUCTION **1**
PROPOSED CONSTRUCTION **1**
PURPOSE AND SCOPE **2**
SITE CONDITIONS **3**
FIELD EXPLORATION AND LABORATORY TESTING **3**
SUBSURFACE CONDITIONS **5**
GEOLOGY **6**
REGIONAL GEOLOGY 6
SITE GEOLOGY 7
PUBLISHED LANDSLIDE MAPS 10
GEOMORPHIC INTERPRETATIONS AND SUBSURFACE CONDITIONS 11
SUBSURFACE GEOLOGIC CONDITIONS 14
RIPPABILITY 20
EARTHQUAKE CONSIDERATIONS **22**
SEISMIC SOURCES 22
SEISMIC HAZARDS/LIQUEFACTION IMPACT 22
FINDINGS AND RECOMMENDATIONS **24**
GENERAL 24
FOUNDATIONS 24
Geotechnical Parameters for Soil Nail/Tieback Wall Design *26*
Retaining Wall Recommendations *29*
Construction Considerations *51*
CULVERT 53
SEISMIC DESIGN CRITERIA 55
CORROSION 55
PLAN REVIEW 56
CONSTRUCTION OBSERVATION 56
INVESTIGATION LIMITATIONS **57**

PROJECT LOCATION MAP ..... Plate 1
GEOLOGIC MAP ..... Plates 2A to 2F
SEISMIC REFRACTION SURVEY LOCATION MAP ..... Plates 3A to 3G
STEREONET PLOTS ..... Plates 4A to 4D
FAULT MAP ..... Plate 5A
ALQUIST-PRIOLO EARTHQUAKE FAULT ZONE MAP ..... Plate 5B
INTERPRETED GEOLOGIC SECTIONS ..... Plates 6A to 6G
SITE PICUTRES (EXISTING ROCK SLOPES) ..... Plates 7A to 7C
TYPICAL CORE SAMPLE PICTURES ..... Plates 8A to 8D

Appendix A
LOG OF TEST BORINGS

Appendix B
LABORATORY TEST DATA

Appendix C
SLOPE STABILITY ANALYSIS RESULTS

Appendix D
"SEISMIC REFRACTION SURVEY REPORT", by NORCAL GEOPHYSICAL, NOV. 2008
RECENTLY PERFORMED SEISMIC REFRACTION RESULTS, LINES 1 TO 5 (DRAFT)

Appendix E
GEOMORPHIC FEATURES MAPS

Appendix F
SOIL NAIL WALL TEST ZONES

Appendix G
CALTRANS REVIEW COMMENTS AND RESPONSES

FOUNDATION REPORT
ROUTE 12/JAMESON CANYON ROAD WIDENING PROJECT
RETAINING WALL RECOMMENDATIONS
SOLANO COUNTY, CALIFORNIA
04-Sol-12-0.0/2.6 EA 04-264141

INTRODUCTION

This report presents the results of our foundation investigation for the proposed retaining walls along Route 12/Jameson Canyon Road in Solano Counties. Our work was performed generally in accordance with the scope of work as per our agreement. The general locations of the walls and their vicinity are shown on the Project Location Map, Plate 1.

The geotechnical recommendations presented in this report are intended for design input and are not intended to be used as specifications. These recommendations should not be used for direct bidding purposes.

PROPOSED CONSTRUCTION

Based on the plans provided, the proposed project along Route 12 will widen the existing two-lane facility to a four-lane divided conventional highway from Route 29 to Red Top Road. The total length of the roadway widening project within Solano County is approximately 2.6 miles.

The proposed widening will be mainly along the north side of the Route 12, and cut slopes will be made at various locations to accommodate the improvements. The newly constructed roadway will be used for the westbound direction, while the existing roadway will be upgraded to a standard shoulder width and will be used for the eastbound direction. These two road beds will be separated by a concrete median barrier with a minimum of 12-foot wide median. Between approximate Sta. 332+00 to 353+64, a soil nail wall (Retaining Wall No. 6) is proposed along the median in order to reduce the wall height on the uphill side of Route 12 (Retaining Walls No. 7A & 7B).

Based on the existing terrain, six retaining walls are planned along the north side of Route 12, and one additional retaining wall is planned along the south side to accommodate the future widening within Solano County. Some of the proposed wall heights are relatively tall. Based on our discussion with the design team and considering need for temporary shoring against hillside slope for conventional wall system, ground anchor system is considered a more cost-effective alternative

for supporting the proposed cut. The soil/rock conditions are better suited for a soil nail wall. In addition, this system provides support as the excavations are made. This is important for the existing slopes. Therefore, it is planned to use ground anchor systems (soil nail or tieback) for most of the walls (Retaining Walls No. 3 thru 7).

A fill wall, Retaining Wall No. 8, is proposed along the north side of the alignment, located at the eastern most end of the project limit. It is planned to use Caltrans standard Type 1 (mod.) wall to support the proposed widening. Another fill wall, Retaining Wall No. 10, is proposed along the south side of Route 12 because of the shift of planned alignment due to right-of-way issues. Therefore, it is planned to use Caltrans standard Type 5 (mod.) wall. Per our discussion with the designer, Caltrans standard wall design will be applied to majority of these two walls. However, portions of the wall will be modified from the standard design at the locations where culvert/pipe crosses the walls, and additional loads may be anticipated, and these portions will be specially designed.

PURPOSE AND SCOPE

The purpose of this investigation was to evaluate the general subsurface conditions at the project site, to evaluate their engineering properties, and to provide geotechnical recommendations for foundation and retaining wall design of the proposed project.

The scope of work performed for this investigation included a review of the readily available soils and geologic literature pertaining to the site including site reconnaissance, obtaining representative soil samples and logging soil and rock materials encountered in the exploratory borings, geophysical studies (seismic refraction), laboratory testing of the collected soil and rock samples, performing engineering analyses based on the field and laboratory data, and preparation of this report.

Due to limitations inherent in geotechnical investigations, it is neither uncommon to encounter unforeseen variations in the subsurface soil conditions during construction nor is it practical to determine all such variations during an acceptable program of drilling and sampling for a project of this scope. Such variations, when encountered, generally require additional engineering

services to attain properly constructed project. We, therefore, recommend that a contingency fund be provided to accommodate any additional charges resulting from technical services that may be required during construction.

Our recommendations in this report are based on the above information. Any major deviation should be reported to this office for consideration.

SITE CONDITIONS

Route 12 serves as an important interregional east-west link between Napa Valley and the Fairfield/Suisun area. Within the project limits, Route 12 is mostly a two-lane undivided highway, and the existing lane widths are 12 feet with shoulder widths ranging from 2.4 to 10 feet. The Southern Pacific railroad line is located relatively parallel to Route 12 on the south side. The general area along Route 12 is in a rural landscape, primarily used for agricultural and grazing purposes.

The existing terrain along Route 12 varies from flat to rolling terrain. The maximum roadway elevation is at approximate Elev. 335 feet at Sta. 265+00, which is close to the county boundary. The existing roadway elevation is at approximately Elev. 110 feet at the eastern end of the project. The existing alignment lies on the northern side of the canyon. A portion of the slopes along the north side of the alignment consists of exposed bedrock. The rock slopes typically range from 3(H):1(V) to 1(H):1(V). Nearly vertical cut faces were noted at some local spots.

FIELD EXPLORATION AND LABORATORY TESTING

The subsurface conditions at the proposed site were studied by multiple exploratory borings and also by seismic refraction surveys at various locations. Visual examination of bedrock exposed in the existing road cuts added to our understanding of subsurface conditions.

Most of the borings were advanced with a track-mounted drill rig using rotary-wash drilling method to a maximum depth of 160 feet. We also utilized a truck-mounted drill rig with hollow stem augers for borings at the existing roadway level. Driven samples were obtained from the

upper soil by using a 2.5-inch I.D. Modified California sampler or 1.4-inch I.D. Standard Penetration Test sampler under the impact of 140-lb hammer with 30-inch free drop. Rock cores were obtained by 101-wireline geobarrel system and HQ diamond core barrels. Both sampling barrels are 2.4-inch I.D. and were advanced by hydraulic pressure.

Horizontal drilling was considered in the early stage of the project. However, this was considered impractical due to the operational requirements of such drilling equipment and the constraint of the existing traffic conditions. (Traffic closure in both directions for the duration of drilling work was not permitted.) This was conveyed to the Project Team, STA and Caltrans. In order to better characterize the subsurface conditions along the wall locations, seismic refraction surveys were conducted.

The seismic refraction method provides a measure of the velocity of compressional p-waves as they propagate through soil and rock. Calculations of depth are made by determining time advances caused by higher velocity refracting layers. Quantification of velocities within rock allows an estimation of the rock hardness and degree of weathering and/or fracturing. An assessment of rock rippability was made by comparing the measured velocities to Caltrans rippability table.

In addition to the exploration program, our engineering geologist logged and mapped the rock bedding along the exposed cuts at the roadway elevation. He also reviewed the samples for defining the consistency in the different layers and attitudes of bedding planes and joint surfaces.

Laboratory tests were performed on selected soil samples collected during field exploration to evaluate the physical and engineering properties of the subsurface soils. The laboratory test methods and test results are presented in Appendix B. Laboratory test results for moisture content, dry unit weight, unconfined compressive strength, Plasticity Index and grain size classification of the soil samples are presented on the LOTB in Appendix A. Detail results of laboratory tests are presented in Appendix B.

It should be noted that the descriptions of the soils encountered and relevant boring information presented on the LOTB depict subsurface conditions only at the locations indicated on the plan and

on the particular date noted on the LOTB. Because of the variability from place to place within soil/rock in general, subsurface conditions at other locations may differ from conditions occurring at the boring locations explored. The abrupt stratum changes shown on the logs may be gradational and relatively minor changes in soil types within a stratum may not be noted on the logs due to field limitations. Also, the passage of time may result in a change in the soil conditions at these locations due to environmental changes.

SUBSURFACE CONDITIONS

Based on the boring data, the subsoils consist of firm to stiff clay with various thicknesses overlying the bedrock. Along the north side of Route 12, the surficial deposits are relatively thin, ranging from 10 to 40 feet. Along the south side of Route 12, the site is generally underlain by alluvium. The boring data indicate that the thickness of the alluvium is up to 60 feet, the maximum depth drilled. More descriptions of the subsurface conditions are presented in the "Geology" section. Detailed descriptions of the materials encountered in the exploratory borings are presented in Appendix A, "Log of Test Borings".

It should be noted that these descriptions and related information depict subsurface conditions only at the locations indicated on logs and on the particular date noted on the logs. Because of the variability from place to place within soil strata in general, subsurface conditions at other locations may differ from conditions occurring at the locations explored. The passage of time may result in a change in the soil conditions at the locations due to environmental changes.

Groundwater was not measured or encountered in the borings, which were advanced by rotary wash drilling method. Groundwater was measured (where encountered) in the borings that were advanced by hollow stem augers, located along the south side of Route 12. The groundwater depths are summarized in the following table.

Boring No.	Location	Elev. (ft)	Groundwater Depth (ft)	Groundwater Elev. (ft)
A-08-032 (B-227)	Sta. 290+60	282.0	18	264.0±
A-08-033 (RW-5)	Sta. 293+90	279.0	29	250.0±
A-08-035 (B-216)	Sta. 309+20	248.5	17.5	231.0±
A-08-036 (B-217)	Sta. 311+00	246.2	19.5	226.7±
A-08-041 (RW-7)	Sta. 320+00	237.0	34	203.0±
A-09-059 (B-223)	Sta. 362+50	220.0	41	179.0±

* The boring locations were not surveyed and are approximate based on the plans provided by the designer.

Borings A-08-035 (B-216) and A-08-036 (B-217) are located in the proximity of Cattle Creek. It is expected that the groundwater elevation could be primarily affected by the water level in the creek. According to the site condition and the topography data, groundwater level should be relatively deep. However, perched water may be expected between soil and rock interface. It is anticipated that groundwater level will vary with the passage of time due to seasonal runoff, groundwater fluctuations in the creek, surface and subsurface flow, ground surface run-off, and other factors that were not existent at the time of investigation.

GEOLOGY

Regional Geology

General geologic features pertaining to the site were evaluated by reference to the Geologic Map of the Cordelia and Fairfield South 7.5-minute Quadrangles, Solano and Napa Counties, California: A Digital Database (S. P. Bezore, C. E. Randolph, J. M. Sowers, and D. L. Wagner; California Geological Survey; 2000), and the Geologic Map of the Cuttings Wharf 7.5-minute Quadrangle, Napa and Solano Counties, California: A Digital Database (S. P. Bezore, C. E. Randolph-Loar, and R. C. Witter (California Geological Survey; 2002). Based on these publications, the geologic units beneath the existing roadway alignment consist of alluvium and bedrock. The bedrock beneath most of the proposed Route 12 alignment consists of Markley Formation (Tmk) and San Pablo Group (Tsp). Existing road cuts along the north side of a portion of the roadway expose sandstone and shale bedrock.

Geologic maps of the general project area and in the vicinity of the proposed retaining walls are shown on Plates 2A to 2F. Descriptions of the main geologic units are as follows:

Qa - Late Pleistocene to Holocene alluvium, undivided. Alluvium deposited in small valleys where separate fan, basin, and terrace units could not be delineated at the map scale, and where Holocene or Pleistocene age was uncertain. The unit includes flat, relatively undissected fan, terrace, and basin deposits, and small active stream channels.

Qls - Landslide deposits. Holocene and Pleistocene landslides.

Tsp - San Pablo Group (Miocene). Brown, gray, and white marine sandstone and minor conglomerates.

Tmk - Markley Formation (Eocene). Gray to yellow-brown, micaceous marine arkosic sandstone. Massive to well-bedded; contains abundant muscovite.

Site Geology

The published geologic maps for the area indicate the bedrock beneath most of the Route 12 alignment consists of Markley Formation sandstone and shale. The dip angles and dip directions indicated on the published geologic maps vary along the extent of the project due to folds whose axes trend generally north/south across Route 12.

Based on our visual examination in the field, bedrock is not exposed in most of the area along Route 12. We have referenced the dip angles and dip directions of bedding planes indicated on the published geologic maps. Portions of cut slopes along north side of Route 12 do expose bedrock. Some of these cut slopes (from Station 337+00 to 347+50) are covered with a drape of filter fabric and wire mesh, which obscures much of the bedrock structure. However, the attitudes of bedding planes and joint surfaces are visible and measurable at a number of places (between Stations 333+50 and 343+75). The following table lists dip angles and directions of bedding planes and joint surfaces we measured where they are exposed in the road cuts.

Attitudes of Bedding Planes and Joints (Exposed in Existing Cut Slope)

Station	Bedding		Joint	
	Angle of Dip (deg)	Direction of Dip (deg)	Angle of Dip (deg)	Direction of Dip (deg)
333+90	22	290	-	-
334+25	19	290	29	100
334+50	14	290	75	130
337+50	-	-	42	200
337+75	32	270	61	170
338+00	20	290	55	120
338+80	18	290	-	-
339+20	20	290	55	120
340+00	20	270	65	130
340+25	17	270	-	-
340+50	-	-	70	160
340+90	18	290	67	140
341+50	-	-	72	150
341+70	-	-	60	170
343+75	20	290	-	-

Between Stations 333+90 and 343+75, our engineering geologist measured the dip angles and dip directions (perpendicular to strike) of 11 bedding planes and 11 joint surfaces exposed in the nearly vertical cut slope. The dip angles of bedding planes vary from 14 to 22 degrees below horizontal; the directions of dip of bedding planes is in the northwesterly direction (270 to 290 degrees). The dips of joint surfaces vary from 42 to 79 degrees below horizontal; the dip direction of joint surfaces is toward the southeast, south, and southwest (100 to 200 degrees, i.e. out-of-slope). Consequently, there are slip-out scars (toppling) of past wedge-type rock fall failures in the taller cut slopes.

Rock cores were collected from some of the borings. However, the cores were not oriented relative to north (special equipment required). Consequently, to estimate the directions of dip of bedding planes in the cores we relied upon the strike and dip symbols on the published map as well as our engineering geologist's observations and measurements of bedding planes exposed in the existing nearby rock cut slopes along the north side of Route 12.

A number of intact rock core samples recovered from the borings contain both bedding planes and joint surfaces. In those cases, the angular difference between the bedding dip direction and the joint dip direction was used in combination with the published dip directions of bedding to calculate the dip direction of joint surfaces. (Refer to the following table). We estimated the directions of dip of joints found in cores that did not contain cohabitating bedding planes based upon the character and dip of joint surfaces found in samples which do have cohabitating bedding planes. Where there was little or no such control, we conservatively assumed that the directions of dip of joint surfaces were directly toward the proposed cuts/walls. The following table lists dip angles and directions of bedding planes and joint surfaces we measured in the cores recovered from the borings.

Attitudes of Bedding Planes and Joint (in core samples)

Boring No.	Depth Interval (ft)	Angle of Dip (deg)		Angular Difference (deg)	Direction of Joint Dip (deg)
		Bedding	Joint		
R-08-046 (RW-17)	48	6	64	-95	195
	54.6	15	58	-140	150
	55	10	53	-158	132
	60	19	62	106	36
	61.7	13	68	-120	170
	68.5	8	57	-150	140
	82.5	14	57	88	18
	84.4	14	49	-90	200
	106.9	14	59	93	23
	107.8	16	84	84	14
	112.1	21	50	-112	178
R-08-047 (RW-18)	39.5	8	33	-106	184
	47.3	11	76	-105	185
	50.7	8	83	-110	180
	83.2	12	38	-122	168
	96.9	9	62	-180	110
R-08-048 (RW-19)	45.1 - 45.8	12.5	63	-104	186
	50.3 - 50.8	7	72	-78	212
	52.4	13.5	72	-79	211
	107.6 - 108	15	33	-96	194
R-08-049 (RW-20)	55.7	13	53	69	359
	102.8	16	38	-73	217
R-08-050 (RW-21)	35.5	25	72	85	15
	52.5	14	61	-63	227

The computer program, RockPack (Watts), was used to prepare stereo-net plots that display the dip angles and dip directions of bedding planes and joint surfaces measured in the cores. (Refer to Plates 4A thru 4D for the stereo-net plots for each boring.)

Published Landslide Maps

Landslide hazards were mapped in the Cordelia - Vallejo Area by M. W. Manson in 1988 (Division of Mines and Geology, Open-File Report 88-22, Landslide Hazard Identification Map No. 13). The publication includes a geologic map and a map of landslides and related features as well as landslide and debris flow susceptibility maps.

Manson's Geologic Map indicates all of the slopes located north of the project roadway are underlain by Markley Sandstone Member of the Eocene-age Kreyenhagen Formation, described as: "Massive, grayish- to yellowish-brown, medium- to coarse-grained, micaceous, feldspathic sandstone; locally cross-bedded and pebbly; indurated but not cemented; ... extremely susceptible to slope failures." Several bedding plane attitudes and fold axes are shown on Manson's Geologic Map; however, the strike of bedding is generally north/south and dips are generally toward the northwest. (In general, Manson's geologic map is similar to that of Bezore, et al which we used to prepare our Plates 2A thru 2F. Therefore, Manson's geologic map is not included in as a plate in our report.)

Manson's Landslides and Related Features Map shows the limits of a number of definite, probable and questionable rotational slump-type landslides both large and small. Those that are too small to delineate are indicated by a filled arrow head symbol. In addition, a number of earth flows and debris flows are indicated symbolically (Scarps are depicted by an ovals; curved line depicts scoured channels; run-out deposits not shown). "Amphitheaters" of multiple debris flow scars are indicated by closely spaced dots. (A portion of Manson's Landslide Map is reproduced in our Plates. In additional, we traced each of Manson's slide features and overlaid them (in pink) on portions of Bezore's Geologic Map in our Plates 2A thru 2F.)

Manson's Relative Landslide Susceptibility Map shows all of the steep slopes located along the north side of the project roadway categorized as "Area A - Most Susceptible to Landslides -

characterized by steep slopes and includes most mapped landslides, underlain by Markley Sandstone, should be considered naturally unstable, subject to failure even in the absence of the activities of man."

Manson's Relative Debris Flow Susceptibility Map shows all of the steep slopes located along the north side of the project roadway categorized as "Area 1 - Most Susceptible to Debris Flows - evidence of debris flows is relatively common ..."

Geomorphic Interpretations and Subsurface Conditions

Our engineering geologist mapped the extents of landslide scarps, slump masses, debris flow source scars, and related downhill run-out deposits by interpreting geomorphic expressions visible in the project topographic contours. Arcuate depressions were identified as landslide or debris flow source areas while lobate features were identified as areas of deposition and accumulation. Areas of apparently thicker soil located downhill of obvious landslide and debris flow source areas were identified as "run-out" deposits. Incised gullies were identified as erosion scars.

Based on the principle of "balanced volume" (whereby the same amount of material that left the source area was deposited in the run-out area), our engineering geologist delineated the apparent extent of run-out deposits on the gentle slopes located downhill of source areas on the steep slopes. It has been our experience that individual debris flow events typically produce relatively thin run-out deposits where debris was able to spread out on gentle slopes located downhill of the source areas.

Appendix E contains maps which show our interpretation of the geomorphic features (landslides, debris flows, and associated run-out deposits). The following sections of this report describe the similarities and differences between the landslides shown on Manson's 1988 landslide map, those shown in the 1998 geologic map by Berzore, et. al., and those mapped by our engineering geologist based upon their geomorphic expression.

- ***Retaining Wall No. 3A,*** *"JC" Sta. 263+85 to "JC" Sta. 271+42*
  Retaining Wall No. 3B, *"JC" Sta. 271+42 to "JC" Sta. 273+17*
  Retaining Wall No. 3C, *"JC" Sta. 273+73 to "JCR2" Sta. 280+27*
  The planned location of Retaining Walls No. 3A, 3B & 3C will cut across several debris flow run-out deposits and one landslide run-out deposits. Manson's landslide map shows several small earth flows on the slope north (uphill) of the proposed wall location (between Stations 265+20 and 271+80). Our geomorphic interpretation of the project topographic contours and air-photos also indicate the presence of these slope features. The thickness of these debris flow run-out deposits is anticipated to be relatively thin.

  For the landslide and landslide run-out deposits, Boring R-09-070 was drilled within the landslide deposits. The boring encountered approximately 15 feet of landslide deposits materials. Beneath the layered landslide deposits, the boring encountered weathered sandstone and claystone bedrock.

- ***Retaining Wall No. 4A,*** *"JCR2" Sta. 285+45 to "JCR2" Sta. 289+86*
  Retaining Wall No. 4B, *"JCR2" Sta. 289+86 to "JCR2" Sta. 296+78*
  Manson's landslide map shows three landslides that extended across Route 12 (between Stations 284+80 and 296+50); these were not included on the Bezore's geologic map. The toes of these slides were mapped by Manson as extending to between 70 and 200 feet south of the highway (see Plate 2C) prior to its construction.

  During the 95% design phase, the alignment of Retaining Wall No. 4 has been modified from the location that was planned at the time we performed our field investigation (seismic refraction survey, Lines A1 & A2, and Boring R-08-030 and R-08-031). The proposed truck turn-around was relocated westward to approximate Sta. 286+00 to 288+00. According to our engineering geologist's geomorphic interpretations, the truck turn-around portion of the revised Retaining Wall No. 4A will cross several potential landslide run-out deposits with various estimated thicknesses as follows:

Sta.	Features	Est. thickness (ft)
285+00 – 286+70	Qlsro? (uncertain)	35
286+70 – 288+00	Qlsro	25 – 35

Borings A-08-028 and A-08-029 were drilled at the planned location where Retaining Wall No. 4A will cross these mapped landslide run-out deposits. Continuous sampling resulted in a nearly continuous column of samples which were split and examined in our laboratory. We interpret the observed layering found in the samples as evidence of repeated episodes of deposition that are visible in the samples down to depths of 35 and 24.5 feet in Borings A-08-028 and A-08-029, respectively. Beneath the layered landslide run-out deposits the borings encountered weathered sandstone and shale bedrock.

- ***Retaining Wall No. 5A**, "JCR2" Sta. 312+20 to "JC" Sta. 320+12*
  ***Retaining Wall No. 5B**, "JC" Sta. 320+12 to "JC" Sta. 323+59*
  The location and extent of the landslide run-out deposit that was mapped between Stations 319+10 and 322+65 are approximately the same on Manson's landslide map and Bezore's geologic map, except that the toe of the slide is shown as extending 100 feet south of the highway on Manson's landslide map (Refer to Plate 2D). According to our engineering geologist's geomorphic interpretation, the planned location of Retaining Wall No. 5B will cut across this relatively large landslide run-out deposit between Sta. 320+00 and 322+00.

  Borings R-08-039 and R-08-039A were drilled at the mid-line of the landslide run-out deposit where Retaining Wall No. 5B will cross it. Continuous sampling with Shelby tubes produced continuous cores that were split and examined in our lab. The bottom of the "tumbled" materials that we interpreted as landslide run-out deposits was found to a depth of 23 feet; weathered bedrock was found beneath that depth.

- ***Retaining Wall No. 6**, "JC" Sta. 331+96 to "JC" Sta. 353+58*
  ***Retaining Wall No. 7A**, "JC" Sta. 331+53 to "JC" Sta. 357+62*
  ***Retaining Wall No. 7B**, "JC" Sta. 335+00 to "JC" Sta. 357+01*
  Along the planned locations of Retaining Walls No. 6, 7A & 7B, no significant debris flows or landslide masses were previously mapped by Manson. Our engineering geologist's geomorphic interpretation indicates several erosion gullies present on the slopes north of the highway; however, no landslide or debris flow sources or run-out deposits were indentified.

The limits of the large landslide mass mapped by Manson between approximate Sta. 350+00 and 400+00 of Route 12 are nearly the same as those shown on Bezore's geologic map and in our geomorphic interpretation of the project topographic contours. The planned Retaining Wall No. 7B will cross the western margin of this very large landslide at approximate Sta. 358+00. This large landslide appears to be relatively old and shows no obvious signs of recent movement (eg. displaced cracks in roadway pavement) at its margins. This was also recognized by Caltrans in the Preliminary Geotechnical Report (dated February 2003).

- ***Retaining Wall No. 8****, "JC" Sta. 358+81 to "JC" Sta. 364+44*
  The boundaries of the large landslide mass mapped by Manson between Stations 350+00 and 400+00 of Route 12 are nearly the same as those shown on Bezore's geologic map. (See our Plate 2F). Our engineering geologist's geomorphic interpretations of the project topographic contours suggest that Retaining Wall No. 8 is entirely within the limits of the large landslide. This landslide is apparently very thick, relatively old, and shows no obvious signs of recent movement (eg. displaced cracks in roadway pavement) at its margins. This was also recognized by Caltrans in the Preliminary Geotechnical Report.

- ***Retaining Wall No. 10****, "JCR2" Sta. 290+05 to "JCR2" Sta. 299+20*
  The planned location for Retaining Wall No. 10 is relatively flat, and it is mainly underlain by alluvium deposits. Based on our geomorphic interpretations of the project topographic contours, landslides or other slope features were not identified where Retaining Wall No. 10 is planned. Therefore, no additional exploration was conducted for evaluating landslide or other potential ground movement at this wall location.

<u>Subsurface Geologic Conditions</u>

- ***Retaining Wall No. 3A,*** *"JC" Sta. 263+85 to "JC" Sta. 271+42*
  Retaining Wall No. 3B, *"JC" Sta. 271+42 to "JC" Sta. 273+17*
  Retaining Wall No. 3C, *"JC" Sta. 273+73 to "JC" Sta. 280+27*
  At the planned location of Retaining Walls No. 3A, 3B & 3C, the bedrock is mapped by both Bezore and Manson as Markley Formation. The orientations of bedding planes shown on Bezore's geologic map suggest that bedding planes: 1) are horizontal at Station 276+00 (the

north/south-trending axis of a synclinal fold), 2) dip downward toward the east at increasing angle west of that, and 3) east of the fold axis, dip moderately (less than 10 degrees below horizontal) toward the west. However, the strike of the bedding is shown as perpendicular to the roadway and the planned retaining wall. Consequently, there is not expected to be an out-of-cut face component of bedding dip. Based on the boring data (R-09-68 thru R-09-070), the bedding planes observed in samples taken from the borings dip between 9 and 44 degrees. The borings encountered approximately 10 to 15 feet thick of lean clay, overlying weathered sandstone and claystone bedrock beneath the planned location of Retaining Walls No. 3A, 3B & 3C.

- ***Retaining Wall No. 4A,*** *"JCR2" Sta. 285+45 to "JCR2" Sta. 289+86*
  Retaining Wall No. 4B, *"JCR2" Sta. 289+86 to "JCR2" Sta. 296+78*
  At the planned location of Retaining Walls No. 4A & 4B, the bedrock is mapped by both Manson and Bezore as Markley Formation with bedding planes dipping 10 degrees below horizontal toward the northwest (296 degrees).

  Four borings were drilled along the proposed location of Retaining Wall No. 4. Boring R-08-030 encountered 15 feet of sandy clay (colluvium) overlying weathered sandstone down to depth of 29.5 feet; below that, claystone was encountered to a depth of 35 feet, below which rock cores contain sandstone and claystone to the depth explored (57 feet). However, the cores did not contain any measurable bedding planes or joint surfaces. Rock cores from Boring R-08-031 consist of weathered sandstone that was recovered down to depth of 50 feet; below which claystone was recovered. However, the cores did not contain any measurable bedding planes or joint surfaces.

  Two seismic refraction survey lines were performed at approximate Sta. 293+50 at the originally planned wall location. The profiles (Lines SR-A1 and SR-A2) indicate approximate 40 feet of highly weathered, soil-like bedrock (compressional wave velocity less than 3500 feet per second) where Retaining Wall No. 4 is planned at Station 293+50. The top of unoxidized bedrock (velocity greater than 7000 feet per second) is indicated at a depth of 50 feet, approximately 11 feet lower than the planned roadbed. (See Plate 6A for the interpreted seismic refraction profiles.)

During the 95% design, the alignment of proposed Retaining Wall No. 4 was shifted, and the truck turn-around was relocated westward to approximate Sta. 286+00 to 288+00. According to our geomorphic interpretation, the proposed turn-around portion of the wall will cut into landslide run-out deposits. To identify the subsurface condition there, two borings (Borings A-08-028 & A-08-029) were drilled at the proposed wall location. Interfaces between successive debris flow run-out deposits were observed at several depths in the samples. Layering we interpret as evidence of repeated episodes of deposition is visible in the samples down to depths of 35 and 24.5 feet in Borings A-08-028 and A-08-029, respectively. Beneath the run-out deposits, weathered bedrock was encountered.

- ***Retaining Wall No. 5A****, "JCR2" Sta. 312+20 to "JC" Sta. 320+12*
  Retaining Wall No. 5B*, "JC" Sta. 320+12 to "JC" Sta. 323+59*
  At the planned location of Retaining Wall No. 5A, the bedrock is mapped by both Manson and Bezore as Markley Formation with bedding planes dipping 10 degrees below horizontal toward the northwest (296 degrees). We anticipate that the soil-like landslide run-out deposits will be at the back of the wall. Based on the published geologic information and geomorphic interpretation by our engineering geologist, the proposed Retaining Wall No. 5B will cut across a landslide run-out deposit that originates from a recently active source area located on the slope uphill of the roadway. It appears that future movement of the recently active mass in that source area could exert a force on the relatively thick run-out deposits sufficient to cause movement at the proposed wall location.

  In the samples obtained from Borings R-08-039 and R-08-039A, the interface between the overlying landslide run-out deposits and in-place soil was observed at approximate 23 feet below the existing ground surface. The maximum design wall height of Retaining Wall No. 5B is up to 22 feet. In our opinion, the observed interface could be a weak zone above which future movement may be expected. Therefore, a tieback wall rather than a soil nail wall is recommended within the landslide run-out deposit (east of Sta. 320+00).

  Seismic refraction data was collected by NORCAL Geophysical at the proposed location of Retaining Wall no. 5B at approximate Sta. 314+50 & Sta. 321+50. The resulting velocity

profiles indicate 30 to 35 feet of highly weathered, soil-like bedrock (compressional wave velocity less than 3500 feet per second). The top of unoxidized bedrock (velocity greater than 6000 feet per second) is indicated at a depth of 60 feet at Sta. 314+50, and at a depth of 40 to 45 feet at Sta. 321+50. (See Plates 6B & 6C for the interpreted seismic refraction profiles.)

- ***Retaining Wall No. 6**, "JC" Sta. 331+96 to "JC" Sta. 353+58*
  ***Retaining Wall No. 7A**, "JC" Sta. 331+53 to "JC" Sta. 357+62*
  ***Retaining Wall No. 7B**, "JC" Sta. 335+00 to "JC" Sta. 357+01*
  Retaining walls No. 6, 7A & 7B are planned to be parallel with each other. The bedrock is mapped as Markley Formation by both Manson and Bezore at the planned locations of these walls. Exposures in the existing cut slopes located immediately south of the planned walls reveal bedding planes that dip 14 to 32 degrees below horizontal toward the northwest (290 degrees). Joint surfaces exposed in the existing cut slope dip at 30 to 75 degrees below horizontal toward the south (100 to 200 degrees).

Multiple borings have been drilled to explore the subsurface conditions at Retaining Walls No. 6, 7A & 7B. The recovered rock cores were examined and the descriptions of each borings are summarized below. (Summaries of measured attitudes of bedding and joint planes are included. References to respective stereo-net plots are provided.)

Boring	Rock Core Description
R-08-043 (RW-14)	The obtained rock cores did not reveal any measurable bedding planes or joint surfaces. The sandstone is deeply weathered to a soil-like texture.
R-08-044 (RW-15)	The obtained rock cores revealed 39 bedding planes that dip 9 to 26 degrees below horizontal toward the northwest (290 degrees) and 14 joint surfaces that dip from 37 to 77 degrees below horizontal toward the south. (See the top stereo-net in Plate 4A.).
R-08-046 (RW-17)	The obtained rock cores revealed 75 bedding planes that dip from 3 to 35 degrees below horizontal toward the northwest (290 degrees) and 23 joint surfaces that dip from 53 to 87 degrees below horizontal toward the south. (See the bottom stereo-net in Plate 4A.)

R-08-047 (RW-18)	The obtained rock cores revealed 24 bedding planes dip 6 to 24 degrees below horizontal toward the northwest (290 degrees) and 11 joint surfaces that dip from 25 to 83 degrees below horizontal toward the south. (See the top stereo-net in Plate 4B.).
R-08-048 (RW-19)	The obtained rock cores revealed 87 bedding planes that dip from 6 to 34 degrees below horizontal toward the northwest (290 degrees) and 16 joint surfaces that dip 47 to 82 degrees below horizontal toward the south. (See the bottom stereo-net in Plate 4B.)
R-08-049 (RW-20)	The obtained rock cores revealed 88 bedding planes dip 5 to 34 degrees below horizontal toward the northwest (290 degrees) and 15 joint surfaces that dip 38 to 89 degrees below horizontal toward the south. (See the top stereo-net in Plate 4C.)
R-08-050 (RW-21)	The obtained rock cores revealed a bedding plane that dips 14 degrees below horizontal and a joint surface that dips 61 degrees below horizontal toward the south. (See the bottom stereo-net in Plate 4C.)
R-08-051 (RW-22)	The obtained rock cores revealed 14 bedding planes dip 23 to 38 degrees below horizontal and 4 joint surfaces that dip 62 to 78 degrees below horizontal toward the south. We plotted on stereo-net the dip and direction of the bedding planes and joint surfaces measured in the rock cores. (See stereo-net in Plate 4D.)

Seismic refraction surveys have been conducted by NORCAL Geophysical at four areas within the vicinity of Retaining Walls No. 6, 7A, and 7B. NORCAL has referred to Caterpillar Performance Handbook when correlating the seismic velocities to the rippability. However, for this study and report, we are referring to Caltrans guidelines. In addition, the discussion below is based on combination of field boring data and seismic refraction data. Our interpretation of the seismic refraction survey results are at specific station locations and are summarized as follows:

Location	Interpretation
Sta. 334+50	Seismic refraction profiles SR-B2, SR-B3 and SR-B4 indicate approximately 15 feet of highly weathered, soil-like bedrock (compressional wave velocity less than 3500 feet per second) at Station 334+50. The top of unoxidized bedrock (velocity greater than 4500 feet per second) is indicated at an

approximately depth of 30 feet. (See Plate 6D and the attached NORCAL report in Appendix D for the interpreted seismic refraction profiles.)

Sta. 338+00 Seismic refraction profiles SR-C1 and SR-C2 indicate approximately 65 feet of highly weathered, soil-like bedrock (compressional wave velocity less than 4000 feet per second) at Station 338+00. The top of unoxidized bedrock (velocity greater than 7000 feet per second) is indicated at a depth of approximately 75 feet, slightly lower than the planned roadbed. (See Plate 6E and the attached NORCAL report in Appendix D for interpreted seismic refraction profiles.)

Sta. 345+50 Seismic refraction profiles SR-D1 and SR-D2 indicate that approximately 30 feet of highly weathered, soil-like bedrock (compressional wave velocity less than 4000 feet per second) at Station 345+50. The top of unoxidized bedrock (velocity greater than 5000 feet per second) is indicated at a depth of approximately 60 feet below the existing ground surface at Station 345+50. (See Plate 6F and the attached NORCAL report in Appendix D for interpreted seismic refraction profiles.)

Due to the existing terrain, access issues and equipment limitations, the seismic refraction survey results could not cross the planned wall location. Therefore, we have extrapolated the subsoil profiles for the purpose of estimating the rock rippability. We have also correlated P-wave velocity with the unconfined compressive strength test results according to Sharma & Singh (2008). According to Caltrans rippability criteria, the materials are considered difficult to rip at the lower elevations of the excavation

Sta. 355+00 The interpreted profiles for seismic refraction data collected along Lines 1 and 2 indicate approximately 70 feet of highly weathered, soil-like bedrock (compressional velocity less than 4000 feet per second) at Sta. 355+00, and approximately 50 feet at Sta. 354+00. The top of the oxidized bedrock (velocity greater than 7500 feet per second) is located at a depth of approximately 90 feet below the existing ground surface at Station 354+00, and approximately 70 feet below Station 355+00. (See Plate 6G and the attached NORCAL report in Appendix D for discussion of the interpreted seismic refraction profiles.)

- ***Retaining Wall No. 8**, "JC" Sta. 358+81 to "JC" Sta. 364+44*
  Based on the published geologic maps, Retaining Wall No. 8 is underlain by landslide deposits (map symbol "Qls"). Two borings were drilled to a maximum depth of 50 feet at the planned wall location. Boring A-09-058 encountered mainly sandy lean clay with interbedded layers of sand, and Boring A-09-059 encountered more granular materials to a depth of 50 feet, the maximum depths drilled. Groundwater was encountered at approximate 40 feet below existing grade in Boring A-09-059.

- ***Retaining Wall No. 10**, "JCR2" Sta. 290+05 to "JCR2" Sta. 299+20*
  Based on the published geologic maps, Retaining Wall No. 10 is underlain by alluvial deposits (map symbol "Qa"). Three borings were drilled to a maximum depth of 60 feet at the planned wall location. Borings A-08-032, A-08-033 & A-08-034 encountered mainly lean clay. Sand layers were encountered at various depths. Groundwater was encountered at approximate Elev. 264 feet in Boring A-08-032 and Elev. 250 feet in Boring A-08-033 at the time of drilling.

Joint surfaces are oriented such that there will be some out-of-cut-face component of dip exposed during construction of Retaining Walls No. 6, 7A & 7B. The depth to which oxidation and weathering has advanced in the other wall areas (Retaining Walls No. 3, 4 &5) has resulted in a significant weakening of the rock mass such that its mechanical behavior is more like soil than rock. Therefore, the presence of discontinuities (bedding planes and joint surfaces) is expected to be less significant for Retaining Walls No. 3, 4 and 5.

Rippability

NORCAL geophysical has provided data from of several seismic refraction survey (Appendix D) that were conducted for the tall walls. They have referred to Caterpillar Performance Handbook when correlating the seismic velocities to rippabiolity. However, for this study and report, we are referring to Caltrans guideline. Based on the publication "Repeatability of Pre- and Post-Excavation Seismic Refraction Data at the New Benicia-Martinez Bridge Toll Plaza, Northern California", by Mr. Dennison Leeds (undated), we understand that Caltrans uses their own chart to correlate seismic velocity with rippability. The standard Caltrans rippability correlation is as follows:

Velocity (m/s)	Velocity (ft/s)	Rippability
<1050	<3445	Easily Ripped
1050 – 1500	3445 – 4920	Moderately Difficult
1500 – 2000	4920 – 6560	Difficult Ripping/Light Blasting
> 2000	>6560	Blasting Required

Based on the available boring data within the vicinity of Retaining Wall No. 3, the bedrock is expected to be intensely weathered within the proposed cut area. The borings were drilled and did not require any coring.

At the planned locations of Retaining Walls No. 4 thru 7, seismic refraction surveys have been performed by NORCAL Geophysical Consultants, Inc. Their report (dated November 3, 2008) explains how the data was collected and processed to produce the color-coded seismic velocity cross-sections which display layers of equal compressional wave velocities. (Refer to Appendix D for the NORCAL report.)

Due to the steepness of the existing terrain, access issues, and equipment limitations, the seismic refraction surveys could not reach downhill to the planned locations of Retaining Walls No. 6, 7A & 7B (between Sta. 338+00 and Sta. 352+00), and horizontal drilling from the existing roadway level was considered impractical along the proposed wall locations. Therefore, for the purpose of estimating rock rippability, we have extrapolated the velocity data downslope. (Refer to Cross-Section 345+00 in Plate 6F.) We have also correlated compressional wave velocity (Vp) with the unconfined compressive strength test results according to Sharma & Singh (2007). The unconfined compressive strengths and the correlated Vp velocities are summarized in the following table:

Boring No.	Depth (ft)	UCS (psi)	Correlated Vp (ft/s)
R-08-048 (RW-19)	52 – 53	1120	6425
	68 – 69	1120	6425
	91 – 92	890	6344
	105.5 – 106	1180	6692

Based upon currently available data, we anticipate that excavations necessary for construction of Retaining Walls No. 3A, 3B, 3C, 4A, 4B, 5A, 5B and a portion of No. 6, 7A & 7B should have rippable rock conditions. The lower elevation of the excavations necessary to construct Retaining Walls No. 6 and 7A have higher velocities and should be considered "difficult to rip/light blasting" or "Blasting required" per Caltrans rippability criteria

It should be noted that these discussions are primarily based on available boring data and the geophysical test results at the specific locations. Therefore, this information should only be used as a general guide, as many other factors should also be considered, including rock jointing and fracture patterns, the experience of the equipment operator, and the equipment and excavation methods selected. In addition, the computed velocities along each line are an average, and there may be localized zones where the velocities may be higher or lower than indicated. Therefore, subsurface condition may vary from those depicted in the seismic refraction test results. Please refer to the study limitations in the report prepared by NORCAL Geophysical.

EARTHQUAKE CONSIDERATIONS

Seismic Sources

The project is located in a seismically active part of northern California. Many faults that exist in the San Francisco Bay Area are capable of producing earthquakes, which may cause strong ground shaking at the site. The attached Fault Map (Plate 5A) presents the locations of the fault systems relative to the project site. Due to the proximity of the faults, the possibility of the site to experience strong ground shaking may be considered moderate to high.

Seismic Hazards/Liquefaction Impact

Potential seismic hazards may arise from three sources: surface fault rupture; ground shaking; and liquefaction. Since no active fault passes through the project site, the potential for fault rupture is relatively low.

Liquefaction is a phenomenon in which saturated cohesionless soils are subject to a temporary but essentially total loss of shear strength under the reversing, cyclic shear stresses associated with earthquake shaking. Submerged cohesionless sands and silts of low relative density are the type of soils, which usually are susceptible to liquefaction. Clays are generally not susceptible to liquefaction.

Based on the available boring data, the site is generally underlain by clayey materials overlying bedrock formation. Also, the groundwater is expected to be relatively deep. In general, the liquefaction potential along the project site should be low.

However, both Borings A-08-035 & A-08-036, drilled in the vicinity of Cattle Creek, encountered submerged, relatively loose sand lenses, which might be subject to liquefaction during earthquake. The sand lenses encountered are relatively thin (approximately 5 feet, between Elev. 225 and 230 feet in Boring A-08-035), and the laboratory test results indicate that the fines contents of those sand lenses appear to be relatively high (>30%). Therefore, surface manifestation of ground failure might not be anticipated. The extent and consequences of this liquefaction, in our opinion, could be limited to some post-liquefaction settlements of the ground surface. Based on the boring data, the estimated volumetric strain based on $(N_1)_{60}$ is approximately 2% per Tokimatsu and Seed (1987). Due to the high fines content, the volumetric strain is expected to be lower. The anticipated post-liquefaction may be on the order of 1 inch, and probably would be random and localized. The impact to the proposed culvert and the head walls is considered relatively insignificant.

Borings A-08-033 and A-08-034 were drilled in the vicinity of recently added Retaining Wall No. 10. Groundwater was encountered in A-08-033 at Elev. 250 feet, approximately 30 feet below grade. Submerged, loose to medium dense sand layer was encountered between Elev. 215 and 230 feet, which may be subject to liquefaction during a strong earthquake. However, the layer appears to be discontinuous, and it is located relatively deep (approximate 50 feet below existing grade). In our opinion, the upper clays are expected to bridge over, and the impact due to the potential liquefaction is considered relatively small.

FINDINGS AND RECOMMENDATIONS

General

Based on the findings of the investigation, it is our opinion that the site is feasible for the planned project provided the recommendations presented in this report are incorporated into the final design and construction.

This report was prepared specifically for the proposed project according to the plans provided to us. Normal construction procedures were assumed throughout our analysis and represent one of the bases of recommendations presented herein. Our design criteria have been based upon the materials encountered at the site. Therefore, we should be notified in the event that these conditions are changed, so as to modify or amend our recommendations.

Foundations

Based on the existing terrain, seven retaining walls (Retaining Walls No. 3A/3B/3C, 4A/4B, 5A/5B, 6, 7A/7B, 8 & 10) are planned along Route 12 within Solano County to accommodate the proposed roadway widening. The design wall heights are relatively tall; therefore, it is planned to use ground anchor systems (soil nail or tieback) to support the cut slopes for most of the walls.

Based on the published geologic information (Bezore 2002 & Manson 1998) and our engineering geologist's geomorphic interpretations, mapped landslides, earth flows, debris flow source areas and zones of accumulations (run-out deposits) were identified at various locations. In the future, excessive moisture, mainly due to intensive rainfall, may cause renewed downhill movement of existing landslide masses and additional discharges of saturated soil from existing debris flow scars.

For the debris flows, future movement in the source area may cause additional soil to be deposited in the zones of accumulation (i.e. add to the debris flow run-out deposits). Such additional deposition is expected to consist of relatively thin layers of saturated soils that will accumulate on top of the fan-like deposits that are already present. The debris flow run-out deposits are generally

relatively thin and should not be subject to significant additional deposition. Therefore, the impact is considered low, and soil nail wall is considered feasible where the planned walls cross such areas.

The existing landslide run-out deposits are generally thicker. Future downhill movement of source landslides may exert a force on the existing run-out deposits located downslope of the source landslides. Where cut is to be made into a landslide run-out deposit, the retaining wall will need to be designed to provide sufficient resistance to counteract the force exerted on the run-out deposit by the source landslide mass plus the force exerted by the run-out deposit itself.

In locations where the planned retaining walls will retain a significant thickness of existing landslide run-out deposits, it is recommended that the wall be designed with tiebacks that are anchored beneath the run-out deposits that may be pushed by future movements of the source landslides located uphill of the run-out deposits.

Based on the above and our discussion with the designer, it is planned to use soil nail walls for Retaining Walls No. 3A, 3C, 4B, 5A, 6, 7A & 7B. For Retaining Wall No. 3B, 4A and 5B, tieback walls are proposed due to the presence of apparent landslide run-out deposits based on the boring data and our engineering geologist's geomorphic interpretations. Such deposits are originated from a source area located uphill of the wall location.

Retaining Walls No. 8 and 10 will be Caltrans Standard Type 1 (mod.) and Type 5 wall (mod.), respectively, to support the proposed widening. The recommendations of these two walls are also provided in the Geotechnical Design & Materials Report, which is submitted separately. The summary of the retaining walls is presented in the following table.

Retaining Wall Summary

Wall No.	Bridge Number	Wall Type	Station	Total Length (ft)	Max. Wall Height (ft)
RW No. 3A	21E0012	Soil Nail Wall	(JC) 263+85 – (JC) 271+42	748±	44±
RW No. 3B		Tieback Wall	(JC) 271+42 – (JC) 273+17	180±	
RW No. 3C		Soil Nail Wall	(JC) 273+73 – (JCR2) 280+27	723±	
RW No. 4A	23E0010	Tieback Wall	(JCR2) 285+45 – (JCR2) 289+86	459±	15±
RW No. 4B		Soil Nail Wall	(JCR2) 289+86 – (JCR2) 296+78	687±	21±
RW No. 5A	23E0011	Soil Nail Wall	(JCR2) 312+20 – (JC) 320+12	793±	27±
RW No. 5B		Soldier Pile and Tieback Wall	(JC) 320+12 – (JC) 323+59	357±	27±
RW No. 6	23E0012	Soil Nail Wall (median)	(JC) 331+96 – (JC) 353+58	2162±	20±
RW No. 7A	23E0013	Soil Nail Wall (bottom tier)	(JC) 331+53 – (JC) 357+62	2662±	53±
RW No. 7B		Soil Nail Wall (upper tier)	(JC) 335+00 – (JC) 357+01	2248±	51±
RW No. 8	23E0014	*Standard Type 1 (Modified)*	*(JC) 358+81 – (JC) 364+44*	*567.5±*	*20±*
RW No. 10	23E0015	*Standard Type 5 (Modified)*	*(JCR2) 290+05 – (JCR2) 299+20*	*1022±*	*12±*

Geotechnical Parameters for Soil Nail/Tieback Wall Design

For the design of the proposed soil nail/tieback walls, the determination of long-term shear strength of the on-site materials was generally based on site-specific borings and laboratory data including drained direct shear tests and Atterberg Limits of the representative samples obtained. Correlations of shear strength parameters with index properties (material type & Atterberg Limits) in available geotechnical literatures were also referenced. The available soil borings at the vicinity of each wall at the time this report is being prepared are summarized as follows.

Retaining Wall	Available Boring	Seismic Refraction Survey	Interpreted Profile
Retaining Wall No. 3A, 3B & 3C	A-08-026, A-08-027, R-09-068, R-09-069, R-09-070	-	-
Retaining Wall No. 4A	A-08-028, A-08-029	-	-
Retaining Wall No. 4B	R-08-030, R-08-031	Sta. 293+00 (2, A1 & A2)	Sta. 293+00 (Plate 6A)
Retaining Wall No. 5A	R-09-037, R-09-038, A-08-041	Sta. 314+50 (1, Line 5)	Sta. 314+50 (Plate 6B)
Retaining Wall No. 5B	R-08-039, R-08-039A, R-08-040, A-08-042	Sta. 321+25 (2, Lines 3 & 4)	Sta. 321+25 (Plate 6C)
Retaining Wall No. 6 Retaining Wall No. 7A Retaining Wall No. 7B	A-08-052, A-08-053, A-08-054, A-08-055, A-08-056, R-08-043, R-08-044, A-08-045, A-08-045A, R-08-046, R-08-047, R-08-048, R-08-049, R-08-050, R-08-051, A-08-057	Sta. 334+50 (3, B2 to B4) Sta. 338+00 (2, C1 & C2) Sta. 345+50 (2, D1 & D2) Sta. 355+00 (2, Lines 1 & 2)	Sta. 334+50 (Plate 6D) Sta. 338+00 (Plate 6E) Sta. 345+50 (Plate 6F) Sta. 355+00 (Plate 6G)
Retaining Wall No. 8	A-09-058, A-09-059	-	-
Retaining Wall No. 10	A-08-033, A-08-034, A-08-032	-	-

For Retaining Walls No. 3 to 5, the design wall heights generally range from 25 to 35 feet for the soil nail/tieback walls. The total height of the cut slope that will be supported by Retaining Walls No. 6 and 7 is greater than 100 feet. It is anticipated that bedrock will be exposed at various locations. The engineering characteristic and strength parameters of the bedrock should be properly assessed. Based on our discussions with Caltrans wall specialist (Ms. Kathryn Griswell), we have analyzed the slope stability and estimated the geotechnical design parameters based on the following approaches as we proposed in our preliminary design memorandum (dated January 23. 2009).

The strength parameters used for wall design were estimated based on field exploration, core samples, seismic refraction data, and back-calculation from the existing slope condition. According to our field observation, the existing rock slopes appear to be relatively stable (shallow rock debris/fall is noted, which is protected by wire mesh at some locations). The factor of safety (FS) from stability back-calculation is expected to be greater than 1.5, the minimum design requirement. The stability of the existing slope was evaluated by using SLOPE/W program. The

strength parameters were first estimated based on the seismic refraction survey data, laboratory test results and examination of the rock core samples. The parameters were then fine-tuned so that the stability of the existing slope has an approximate F.S. between 1.5 and 2. The factor is for the overall (global) stability of the slope.

Seismic Design. The proposed wall design under seismic loading condition should be analyzed per Caltrans guidelines (Guidelines for Structures Foundation Reports manual, Ver. 2.0, 2006), which recommends that the seismic factor equal to one third of the horizontal peak acceleration and not exceeding 0.2g. Sites with a pseudo-static factor of safety equal to or greater than 1.1 shall be considered to have adequate stability.

Bond Strength. The ultimate bond strengths of soil nails were estimated with reference to "Soil Nail Walls", published by FHWA (Geotechnical Engineering Circular No. 7, Report No.: FHWA-IF-03-017, 2003), and the ultimate bond strength of tiebacks were estimated with reference to "Recommendations for Prestressed Rock and Soil Anchors", published by Post-Tensioning Institute, 1996. The bond strengths were provided to the designer for analysis purposes.

For the proposed soil nail & tieback walls, we have provided design parameters for structural design and cost estimation purposes. The geotechnical parameters provided were estimated mainly based on the available boring data, geologic information and seismic refraction survey results. The recommendations of each wall are presented in the following paragraphs.

Per our discussion with the designer, it was suggested by Caltrans (Office of Special Funded Projects, OSFP) that the SNAIL program be conducted by the structure engineers in order to design the wall details (in determining yielding, punching or pull-out control mode). The detail wall design and calculations will be prepared and submitted by Mark Thomas & Co., Inc.

Retaining Wall Recommendations

- ***Retaining Wall No. 3A,*** *"JC" Sta. 263+85 to "JC" Sta. 271+42*
  Retaining Wall No. 3B, *"JC" Sta. 271+42 to "JC" Sta. 273+49*
  Retaining Wall No. 3C, *"JC" Sta. 273+73 to "JCR2" Sta. 280+27*
  The design wall height has increased up to 41.5 feet because of the alignment shift from the previous design phase (95%). According to our engineering geologist's geomorphic interpretations, a portion of Retaining Wall No. 3 will cross landslide run-out deposits, located around Sta. 272+00, as discussed in the "Geology" section. Boring R-09-070 was drilled at the planned wall location where the wall will cross these mapped landslide run-out deposits. The boring encountered approximately 15 feet thick of lean clay, overlying weathered sandstone and claystone bedrock.

  Tieback wall is recommended for the portion of the wall between Sta. 271+48 to 273+49, where the wall (Retaining Wall No. 3B) cuts into the landslide run-out deposits. For the rest of the wall, it is planned to use soil nail wall to support the cut slope.

  Retaining Walls No. 3A & 3C (Soil Nail Walls). Based on the boring data and the currently available geologic information, it is our opinion that soil nail wall should be feasible for the proposed retaining wall.

  The design parameters were originally estimated based on A-08-026 & A-08-027, which were explored to a depth of 30 feet from the existing roadway elevation for the originally planned Caltrans standard Type 1 wall. Based on the boring data, the surficial soils are relatively thin, approximately 5 to 10 feet. The consistency of the clays is generally very stiff. We have first estimated the long-term strength parameters based on the correlation between Atterberg test results and effective friction angle. For analysis purpose, we have assumed the soil/rock interface to be parallel to the ground surface.

  The parameters were then used to perform global stability analysis on the existing slope for verification. The parameters were then fine-tuned so that the global stability of the existing slope has an approximate F.S. of 2. We have conducted analysis along Sta. 266+00 based on the soil profile interpreted from Boring A-08-026 in order to verify the soil strength of the

surficial clay. According to the boring data, the clay thickness is approximately 10 feet. Based on the laboratory test results, the Liquid Limit (LL) of the clays is 51%, and the Plasticity Index (PI) is 24%. Similar analysis was conducted along Sta. 269+00 based on the soil profile interpreted from Boring A-08-027 for verifying the strength parameters of the weathered sandstone. Boring A-08-027 encountered weathered sandstone at relatively shallow depth (approximately 2 feet below the existing grade).

More borings were conducted in October 2009 within the private properties after the right-of-entry was granted (R-09-068 & R-09-069). The borings encountered approximately 10 to 15 feet thick of lean clay, overlying weathered sandstone and claystone bedrock beneath the planned wall location. This is consistent with our assumption for the estimated strength parameters for soil nail wall design. The laboratory test results also indicate that the encountered materials at the planned wall location have similar engineering properties as what was encountered in the previously conducted borings. The Atterberg limits are on the same order as the previous test results.

Based on the above, it is prudent to adopt the same geotechnical parameters for soil nail wall design as what were recommended previously. The recommended long-term strength parameters for soil nail wall design are listed as follows.

– *Retaining Wall No. 3A, Sta. 263+85 – Sta. 271+48*

Depth* (ft)	Soil Type	Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
0-15	Clay	120	28	250
Below 15	Weathered Rock	130	36	500

*Note: The depth is the vertical distance from the top of the wall.

– *Retaining Wall No. 3C, Sta. 273+49 – Sta. 276+50*

Depth* (ft)	Soil Type	Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
Full depth	Clay	120	28	250

*Note: The depth is the vertical distance from the top of the wall.

– *Retaining Wall No. 3C, Sta. 276+50 – Sta. 280+30*

Depth* (ft)	Soil Type	Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
0-15	Clay	120	28	250
Below 15	Weathered Rock	130	36	500

*Note: (1) The depth is the vertical distance from the top of the walls. (2) An additional boring was planned for Retaining Wall No. 3C. It has not been conducted due to constrain of accessing private property.

Retaining Walls No. 3B (Tieback Wall). Based on the geomorphic interpretation, the planned location of Retaining Wall No. 3B will cross one landslide run-out deposits between approximate Sta. 271+50 and Sta. 273+00. Boring R-09-070, which was drilled within the landslide deposits, encountered 15 feet of lean clay overlying weathered sandstone/claystone bedrock. The samples were closely examined, and an interface was observed at approximately 15 feet depth.

Based on the boring data and the geometry of the existing topography, we have assumed a weak plane at the bottom of the wall. Where the deposits are below the proposed cut, it is considered relatively stable as the materials are self-buttressed.

The run-out deposits may be pushed by future movements of the source landslides located uphill of the run-out deposits. Based on the nature of the landslide run-out deposits (layering deposits), we have assumed a relatively weak interface layer parallel to the existing ground surface that passes through the bottom of the wall.

The existing site condition appears to be relatively stable. The friction angle of the weak interface beneath landslide was back-calculated based on the geometry of the slope (slope and length of the slide) with conservatively assuming a F.S. of 1.0 and no groundwater. As discussed in the previous section, the future movement could be triggered by intense rainfall. Therefore, we have assumed groundwater at 5 feet above the weak interface, which resulted in a lower F.S. (less than 1.0), indicating that the mass becomes unstable. We have then back-calculated the force to achieve F.S. of 1.0.

For the run-out deposits, the same concept was adopted. However, based on the boring data and the existing terrain, the existing run-out deposits is considered even more stable, and the potential weak interface is expected to be relatively level. We have assumed the same friction angle for the weak interface within the run-out deposits as what was obtained from the previous analysis for landslide.

When calculating P_{TOTAL} (Caltrans Bridge Design Specifications, Section 5), we have also assumed groundwater at 5 feet above the weak interface, and the estimated load exerted by the landslide which was obtained from the previous step was also applied. P_{TOTAL} is the total external lateral load required at the wall face to provide a target factor of safety (FS) for the retained soil mass when stability is analyzed using an appropriate limiting equilibrium method of analysis. The minimum FS of 1.3 for static loads shall be used for the wall design. However, P_{TOTAL} should not be less than $1.44 \times P_{active}$. P_{active} for the proposed Retaining Wall No. 3B was estimated using an equivalent fluid pressure of 52 pcf (Ka = 0.43 for $\phi' = 28°$ and $\gamma = 120$ pcf).

The analyses were performed by using the computer program SLOPE/W (Geo-Slope, 2007). The estimation of the long-term shear strength of the on-site soil was based on boring data. The results of the slope stability analyses are attached in Appendix C of the report. The analyses results of P_{TOTAL} and the strength parameters are shown as follows:

- *Residual friction angle below landslide,* $\phi'_{LS} = 25°$
- *Residual friction angle below landslide run-out deposits,* $\phi'_{LSRO} = 25°$
- *Estimated force exerted from landslide,* $P_{QLS} = 15.5$ *kips*
- *Estimated* $P_{TOTAL} = 12.5$ *kips* ($>1.44 \times Pactive = 5.4$ *kips*)

Therefore, the estimated P_{TOTAL} based on F.S. of 1.3 will govern the tieback wall design. The P_{TOTAL} was derived based on the maximum design wall height. According to the extent of the run-out deposits, it is reasonable to assume P_{TOTAL} to be proportional with design wall height for design purpose. It is recommended that the lateral pressure diagram as shown in Figure 5.5.5.7.1-1 be used for designing the permanent tieback retaining wall.

It is our understanding that the minor fill (on the order of 3 feet) will be place behind the wall for the access road. After reviewing our analysis, this fill has relatively insignificant impact

when estimating the P_{TOTAL}. Therefore, it is recommended that the tieback wall be design based on the estimated P_{TOTAL} of 12.5 kips.

Installation. The tiebacks are anticipated to be anchored behind the weak plane into the native clayey soil or the weathered rock. It should be noted that changes in the subsurface conditions during construction may be expected. Caltrans standard performance specifications for tieback systems should be utilized for attaining the required design capacity. The contractor should develop their design and construction criteria. Hard drilling condition into the rock may be anticipated. Special tool/equipment may be required.

The bond strength for design of tieback bond length depends on factors such as installation technique, diameter of the holes etc. The estimated bond strengths were provided to the designer for analysis/cost-estimation purposes. Note that tieback is a design-build system, and the contractor should determine the bond length, drilling and grouting method, etc.

Unbonded & Bonded Zone. The minimum required unbonded zone for the tiebacks should be the distance between the wall face and weak plane or 15 feet, whichever is greater. For Retaining Wall 3B, it is our understanding that the right-of-way is limited. Therefore, based on available boring data, inferred slide plane angle and depth, it is recommended that 20 degrees tieback inclination be used to reduce the unbonded length. The minimum recommended unbonded length is 25 feet.

Due to the relatively long free lengths and potential perched water/groundwater, there could be caving potential of the drilled holes in existing deposits and fractured rock, and casing may be required for tieback installation.

Soldier Piles (CIDH). Based on the geologic condition, the landslide is considered smaller, and the design wall height is lower compared to Retaining Wall No. 5B. Therefore, cast-in-drilled-hole (CIDH) concrete piles are not considered necessary for Retaining Wall No. 3B.

However, in our opinion, soldier piles may be needed if the wall consists of only single row of tieback. If multiple rows of tiebacks will be used, then soldier piles might not be

necessary. Also, the need of soldier piles depends on the tieback angle. If the right-of-way needs to be minimized with steeper tieback angle, soldier piles may be required for supporting the vertical loads.

- ***Retaining Wall No. 4A****, "JCR2" Sta. 285+45 to "JCR2" Sta. 289+86*
  Retaining Wall No. 4B*, "JCR2" Sta. 289+86 to "JCR2" Sta. 296+78*
  Based on the General Plans provided, the design wall height is up to 21 feet. During the 95% design phase, the alignment of Retaining Wall No. 4 has been modified. The proposed truck turn-around was relocated to the western end at approximate Sta. 286+00 to 288+00. Four borings, R-08-030, R-08-031, A-08-028 & A-08-029 were drilled to a maximum depth of 60 feet along the wall alignment. In addition, two seismic refraction survey lines (SR A-1 & A-2) were conducted, located parallel and perpendicular to the wall alignment.

  According to our engineering geologist's geomorphic interpretations, the revised portion of Retaining Wall No. 4 will cross landslide run-out deposits, located west of Sta. 290+00, as discussed in the "Geology" section. Boring A-08-028 and A-08-029 were drilled at the planned location where Retaining Wall No. 4 will cross these mapped landslide run-out deposits. Continuous driven samples resulted in a nearly continuous column of samples which were split and examined in our laboratory. Layering that we interpret as evidence of repeated episodes of deposition are visible in the samples down to depths of 35 and 24.5 feet in Borings A-08-028 and A-08-029, respectively. Beneath the deposits, weathered bedrock was found.

  Therefore, it is planned to use soil nail wall to support the cut slope for wall east of Sta. 290+00, and tieback wall is recommended for the portion of the wall west of Sta. 290+00 where the wall cuts into the landslide run-out deposits.

  Retaining Wall 4A (Tieback Wall). Based on the geomorphic interpretation by our engineering geologist, the proposed wall will cross landslide deposits that originates from an active source area located on the slope uphill of the roadway. According to the wall height and the geologic condition, it is recommended that tieback wall be used to support the future cut slope in the landslide deposit.

In addition to the original project scope, two soil borings have been conducted at the proposed location of the wall. The samples were closely examined, and an interface was observed at approximately 23 feet depth. Layers of repeated episodes of deposition are visible in the samples down to depths of 35 and 24.5 feet in Borings A-08-028 and A-08-029, respectively. Beneath the deposits, weathered bedrock was found. Based on the boring data and the geometry of the existing topography, we have assumed a weak plane at the bottom of the wall. Where the deposits are below the proposed cut, it is considered relatively stable as the materials are self-buttressed.

The run-out deposits may be pushed by future movements of the source landslides located uphill of the run-out deposits. Based on the nature of the landslide run-out deposits (layering deposits), we have assumed a relatively weak interface layer parallel to the existing ground surface that passes through the bottom of the wall.

The existing site condition appears to be relatively stable. The friction angle of the weak interface beneath landslide was back-calculated based on the geometry of the slope (slope and length of the slide) with conservatively assuming a F.S. of 1.0 and no groundwater. As discussed in the previous section, the future movement could be triggered by intense rainfall. Therefore, we have assumed groundwater at 5 feet above the weak interface, which resulted in a lower F.S. (less than 1.0), indicating that the mass becomes unstable. We have then back-calculated the force to achieve F.S. of 1.0.

For the run-out deposits, the same concept was adopted. However, based on the boring data and the nature of the deposits, the existing run-out deposits are considered even more stable. For the friction angle of the weak interface beneath the deposits, it was back-calculated also based on the geometry of the slope (slope and length of the slide). The friction angle was iterated by assuming a F.S. of 1.3 and no groundwater condition.

When calculating P_{TOTAL} (Caltrans Bridge Design Specifications, Section 5), we have also assumed groundwater at 5 feet above the weak interface, and the estimated load exerted by the landslide which was obtained from the previous step was also applied. P_{TOTAL} is the total external lateral load required at the wall face to provide a target factor of safety (FS) for the retained soil mass when stability is analyzed using an appropriate limiting equilibrium method

of analysis. The minimum FS of 1.3 for static loads shall be used for the wall design. However, P_{TOTAL} should not be less than $1.44 \times P_{active}$. P_{active} for the proposed Retaining Wall No. 4 was estimated using an equivalent fluid pressure of 52 pcf (Ka = 0.43 for $\phi' = 28°$ and $\gamma = 120$ pcf). The analyses were performed by using the computer program SLOPE/W (Geo-Slope, 2007). The estimation of the long-term shear strength of the on-site soil was based on boring data. The results of the slope stability analyses are attached in Appendix C of the report. The analyses results of P_{TOTAL} and the strength parameters are shown as follows:

- *Residual friction angle below landslide,* $\phi'_{LS} = 14.5°$
- *Residual friction angle below landslide run-out deposits,* $\phi'_{LSRO} = 20°$
- *Estimated force exerted from landslide,* $P_{QLS} = 17.5$ *kips*
- *Estimated* $P_{TOTAL} = 25$ *kips* ($>1.44 \times Pactive = 8.4$ *kips*)

Therefore, the estimated P_{TOTAL} based on F.S. of 1.3 will govern the tieback wall design. The P_{TOTAL} was derived based on the maximum design wall height. According to the extent of the run-out deposits, it is reasonable to assume P_{TOTAL} to be proportional with design wall height for design purpose. It is recommended that the lateral pressure diagram as shown in Figure 5.5.5.7.1-1 be used for designing the permanent tieback retaining wall.

Installation. The tiebacks are anticipated to be anchored behind the weak plane into the native clayey soil or the weathered rock. It should be noted that changes in the subsurface conditions during construction may be expected. Caltrans standard performance specifications for tieback systems should be utilized for attaining the required design capacity. The contractor should develop their design and construction criteria. Hard drilling condition into the rock may be anticipated. Special tool/equipment may be required.

The bond strength for design of tieback bond length depends on factors such as installation technique, diameter of the holes etc. The estimated bond strengths were provided to the designer for analysis/cost-estimation purposes. Note that tieback is a design-build system, and the contractor should determine the bond length, drilling and grouting method, etc.

Unbonded & Bonded Zone. The minimum required unbonded zone for the tiebacks should be the distance between the wall face and weak plane or 15 feet, whichever is greater. Based

on available boring data, inferred slide plane angle and depth, and 15° tieback inclination (typical), the unbonded lengths are anticipated to be on the order of 30 feet.

The tieback angle may be steeper to reduce the unbonded length. Due to the relatively long free lengths and potential perched water/groundwater, there could be caving potential of the drilled holes in existing deposits and fractured rock, and casing may be required for tieback installation.

Soldier Piles (CIDH). Based on the geologic condition, the landslide is considered smaller in size, and the design wall height is lower compared to Retaining Wall No. 5B. Therefore, cast-in-drilled-hole (CIDH) concrete piles are not considered necessary for Retaining Wall No. 4.

However, in our opinion, soldier piles may be needed if the wall consists of only single row of tieback. If multiple rows of tiebacks will be used, then soldier piles might not be necessary. Also, the need of soldier piles depends on the tieback angle. If the right-of-way needs to be minimized with steeper tieback angle, soldier piles may be required for supporting the vertical loads.

Retaining Wall 4B (Soil Nail Wall). Based on the boring data and the seismic survey results, the subsoils generally consist of approximately 30 to 35 feet of soils, overlying bedrock along the north side of Route 12. Bedding planes also appear to dip in the northwesterly direction, and adverse bedding condition is not expected at this location.

The subsurface profile was mainly interpreted based on the seismic refraction survey. Based on the results, a "buried cliff" is noted at the back of the proposed wall (see Plate 6A). The borings, R-08-030 & R-08-031, encountered approximately 5 to 10 feet thick lean clay overlying clayey/silty sand and weathered sandstone. The Liquid Limit (LL) of the clay ranges from 42% to 56%, and the Plasticity Index (PI) ranges from 23% to 34%. The consistency of the clay is generally stiff to very stiff. We have estimated the long-term strength parameters based on the correlation between Atterberg test results and effective friction angle. For the sandy materials, drained direct shear test was performed on selected sample. The test result indicated that the clayey/silty sand has an effective friction angle (ϕ') of 30°, and c' of 280 psf within the stress range of interest.

We have conservatively assumed a lower bound strength parameters based on the correlation and the laboratory test results. The parameters were then used to perform global stability analysis on the existing slope for verification. Based on the analysis, the estimated parameters yielded a FS on the order of 2.5. According to the existing slope condition, this is considered reasonable. Based on the above, the recommended long-term strength parameters for soil nail wall design are listed in the following tables.

Design Parameters for Retaining Wall No. 4 – Sta. 290+00 to 293+75 (Plate C-2)

Depth* (ft)	Soil Type	Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
0-30	Clay	125	26	300
30-45	Soil-Like Weathered Rock	130	36	750
Below 45	Oxidized Rock	135	36	2000

*Note: The depth is the vertical distance from the top of the wall.

- ***Retaining Wall No. 5A**, "JCR2" Sta. 312+20 to "JC" Sta. 320+12*
  ***Retaining Wall No. 5B**, "JC" Sta. 320+12 to "JC" Sta. 323+59*

  Retaining Wall No. 5 was added into our project scope during 65% design due to the alignment shift. The maximum design wall height is approximately 27 feet. It is planned to use anchor wall system to support the proposed cut along the north side of Route 12. Along the proposed wall location, five more borings and seismic refraction survey have been conducted for the proposed wall No. 5. Based on the geomorphic interpretation by our engineering geologist, a portion of the wall will cross through a landslide run-out deposit (approximately Sta. 320+00 to 323+00) that originates from an active source area located on the slope uphill of the roadway. In our opinion, a tieback wall system should be used to retain the cut that will be made through the landslide run-out deposit. Therefore, the wall was divided into two segments shown as follows:

Wall No.	Wall Type	Station ("JC" Line)	Max. Wall Height (ft)
Retaining Wall No. 5A	Soil Nail Wall	312+20 – 320+00	27±
Retaining Wall No. 5B	Tieback Wall	320+00 – 323+59	27±

Retaining Wall No. 5A (Soil Nail Wall). Based on the two borings drilled along the proposed wall location, the subsoils mainly consist of "soil-like" highly weathered bedrock. Boring R-09-037 encountered approximately 25 to 30 feet of silty sand (highly weather sandstone) overlying lean clay (highly weathered claystone). Boring R-09-038 encountered lean clay and highly weathered claystone to approximate Elev. 216.5, the maximum depth drilled.

Based on the boring data, we have performed global stability analysis on the existing slope for estimating the strength parameters. The parameters were then fine-tuned so that the global stability of the existing slope has a reasonable F.S. (greater than 1.5). The following preliminary long-term strength parameters may be used for cost-estimation purpose.

Design Parameters for Retaining Wall No. 5A (Plate C-3)

Depth* (ft)	Soil Type	Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
0-30	Clay/Sand	125	30	300
30-50	Weathered Rock	130	36	400
50-60	Oxidized Rock	135	36	2000
Below 60	Un-oxidized Rock	140	36	4000

Retaining Wall No. 5B (Tieback Wall). Based on the available publication and the geomorphic interpretation by our engineering geologist, the proposed wall will cross a landslide run-out deposit that originates from an active source area located on the slope uphill of the roadway. According to the wall height and the geologic condition, it is recommended that soldier piles and lagging wall with tieback be used to support the future cut slope in the landslide deposit.

In addition to the original project scope, three additional soil borings have been conducted. The boring (R-08-039) encountered approximately 45 feet of lean clay overlying weathered sandstone. Based on the geometry of the existing topography, the slide plane is expected to be approximately 20 to 25 feet below the ground surface. We have collected continuous samples within that interval in Boring R-08-039A. The samples were closely examined, and an

interface was observed at approximately 23 feet depth. For analysis purpose, we have assumed that the weak interface intersects the bottom of the wall.

For estimating the P_{TOTAL} for the tieback wall design, the same approach as Retaining Wall No. 4 was adopted. The friction angle of the weak interface beneath landslide was back-calculated based on the geometry of the slope (slope and length of the slide) with conservatively assuming a F.S. of 1.0 and no groundwater. As discussed in the previous section, the future movement could be triggered by intense rainfall. Therefore, we have assumed groundwater at 5 feet above the weak interface, which resulted in a lower F.S. (less than 1.0), indicating that the mass becomes unstable. We have then back-calculated the force to achieve F.S. of 1.0.

For the landslide run-out deposits, the same concept was adopted. However, based on the boring data and the nature of the deposits, the existing run-out deposits is considered even more stable. For the friction angle of the weak interface beneath the deposits, it was back-calculated also based on the geometry of the slope (slope and length of the slide). The friction angle was iterated by assuming a F.S. of 1.3 and no groundwater condition.

When calculating P_{TOTAL} (Caltrans Bridge Design Specifications, Section 5), we have also assumed groundwater at 5 feet above the weak interface, and the estimated load exerted by the landslide which was obtained from the previous step was also applied. P_{TOTAL} is the total external lateral load required at the wall face to provide a target factor of safety (FS) for the retained soil mass when stability is analyzed using an appropriate limiting equilibrium method of analysis. The minimum FS of 1.3 for static loads shall be used for the wall design. However, P_{TOTAL} should not be less than $1.44 \times P_{active}$. P_{active} for the proposed Retaining Wall No. 5B was estimated using an equivalent fluid pressure of 52 pcf (Ka = 0.43 for $\phi' = 28°$ and $\gamma = 120$ pcf).

The analyses were performed by using the computer program SLOPE/W (Geo-Slope, 2007). The estimation of the long-term shear strength of the on-site soil was based on boring data. The results of the slope stability analyses are attached in Appendix C of the report. The analyses results of P_{TOTAL} and the strength parameters are shown as follows:

- *Residual friction angle below landslide, $\phi'_{LS} = 12.5^o$*
- *Residual friction angle below landslide run-out deposits, $\phi'_{LSRO} = 16.5^o$*
- *Estimated force exerted from landslide, $P_{QLS} = 20$ kips*
- *Estimated $P_{TOTAL} = 45$ kips ($>1.44 \times$Pactive = 15 kips)*

Therefore, the estimated P_{TOTAL} based on F.S. of 1.3 will govern the tieback wall design. The P_{TOTAL} was derived based on the maximum design wall height. According to the extent of the run-out deposits, it is reasonable to assume P_{TOTAL} to be proportional with design wall height for design purpose. It is recommended that the lateral pressure diagram as shown in Figure 5.5.5.7.1-1 be used for designing the permanent tieback retaining wall. For designing the temporary concrete lagging, an active earth pressure of 12.5 pcf EFP is recommended.

Installation. The tiebacks are anticipated to be anchored behind the slide plane into the native clayey soil or the weathered rock. It should be noted that changes in the subsurface conditions during construction may be expected. Caltrans standard performance specifications for tieback systems should be utilized for attaining the required design capacity. The contractor should develop their design and construction criteria. Hard drilling condition into the rock may be anticipated. Special tool/equipment may be required.

The bond strength for design of tieback bond length depends on factors such as installation technique, diameter of the holes etc. The estimated bond strengths were provided to the designer for analysis/cost-estimation purposes. Note that tieback is a design-build system, and the contractor should determine the bond length, drilling and grouting method, etc.

Unbonded & Bonded Zone. The minimum required unbonded zone for the tiebacks should be the distance between the wall face and slide plane or 15 feet, whichever is greater. Based on available boring data, inferred slide plane angle and depth, and 15° tieback inclination (typical), the unbonded lengths are anticipated to be on the order of 50 feet.

The tieback angle may be steeper to reduce the unbonded length. Due to the relatively long free lengths and potential perched water/groundwater, there could be caving potential of the drilled holes in existing deposits or fractured rock, and casing may be required for tieback installation.

Soldier Piles (CIDH). For the proposed wall, Cast-In-Drilled-Hole (CIDH) concrete piles will be installed as part of the wall system. Based on the boring data, the subsoils consist of approximately 35 to 45 feet of "soil-like" materials overlying weathered bedrock. The maximum design wall height is 25 feet. CIDH piles are considered feasible, and the capacity may be derived from the shaft resistance and the end bearing from the bedrock.

We have estimated the pile capacity by assuming 24-inch diameter CIDH piles. The estimated allowable vertical resistance is 1.5 tons per foot to 25 feet depth and 7 tons per foot below 25 feet. The vertical capacity within 5 feet below the finish grade should be neglected.

Based on the sections provided by the designer, we have assumed the wall with sloping soil condition (2H:1V). The soldier pile lagging wall design should be performed in accordance with Caltrans Bridge Design Specifications (BDS). The passive resistance (Kp) is determined based on the Section 5.5.5.4 of BDS (Caquot and Kerisel Analysis). Relevant geotechnical parameters for design are summarized as follows:

- Design Wall Height = 25 feet with sloping soil condition (2H:1V) above the wall.
- Unit Weight = 125 pcf
- Passive Earth Pressure: Kp = 10 (per Caltrans BDS Section 5.5.5.4)
- Maximum Pile Isolation Factor (passive arcing ability) = 2.0 for permanent wall with facing that is continuous across the vertical elements. Therefore, the effective width for passive resistance is two times the diameter of the planned CIDH piles.

– ***Retaining Wall No. 6**, "JC" Sta. 331+96 to "JC" Sta. 353+58*
***Retaining Wall No. 7A**, "JC" Sta. 331+53 to "JC" Sta. 357+62*
***Retaining Wall No. 7B**, "JC" Sta. 335+00 to "JC" Sta. 357+01*
In order to straighten the alignment, the future widening will cut into the hill. The proposed cut will be approximately over 100 feet high. Per discussion with the designer, the cut will be supported by multi-tiered soil nail walls to reduce visual impact.

In order to lower the design wall height on the uphill side, it is planned to split the finish grades between westbound and eastbound travel lanes. Retaining Wall 6 is proposed along the

median to support the cut and separate the traffic. The wall system on the uphill side will consist of Retaining Wall No.7A (the bottom tier) and Retaining Wall No. 7B (the top tier). An 18-foot wide horizontal bench will be provided between the two tiers of Retaining Wall No. 7, which will serve as maintenance access per Caltrans maintenance department's request. The maximum total design wall height is approximately 110 feet. It is planned to use soil nail wall to support the proposed cut slope.

Based on the interpreted geologic cross-section (from the boring data and topography data) provided by the designer, the stability of the existing slope was evaluated by using SLOPE/W program. According to our field observation, the existing rock slope, which is standing at roughly 1H:1V, appears to be relatively stable (shallow rock debris/fall is noted, which is protected by wire mesh). In our opinion, the factor of safety (FS) from stability back-calculation is expected to be greater than 1.5, the minimum design requirement. Therefore, the strength parameters were first estimated based on the laboratory test results and examination of the rock core samples. The parameters were then fine-tuned so that the global stability of the existing slope has an approximate F.S. of 2.

Based on the seismic refraction survey results and the boring data, we have prepared four interpreted sections for estimating the strength parameters. The F.S. from the stability analyses range from 1.5 to 2.4. The section along Sta. 338+00 yields the lowest F.S. The strength parameter of the "Soil-Like" material was increased to achieve F.S. of 1.5. For analysis purpose, we have assumed lower values for soil nail wall design. The higher strength values should only be used where the p-wave velocity is greater than 2000 ft/sec. Based on the above, the recommended long-term strength parameters for soil nail wall design are listed in the following tables.

Design Parameters for Retaining Walls No. 6, 7A & 7B

Soil Type	Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
Sand	125	35	-
Soil-Like Weathered Rock (Vs<2000 ft/sec)	130	36	400
Soil-Like Weathered Rock (Vs>2000 ft/sec)	130	36	750
Oxidized Rock	135	36	2000
Un-Oxidized Rock	140	38	4000

The walls are generally more than 2000 feet long. Therefore, various design parameters were developed based on the wall alignment, boring data and the geologic condition. The recommended parameters are summarized as follows.

– *West of Sta. 330+00*

Depth* (ft)	Soil Type	Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
0-15	Clay	125	30	300
Below 60	Soil-Like Weathered Rock	130	36	400

*Note: The depth is the vertical distance from the top of the wall.

– *Sta. 330+00 – 335+00*

Depth* (ft)	Soil Type	Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
0-5	Sand	125	36	0
5-15	Soil-Like Weathered Rock	130	36	400
15-40	Oxidized Rock	135	36	2000
Below 40	Un-oxidized Rock	140	38	4000

*Note: The depth is the vertical distance from the top of the wall.

– *Sta. 335+00 – 337+00*

Depth* (ft)	Soil Type	Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
0-15	Clay	125	30	250
Below 15	Soil-Like Weathered Rock	130	36	400

*Note: The depth is the vertical distance from the top of the wall.

– *Sta. 337+00 – 339+00*

Depth* (ft)	Soil Type	Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
0 - 25~55	Soil-Like Weathered Rock (Vs<2000 ft/sec)	130	36	400
25~55 - 75±	Soil-Like Weathered Rock (Vs>2000 ft/sec)	130	36	750
below 75	Oxidized Rock	135	36	2000

*Note: The depth is the vertical distance from the top of the wall.

– *Sta. 339+00 – 342+50*

Depth* (ft)	Soil Type	Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
0-35	Soil-Like Weathered Rock (Vs<2000 ft/sec)	130	36	400
35-65	Soil-Like Weathered Rock (Vs>2000 ft/sec)	130	36	750
Below 65	Oxidized Rock	135	36	2000

*Note: The depth is the vertical distance from the top of the wall.

– *Sta. 342+50 – 343+50*

Depth* (ft)	Soil Type	Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
0-25	Clay	125	30	250
Below 25	Soil-Like Weathered Rock	130	36	400

*Note: The depth is the vertical distance from the top of the wall.

- *Sta. 343+50 – 347+00*

Depth* (ft)	Soil Type	Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
0-35	Soil-Like Weathered Rock	130	36	400
35-60	Oxidized Rock	135	36	2000
Below 60	Un-oxidized Rock	140	36	4000

*Note: The depth is the vertical distance from the top of the wall.

- *Sta. 347+00 – 349+00*

Depth* (ft)	Soil Type	Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
0-40	Soil-Like Weathered Rock	130	36	400
40-65	Oxidized Rock	135	36	2000
Below 65	Un-oxidized Rock	140	36	4000

*Note: The depth is the vertical distance from the top of the wall.

- *East of Sta. 349+00*

Depth* (ft)	Soil Type	Unit Weight (pcf)	Friction Angle (°)	Cohesion (psf)
0-45	Clay	125	30	400
45-60	Soil-Like Weathered Rock	130	36	750
Below 60	Oxidized Rock	135	36	2000

*Note: The depth is the vertical distance from the top of the wall.

For Retaining Wall No. 7A (bottom tier wall), level back slope should be assumed. The overburden pressure from the upper portion of the wall should be converted into equivalent surcharge for SNAILZ analysis. A seismic coefficient of 0.2g (one-third of the anticipated PBA of 0.6g) is recommended for Psuedo-Static analysis under seismic loading condition. The horizontal distance between Retaining Walls No. 6 (median wall) and 7A (bottom tier wall) is approximately 40 feet. Based on the distance, the influence due to the uphill wall on Retaining Wall No. 6 should be relatively insignificant. In our opinion, this wall should be analyzed as a stand-alone wall.

It is our understanding that the existing terrain, from approximate Sta. 335+00 to 336+00 and Sta. 342+00 to 343+00, is lower than the finish configuration of the soil nail wall. It is planned to construct embankment prior to the soil nail wall construction. For the fill materials, it should be in accordance with the specification set forth in Caltrans Standard Specification, Section 19. The materials should be free of organic or other deleterious materials and have minimum PI of 8 and maximum PI of 15. All the materials within the wall limit shuld be compacted to minimum 95% per project specification.

Discontinuities (Joints). At the planned locations of Retaining Walls No. 6 & 7A, the excavations will expose less weathered bedrock where out-of-plane joints have been observed to dip at an average angle of 60 degrees below horizontal. Based on our observations and the core samples, the lengths of potential out-of-plane joints are expected to be typically less than 30 feet. For analysis purpose, we have performed additional SNAIL analysis on one of the most critical cases for Retaining Wall No. 7A with the following assumptions:

1. Full wall height of 54 feet with surcharge (representing mass retained by the wall above and traffic loads);
2. For modeling purpose, the joints extending the full height for the wall;
3. The search limits between 20 feet to 45 feet behind the wall, which simulates 50- and 70-degree imaginary failure planes from the toe of the wall.
4. Friction angle of 36 degrees without cohesion for all soil type and linear failure plane to model the potential wedge failure;
5. Ten-tier of soil nail (total of eleven tiers of soil nails are planned), without the last tier. This is immediately prior to the completion of the wall construction with full reinforcement, which is considered the most critical case.

Based on our analysis, the program yields a F.S. of 1.19, which is considered acceptable for temporary construction case (F.S. $\approx$ 1.2). However, our assumptions are rather conservative. The joints are expected to be shorter, and the surcharge should not pose significant effect for wedge failure. In our opinion, the discontinuities should not govern the wall design.

- ***Retaining Wall No. 8**, "JC" Sta. 358+81 to "JC" Sta. 364+44*

  Retaining Wall No. 8 is located along the north side of westbound Route 12. The wall is approximately 567.5 feet long with maximum wall height of 20 feet. Based on the boring data, Boring A-09-058, located at the western end of the wall, encountered mainly sandy lean clay with interbedded sand layers. Boring A-09-059, located at the eastern end of the wall, encountered more granular materials to 50 feet, the maximum depth drilled. Groundwater was encountered at approximate 40 feet below existing grade in Boring A-09-059.

  According to the plans provided, the proposed wall will be cantilever wall. Majority of the wall are designed based on Caltrans standard Type 1 wall, to support the proposed widening. The design wall heights range from 4 to 20 feet. There is an existing culvert located at approximate Sta. 360+60. On both sides of the existing culvert, the design wall height is up to 20 feet. Additional loads are anticipated to be transferred from the portion of the wall above the culvert. Therefore, these portions of the wall will be modified Type 1 retaining wall, which will be specially designed.

  Based on the planned footing elevations and boring data, the recommended allowable bearing capacities are shown as follows.

Location	Allowable Bearing Capacity
West of Sta. 359+88	3 ksf
Sta. 359+88 – Sta. 362+45	4.5 ksf
East of Sta. 362+45	3 ksf

  Caltrans standard Type 1 wall supported on spread footings should be feasible for the proposed retaining wall. However, the design wall height between Sta. 359+88 and 362+45 are relatively tall, ranging from 12 to 20 feet. In order to provide uniform support and account for local irregularity, it is recommended that the subgrade be over-excavated 2 feet below the bottom of the footing and replaced with compacted Class 3 Aggregate Base rock (AB3) within this section. It is also recommended that a layer of geosynthetic reinforcement be placed at the bottom of the compacted AB3 layer to control bearing pressure and differential settlement.

In addition, the subgrade at the culvert may be relatively wet and soft. Should soft subgrade or groundwater be encountered during footing excavation, where it is difficult to achieve required compaction, Lean Concrete Base (LCB) may be considered as an alternative in lieu of AB3 with geosynthetic reinforcement.

The recommendations of Retaining Wall No. 8 are also presented in the Geotechnical Design and Materials Report.

- ***Retaining Wall No. 10**, "JCR2" Sta. 290+05 to "JCR2" Sta. 299+20*

  Retaining Wall No. 10 is located along the south side of eastbound Route 12. The wall is approximately 1022 feet long with maximum wall height of 12 feet. According to our discussion with the designer, the majority of the wall will be cantilever wall, which will be designed based on Caltrans standard Type 5 wall, to support the proposed widening. The design wall heights range from 4 to 12 feet. However, there is an existing culvert located at approximate Sta. 290+75. For the wall portion located on both sides of the existing culvert, additional loads are anticipated to be transferred from the wall above the culvert. Therefore, the design of these wall segments will be specially designed, which is modified from Caltrans standard Type 5 wall.

  Based on the boring data (A-09-032, A-08-033 & A-08-034), the subgrade mainly consists of lean clay. Sand layers were encountered at various depths. Groundwater was encountered at approximate Elev. 264 feet in Boring A-09-032 and Elev. 250 feet in Boring A-08-033 during field exploration. According to the proposed footing elevations and subsurface conditions, the recommended allowable bearing capacity is 3 ksf west of Sta. 291+00 and 2.75 ksf east of Sta. 290+00. The bearing capacity is slightly lower than the required number shown on the standard plans (Loading Case I, design toe pressure of 2.5 ksf, 3.0 ksf & 3.6 ksf for wall height of 8 feet, 10 feet & 12 feet, respectively).

  In order to lower the footing contact pressure and account for the local irregularity at the footing subgrade, it is recommended that the subgrade be over-excavated 2 feet below the bottom of the footing and replaced with compacted Class 3 Aggregate Base rock (AB3) for the design wall height greater than 10 feet. It is also recommended that a layer of geosynthetic

reinforcement be placed at the bottom of the compacted AB3 layer to control bearing pressure and differential settlement.

An existing culvert is located at approximate Sta. 290+80. The subgrade may be relatively wet and soft. Should soft subgrade or water be encountered during footing excavation, Lean Concrete Base (LCB) may be used instead of compacted AB3 and geosynthetic reinforcement. This pad should serve as a "load distribution bridge" for reducing loads and differential settlements. With the proposed over-excavation, the footing contact pressure can be reduced by approximately 20%.

However, between Sta. 297+00 and 297+50, it is recommended that the subgrade be over-excavated 3 feet below the bottom of the footing and replaced with compacted Class 3 Aggregate Base rock (AB3) and a layer of geosynthetic reinforcement for the design wall height of 12 feet. It is our opinion that Caltrans Standard Type 5 (mod.) wall supported on spread footing is considered feasible for Retaining Wall No. 10 with proposed subgrade improvement.

Submerged, loose silty sand pockets were encountered at about Elev. 245 to 250 feet and 225 to 240 feet in Borings A-08-033, which may be subject to liquefaction during earthquake. Liquefaction potential in the other two borings (A-09-032 & A-08-034) appears to be low. Those layers in Boring A-08-033 appear to be relatively deep and considered discontinuous based on the comparison of nearby borings.

The consequence may be limited to post-liquefaction settlement, which probably would be random and localized. With the recommended subgrade improvement, the impact due to the potential liquefiable layer may be reduced. In addition, the overlying clayey materials are relatively thick (greater than 20 feet), which may bridge over the liquefiable sand layer when volumetric change occurs. Therefore, the impact due to liquefaction is considered low at this wall location.

The recommendations of Retaining Wall No. 10 are also presented in the Geotechnical Design and Materials Report.

Construction Considerations.

- *Soil Nail Wall*

  The strength of the soil nails shall be verified during construction using proof tests on nails. Caltrans specifications for soil nail construction are recommended. Prefabricated vertical drainage or geocomposite drain should be provided. This drainage is generally provided at about 4 to 5 feet horizontal interval and has an outlet through the facing at each location. The facing should be reinforced and shotcreted as quickly as possible to maintain the integrity of the cut. Hard drilling conditions should be anticipated for drilling into the rock with possible cobbles and boulders. The contractor should make his own interpretation and perform independent study to the constructability of the nails. Special tool or drilling equipment may be expected to drill into the rock. It is important to achieve the design length of the nails, since they need to be behind a certain hypothetical "failure plane" as required by the designer. The proof tests alone should not be the criteria for acceptance of the soil nails.

  Cleaning of the drilled holes and proper grouting of the nails (using proper grout mix) is critical to the success of the project. Leaving loose material in the hole and/or using low flow grout may cause the nails to be inadequate even if they meet the proof test requirements. Therefore, proper quality control by the contractor and experienced inspection by the agency should be implemented.

  Soil nails, wire mesh, rebar and shotcrete should be installed as soon as possible. Generally, if excavated slope appears loose or unstable, the area of excavation should be limited to an area that can be excavated, nailed, mesh and rebar installed and shotcreted in a day. Leaving cuts unsupported for longer duration may result in instability.

  It is our understanding that the contractor should perform stability testing to verify the proposed excavation lift height and exposure duration for soil nail wall construction. Based on the subsurface condition, the recommended test wall zones are shown in Appendix F.

- *Tieback Wall*

  The tiebacks should be constructed and tested as per Caltrans standard performance specifications for tieback systems. All tiebacks should be either performance tested or proof tested. We recommend that at least 5% of the total number of tiebacks be performance tested. The remaining tiebacks should be proof tested. If the design tieback capacity is not achieved during the initial test program, post-grouting technique, large diameter tieback holes etc. may be considered for the tieback installation.

  Because of the variability in the naturally occurring materials and the limitations in the exploration program, it is recommended that several cost control measures be implemented in the specifications for the tieback system. The contractor should be advised to verify the field conditions and verify the tieback capacity through his own efforts. It would be advisable for the contractor to have capability to perform post-grouting for the tieback installation. He should also verify the drilling conditions into the existing material (such as by horizontal drilling). This is to see if the operation may require special drilling tools and equipment.

- *CIDH piles*

  Caltrans standard specifications and standard special provisions (SSP) for "Cast-in-Place Concrete Piling" should be used for the construction of CIDH piles. It is anticipated that groundwater will be encountered during construction and "dry" condition as per the standard specifications Section 49-4 can not be maintained. The "wet" specifications are contained in Caltrans SSP.

  Vertical inspection pipes for acceptance testing should be provided in all CIDH piles that are 24 inches in diameter or larger, except when the holes are dry or when the holes are dewatered without the use of temporary casing to control groundwater. The acceptance test should include Gamma-Gamma Logging and may also include crosshole sonic logging. Gamma-Gamma Logging should be performed in accordance with California Test 233 Standard (CT233) to check the homogeneity of CIDH piles. CT233 defines pile rejection criteria based on the statistical principles of mean and three standard deviations to analyze the homogeneity of a pile. Anomalies detected should be evaluated by the designer for their significance and potential impact on design and to see if mitigation plans are required. Details

of the acceptance testing and Gamma-Gamma Logging are contained in Caltrans SSP and CT233.

Due to the presence of granular material and groundwater, raveling or caving is expected which may require additional drilling and cleaning effort and may increase the concrete volume for the piles. It is prudent to make the contractor aware of these conditions so that he takes appropriate steps to comply with the standards and maintain the integrity of the CIDH piles. The use of temporary steel casing should be anticipated at all times to maintain the integrity of the piles. It is also recommended that the specifications set certain criteria for qualifications and previous work experience requirements to pre-qualify the potential contractors. The intent is to help select qualified contractors to reduce construction issues.

All piles excavations should be observed by the geotechnical engineer or regulatory agency prior to the placement of reinforcement and concrete so that if conditions differ from those anticipated, appropriate recommendations can be made.

Culvert

- ***Head Walls at Wild Life Box Culvert***

  For the proposed widening along Route 12, a wild life box culvert is planned at approximate Sta. 310+21. The box culvert will be a 12 feet×12 feet reinforced concrete box (RCB) of about 75 feet long. Head walls are planned at each end to support the highway embankment. Based on the plans provided, the proposed structures will be cantilever retaining wall, which will be modified from Caltrans standard Type 1 wall. The design wall heights range from 12 to 18 feet.

  Based on the boring data (A-08-035 & A-08-036), the subgrade mainly consists of firm to stiff lean clay. Sand pockets were encountered at various depths. Groundwater was encountered at approximate Elev. 231 feet in Boring A-08-035 and Elev. 226.7 feet in Boring A-08-036 during field exploration. According to the proposed footing elevations and subsurface conditions, the recommended allowable bearing capacity is 1.5 ksf and 2 ksf for design wall height of 12 feet and 18 feet, respectively. However, according to the Caltrans standard plans,

Sheet B3-1, the required footing pressures are 2.9 ksf for design wall height of 12 feet and 4.3 ksf for design wall height of 18 feet (Loading Case III).

Per our discussion with the designer, deep foundation is not preferred, and it is planned to use spread footing for foundation support. In order to reduce the footing pressure, it is recommended that lightweight fill be used behind the wall. The unit weight of the lightweight fill is on the order of 65 pcf. For the retaining wall design, an active earth pressure of 18 pcf EFP may be used for analysis.

In addition, footing subgrade improvement should also be conducted. Based on the design wall heights of 12 and 18 feet, it is recommended that the footing subgrade be over-excavated 2 feet and 5 feet below the bottom of the footing, respectively, and replaced with compacted Class 3 Aggregate Base rock (AB3). It is also recommended that a layer of geosynthetic reinforcement be placed at the bottom of the compacted AB3 layer to control bearing pressure and differential settlement. Based on the boring data, groundwater was encountered few feet below the footing. The subgrade materials at the creek crossing may be relatively wet and soft. Should soft subgrade or groundwater be encountered during footing excavation where required compaction cannot be achieved, Lean Concrete Base (LCB) may be used instead of compacted AB3 and geosynthetic reinforcement.

This pad should serve as a "load distribution bridge" for reducing loads and differential settlements. For the wall portion with design wall height of 12 feet and 18 feet, the footing pressures provided from the structure engineer are approximately1.8 ksf and 2.8 ksf, respectively. With the proposed subgrade improvement, the contact pressures at the bottom of the pad are anticipated to be 1.4 ksf and 1.8 ksf, respectively, which is less than the recommended allowable pressures.

Therefore, it is considered feasible to design the head walls by using Caltrans Standard Type 1 wall supported on spread footing with proposed subgrade improvement.

Seismic Design Criteria

Based on the 2007 Caltrans Deterministic PGA Map, the project is located in-between the Green Valley Fault (Fault ID: 213, Mmax=6.9, RLSS) and the West Napa fault zone (Fault ID: 416, Mmax=6.5, RLSS). The most of the proposed retaining walls are located closer to the Green Valley Fault, which is the governing fault of the project, and the distances between the fault and the walls range from approximately 0.6 mile (Retaining Wall No. 7) to 3.2 miles (Retaining Wall No. 1), and the anticipated Peak Bedrock Accelerations (PBA) for earthquake originating on these faults range from 0.71g to 0.50g (per Sadigh, 1997). For design purpose, we have assumed a PBA of 0.5g for Retaining Wall No. 1, 0.55g for Retaining Wall No. 9, 0.6g for Retaining Walls No. 2 to 4 and 10, 0.65g for Retaining Wall No. 5, and 0.7g for Retaining Walls No. 6 to 8.

Earthquake Data & PBA

Retaining Wall No.	Estimated Closest Distance to the Fault (miles)		Peak Bedrock Acceleration (g)
	Green Valley Fault (RLSS, M_{max}=6.9)	West Napa Fault (RLSS, M_{max}=6.5)	
3	2.04	3.74	0.58
4	1.85	3.88	0.60
10	1.85	3.88	0.60
5	1.33	4.26	0.64
6/7	0.99 (western end)/0.62 (eastern end)	4.50 (western end)/4.97 (eastern end)	0.67 (w)/0.71(e)
8	0.57	5.02	0.71

Corrosion

The corrosion investigations performed are in general accordance with the provisions of California Test Method 643. A summary of the corrosion test data is presented below.

Boring	Depth (ft)	pH	Minimum Resistivity (ohms-cm)	Chloride (ppm)	Sulfate (ppm)
R-08-030	10	7.95	1310	80.2	95.7
A-08-034	5	6.56	2650	8.8	3.0
A-08-041	5	6.40	2390	11.7	5.6
A-08-052	5	7.32	560	25.6	3.4
R-08-043	6	7.68	860	204.7	373.9
A-08-057	2	7.31	1230	12.9	27.6

Based on the data, the site subsoil is considered non-corrosive per Caltrans corrosion design guidelines, and standard Type II modified or Type I-P (MS) modified cement may be used for the concrete substructures. The minimum cement factor and cover thickness should be per Caltrans Bridge Design Specifications (Section 8.22).

Plan Review

We recommend that final plans for foundations be reviewed by this office prior to construction so that the intent of our recommendations is included in the project plans and specifications and to further see that no misunderstandings or misinterpretations have occurred.

Construction Observation

To a degree, the performance of any structure is dependent upon construction procedures and quality. Hence, observation of foundation excavations, and pile installations should be carried out by the regulating agencies. If the subsurface conditions different from those forming the basis of our recommendations is encountered this office should be informed in order to assess the need for design changes. Therefore, the recommendations presented in this report are contingent upon good quality control and these geotechnical observations during construction.

INVESTIGATION LIMITATIONS

Our services consist of professional opinions and recommendations made in accordance with generally accepted geotechnical engineering principles and practices and are based on our site reconnaissance and the assumption that the subsurface conditions do not deviate from observed conditions. All work done is in accordance with generally accepted geotechnical engineering principles and practices. No warranty, expressed or implied, of merchantability or fitness, is made or intended in connection with our work or by the furnishing of oral or written reports or findings.

The scope of our services did not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in structures, soil, surface water, groundwater or air, below or around this site. Unanticipated soil conditions are commonly encountered and cannot be fully determined by taking soil samples and excavating test borings; different soil conditions may require that additional expenditures be made during construction to attain a properly constructed project. Some contingency fund is thus recommended to accommodate these possible extra costs.

This report has been prepared for the proposed project as described earlier, to assist the engineer in the design of this project. In the event any changes in the design or location of the facilities are planned, or if any variations or undesirable conditions are encountered during construction, our conclusions and recommendations shall not be considered valid unless the changes or variations are reviewed and our recommendations modified or approved by us in writing.

This report is issued with the understanding that it is the designer's responsibility to ensure that the information and recommendations contained herein are incorporated into the project and that necessary steps are also taken to see that the recommendations are carried out in the field.

The findings in this report are valid as of the present date. However, changes in the subsurface conditions can occur with the passage of time, whether they be due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or from the broadening of knowledge. Accordingly, the findings in this report might be invalidated, wholly or partially, by changes outside of our control.

Respectfully submitted,
PARIKH CONSULTANTS, INC.

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Project Engineer

Gary Parikh, G.E. 666
Project Manager

REGISTERED PROFESSIONAL ENGINEER
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No. 666
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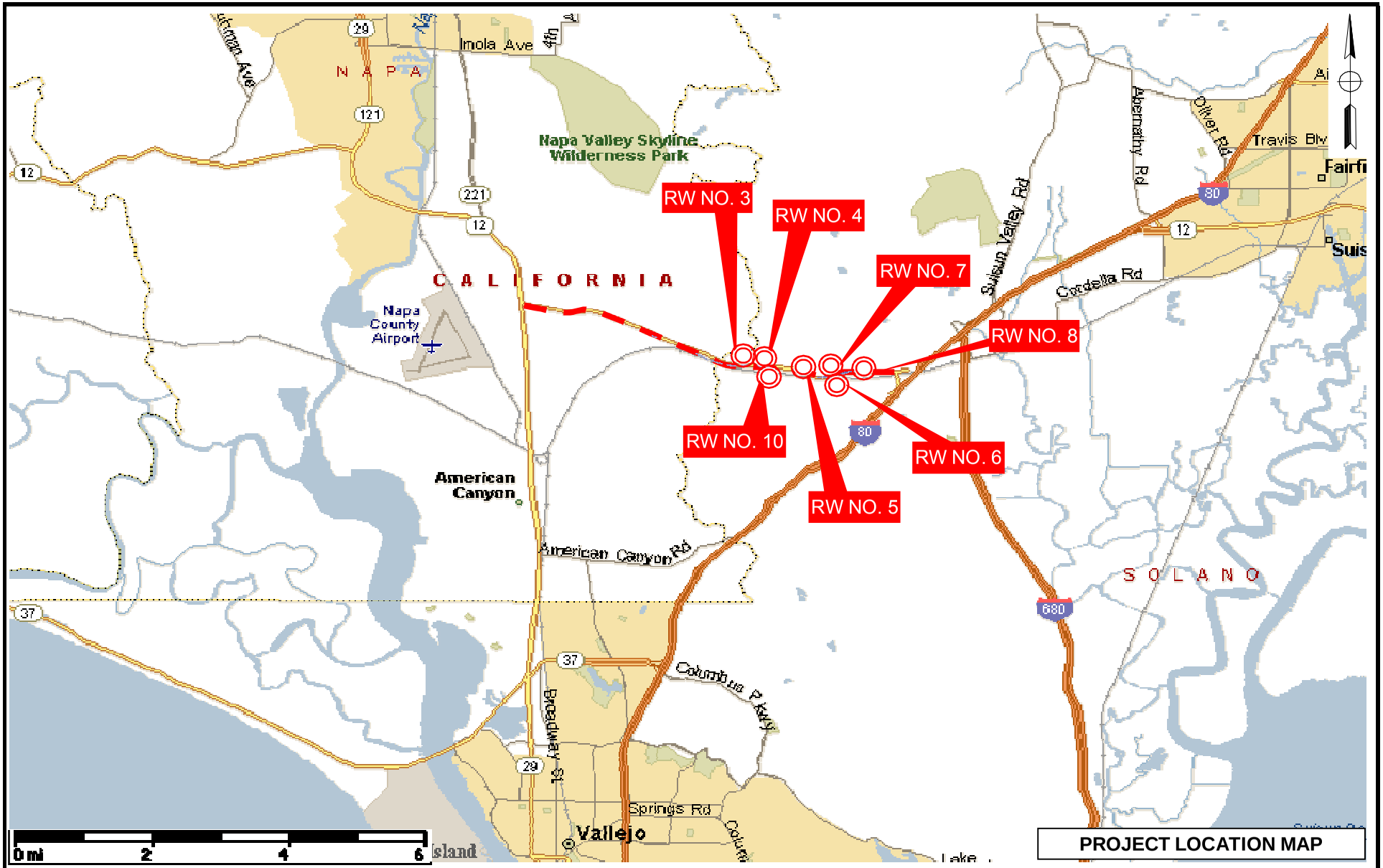
Engineering Geologist



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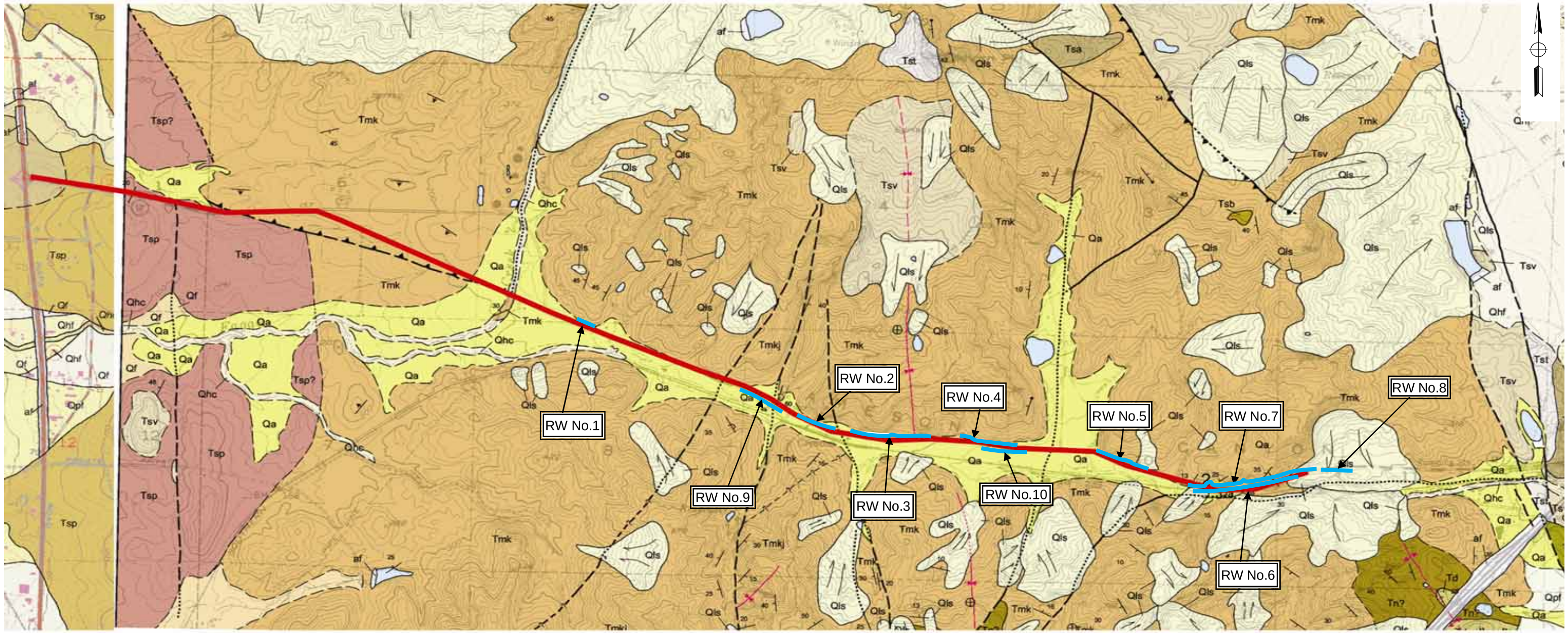
JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 1



0 1000 2000 3000 4000 5000 6000 7000 Feet

LEGEND

Qa - Late Pleistocene to Holocene alluvium
Qls - Landslide deposits
Tsp - San Pablo Group (Miocene)
Tmk - Markley Formation (Eocene)

SOURCE

Bezore, et al; 2002 & 2008

GEOLOGIC MAP

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SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 2A.1

LANDSLIDE DEPOSITS

A landslide is a mass of rock, soil, and debris that has been displaced downslope by sliding, flowing, or falling. Landslides include cohesive block glides and disrupted slumps that have formed by translation or rotation of the slope materials along one or more planar or curviplanar slip surfaces. Most of the landslides whose boundaries are delineated on the map are greater than 10 feet thick. Also shown are selected surficial features that typically involve only soil, colluvium, or other superficial debris that covers bedrock. The rates of movement of slope failures range from almost imperceptibly slow (as in earthflows) to extremely, even dangerously, rapid (as in debris flows).

DEFINITE LANDSLIDE. Exhibits all or nearly all of the diagnostic features, including but not limited to headwall scarps, cracks, rounded toes, well-defined benches, closed depressions, springs, and irregular or hummocky topography, that are common to landslides and indicative of downslope movement. Continuous, single-barbed arrows indicate general direction of movement. Scarp (headwall of slump or block glide) is indicated by hachures where mapped.

PROBABLE LANDSLIDE. Exhibits several diagnostic features that are common to landslides and relatively likely to have resulted from downslope movement, but that are not so clearly defined that the existence of the landslide is certain. Interrupted, single-barbed arrows indicate general direction of movement.

QUESTIONABLE LANDSLIDE. Exhibits one or a few, generally very subdued, diagnostic features that commonly are associated with landslides. Typically lacks distinct landslide morphology but may exhibit disrupted terrain or other abnormal features that strongly to vaguely imply the occurrence of downslope movement. Question mark signifies the uncertainty in the existence of the landslide.

SMALL LANDSLIDE. Filled arrowhead indicates a landslide too small to delineate at the scale of the map. Center of arrowhead corresponds to the location of the landslide; arrowhead points in the direction of movement (downhill). Question mark used where existence of the landslide is uncertain.

MULTIPLE SMALL LANDSLIDES. Two or more landslides too small to delineate at the scale of the map.

EARTHFLOW. A relatively shallow deposit of soil or other colluvial material that has oozed downslope, commonly at a rate too slow to observe except over long duration. Head scarp shown by hachures where mapped. Area immediately upslope of failure typically unravels due to successive small slumps that occur in the oversteepened banks left by movement of the main body away from the source area. Wiggly arrow shows general direction of movement.

EARTHFLOW COMPLEX. A group of earthflows that are too numerous to delineate accurately at this map scale.

SMALL EARTHFLOW. Arrow with solid arrowhead shows earthflow too small to delineate at the scale of the map. Center of shaft corresponds to center of failure.

DEBRIS FLOW. (Also called mudflow, soil slip, or debris avalanche.) A short-lived phenomena resulting from the rapid failure of surficial slope materials. Typically leaves a train of debris in a scoured channel following runout of the flow. Curved line delineates channel. Scarp depicted by oval.

DEBRIS FLOW AMPHITHEATER/SLOPE. Area of multiple debris flows and flow scars.

CREEP. (Not a deposit.) Areas where shallow downslope movement of surficial materials, especially soil, is occuring under the influence of gravity. Creep generally is recognizable only on grassy or bare slopes. Slopes undergoing creep typically do not exhibit morphology indicative of specific types of slope failure such as landslides or earthflows. Creep is characterized by indirect evidence such as tilting trees, poles, and posts, and, locally, by terracettes created by animals grazing along slopes.

SOURCE
Landslide Hazard Identification Map No. 13, M. W. Manson, 1988 (Division of Mines and Geology (DMG), Open-File Report 88-22)

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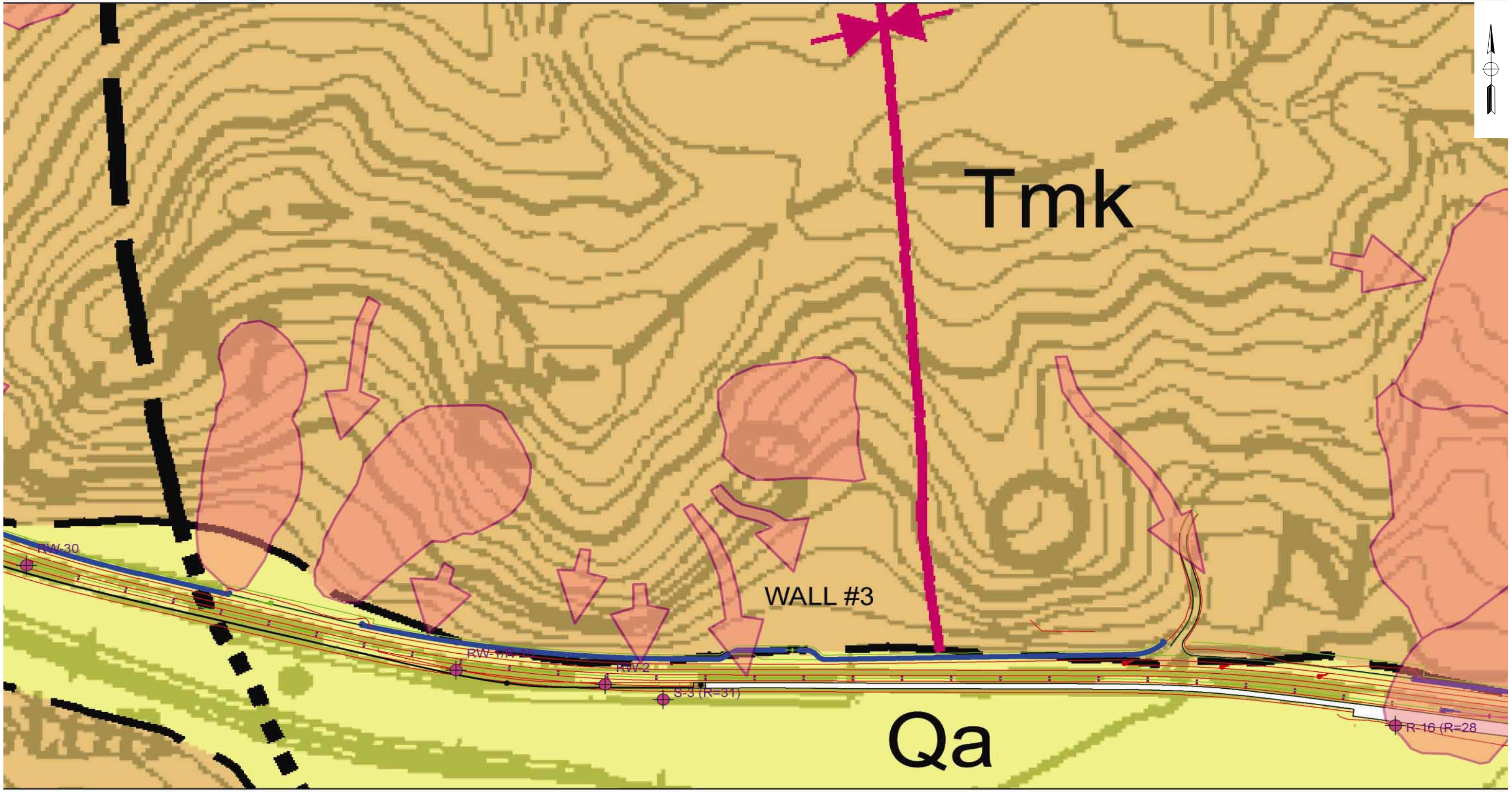
LANDSLIDE AND RELATED FEATURES MAP

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 2A.2



0 100 200 400 600 800 1,000 Feet

LEGEND

:Landslide* :Small earthflow*

See Plate 2A for other unit descriptions**

SOURCE:

* Mason, 1988 (DMG Open-File Report 88-22, Plate 13B)

** Bezore et al; 2002 & 2008

GEOLOGIC MAP - RW #3

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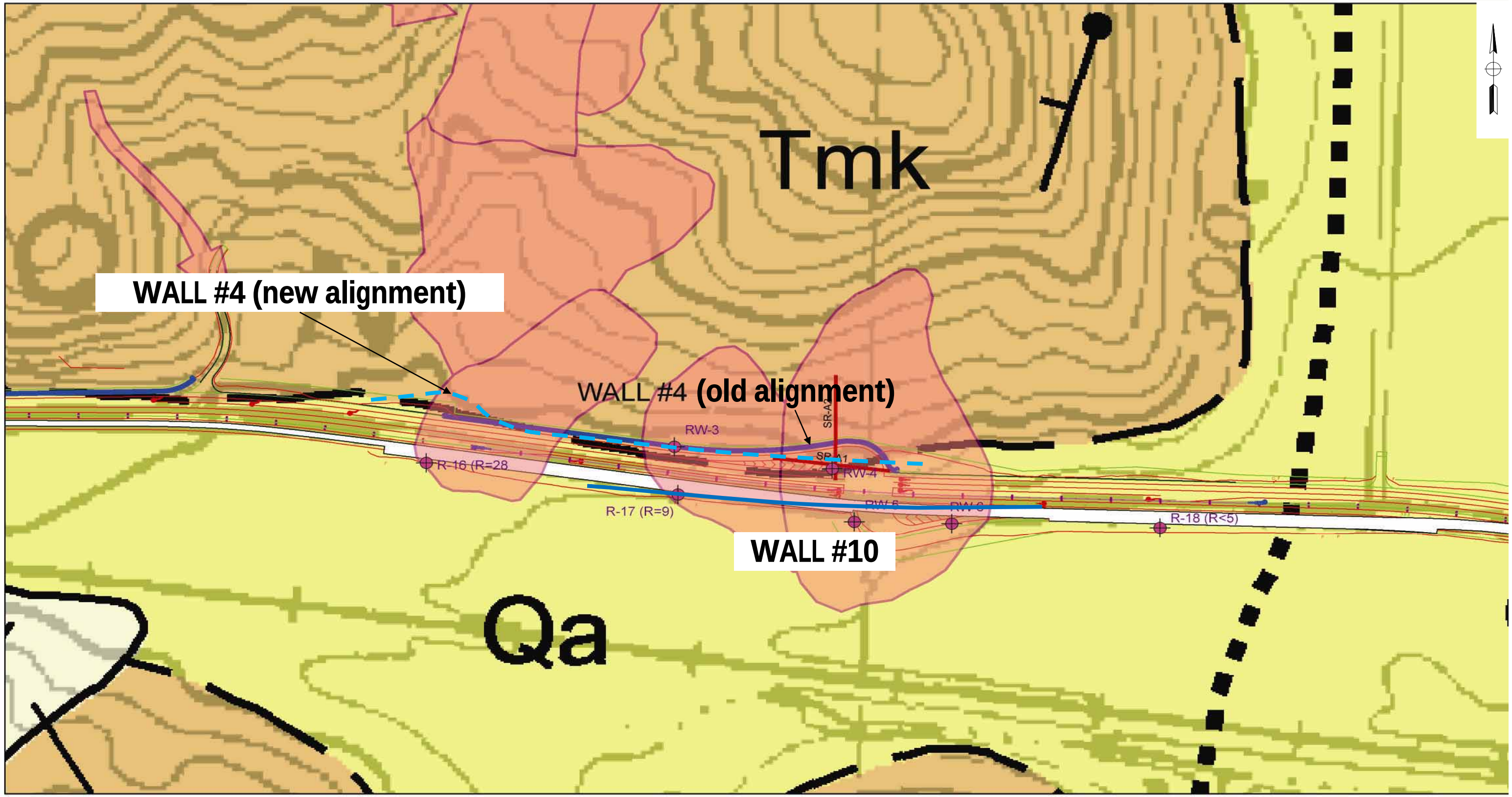
JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 2B



0 100 200 400 600 800 1,000 Feet

LEGEND

:Landslide* :Small earthflow*

See Plate 2A for other unit descriptions**

SOURCE:

* Mason, 1988 (DMG Open-File Report 88-22, Plate 13B)

** Bezore et al; 2002 & 2008

GEOLOGIC MAP - RW #4 & #10

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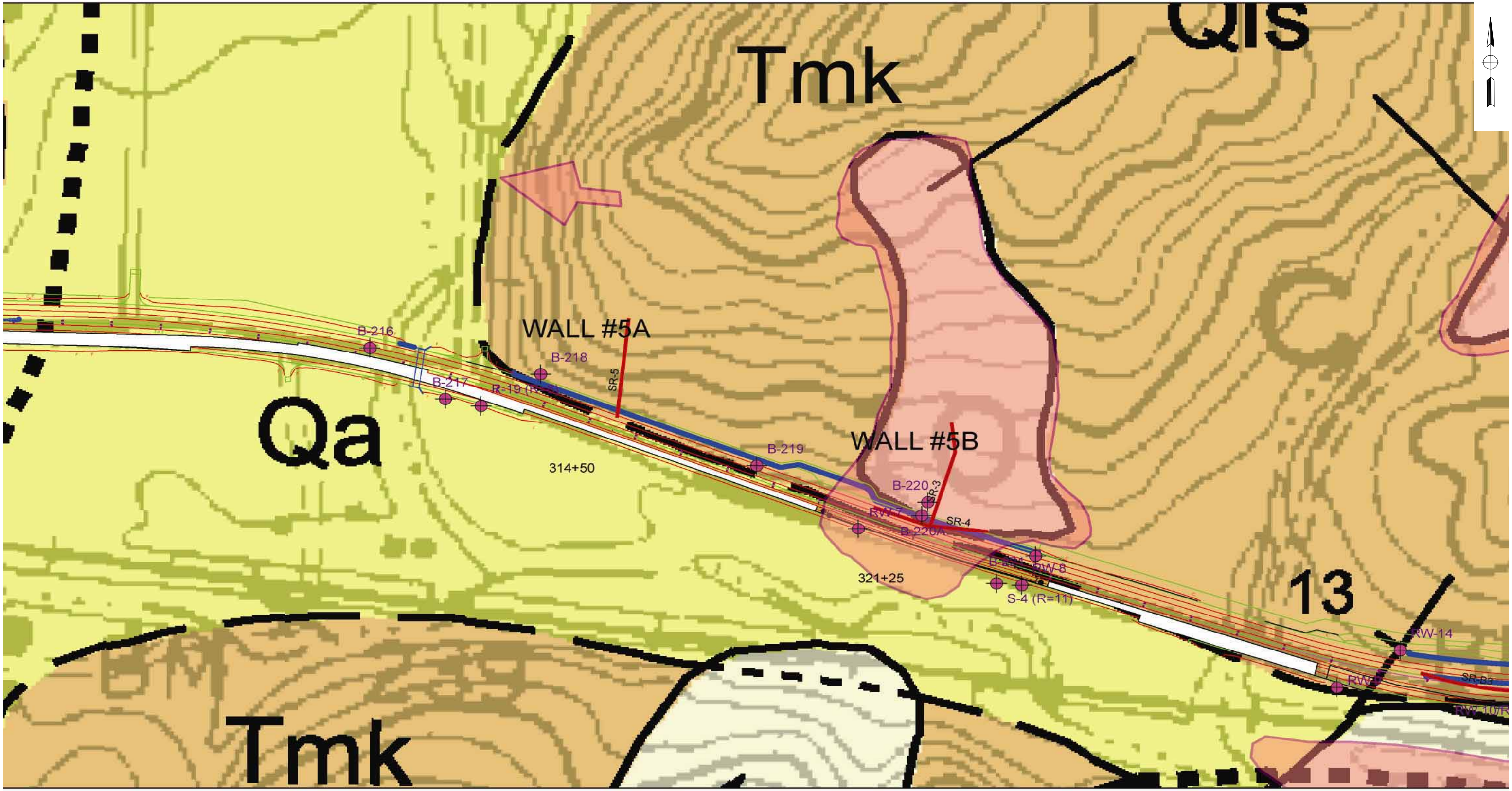
JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 2C



0 100 200 400 600 800 1,000 Feet

GEOLOGIC MAP - RW #5

LEGEND

:Landslide* :Small earthflow*

See Plate 2A for other unit descriptions**

SOURCE:

* Mason, 1988 (DMG Open-File Report 88-22, Plate 13B)

** Bezore et al; 2002 & 2008

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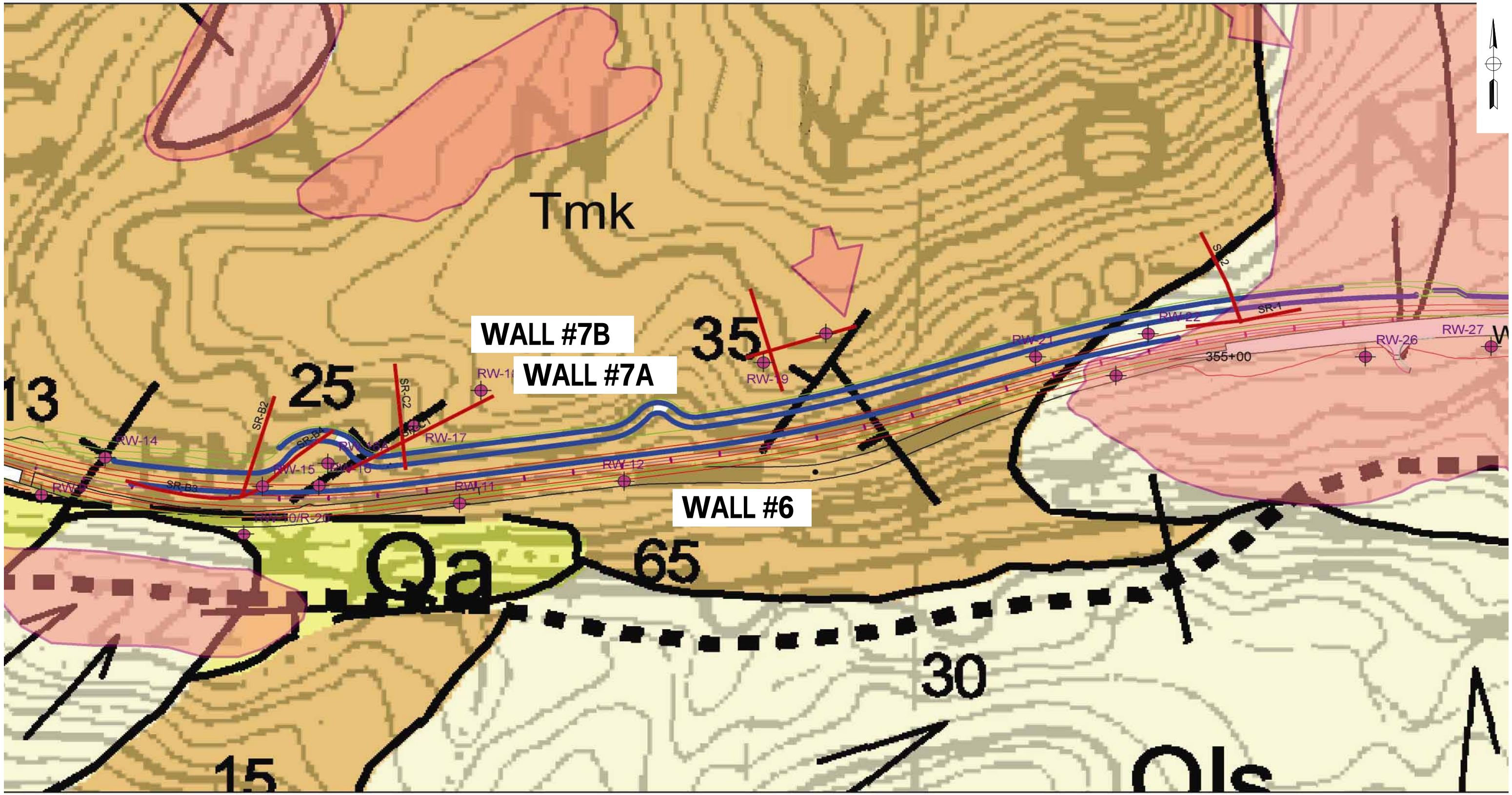
JAMESON CANYON ROAD WIDENING PROJECT

SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 2D



0 100 200 400 600 800 1,000 Feet

LEGEND

:Landslide* :Small earthflow*

See Plate 2A for other unit descriptions**

SOURCE:

* Mason, 1988 (DMG Open-File Report 88-22, Plate 13B)

** Bezore et al; 2002 & 2008

GEOLOGIC MAP - RW #6 & #7

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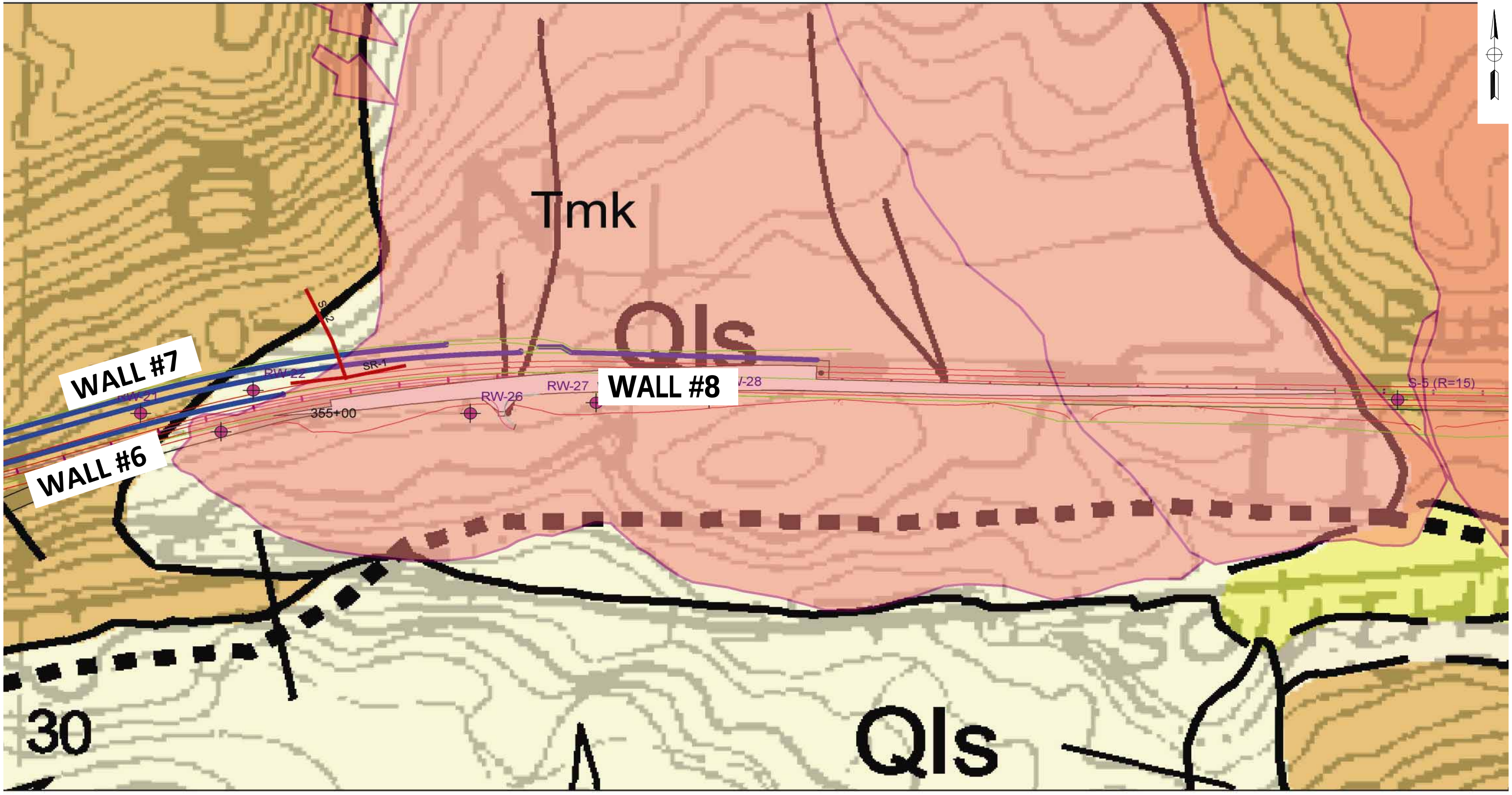
JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 2E



0 100 200 400 600 800 1,000 Feet

LEGEND

:Landslide* :Small earthflow*

See Plate 2A for other unit descriptions**

SOURCE:

* Mason, 1988 (DMG Open-File Report 88-22, Plate 13B)
** Bezore et al; 2002 & 2008

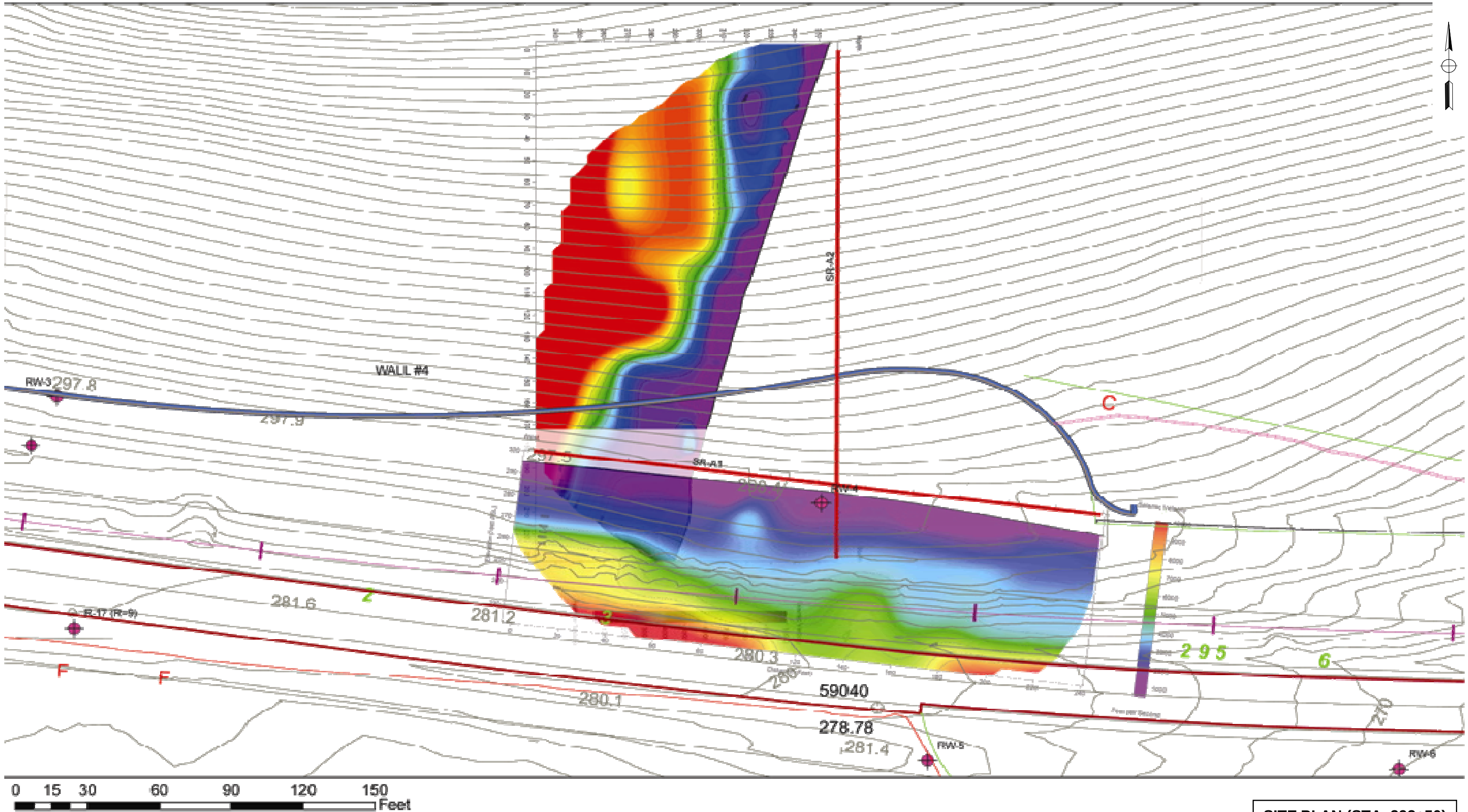
GEOLOGIC MAP - RW #9

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 2F



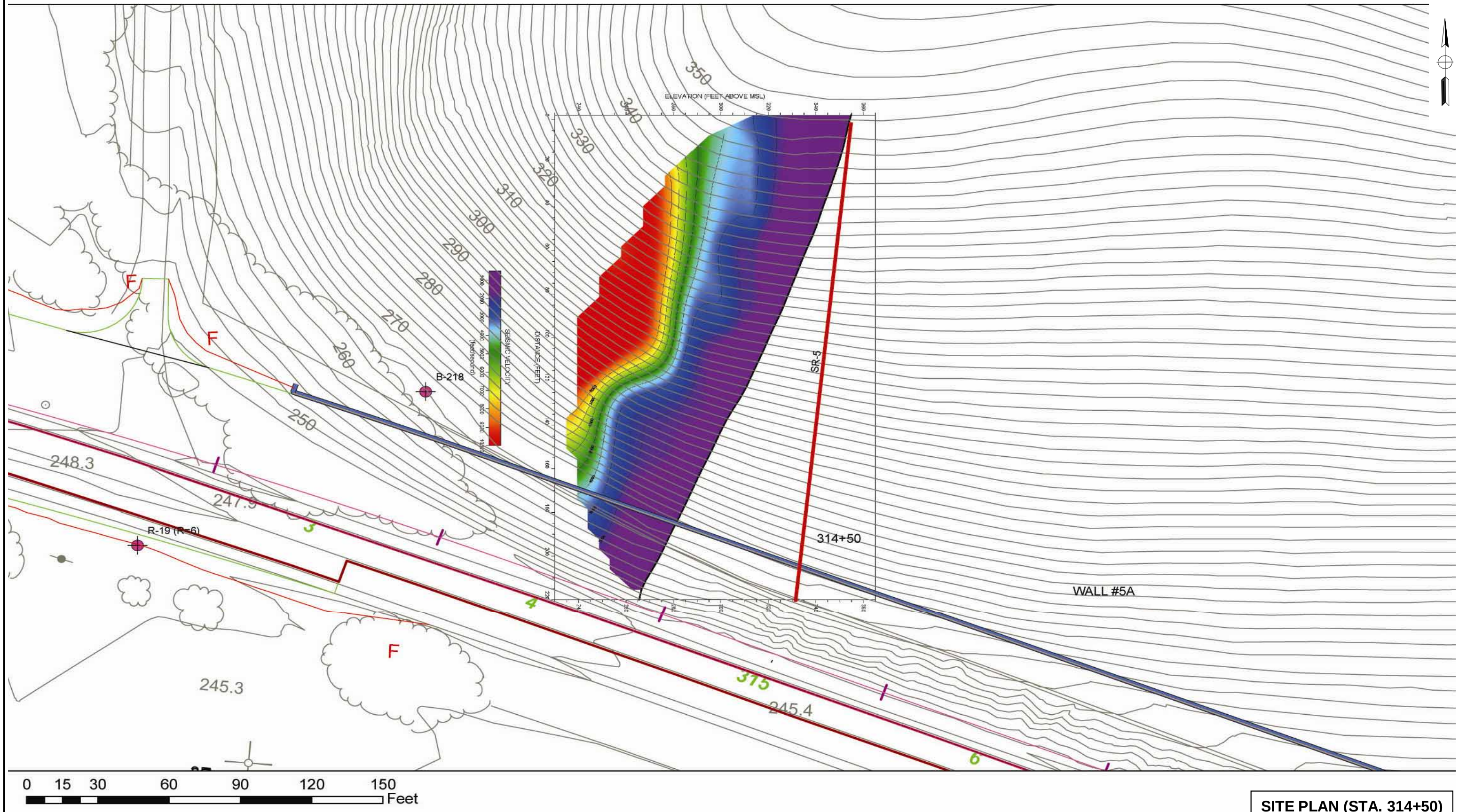
SITE PLAN (STA. 293+50)

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 3A



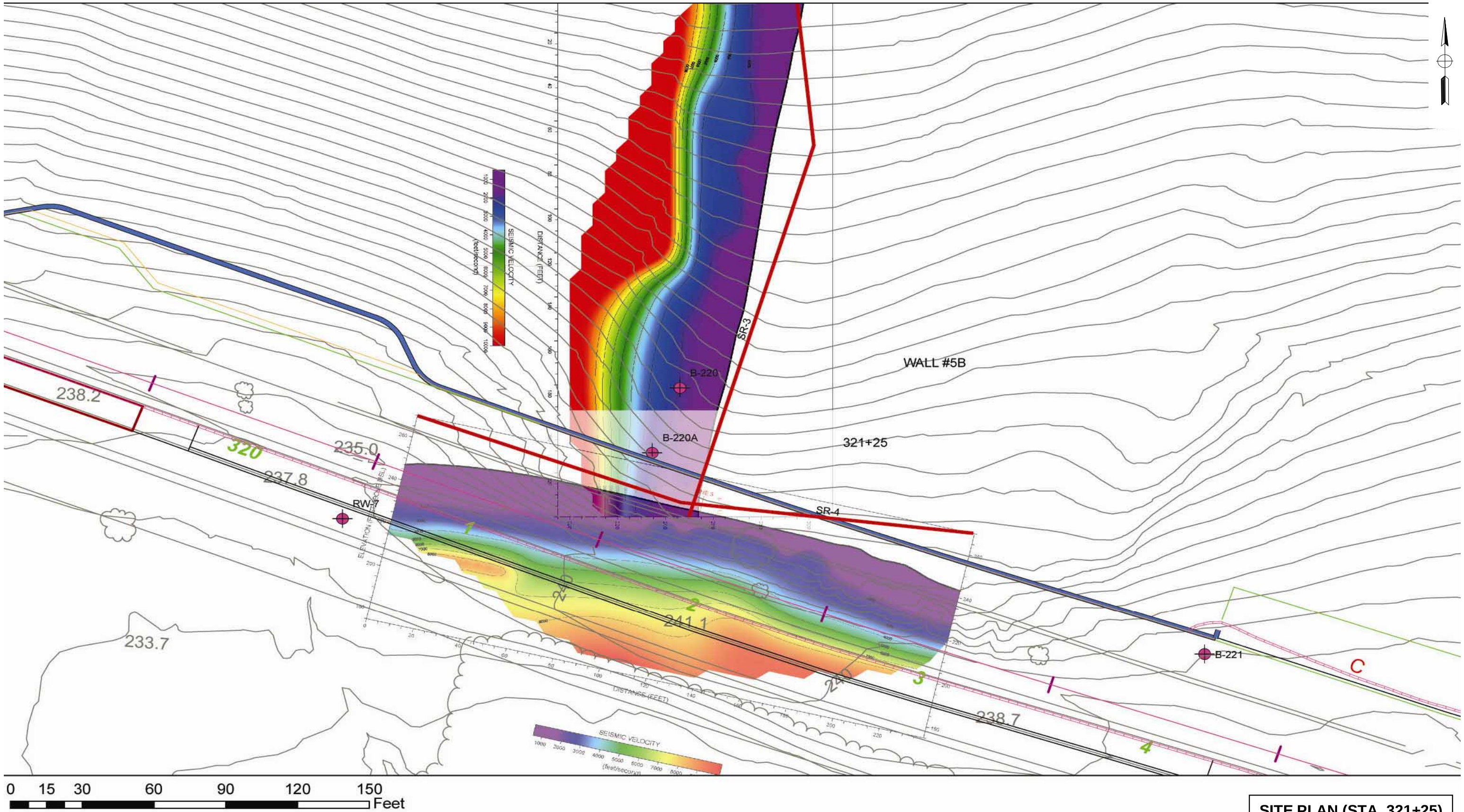
SITE PLAN (STA. 314+50)

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 3B



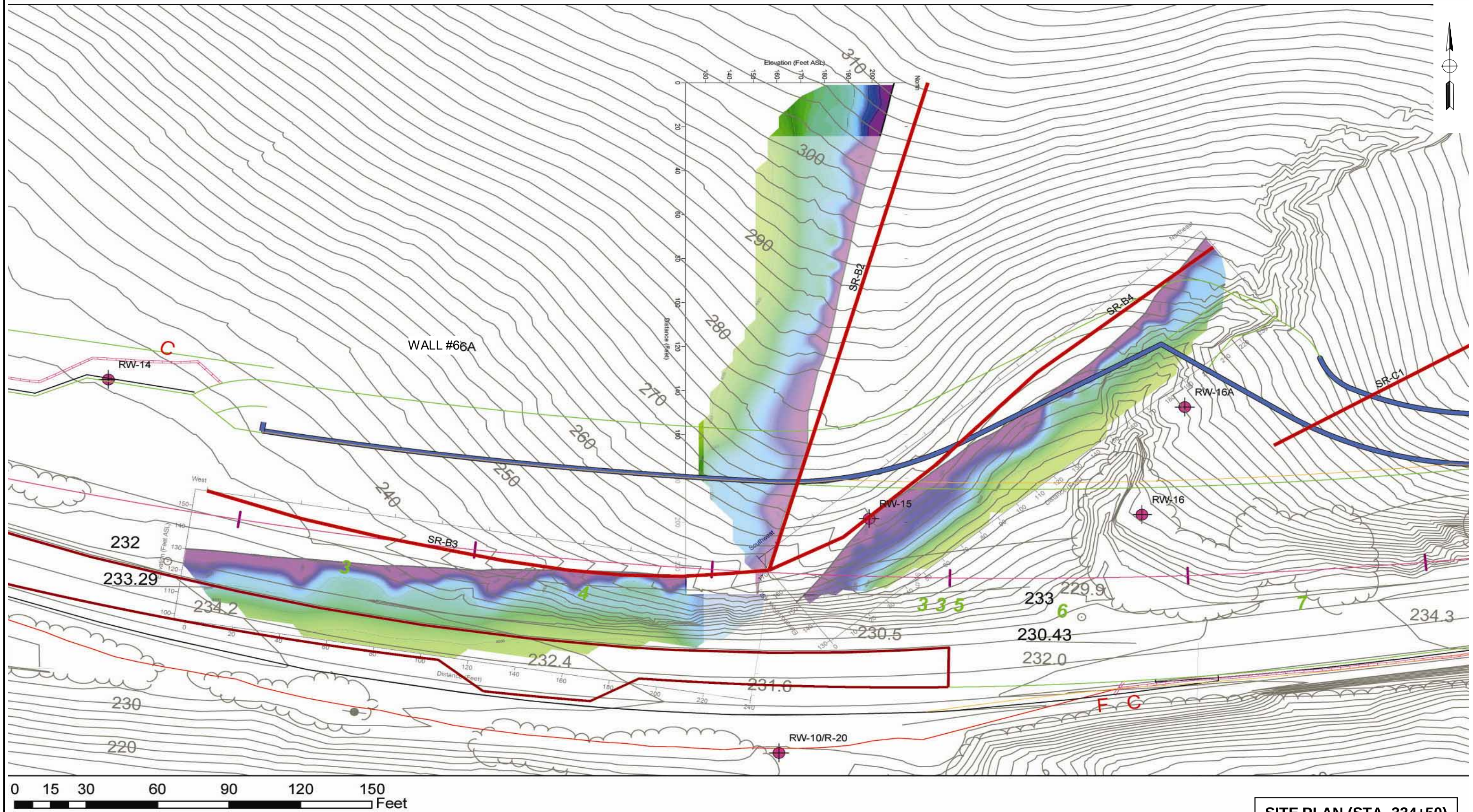
SITE PLAN (STA. 321+25)

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

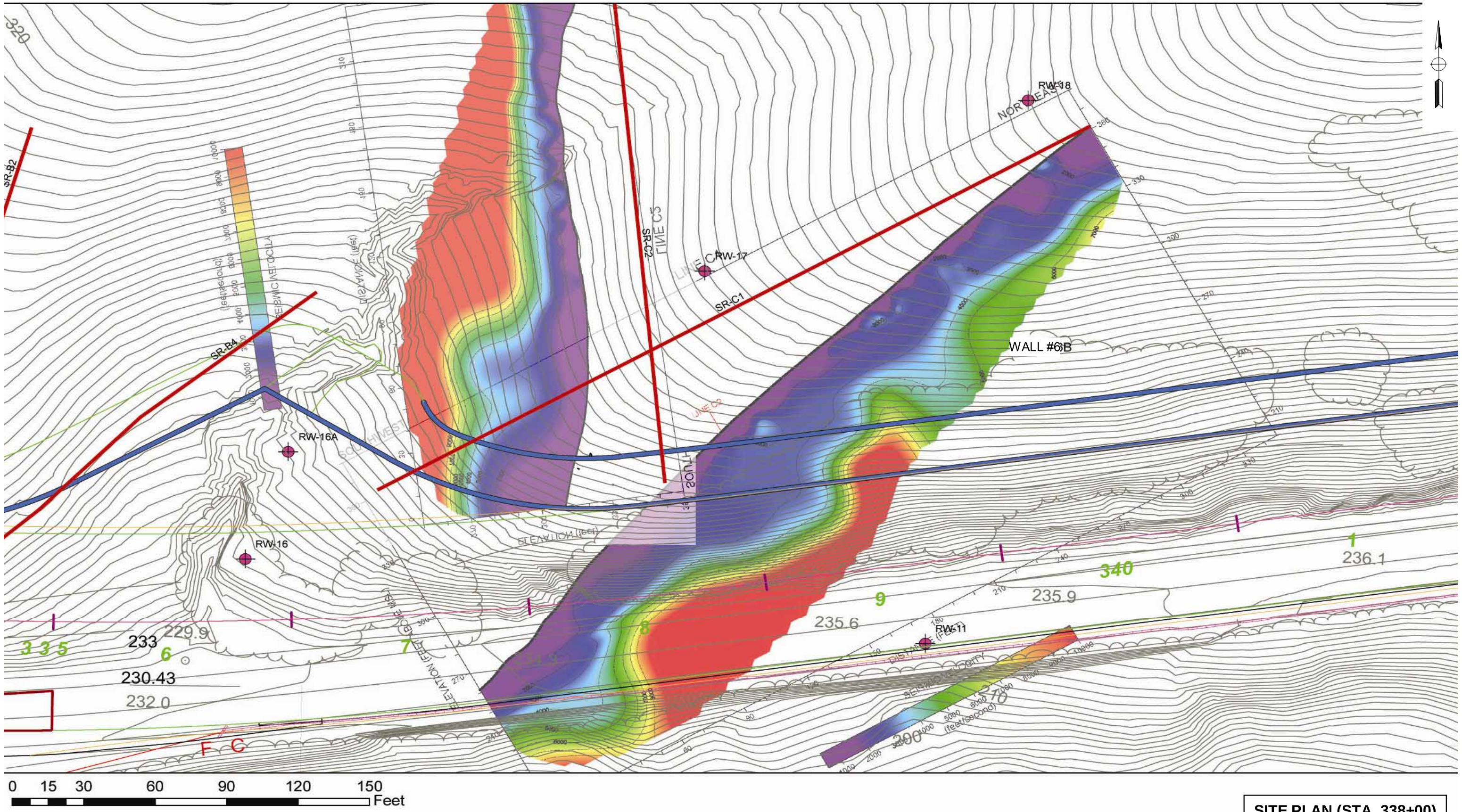
JOB NO.: 208117.FDN

PLATE NO.: 3C



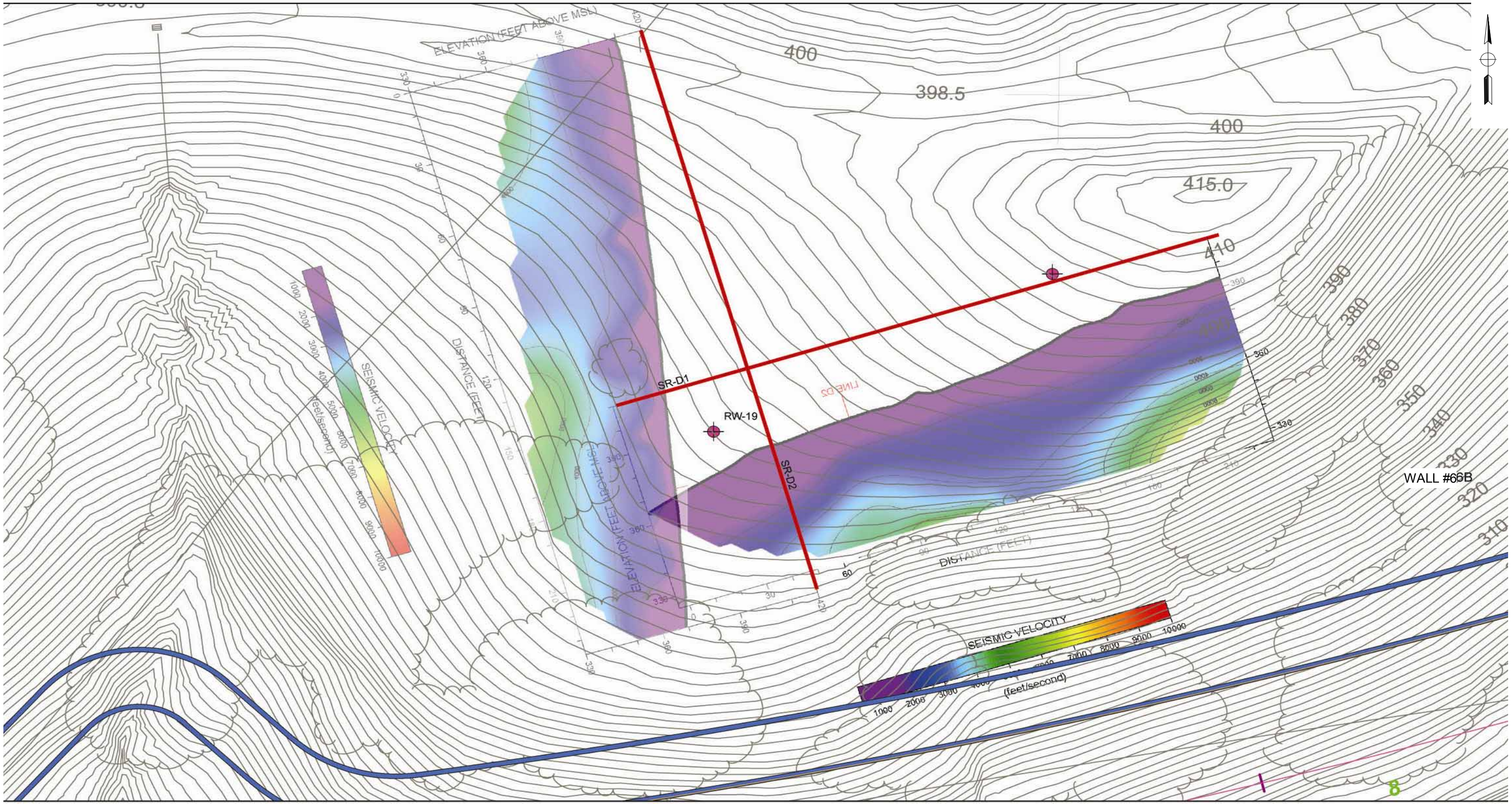
SITE PLAN (STA. 334+50)

PARIKH CONSULTANTS, INC. GEOTECHNICAL CONSULTANTS MATERIALS TESTING	**JAMESON CANYON ROAD WIDENING PROJECT** **SOLANO COUNTY, CALIFORNIA**	
	JOB NO.: 208117.FDN	**PLATE NO.: 3D**



SITE PLAN (STA. 338+00)

PARIKH CONSULTANTS, INC. GEOTECHNICAL CONSULTANTS MATERIALS TESTING	**JAMESON CANYON ROAD WIDENING PROJECT** **SOLANO COUNTY, CALIFORNIA**	
	JOB NO.: 208117.FDN	**PLATE NO.: 3E**



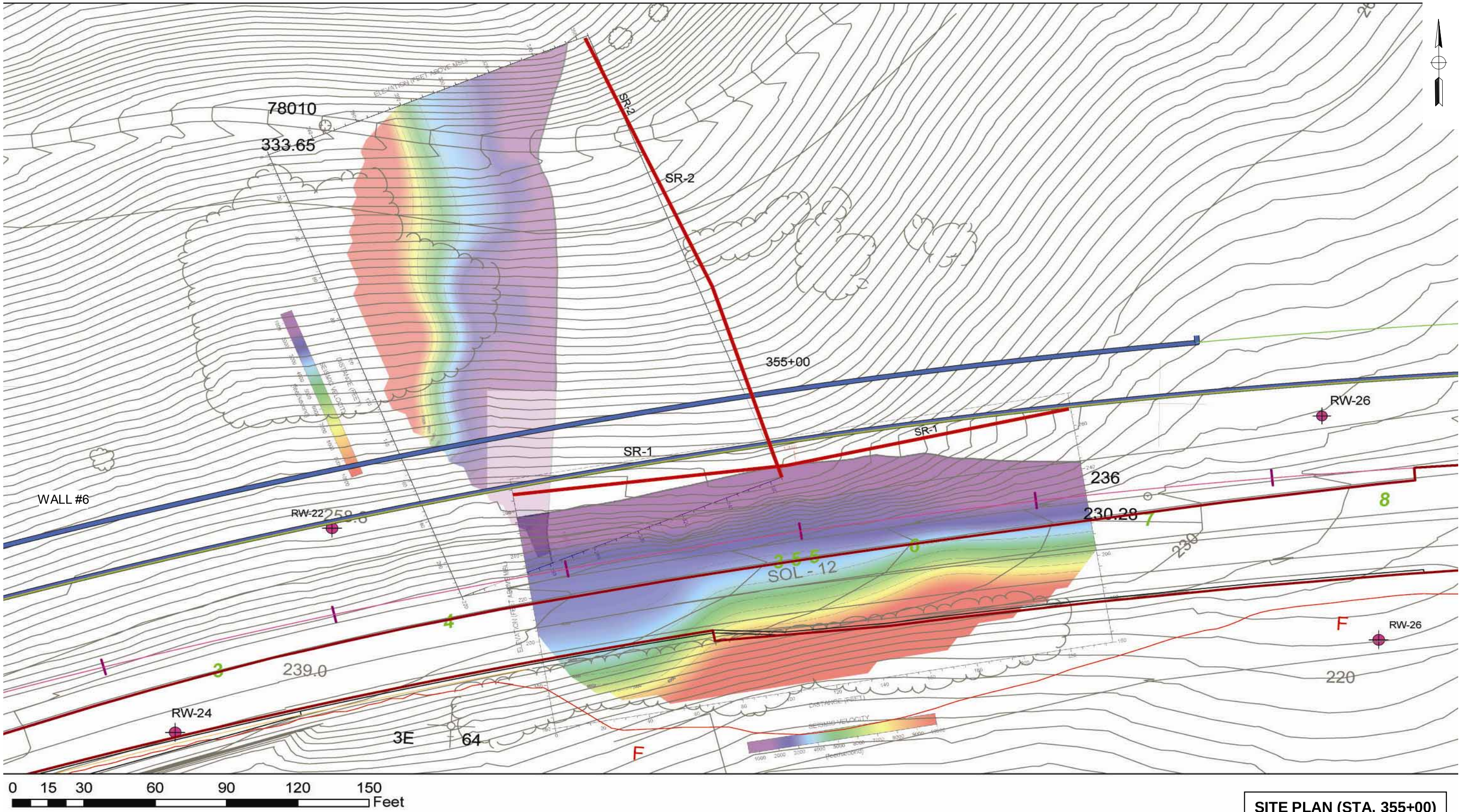
SITE PLAN (STA. 345+50)

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 3F



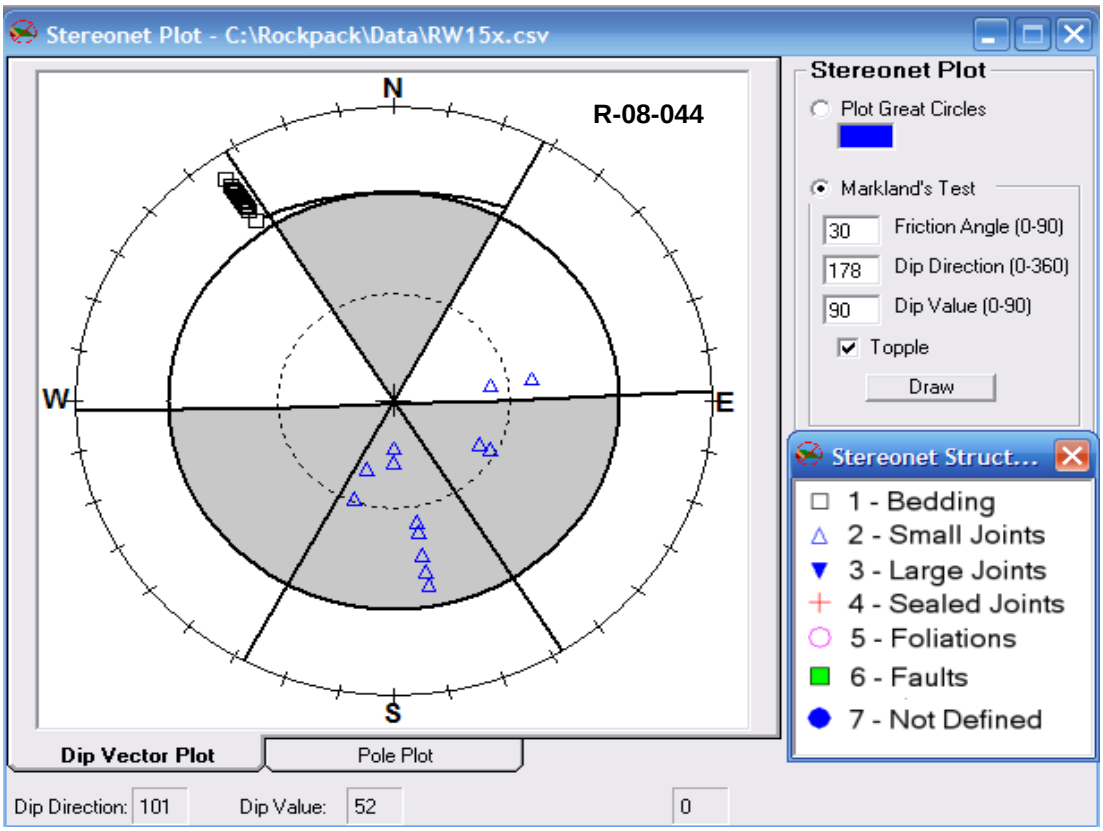
SITE PLAN (STA. 355+00)

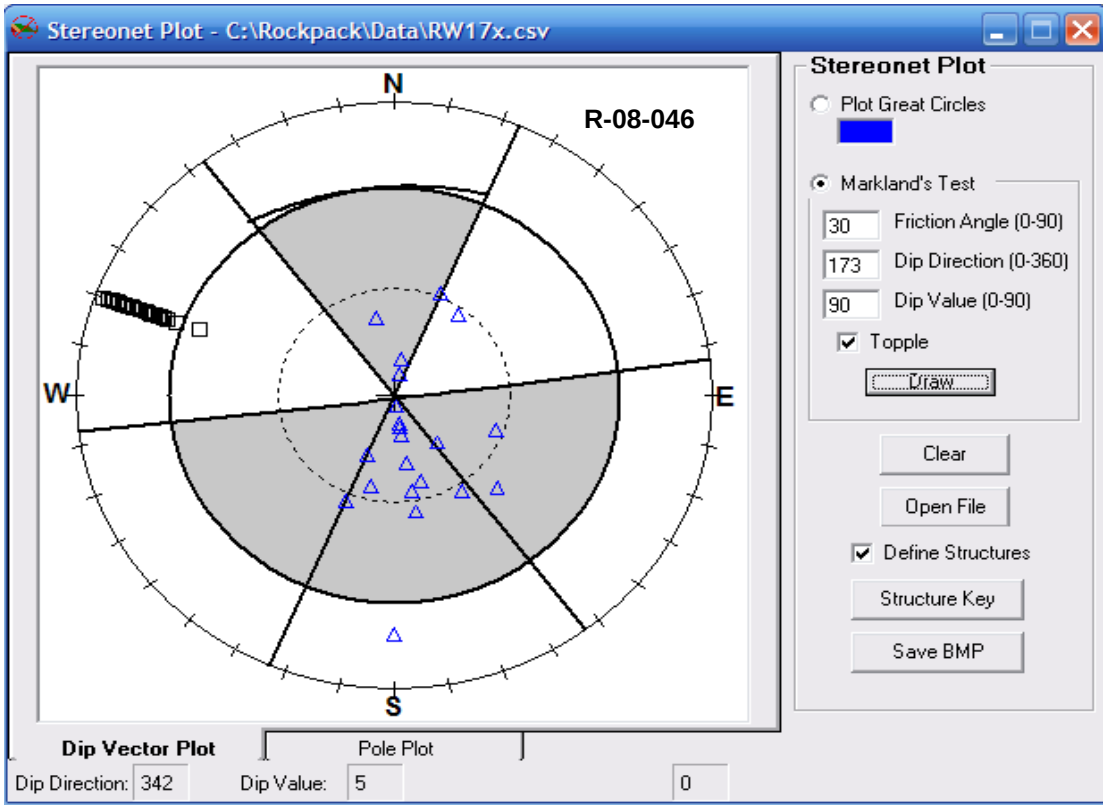
PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 3G





LEGEND:
- □ 1 - Bedding
- △ 2 - Small Joints

STEREONET PLOTS

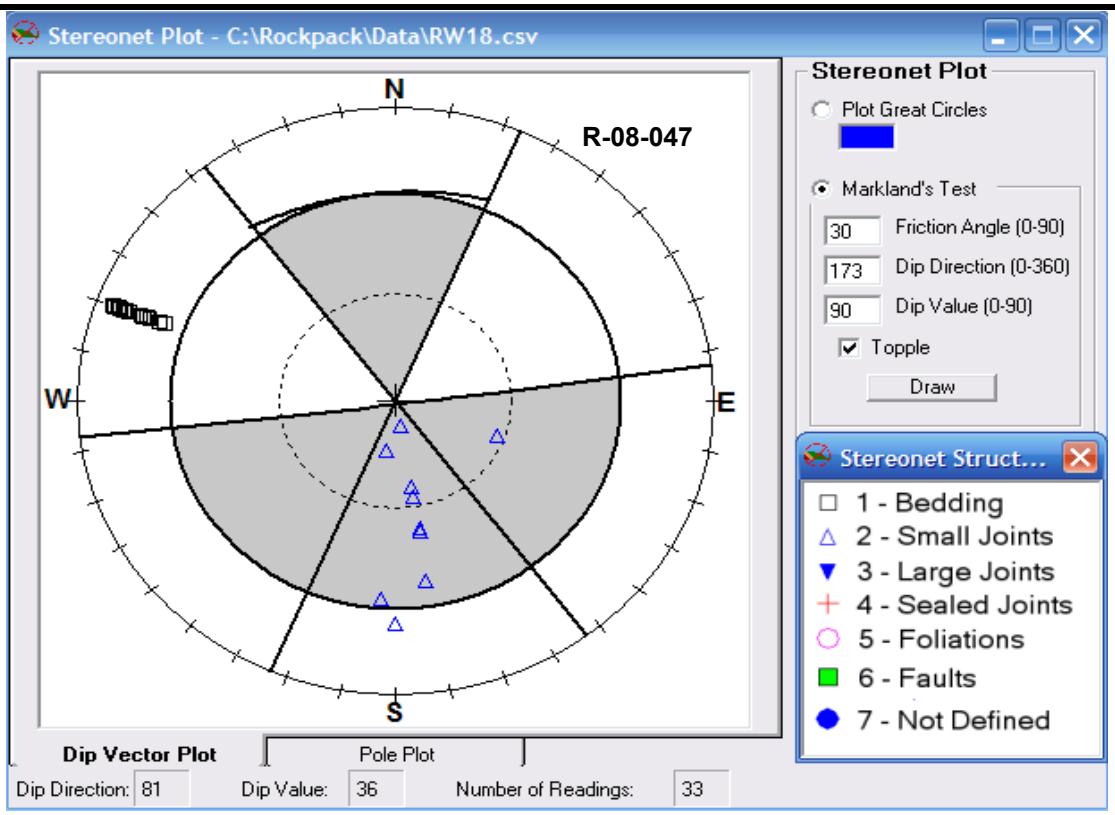
PARIKH CONSULTANTS, INC.

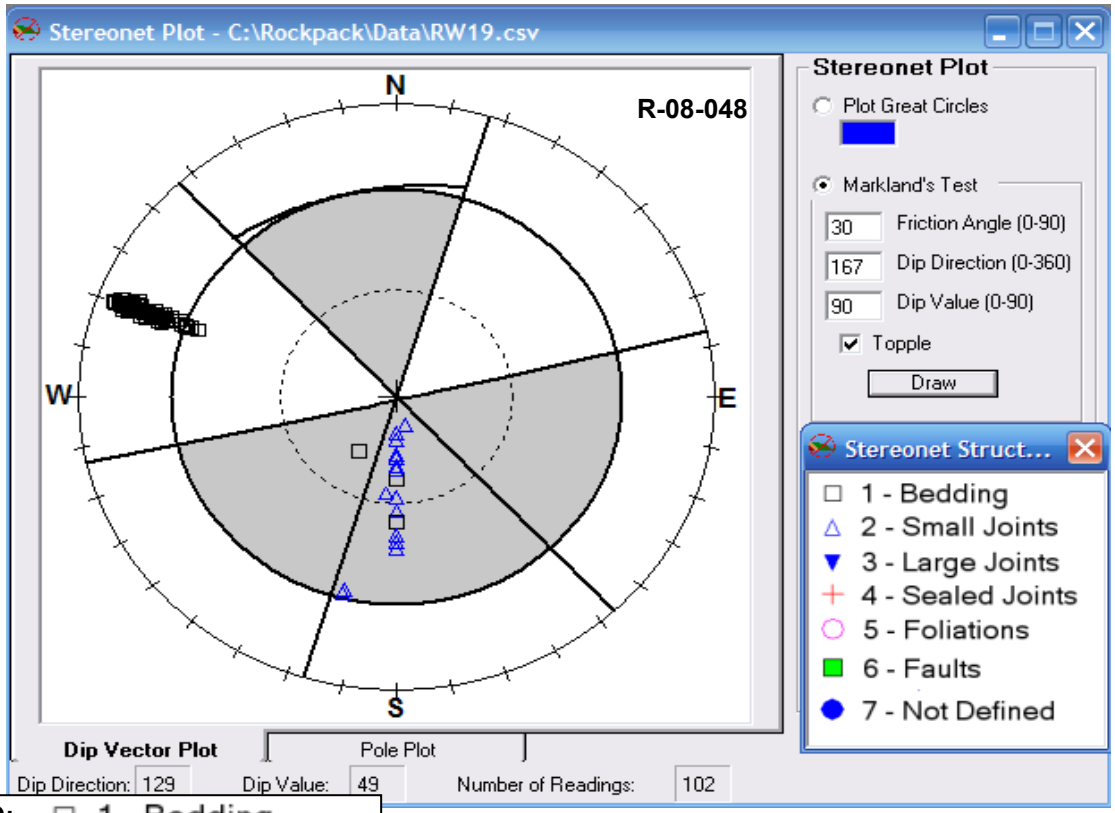
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.:4A





LEGEND:
- □ 1 - Bedding
- △ 2 - Small Joints

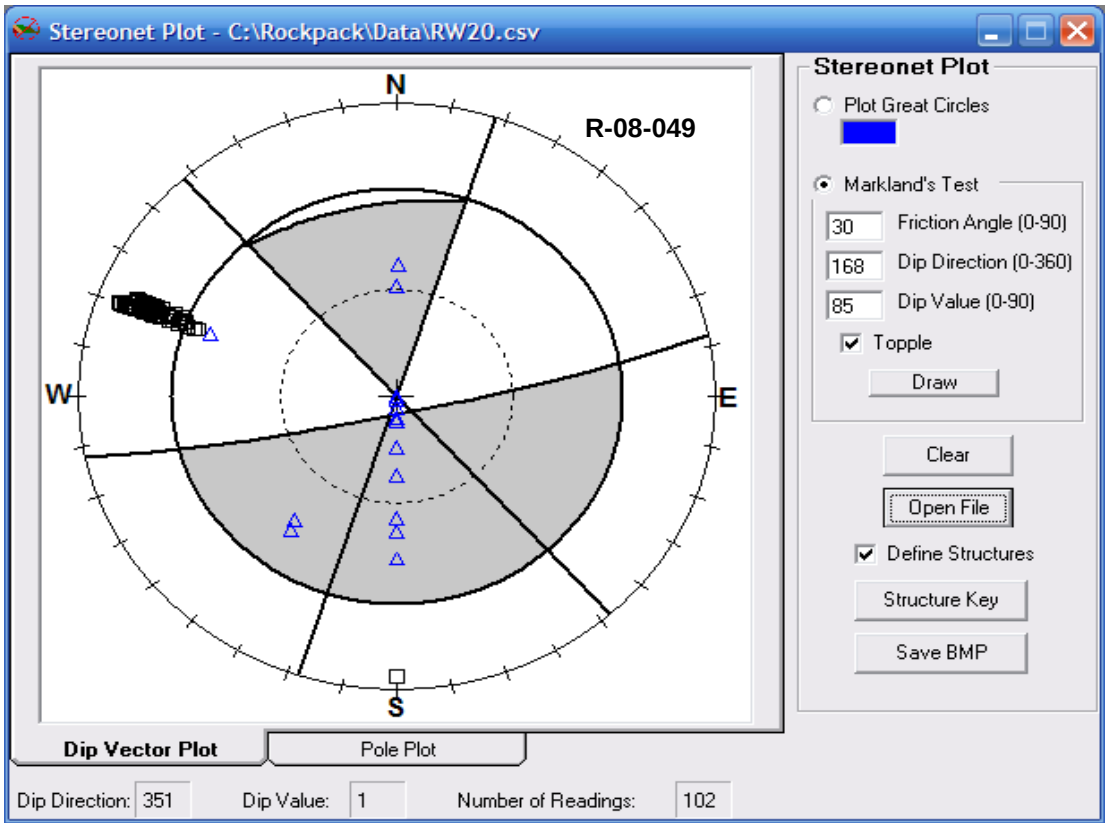
STEREONET PLOTS

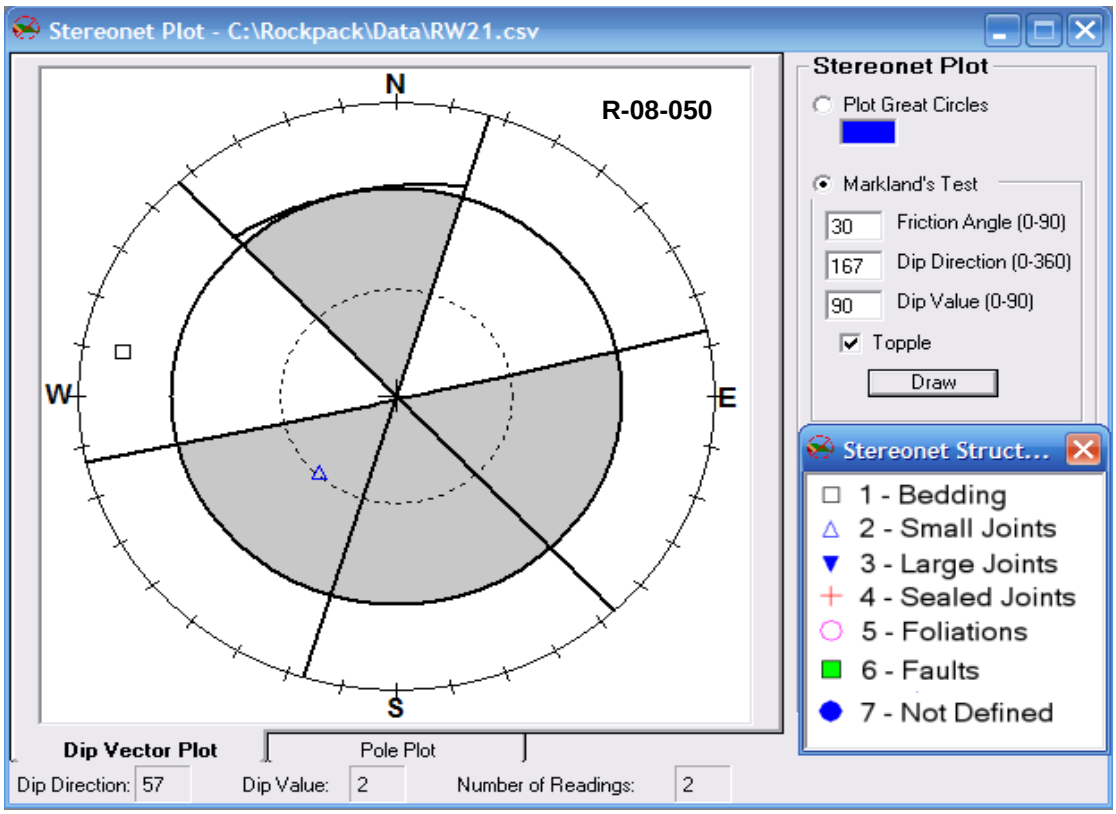
PARIKH CONSULTANTS, INC.

GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN | **PLATE NO.:4B**





LEGEND:
- □ 1 - Bedding
- △ 2 - Small Joints

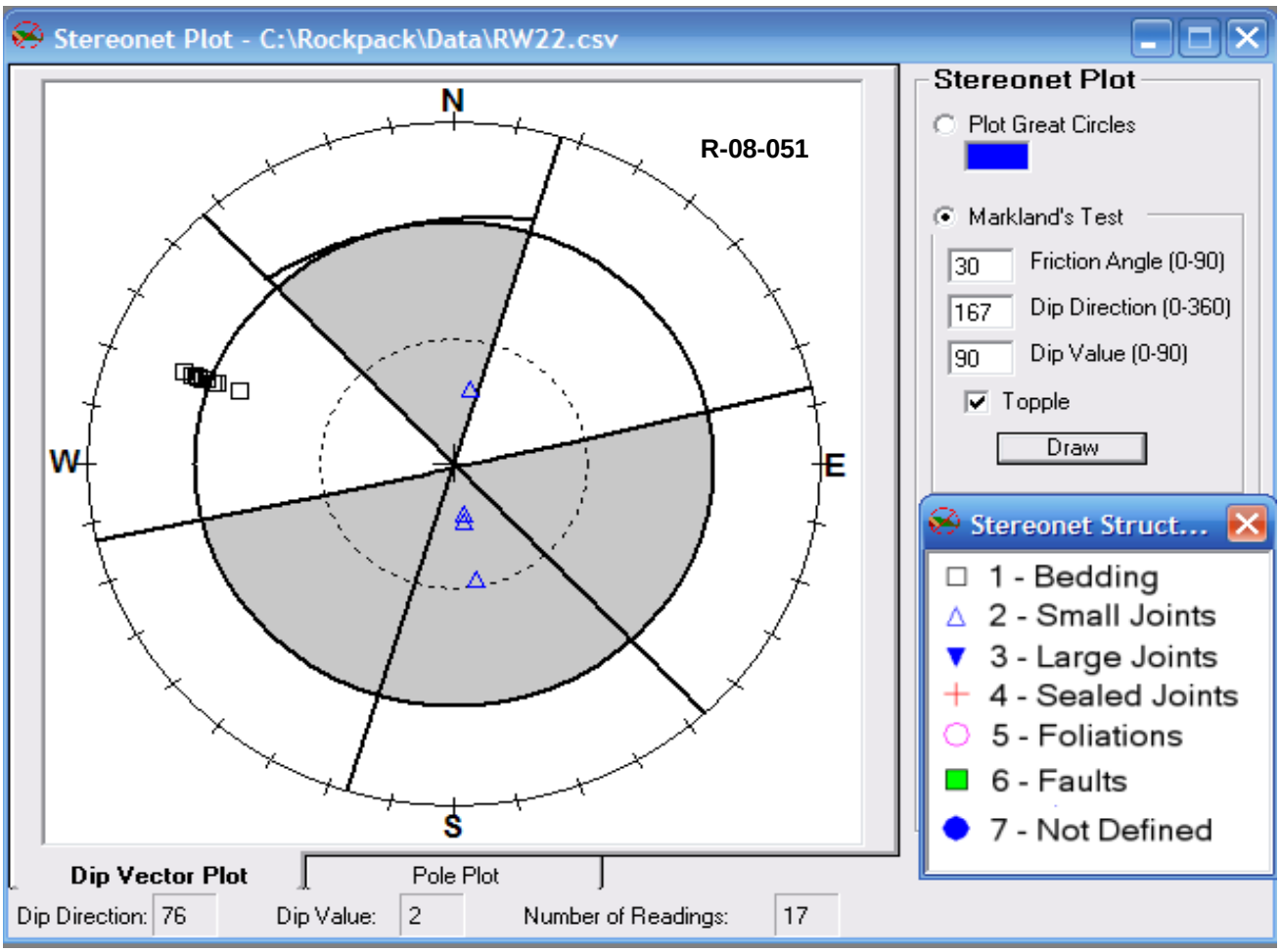
STEREONET PLOTS

PARIKH CONSULTANTS, INC.

GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN	PLATE NO.:4C



LEGEND:
- □ 1 - Bedding
- △ 2 - Small Joints

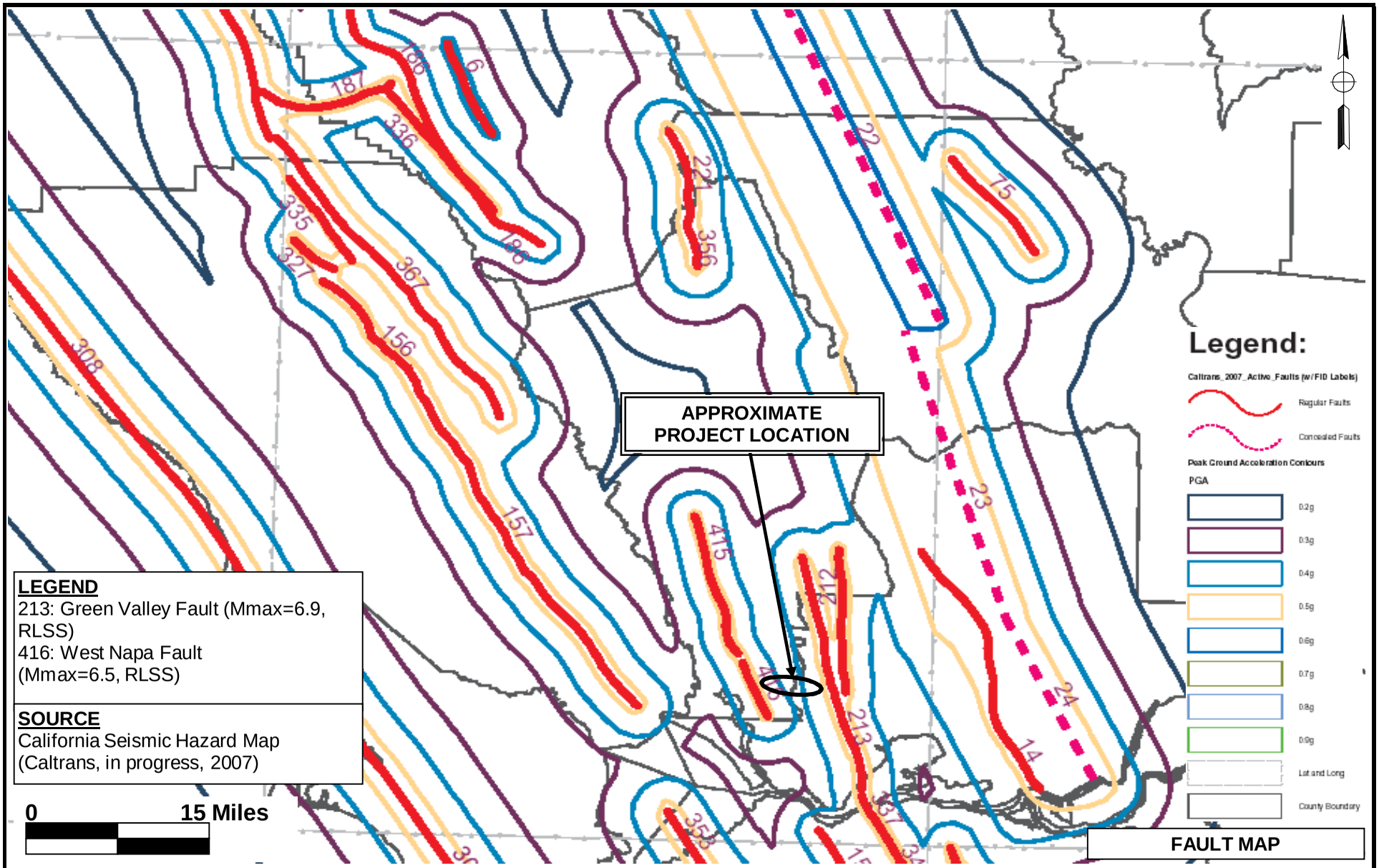
STEREONET PLOTS

PARIKH CONSULTANTS, INC.

GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN | PLATE NO.:4D



LEGEND
213: Green Valley Fault (Mmax=6.9, RLSS)
416: West Napa Fault (Mmax=6.5, RLSS)

SOURCE
California Seismic Hazard Map (Caltrans, in progress, 2007)

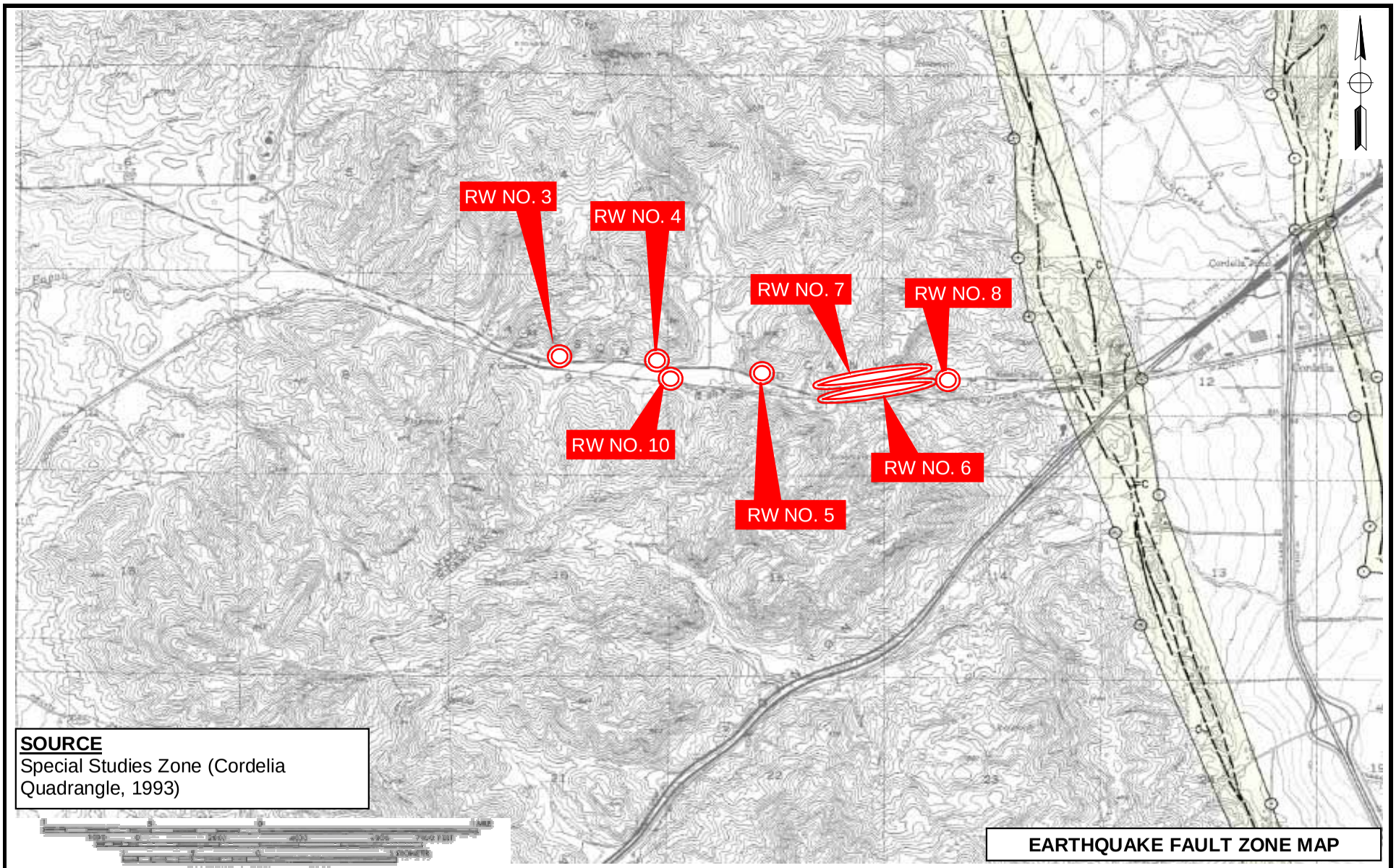
FAULT MAP

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMENSON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 5A



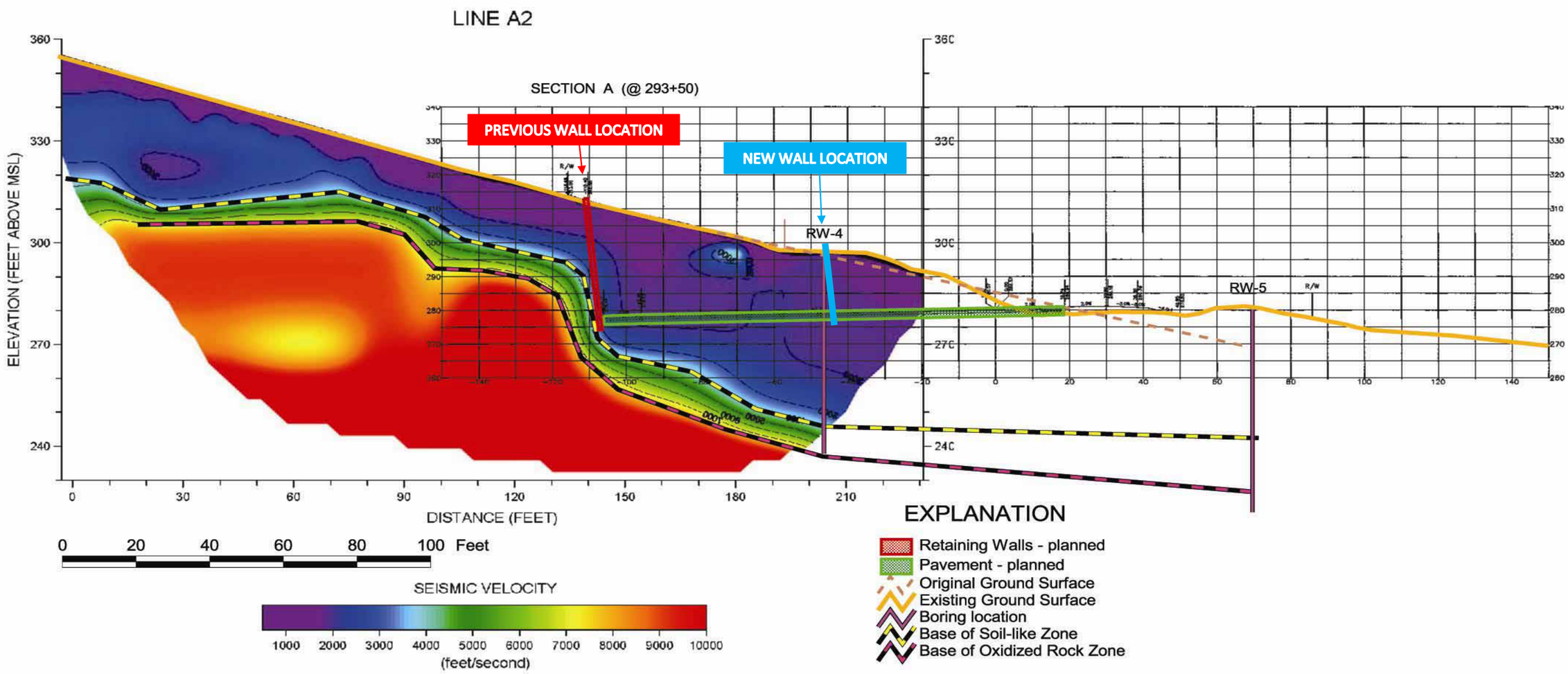
EARTHQUAKE FAULT ZONE MAP

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMENSON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 5B



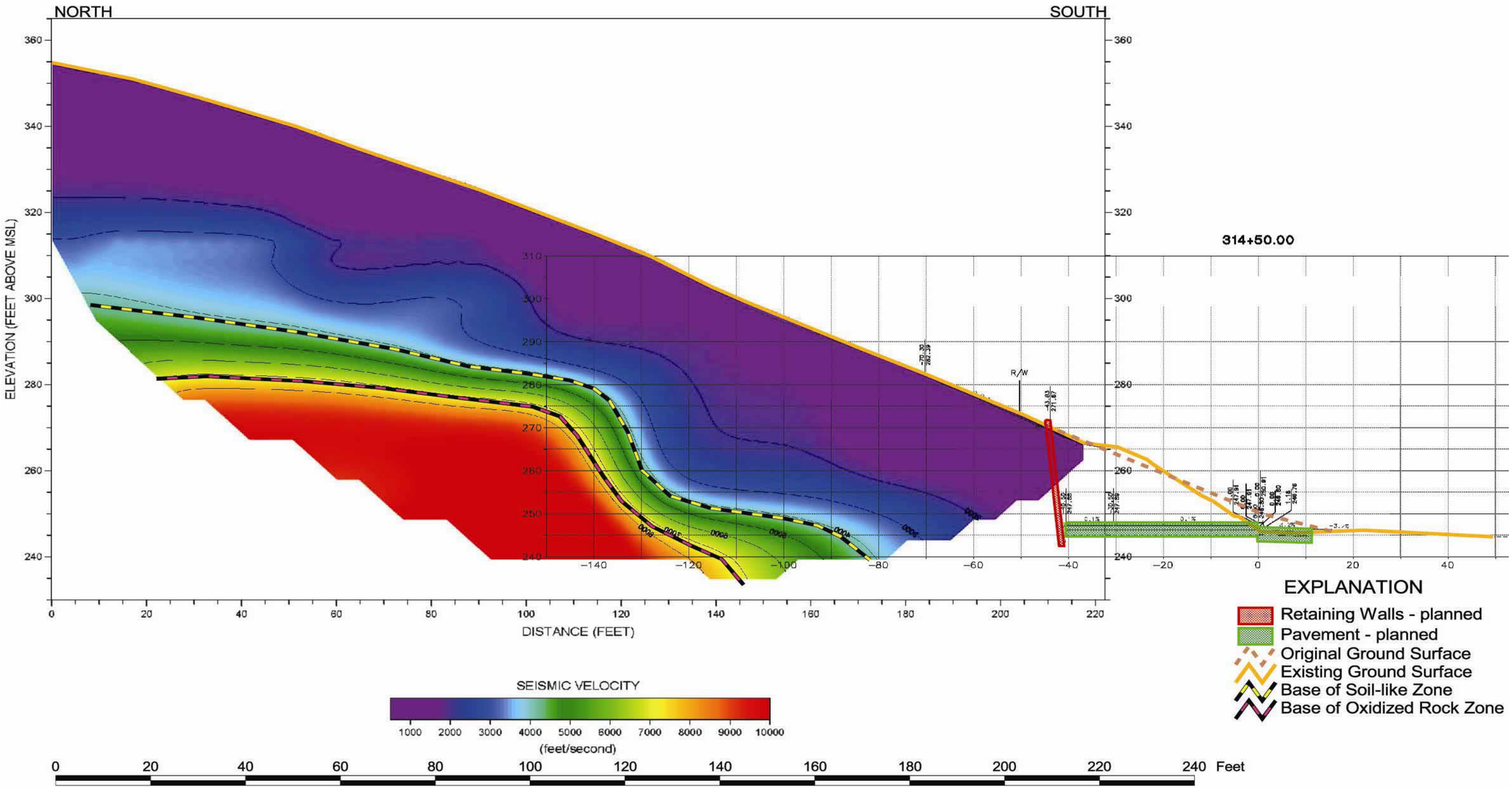
Note:
The seismic refraction profile is provided by NORCAL Geophysical. The "Explanation" is added by Parikh to aid in the analysis and is only valid at the station noted. This information should not be used for construction purpose.

CROSS-SECTION AT STA. 293+50

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN | **PLATE NO.: 6A**



Note:
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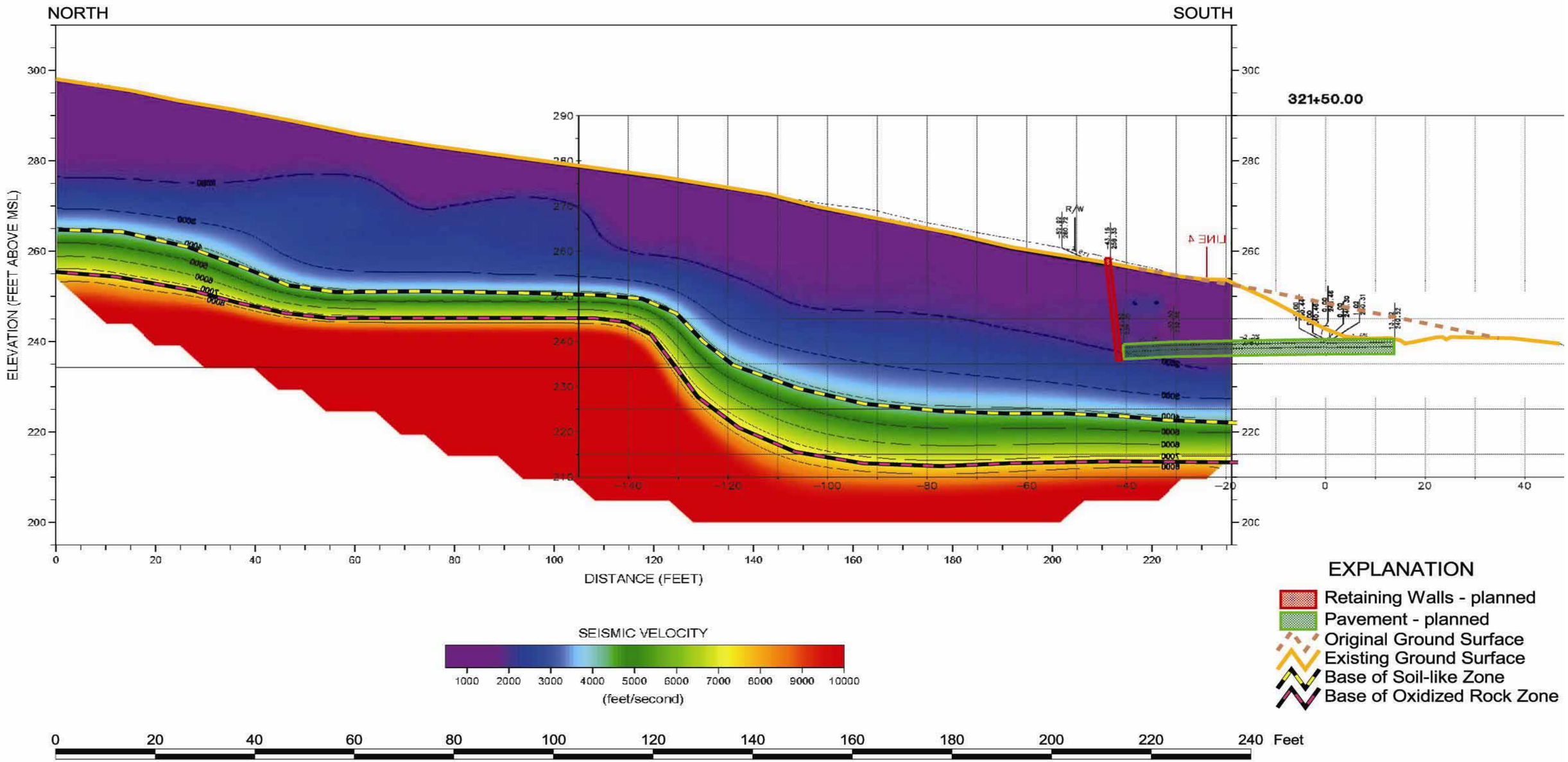
CROSS-SECTION AT STA. 314+50

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN | **PLATE NO.: 6B**



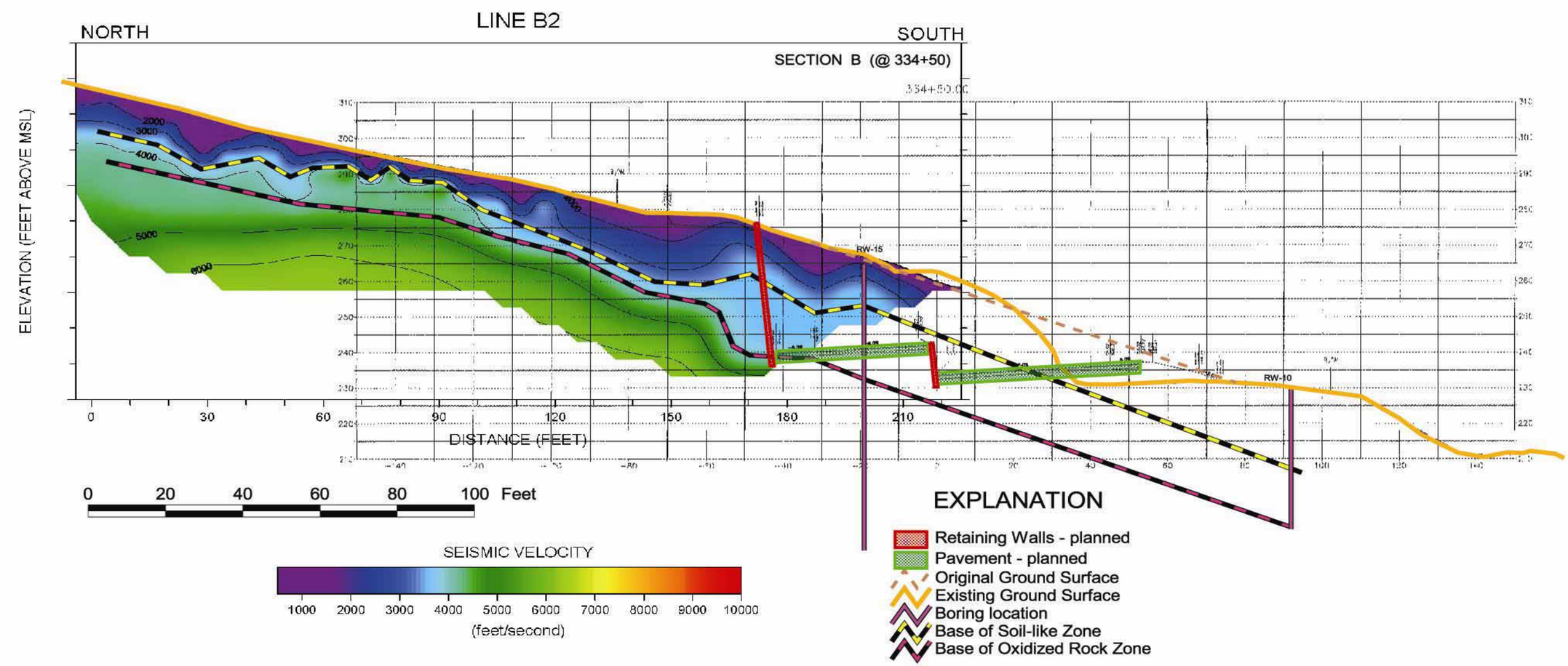
Note:
The seismic refraction profile is provided by NORCAL Geophysical. The "Explanation" is added by Parikh to aid in the analysis and is only valid at the station noted. This information should not be used for construction purpose.

CROSS-SECTION AT STA. 321+50

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN | **PLATE NO.: 6C**



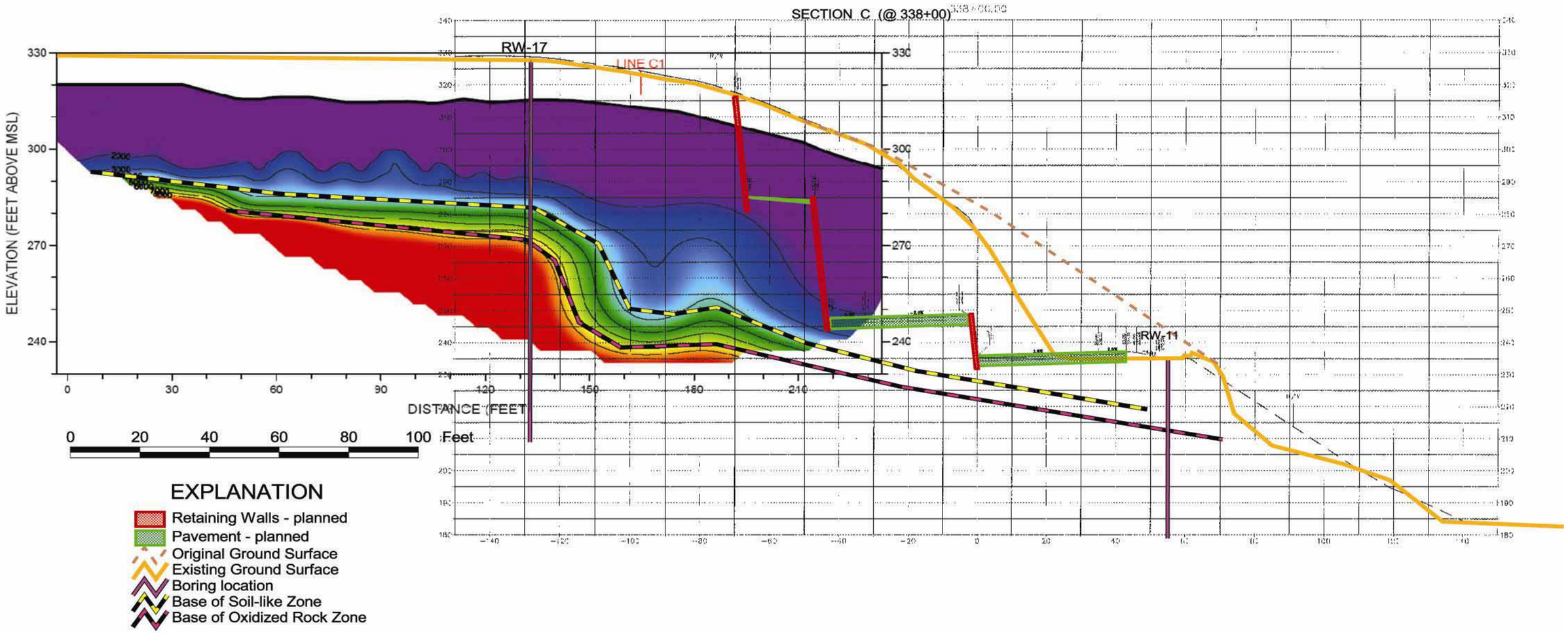
Note:
The seismic refraction profile is provided by NORCAL Geophysical. The "Explanation" is added by Parikh to aid in the analysis and is only valid at the station noted. This information should not be used for construction purpose.

CROSS-SECTION AT STA. 334+50

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN | **PLATE NO.: 6D**



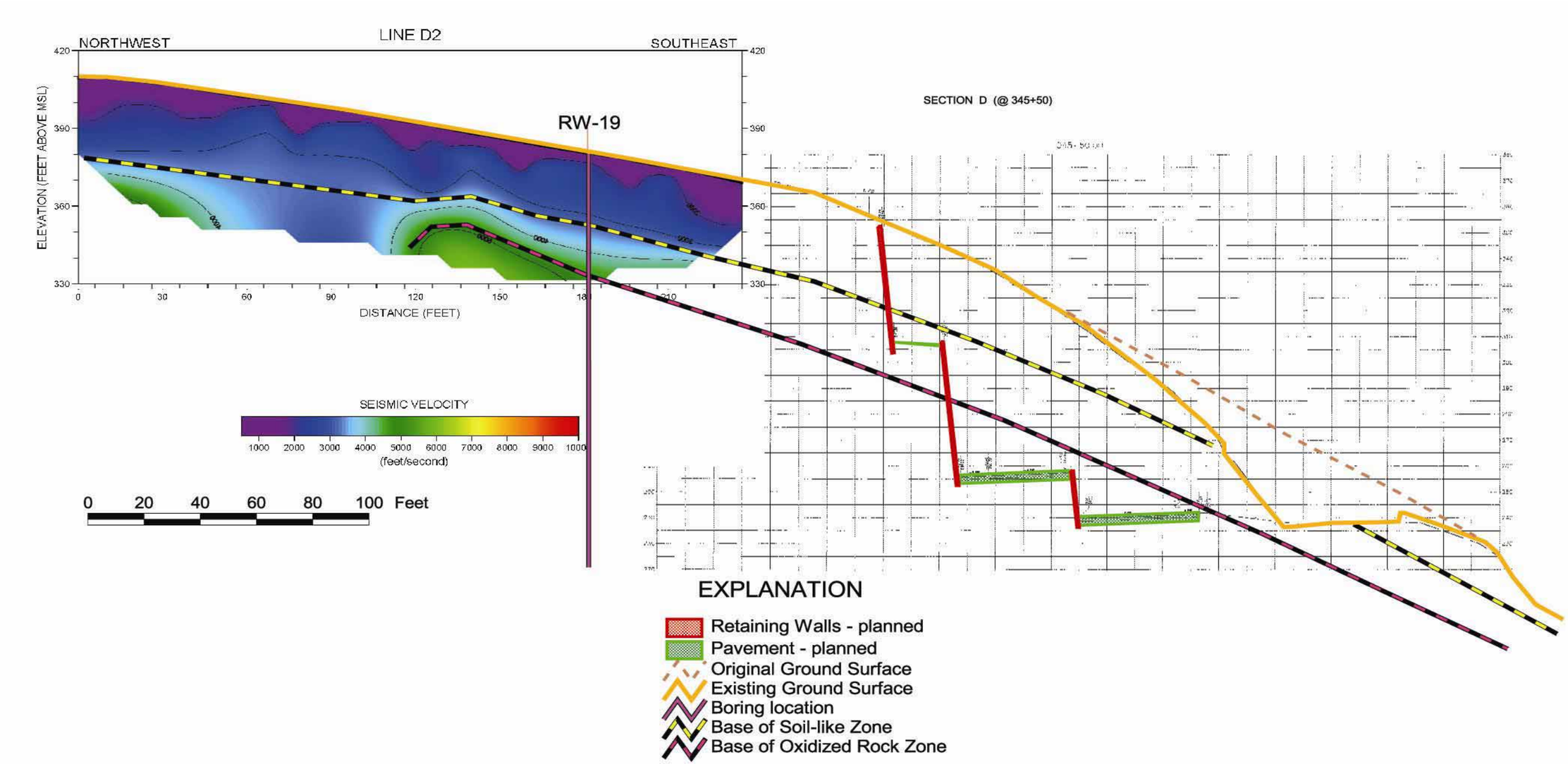
Note:
The seismic refraction profile is provided by NORCAL Geophysical. The "Explanation" is added by Parikh to aid in the analysis and is only valid at the station noted. This information should not be used for construction purpose.

CROSS-SECTION AT STA. 338+00

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

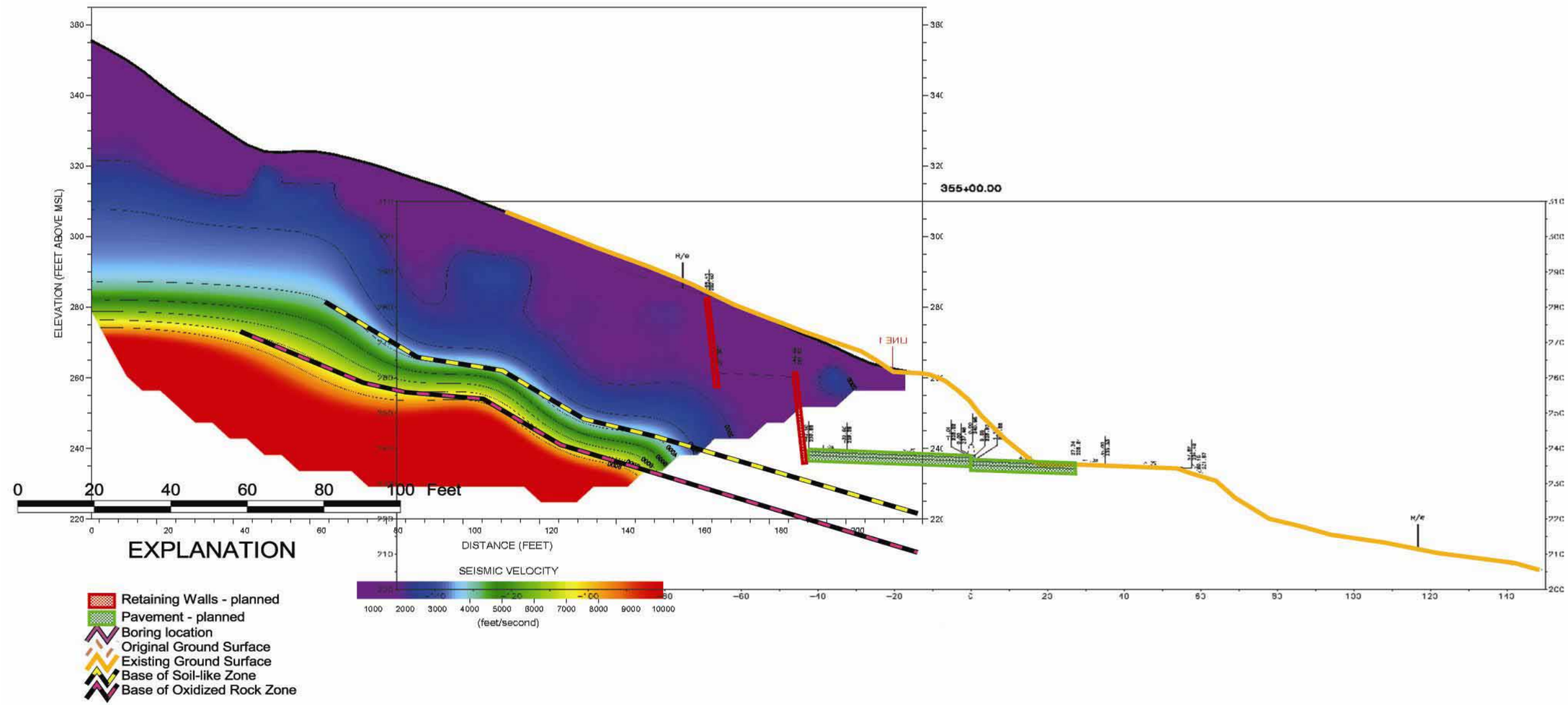
JOB NO.: 208117.FDN | **PLATE NO.: 6E**



Note:
The seismic refraction profile is provided by NORCAL Geophysical. The "Explanation" is added by Parikh to aid in the analysis and is only valid at the station noted. This information should not be used for construction purpose.

CROSS-SECTION AT STA. 345+50

PARIKH CONSULTANTS, INC. GEOTECHNICAL CONSULTANTS MATERIALS TESTING	**JAMESON CANYON ROAD WIDENING PROJECT** **SOLANO COUNTY, CALIFORNIA**	
	JOB NO.: 208117.FDN	**PLATE NO.: 6F**



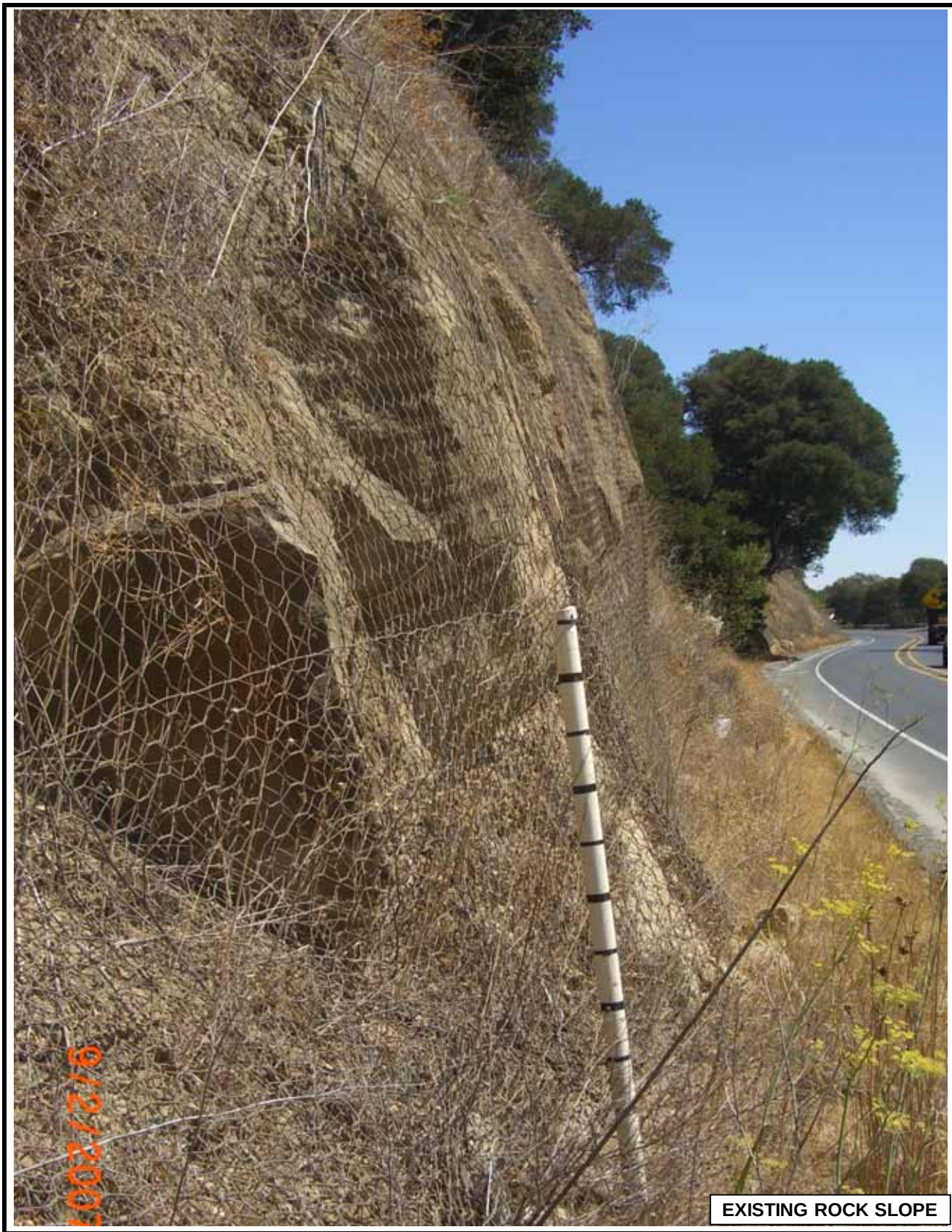
Note:
The seismic refraction profile is provided by NORCAL Geophysical. The "Explanation" is added by Parikh to aid in the analysis and is only valid at the station noted. This information should not be used for construction purpose.

CROSS-SECTION AT STA. 355+00

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN | **PLATE NO.: 6G**



EXISTING ROCK SLOPE

PARIKH CONSULTANTS, INC.

GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN	PLATE NO.: 7A

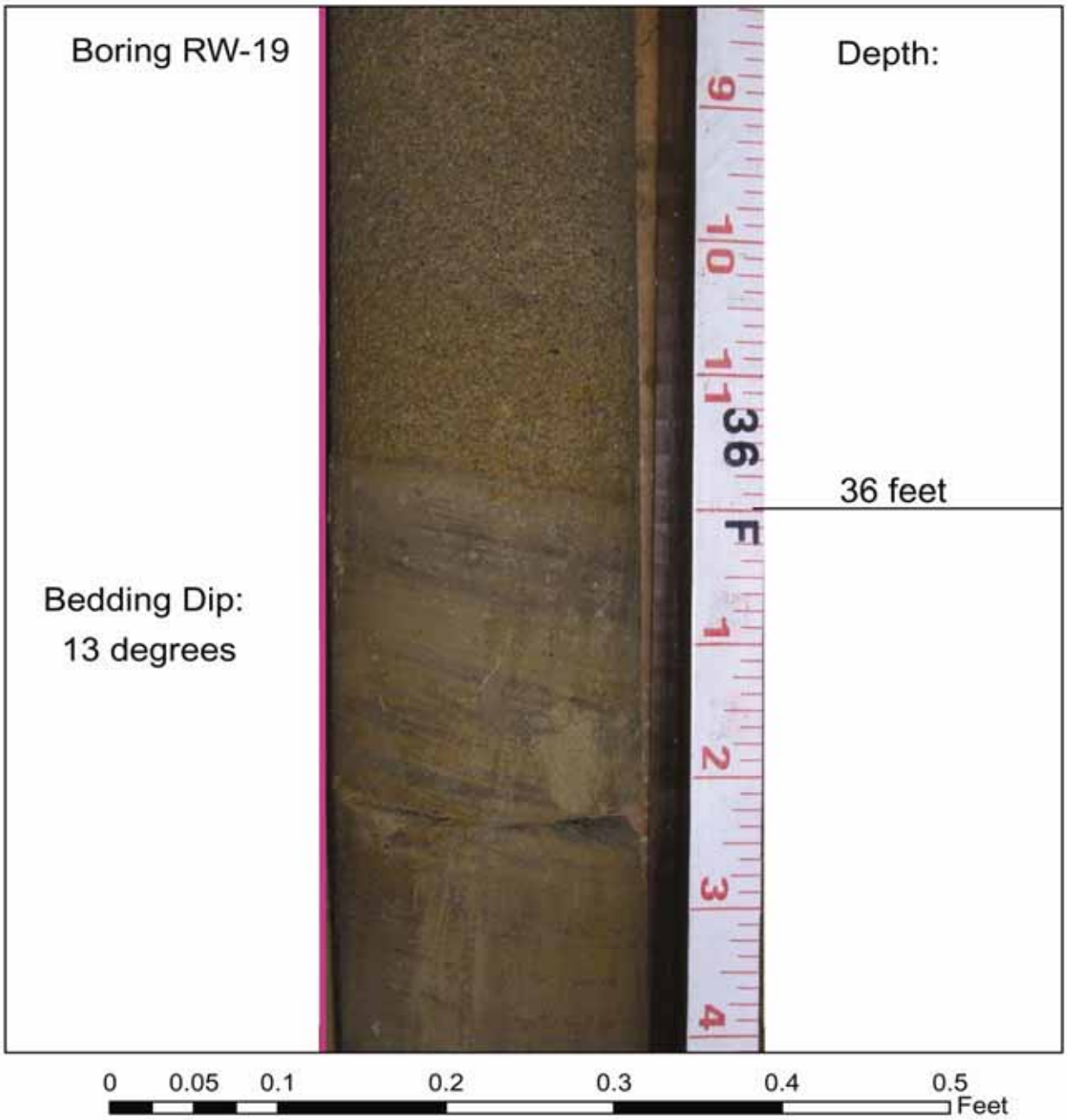
EXISTING ROCK SLOPE

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 7B



CORE SAMPLES

PARIKH CONSULTANTS, INC. GEOTECHNICAL CONSULTANTS MATERIALS TESTING	**JAMESON CANYON ROAD WIDENING PROJECT** **SOLANO COUNTY, CALIFORNIA**	
	JOB NO.: 208117.FDN	PLATE NO.: 8A

EXISTING ROCK SLOPE

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN

PLATE NO.: 7C

Boring RW-19

Depth:

Bedding Dip:
16 degrees

Bedding Dip:
18 degrees

Bedding Dip:
12 degrees

50 feet

0 0.05 0.1 0.2 0.3 0.4 0.5 Feet

CORE SAMPLES

PARIKH CONSULTANTS, INC.

GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN | **PLATE NO.: 8B**

Boring RW-20

Depth: 77 feet

Bedding Dip:
18 degrees

Bedding Dip:
20 degrees

0 0.05 0.1 0.2 0.3 0.4 0.5 Feet

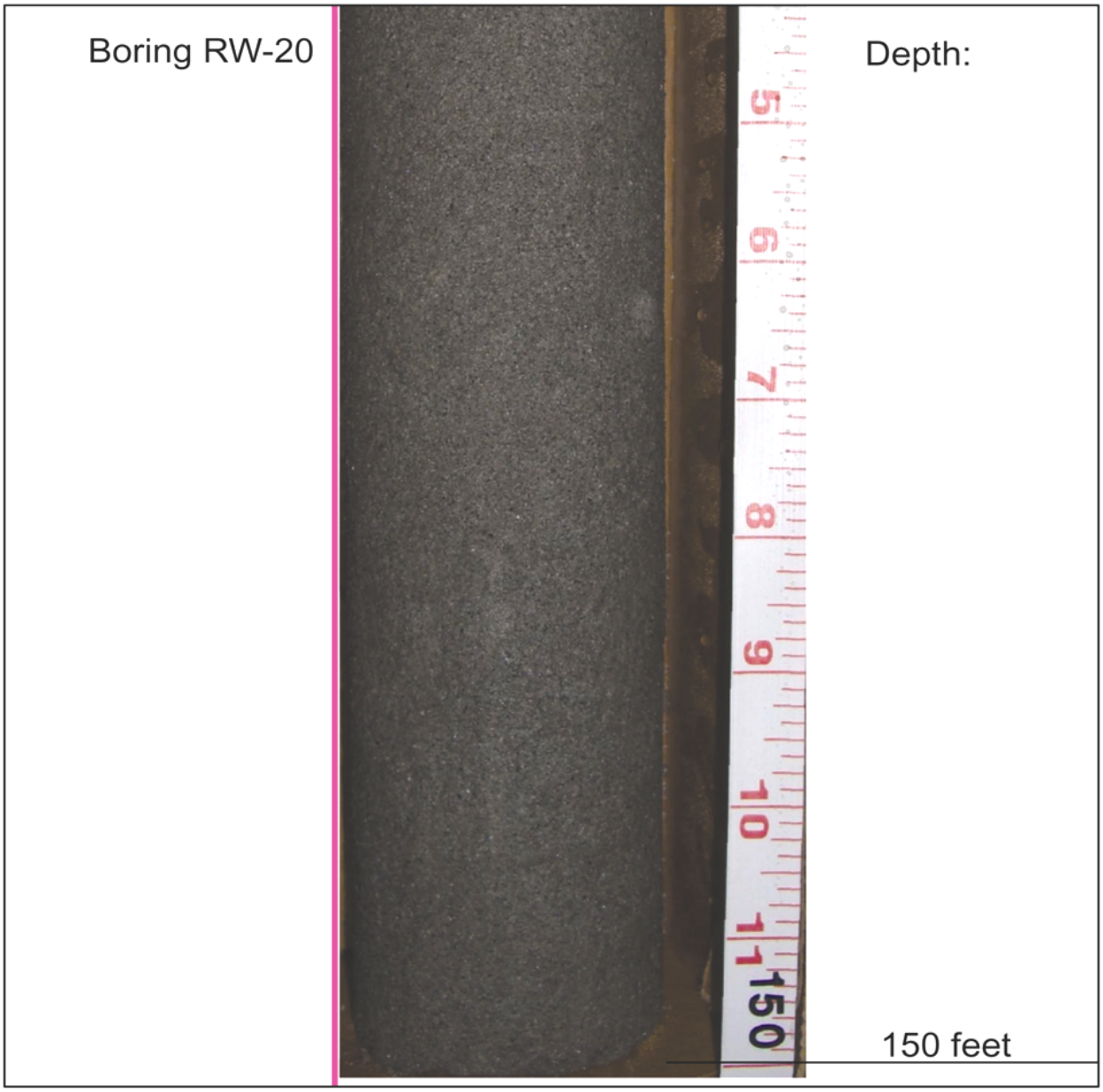
CORE SAMPLES

PARIKH CONSULTANTS, INC.

GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN | **PLATE NO.: 8C**



0 0.05 0.1 0.2 0.3 0.4 0.5 Feet

CORE SAMPLES

PARIKH CONSULTANTS, INC.

GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN | **PLATE NO.: 8D**

APPENDIX A

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6		

REGISTERED ENGINEER-GEOTECHNICAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp.12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GM	SILTY GRAVEL SILTY GRAVEL with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL
SP	Poorly graded SAND Poorly graded SAND with GRAVEL
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SM	SILTY SAND SILTY SAND with GRAVEL
SC	CLAYEY SAND CLAYEY SAND with GRAVEL
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL
PT	PEAT
	COBBLES COBBLES and BOULDERS BOULDERS

Graphic/Symbol	Group Names
CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

DESIGN OVERSIGHT

SIGN OFF DATE

DRAWN BY L. TRAN

CHECKED BY F. WANG

V. SANTOS
FIELD INVESTIGATION BY:
DATE: AUGUST 2008 TO OCTOBER 2009

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

F. WANG
PROJECT ENGINEER

BRIDGE NO. –

POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT

SOIL LEGEND NO. 1 OF 3

OGS CIVIL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04264
EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 7/20/09 11/09/09

SHEET OF

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6	----	----

REGISTERED ENGINEER-GEOTECHNICAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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SAN JOSE, CA 95131

CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

CONSISTENCY OF COHESIVE SOILS

Description	Unconfined Compressive Strength (tsf)	Pocket Penetrometer Measurement (tsf)	Torvane Measurement (tsf)	Field Approximation
Very Soft	< 0.25	< 0.25	< 0.12	Easily penetrated several inches by fist
Soft	0.25 to 0.50	0.25 to 0.50	0.12 to 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 to 1.0	0.50 to 1.0	0.25 to 0.50	Penetrated several inches by thumb with moderate effort
Stiff	1 to 2	1 to 2	0.50 to 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2 to 4	2 to 4	1.0 to 2.0	Readily indented by thumbnail
Hard	> 4.0	> 4.0	> 2.0	Indented by thumbnail with difficulty

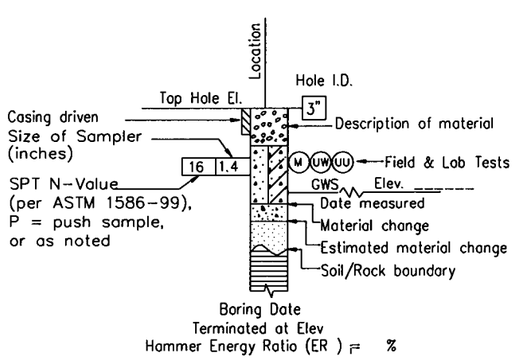
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring
Size	R P	Rotary drilled boring Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778-95)
□	O	Other

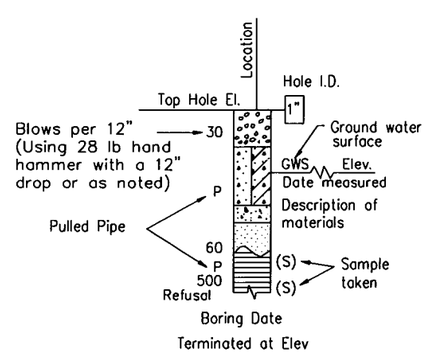
Note: Size in inches.

PLASTICITY OF FINE-GRAINED SOILS

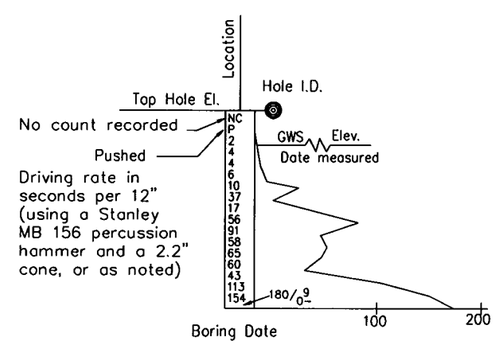
Description	Criteria
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.



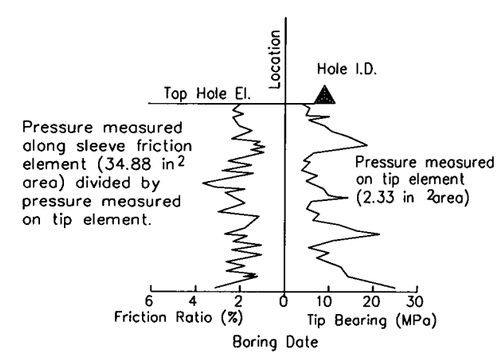
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) SOUNDING

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: AUGUST 2008 TO OCTOBER 2009		

BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT

SOIL LEGEND NO. 2 OF 3

CU 04264
EA 264141

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 7/20/09 11/03/09

SHEET OF

OGS CIVIL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6		

REGISTERED ENGINEER-GEOTECHNICAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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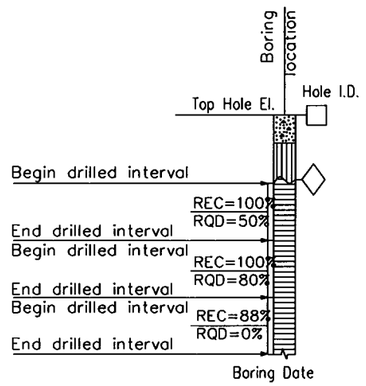
PERCENT CORE RECOVERY (REC) + ROCK QUALITY DESIGNATION (RQD)

$$REC = \frac{\sum \text{Length of the recovered core pieces (inches)}}{\text{Total length of core run (inches)}} \times 100\%$$

$$RQD = \frac{\sum \text{Length of intact core pieces} \geq 4"}{\text{Total length of core run (inches)}} \times 100\%$$



RELATIVE STRENGTH OF INTACT ROCK

Term	Uniaxial Compressive Strength (PSI)
Extremely Strong	> 30,000
Very Strong	14,500 - 30,000
Strong	7,000 - 14,500
Medium Strong	3,500 - 7,000
Weak	700 - 3,500
Very Weak	150 - 700
Extremely Weak	< 150

BEDDING SPACING

Description	Thickness / Spacing
Massive	Greater than 10 ft
Very thickly bedded	3 to 10 ft
Thickly bedded	1 to 3 ft
Moderately bedded	3-5/8" to 1 ft
Thinly bedded	1-1/4" to 3-5/8"
Very thinly bedded	3/8" to 1-1/4"
Laminated	Less than 3/8"

LEGEND OF ROCK MATERIALS

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

ROCK HARDNESS

Description	Criteria
Extremely Hard	Specimen cannot be scratched with a pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows.
Very Hard	Specimen cannot be scratched with a pocket knife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Specimen can be scratched with a pocket knife or sharp pick with difficulty (heavy pressure). Heavy hammer blows required to break specimen.
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure. Core breaks with moderate hammer pressure.
Moderately Soft	Specimen can be grooved 1/6" deep with a pocket knife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Specimen can be grooved or gouged easily by a pocket knife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Specimen can be readily indented, grooved or gouged with fingernail, or carved with a pocket knife. Breaks with light manual pressure.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures.
Very slightly fractured	Lengths greater than 3 feet.
Slightly fractured	Lengths from 1 to 3 feet with few lengths less than 1 foot or greater than 3 feet.
Moderately fractured	Lengths mostly in 4" to 1 foot range with most lengths about 8"
Intensely fractured	Lengths average from 1 to 4" with scattered fragmented intervals with lengths less than 4"
Very intensely fractured	Mostly chips and fragments with a few scattered short core lengths.

Combination descriptors (such as "Very intensely to intensely fractured") are used where equal distribution of both fracture density characteristics is present over a significant interval or exposure, or where characteristics are "in between" the descriptor definitions. Only two adjacent descriptors may be combined.

WEATHERING DESCRIPTORS FOR INTACT ROCK

Description	Diagnostic features					General Characteristics
	Chemical Weathering–Discoloration and/or oxidation		Mechanical Weathering–Grain boundary conditions (disaggregation) primarily for granitics and some coarse-grained sediments	Texture and Solutioning		
	Body of Rock	Fracture Surfaces		Texture	Solutioning	
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change.	No solutioning.	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved.	Minor leaching of some soluble minerals may be noted.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved.	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

Combination descriptors (such as "slightly weathered to fresh") are permissible where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant, identifiable zones can be delineated. Only two adjacent descriptors may be combined. "Very intensely weathered" is the combination descriptor for "intensely weathered to decomposed."

DESIGN OVERSIGHT

SIGN OFF DATE

DRAWN BY L. TRAN

CHECKED BY F. WANG

V. SANTOS
FIELD INVESTIGATION BY:
DATE: AUGUST 2008 TO OCTOBER 2009

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

F. WANG
PROJECT ENGINEER

BRIDGE NO. –

POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT

SOIL LEGEND NO. 3 OF 3

OGS CIVIL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04264
EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 7/28/08 11/05/08

SHEET OF

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6		

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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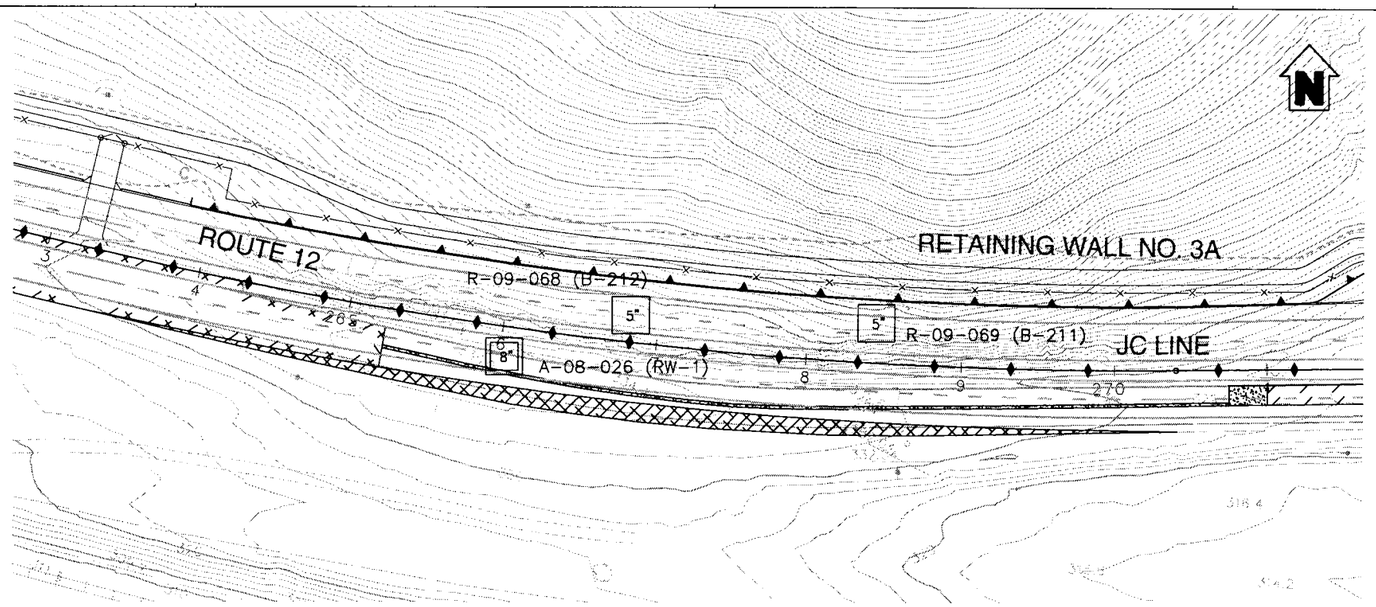
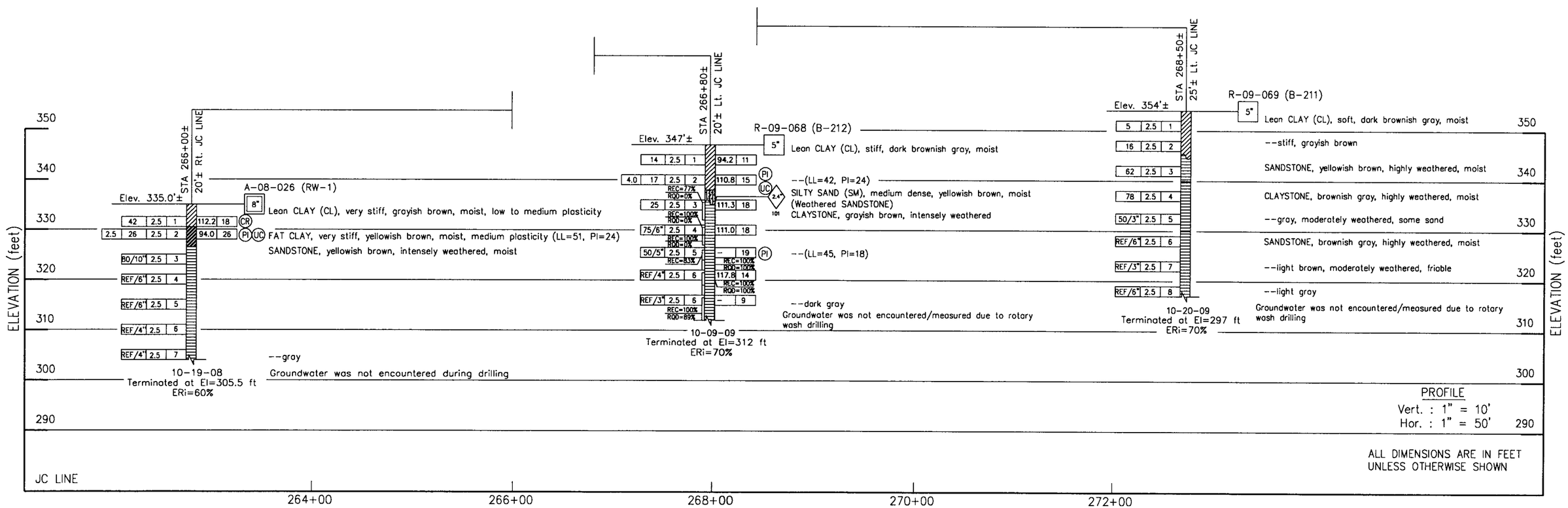


PLAN
1"=50'

Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)



DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG
SIGN OFF DATE	CHECKED BY	F. WANG	FIELD INVESTIGATION BY: DATE: OCTOBER 2008 & OCTOBER 2009		PROJECT ENGINEER

BRIDGE NO. 21E0012
POST MILES 0.0

ROUTE 12/JAMESON CANYON ROAD PROJECT

RW3A, 3B & 3C - LOG OF TEST BORINGS 1 OF 2

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04264
EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 7/28/09 11/05/09 SHEET OF

Nov 04, 2009 - 10:00am S:\ACAD\208117.FDN\LOTB (SOLANO FDN).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6		

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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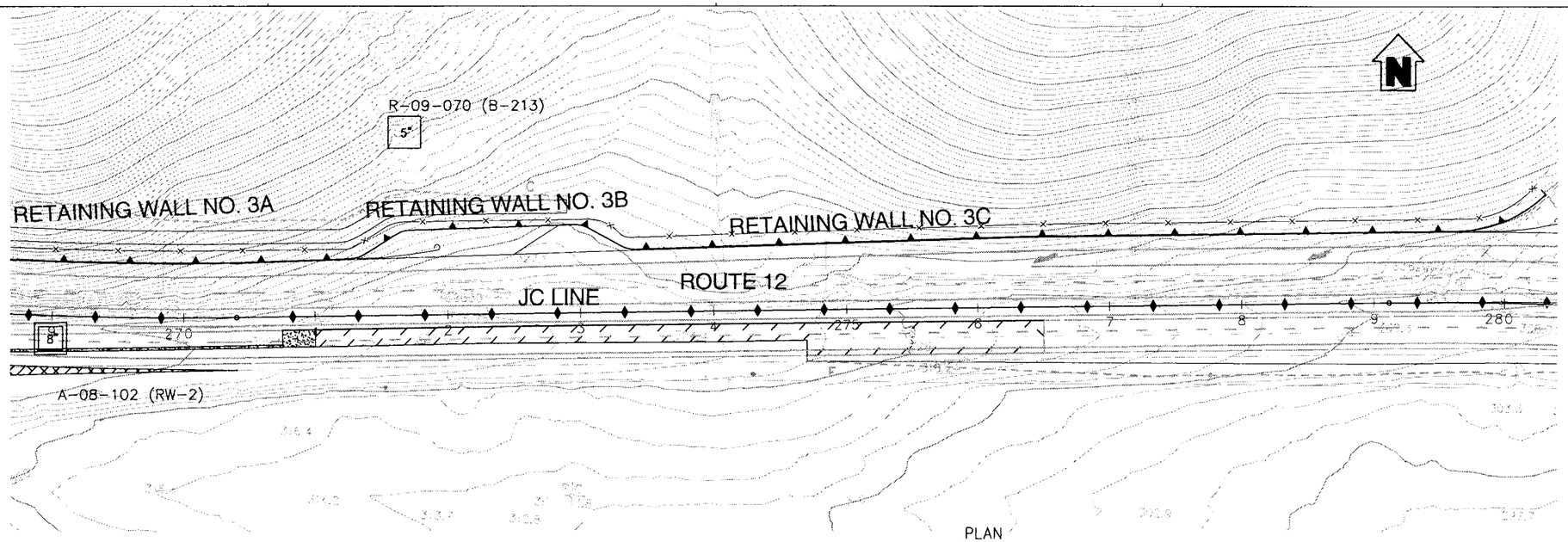

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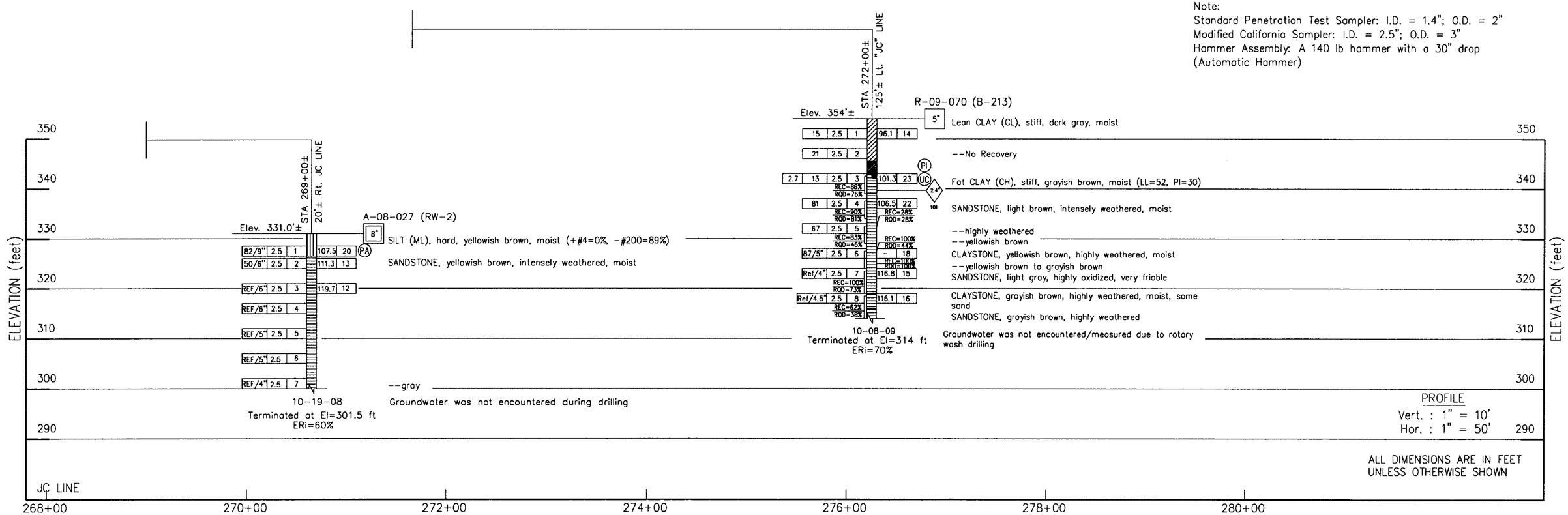

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 50'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG
SIGN OFF DATE	CHECKED BY	F. WANG	FIELD INVESTIGATION BY: DATE: OCTOBER 2008 & OCTOBER 2009		PROJECT ENGINEER

BRIDGE NO. 21E0012
POST MILES 0.0

ROUTE 12/JAMESON CANYON ROAD PROJECT
RW3A, 3B & 3C - LOG OF TEST BORINGS 2 OF 2

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04264
EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 7/09/09 11/05/09 SHEET OF

Nov 05, 2009 - 1:54pm S:\ACAD\208117.FDN\LOTB (SOLANO FDN).dwg
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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6		

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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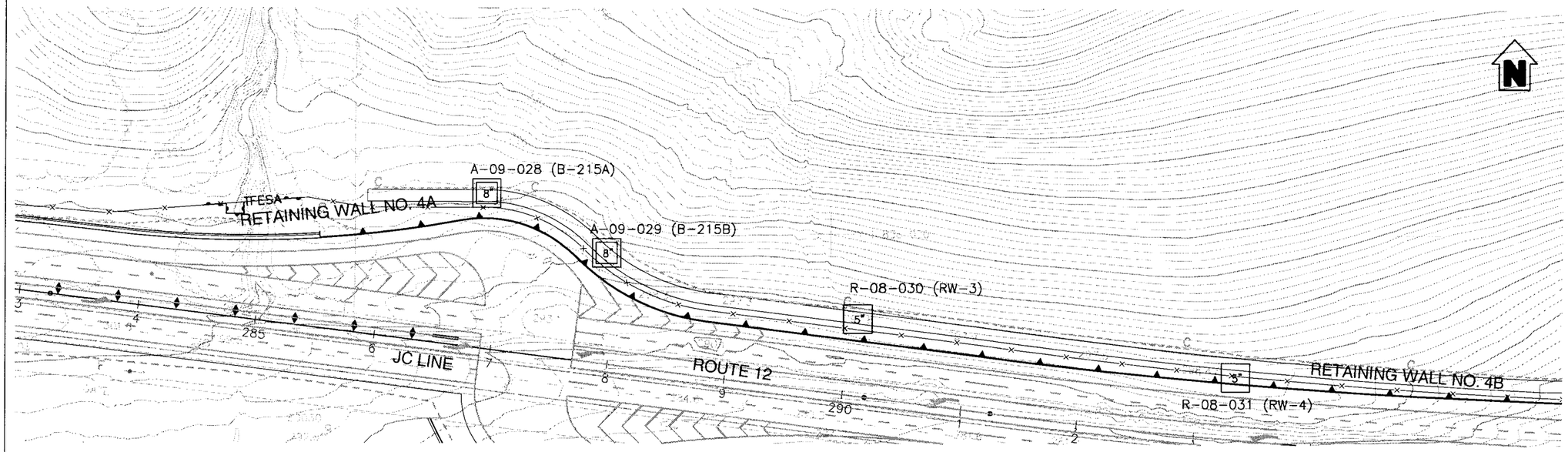
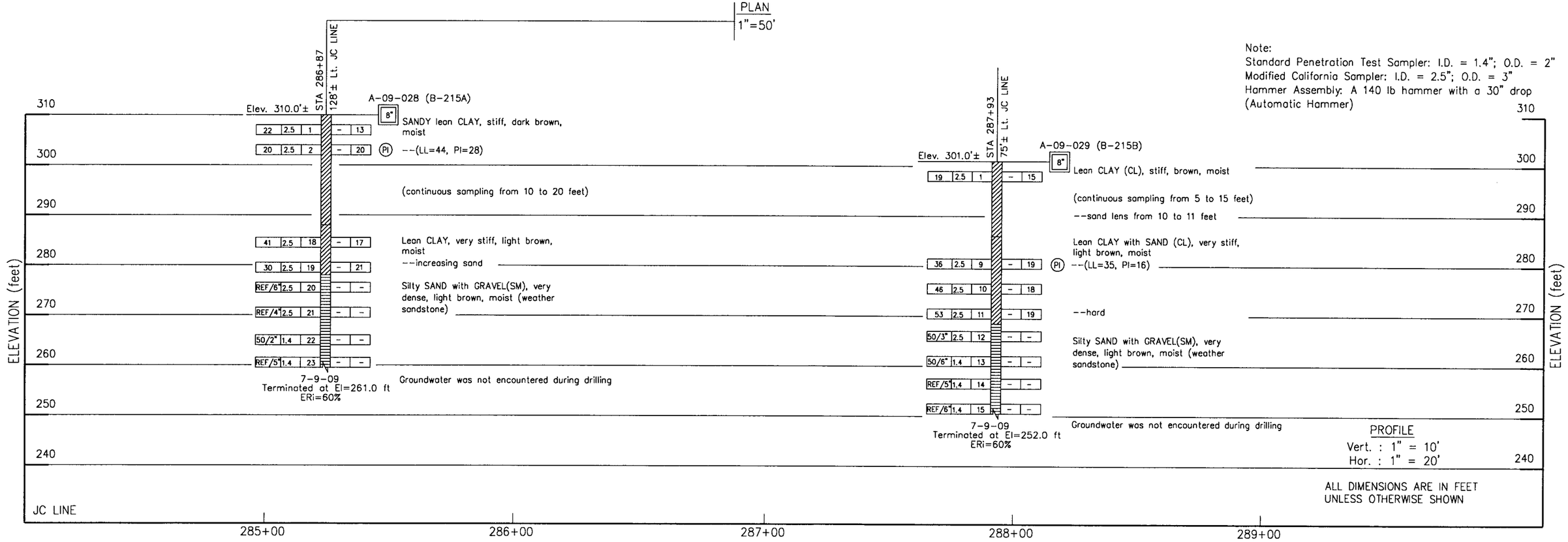


PLAN
1"=50'

Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)



PROFILE
Vert. : 1" = 10'
Hor. : 1" = 20'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: JULY 2009		

BRIDGE NO. 23E0010
POST MILES 0.3

ROUTE 12/JAMESON CANYON ROAD PROJECT

RW4A & 4B - LOG OF TEST BORINGS 1 OF 2

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

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EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 7/09/09 11/05/09 SHEET OF

Nov 04, 2009 - 10:01am S:\ACAD\208117-FDN\LOTB (SOLANO FDN).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

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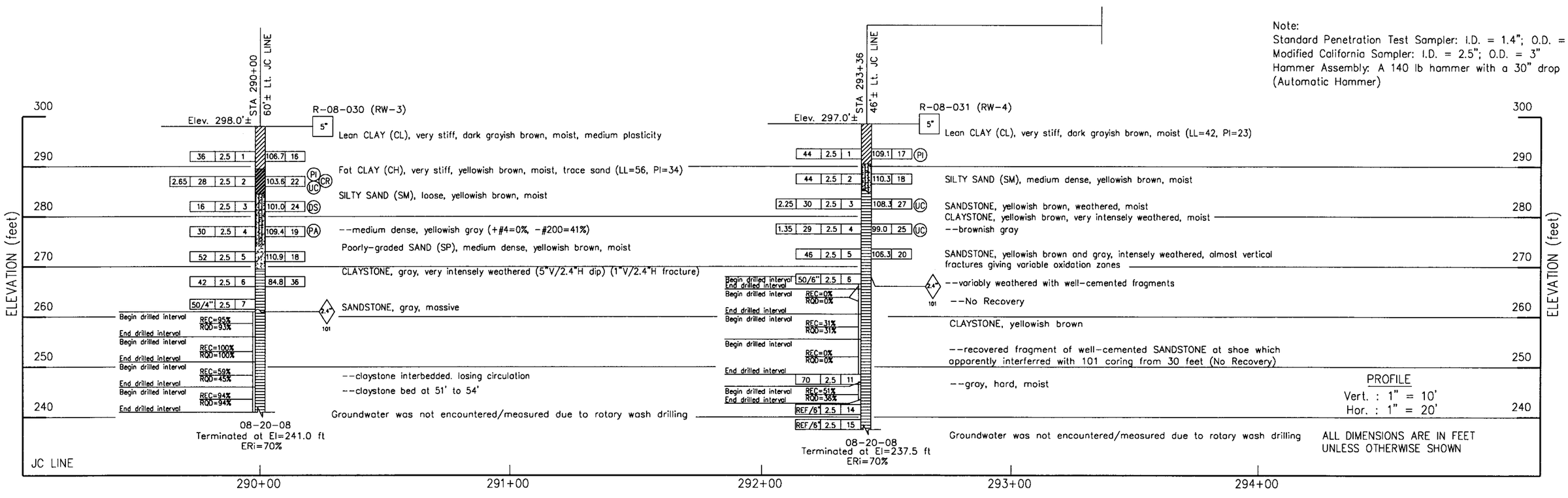
SAN JOSE, CA 95131

(SEE LOG OF TEST BORINGS, SHEET 1 OF 2, FOR BORING LOCATIONS)

Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)



DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS	F. WANG	BRIDGE NO. 23E0010
SIGN OFF DATE	CHECKED BY	F. WANG	FIELD INVESTIGATION BY: DATE: AUGUST 2008	PROJECT ENGINEER	POST MILES 0.3

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

ROUTE 12/JAMESON CANYON ROAD PROJECT

RW4A & 4B - LOG OF TEST BORINGS 2 OF 2

CU 04264
EA 264141

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES 7/29/09 11/05/09

REVISION DATES SHEET OF

Nov 04, 2009 - 10:01am S:\ACAD\208117.FDN\LOTB (SOLANO FDN).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6		

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

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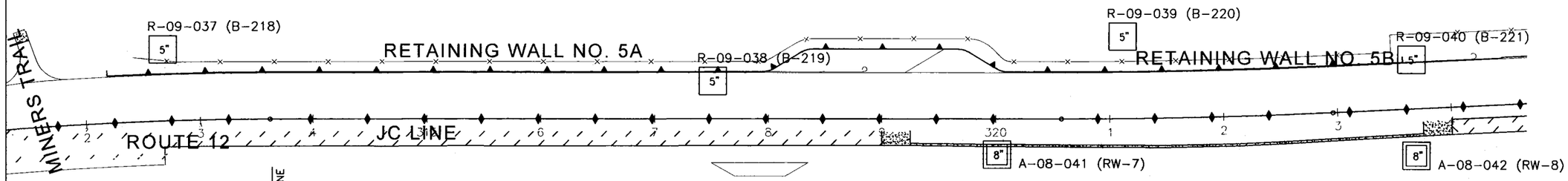
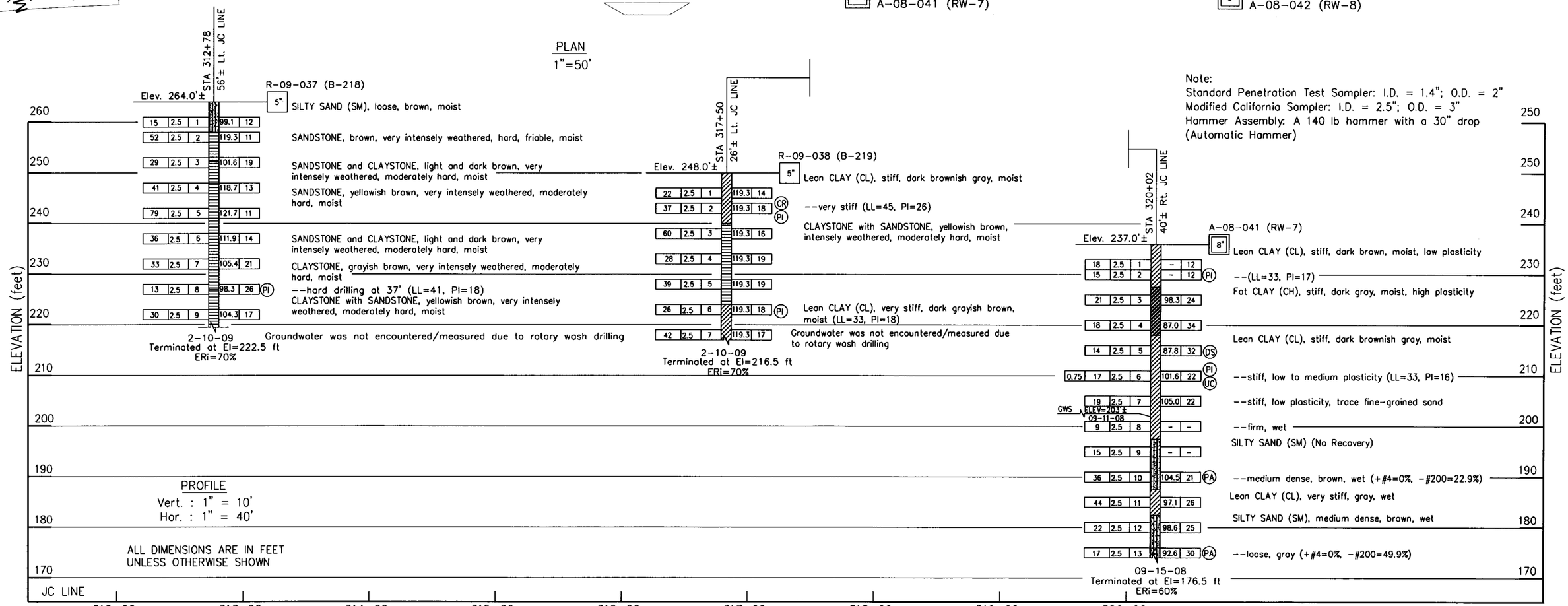
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131



PLAN
1"=50'



Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 40'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: SEPTEMBER 2008 & FEBURARY 2009		

BRIDGE NO. 23E0011
POST MILES 0.9

ROUTE 12/JAMESON CANYON ROAD PROJECT

RW5A & 5B - LOG OF TEST BORINGS 1 OF 2

ODS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04264
EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 7/30/09 11/05/09 SHEET OF

Nov 04, 2009 - 10:18am S:\ACAD\208117.FDN\LOTB (SOLANO FDN).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6		

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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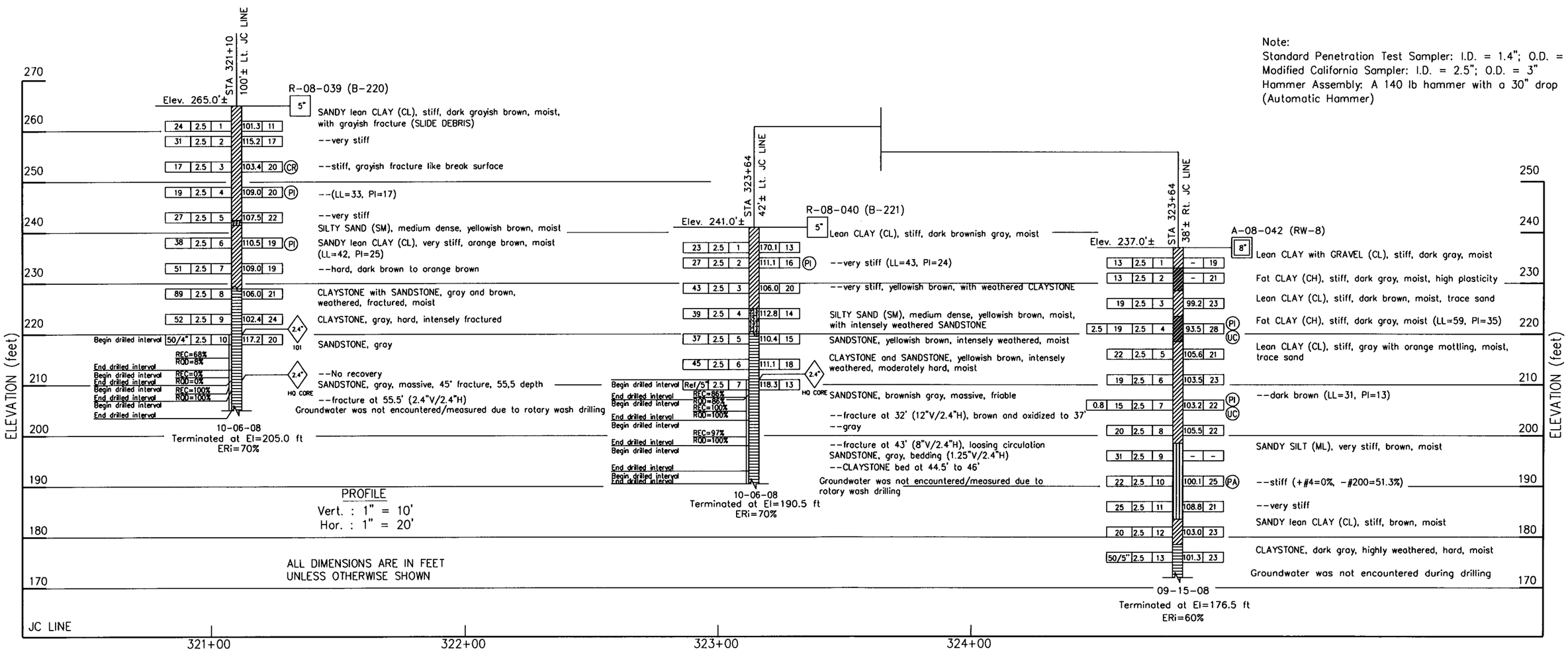
PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

(SEE LOG OF TEST BORINGS, SHEET 1 OF 2, FOR BORING LOCATIONS)

Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)



DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: SEPTEMBER 2008 & OCTOBER 2008		

BRIDGE NO. 23E0011
POST MILES 0.9

ROUTE 12/JAMESON CANYON ROAD PROJECT

RW5A & 5B - LOG OF TEST BORINGS 2 OF 2

CU 04264
EA 264141

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 7/30/09 11/05/09 SHEET OF

Nov 04, 2009 - 10:19am S:\ACAD\208117.FDN\LOTB (SOLANO FDN).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6		

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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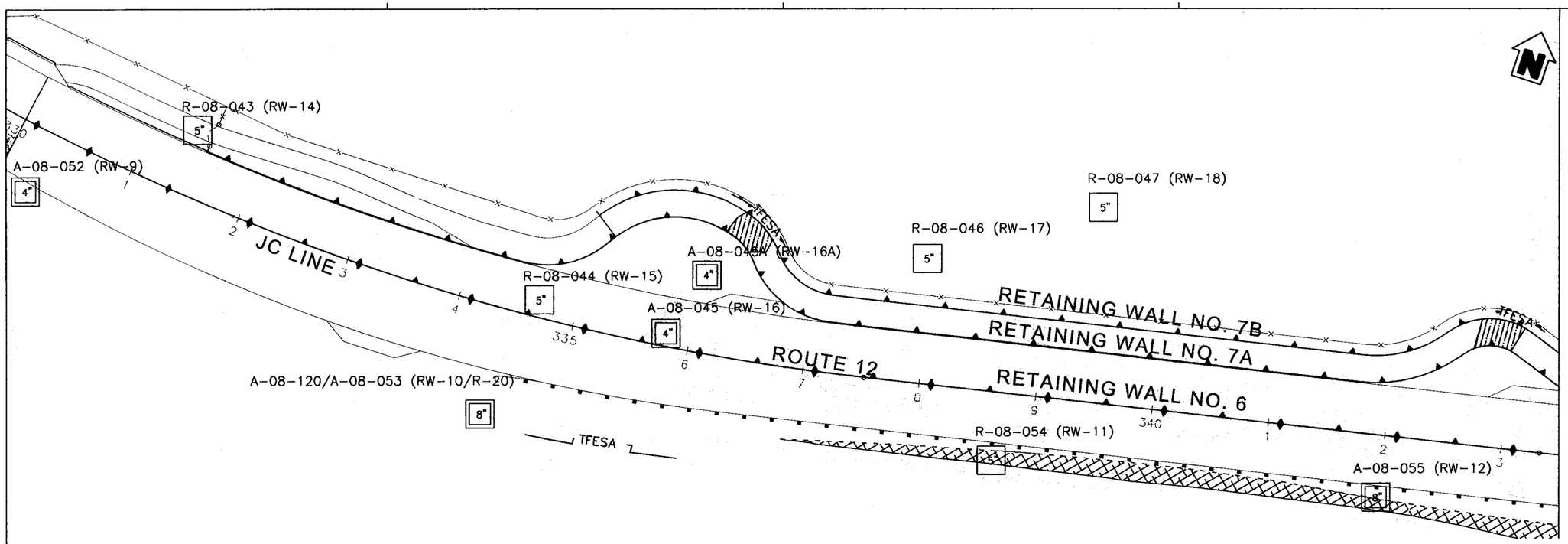
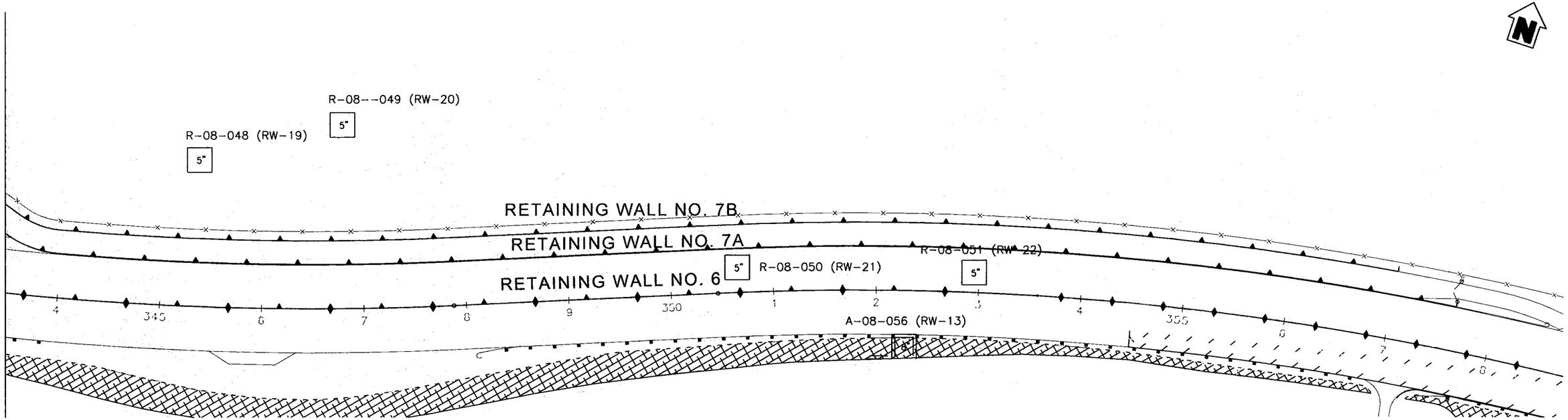
PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131



SEE BELOW

SEE ABOVE



PLAN
1"=50'

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG
SIGN OFF DATE	CHECKED BY	F. WANG	FIELD INVESTIGATION BY: DATE: N/A		PROJECT ENGINEER

BRIDGE NO. 23E0012/ 23E0013
POST MILES 1.2/1.2

ROUTE 12/JAMESON CANYON ROAD PROJECT

RW6, 7A & 7B - LOG OF TEST BORINGS 1 OF 8

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04264
EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 7/06/09 11/05/09

REVISION DATES | SHEET | OF

Nov 04, 2009 - 10:46am S:\ACAD\208117.FDN\LOTB (SOLANO FDN).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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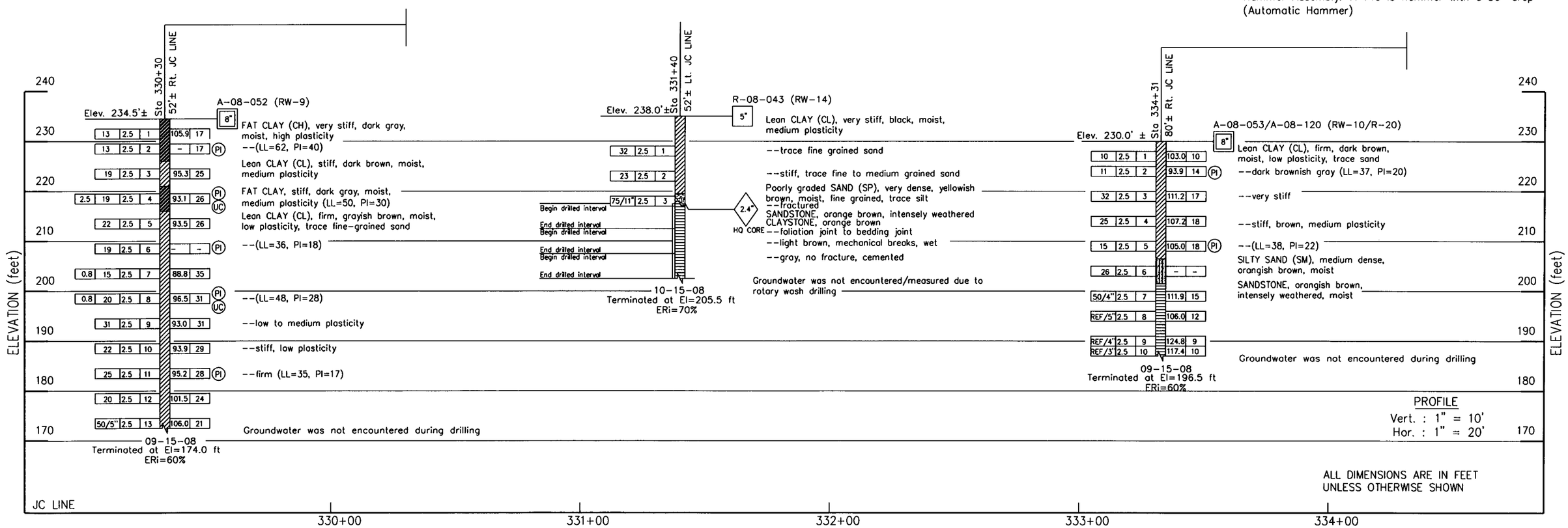
PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

(SEE LOG OF TEST BORINGS, SHEET 1 OF 8, FOR BORING LOCATIONS)

Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)



DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG	BRIDGE NO. 23E0012/ 23E0013	ROUTE 12/JAMESON CANYON ROAD PROJECT
SIGN OFF DATE	CHECKED BY	F. WANG	FIELD INVESTIGATION BY: DATE: SEPTEMBER 2008 & OCTOBER 2008		PROJECT ENGINEER	POST MILES 1.2/1.2	RW6, 7A & 7B - LOG OF TEST BORINGS 2 OF 8

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04264
EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES 7/09/09 11/05/09

REVISION DATES SHEET OF

Nov 04, 2009 - 10:21am S:\ACAD\208117.FDN\L07B (SOLANO FDN).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6		

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp.12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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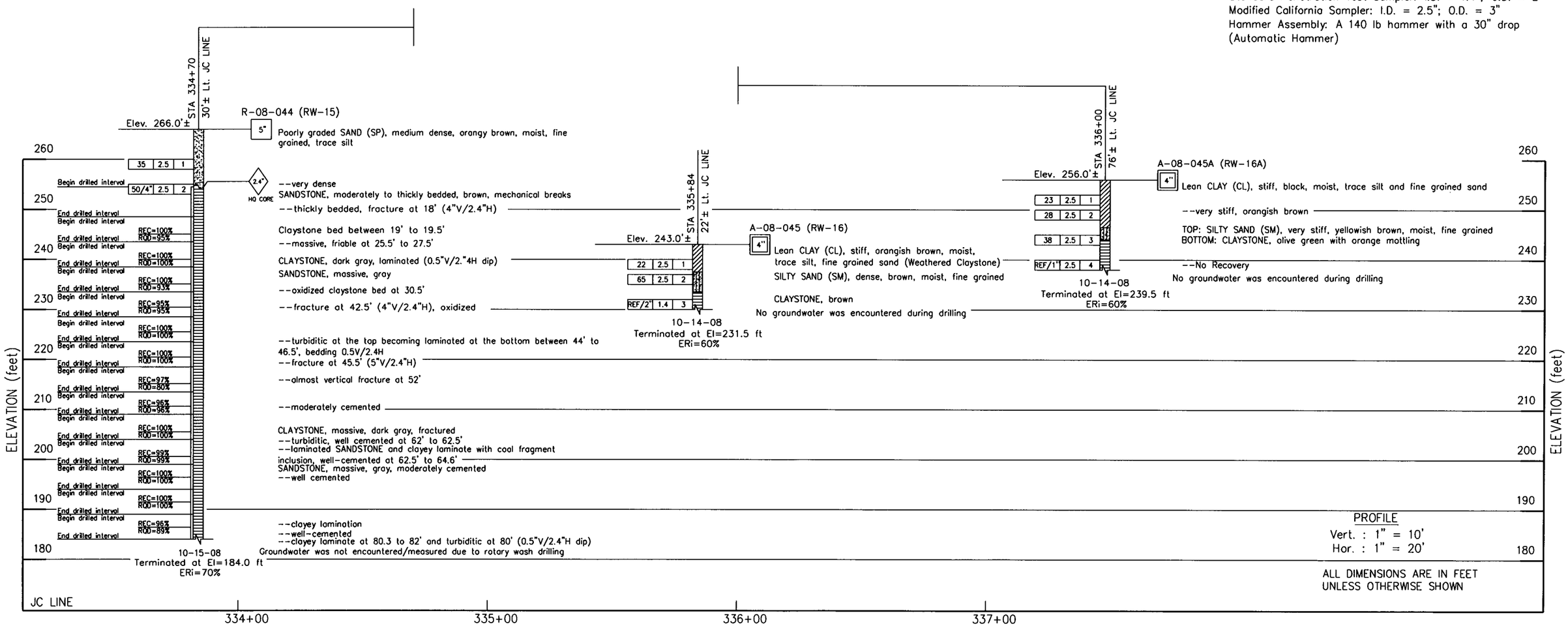
PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

(SEE LOG OF TEST BORINGS, SHEET 1 OF 8, FOR BORING LOCATIONS)

Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)



DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG
SIGN OFF DATE	CHECKED BY	F. WANG	FIELD INVESTIGATION BY: DATE: OCTOBER 2008		PROJECT ENGINEER

BRIDGE NO. 23E0012/ 23E0013
POST MILES 1.2/1.2

ROUTE 12/JAMESON CANYON ROAD PROJECT

RW6, 7A & 7B - LOG OF TEST BORINGS 3 OF 8

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04264
EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 7/08/09 11/05/09 SHEET OF

Nov 04, 2009 - 10:22am S:\ACAD\208117.FDN\LOTB (SOLANO FDN).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp.12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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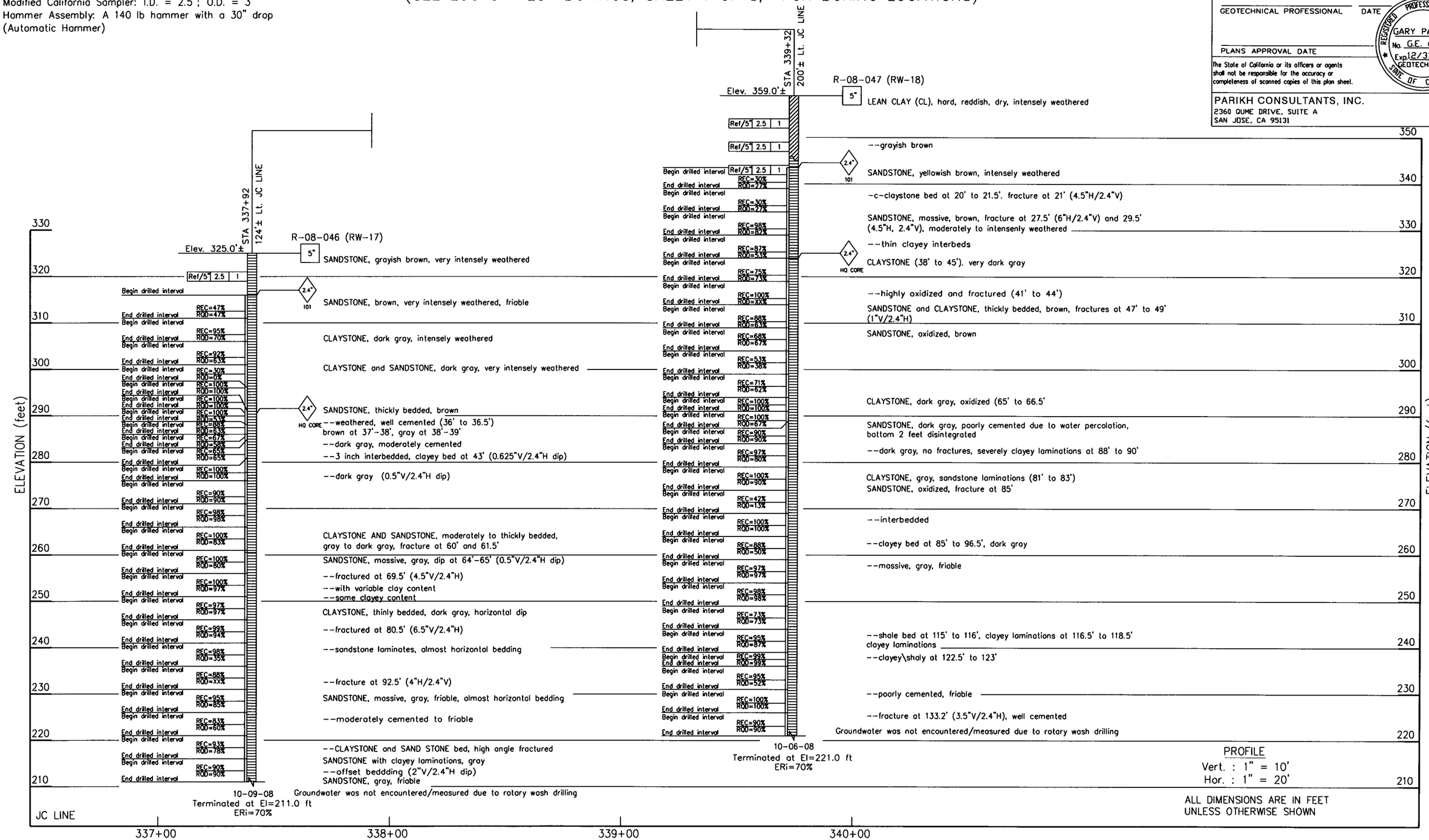
PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop
(Automatic Hammer)

(SEE LOG OF TEST BORINGS, SHEET 1 OF 8, FOR BORING LOCATIONS)



DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: OCTOBER 2008		

BRIDGE NO. 23E0012/ 23E0013
POST MILES 1.2/1.2

ROUTE 12/JAMESON CANYON ROAD PROJECT

RW6, 7A & 7B - LOG OF TEST BORINGS 4 OF 8

CU 04264
EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 7/28/09 11/05/09 SHEET OF

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

Nov 04, 2009 - 10:23am S:\VCAD\208117.FDR\LOTB (SOLANO FDR).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6		

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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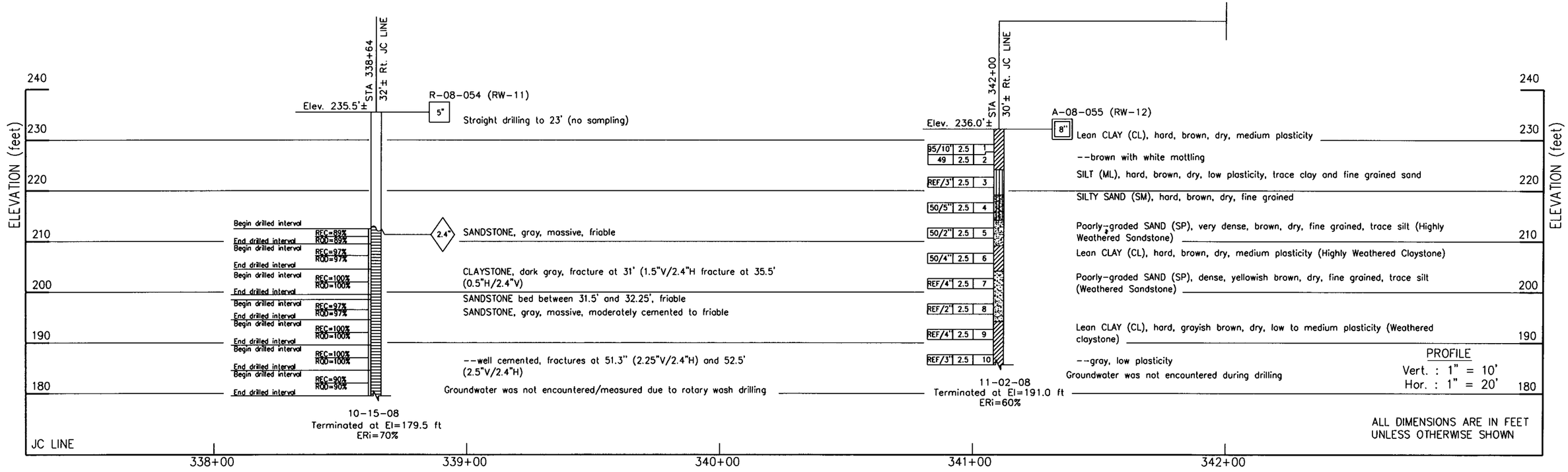
PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

(SEE LOG OF TEST BORINGS, SHEET 1 OF 8, FOR BORING LOCATIONS)



DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG
SIGN OFF DATE	CHECKED BY	F. WANG	FIELD INVESTIGATION BY: DATE: OCTOBER 2008 & NOVEMBER 2008		PROJECT ENGINEER

BRIDGE NO. 23E0012/ 23E0013
POST MILES 1.2/1.2

ROUTE 12/JAMESON CANYON ROAD PROJECT
RW6, 7A & 7B - LOG OF TEST BORINGS 5 OF 8

CU 04264
EA 264141

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 7/09/09 11/05/09 SHEET OF

Nov 04, 2009 - 10:23am S:\ACAD\2081117.FDN\LOTB (SOLANO FDN).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6		

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp.12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

(SEE LOG OF TEST BORINGS, SHEET 1 OF 8, FOR BORING LOCATIONS)

Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

R-08-048 (RW-19)

STA 345+28, 180'± Lt. JC LINE — Elev. 378.0' ±

ELEVATION (feet): 380, 370, 360, 350, 340, 330, 320, 310, 300, 290, 280, 270, 260, 250, 240, 230, 220

5"
SILTY SAND (SM), medium dense, yellowish brown, moist (weathered sandstone)
--very dense (weathered sandstone)
2.4" 101
Lean CLAY (CL), hard, yellowish brown, moist (weathered sandstone and claystone)
SANDSTONE and CLAYSTONE, intensely weathered
--fracture at 24' (6"V/2.25"H)
SANDSTONE, brown, intensely weathered
2.4" HQ CORE
--moderately weathered, friable
SANDSTONE and CLAYEY SANDSTONE, moderately bedded, brown (0.2"V/2.4"H dip)
SANDSTONE, massive, brown
SANDSTONE and CLAYSTONE, intensely weathered, brown
--gray, 0.5"V/2.4"H dip at 47.5'
--fracture at 50' (6"V/2.4"H)
UC CLAYSTONE, gray, interbedded brown sandstone
--fracture at 51' (8"V/2.4"H) (Compressive Strength=1120 psi)
SANDSTONE at 51', brown (claystone bed at 55' to 55.5')
--very thickly bedded, friable
--thinly interbedded with clay section (65.5' to 66.5')
UC (Compressive Strength=1120 psi)
--thickly bedded, clayey section (74.5' to 75')
--color changes from brown to dark gray at 83'
UC --dark gray, oxidized, well indurated at 93' to 95'
(Compressive Strength=890 psi)
--highly angle fracture at 97'
--well indurated to almost recrisytalized
--thinly bedded with shale, dark gray
UC SHALE, dark gray, moderately fractured (Compressive Strength=1880 psi)
SANDSTONE, dark gray, 2" shale bed at 112.5' and 1" shale bed at 115'
--high angle fracture at 118' to 119'
--claystone bed at 115.5' to 116.75'
--brown, oxidized, fracture at 122' (3"V/2.4"H)
--well indurated with highly oxidized fractured
--clayey section at 132.5' to 133'
--gray, clayey section at 136' to 138'
--CLAYSTONE bed at 145' to 146.5'
SANDSTONE, with clayey section
SANDSTONE, gray
--laminated (1.125"V/2.4"H)
Groundwater was not encountered/measured due to rotary wash drilling

10-01-08
Terminated at El=218.0 ft
ERi=70%

33	2.5	1
26	2.5	2
69/9"	2.5	3

Begin drilled interval / End drilled interval:

REC	RQD
81%	67%
98%	93%
65%	54%
60%	48%
100%	95%
100%	100%
95%	90%
100%	93%
100%	90%
98%	92%
98%	98%
100%	91%
100%	100%
100%	100%
83%	83%
98%	92%
XX%	82%
100%	100%
86%	86%
100%	87%
93%	93%
98%	98%
XX%	XX%
100%	86%
25%	0%
XX%	XX%
XX%	82%
XX%	82%
100%	100%
92%	87%
100%	100%

JC LINE
345+00 346+00

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 20'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

R-08-049 (RW-20)

STA 346+80, 220'± Lt. JC LINE — Elev. 402.0' ±

ELEVATION (feet): 410, 400, 390, 380, 370, 360, 350, 340, 330, 320, 310, 300, 290, 280, 270, 260, 250

5"
SILTY SAND (SM), medium dense, yellowish brown, moist (colluvium)
Lean CLAY (CL), very stiff, yellowish brown, moist (colluvium)
SILTY SAND (SM), medium dense, yellowish brown, moist (intensely weathered sandstone)
2.4" 101
CLAYSTONE with weathered shale, dark gray, hard
SANDSTONE and CLAYSTONE with weathered shale, yellowish brown
SANDSTONE, grayish brown, intensely weathered, fractured
--brown
--intensely weathered
--No Recovery
CLAYSTONE, dark gray (51' to 53')
2.4" HQ CORE
SANDSTONE, brown, intensely weathered, fracture at 55'
--brownish gray
--moderately weathered
--laminated sandstone with dip 0.5"V/2.4"H
--massive, brown
--bedded, laminated, unoxidized section from 77.5' to 78.5', fracture at 80' (3.5"V/2.4"H)
CLAYSTONE, dark gray (from 83.25' to 85')
--brown, clayey section (from 85' to 86')
SANDSTONE and CLAYSTONE, brownish gray, moderately oxidized
--intensely fractured at approx. 90'
SANDSTONE. intensely weathered, brown to 93'
--gray to dark gray (unoxidized) at 97'
--claystone bed from 103' to 106.5'
--gray, clayey sandstone
--sandstone with clayey sections, friable
--fracture (10"V/2.4"H) (124' to 136')
--massive, gray, laminated clayey section from 128.5' to 131' (0.5"V/2.4"H)
--claystone bed from 134.5 to 135'
SANDSTONE, gray
--CLAYSTONE, bed from 139' to 140'
SANDSTONE, gray
--massive, gray
Groundwater was not encountered/measured due to rotary wash drilling

9-26-08
Terminated at El=352.0 ft
ERi=70%

29	2.5	1
30	2.5	2
31	2.5	3
Ref/6"	2.5	4

Begin drilled interval / End drilled interval:

REC	RQD
89%	83%
89%	27%
97%	56%
95%	95%
93%	93%
97%	93%
0%	
67%	57%
98%	98%
87%	87%
94%	83%
96%	89%
80%	80%
94%	91%
98%	98%
100%	100%
97%	73%
97%	XX%
89%	86%
98%	98%
100%	98%
89%	89%
99%	99%
97%	45%
100%	99%
75%	75%
100%	100%
100%	100%
88%	96%

JC LINE
347+00 348+00

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 20'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

DESIGN OVERSIGHT
SIGN OFF DATE

DRAWN BY L. TRAN
CHECKED BY F. WANG

V. SANTOS
FIELD INVESTIGATION BY:
DATE: SEPTEMBER 2008 & OCTOBER 2008

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

F. WANG
PROJECT ENGINEER

BRIDGE NO. 23E0012/23E0013
POST MILES 1.2/1.2

ROUTE 12/JAMESON CANYON ROAD PROJECT

RW6, 7A & 7B - LOG OF TEST BORINGS 6 OF 8

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04264
EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES — REVISION DATES 7/30/09 11/05/09 — SHEET OF

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ltran Nov 05, 2009 - 2:37pm S:\ACAD\208117.FDN\LOTB (SOLANO FDN).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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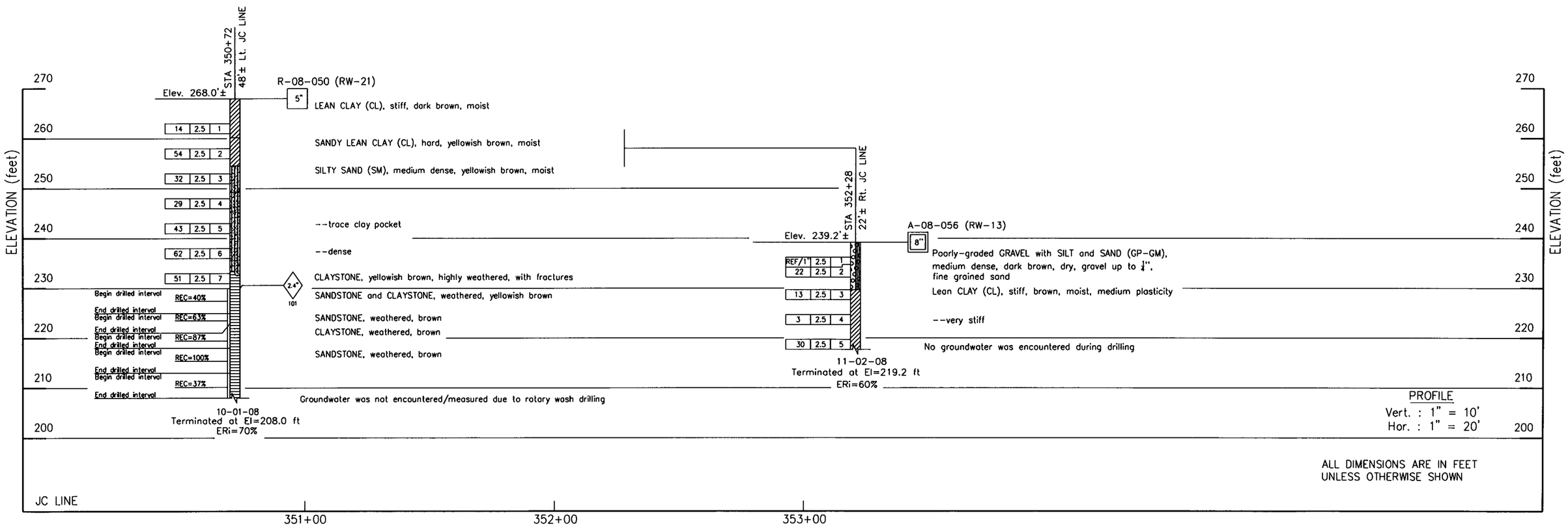
PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

(SEE LOG OF TEST BORINGS, SHEET 1 OF 8, FOR BORING LOCATIONS)

Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)



DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS	F. WANG	BRIDGE NO. 23E0012/ 23E0013
SIGN OFF DATE	CHECKED BY	F. WANG	FIELD INVESTIGATION BY: DATE: OCTOBER 2008 & NOVEMBER 2008	PROJECT ENGINEER	POST MILES 1.2/1.2

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

ROUTE 12/JAMESON CANYON ROAD PROJECT

RW6, 7A & 7B - LOG OF TEST BORINGS 7 OF 8

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04264
EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 1/30/09 11/05/09 SHEET OF

Nov 04, 2009 - 10:24am S:\HCAD\J08117\FDN\LOTB (SOLANO FDN).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6		

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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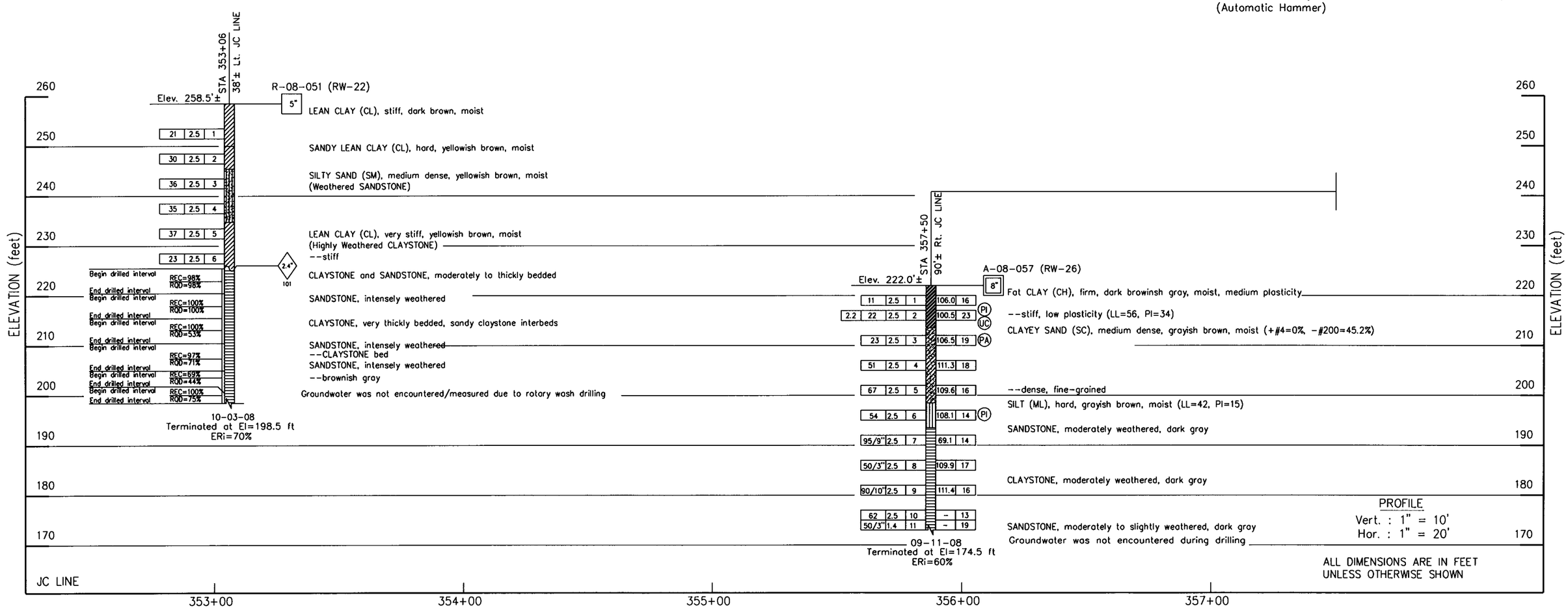
PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

(SEE LOG OF TEST BORINGS, SHEET 1 OF 8, FOR BORING LOCATIONS)

Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)



DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: SEPTEMBER 2008 & OCTOBER 2008		

BRIDGE NO. 23E0012/ 23E0013
POST MILES 1.2/1.2

ROUTE 12/JAMESON CANYON ROAD PROJECT

RW6, 7A & 7B - LOG OF TEST BORINGS 8 OF 8

CU 04264
EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 1/30/09 11/05/09 SHEET OF

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

Nov 04, 2009 - 10:24am S:\ACAD\208117.FDN\LOTB (SOLANO FDN).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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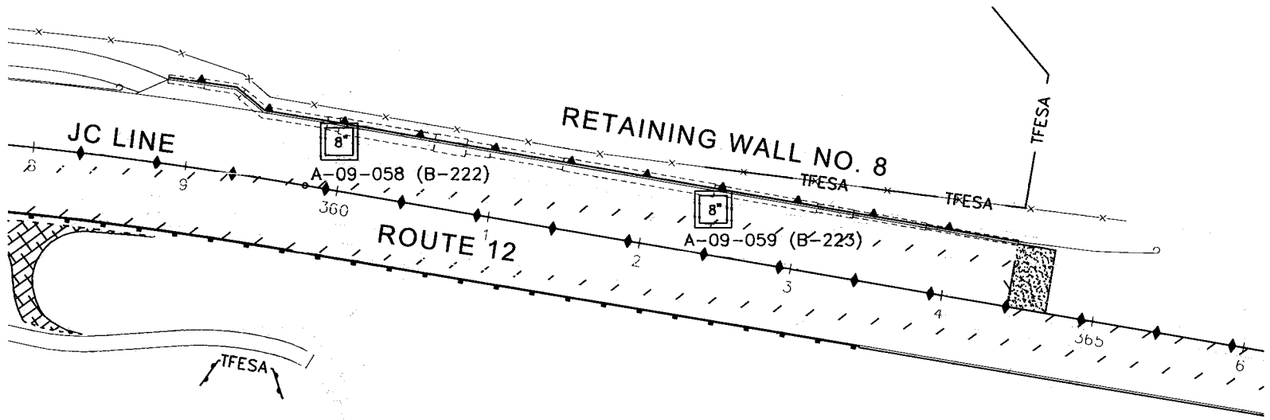
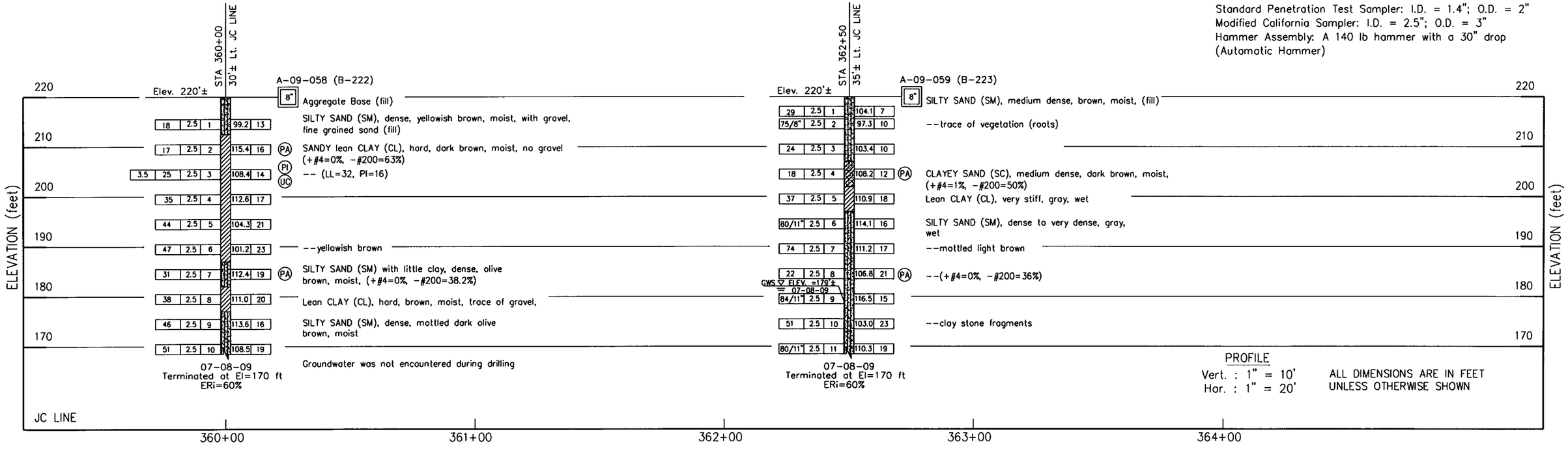
PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131



PLAN
1"=50'

Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)



PROFILE
Vert. : 1" = 10'
Hor. : 1" = 20'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: JULY 2009		

BRIDGE NO. 23E0014
POST MILES 1.7

ROUTE 12/JAMESON CANYON ROAD PROJECT
RW8 - LOG OF TEST BORINGS

CU 04264
EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 1/30/09 11/05/09

REVISION DATES | SHEET | OF

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

FILE => #REQUEST

Nov 04, 2009 - 10:26am S:\VACAD\208117.FDR\LOTB (SOLANO FDN).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6		

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

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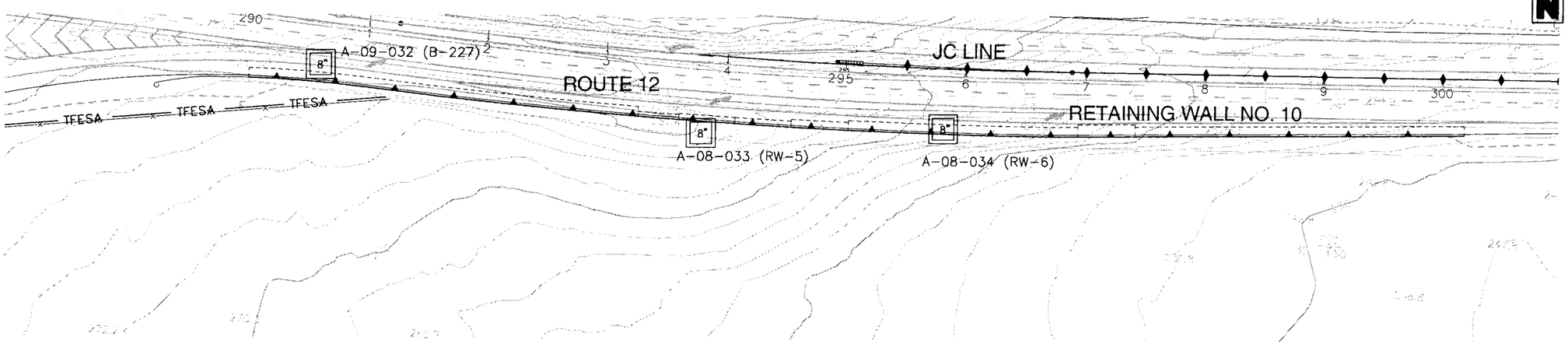
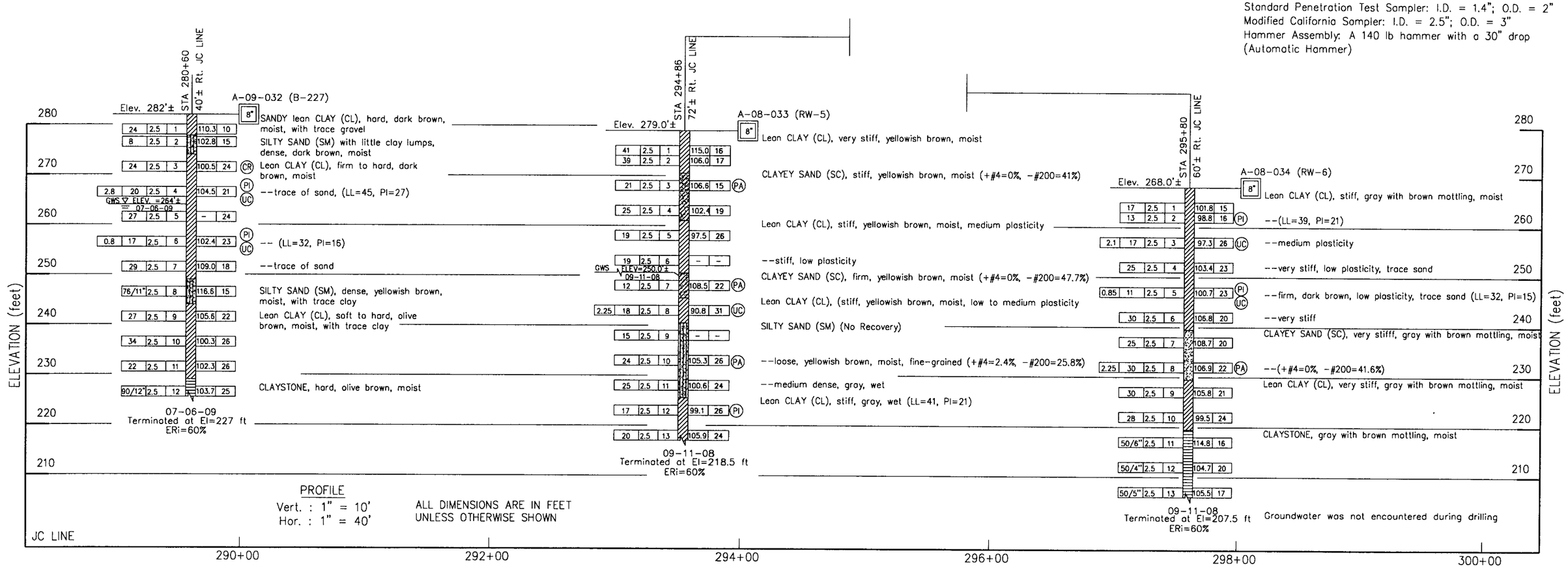
REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131



PLAN
1"=50'

Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)



PROFILE
Vert. : 1" = 10'
Hor. : 1" = 40'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

DESIGN OVERSIGHT	DRAWN BY L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER	BRIDGE NO. 23E0015
SIGN OFF DATE	CHECKED BY F. WANG	DATE: SEPTEMBER 2008 & JULY 2009			POST MILES 0.4

ROUTE 12/JAMESON CANYON ROAD PROJECT
RW10 - LOG OF TEST BORINGS

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04264
EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES 1/30/09 11/05/09

REVISION DATES | SHEET | OF

Nov 05, 2009 - 2:34pm S:\ACAD\208117.TDM\LOTB (SOLANO FDN).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Sol	12	0.0/2.6		

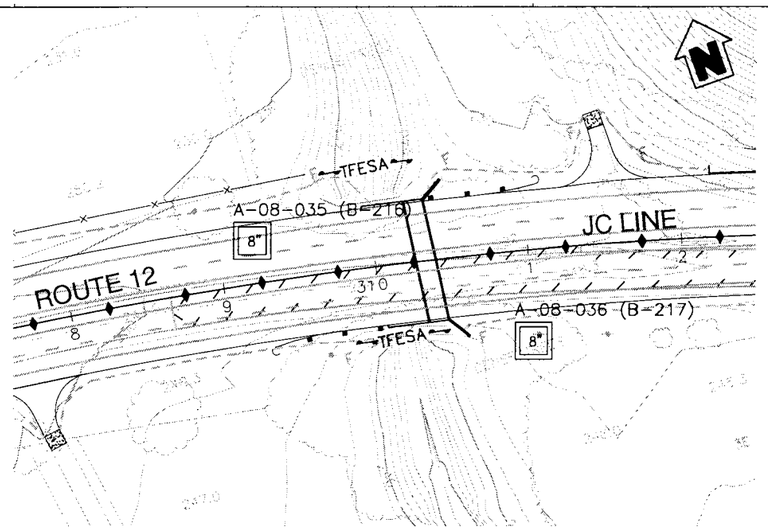
GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of scanned copies of this plan sheet.

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131



BENCHMARKS:
Benchmark No. 3 – Set 2" brass disk with iron pipe (California Department of Transportation SOL-48) in concrete along the southerly side of eastbound Highway 12, on dirt shoulder, approximately 150 feet easterly of Spurs trail, approximately 150 feet westerly of centerline of driveway for mailing address no. 1394; approximately 29 feet southerly of edge of pavement; approximately 2.8 feet northerly of a white board fence. Elevation: 251.036
Northing: 1837729.6610 Easting: 6508101.0390

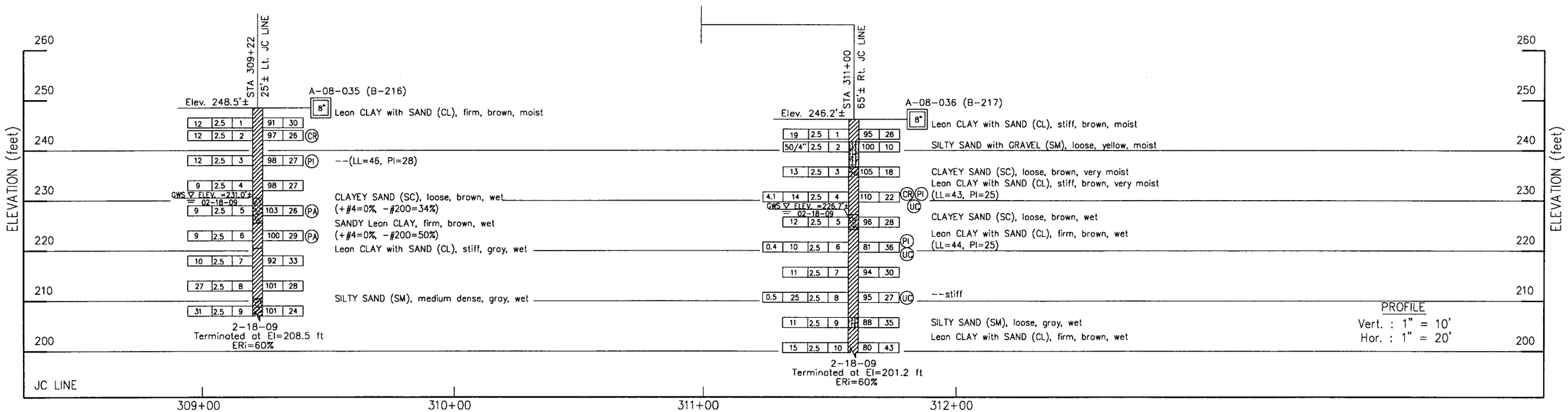
Benchmark No. 4 – Set 2" brass disk (California Department of Transportation SW-530) in concrete along the northerly side of westbound Highway 12, at PM 0.8, about 1.75 miles west of 12/80 Interchange, approximately 34.8 feet northerly of westbound edge of pavement; approximately 78.7 feet westerly of gas marker, approximately 1.9 feet northwesterly of reflector; approximately 67.9 feet southwesterly of mailbox. Elevation: 246.958
Northing: 1837767.8070 Easting: 6508530.0180

PLAN
1"=50'

Notes:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2" Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock, Logging, Classification, and Presentation Manual (June 2007)

All dimensions are in feet unless otherwise shown



WILD LIFE BOX CULVERT

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG
SIGN OFF DATE	CHECKED BY	F. WANG	FIELD INVESTIGATION BY: DATE: FEBRUARY 2009		PROJECT ENGINEER

BRIDGE NO. –
POST MILES 0.8

ROUTE 12/JAMESON CANYON ROAD PROJECT

WILD LIFE BOX CULVERT - LOG OF TEST BORINGS

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU 04264
EA 264141

DISREGARD PRINTS BEARING EARLIER REVISION DATES 7/09/09 11/05/09

REVISION DATES SHEET OF

Dec 23, 2009 – 10:12am S:\ACAD\208117.FDN\LOTB (SOLANO FDN).dwg

APPENDIX B

APPENDIX B
LABORATORY TESTS

Classification Tests
The field classification of the samples was visually verified in the laboratory according to the Unified Soil Classification System (ASTM Test Method D 2488, Visual-Manual Procedure). The classification has been verified with laboratory data as necessary. The classification tests are presented on "Log of Test Borings", Appendix A.

Moisture-Density
The natural moisture contents and dry unit weights were determined for selected undisturbed samples of the soils in general accordance with ASTM Test Method D 2216-92. This information was used to classify and correlate the soils. The results are presented at the appropriate depths on the "Log of Test Borings", Appendix A.

Unconfined Compression Tests
Strength tests were performed on selected undisturbed sample using unconfined compression machine. Unconfined compression test was performed in general accordance with California Test Method T 221. The results are presented on "Log of Test Borings".

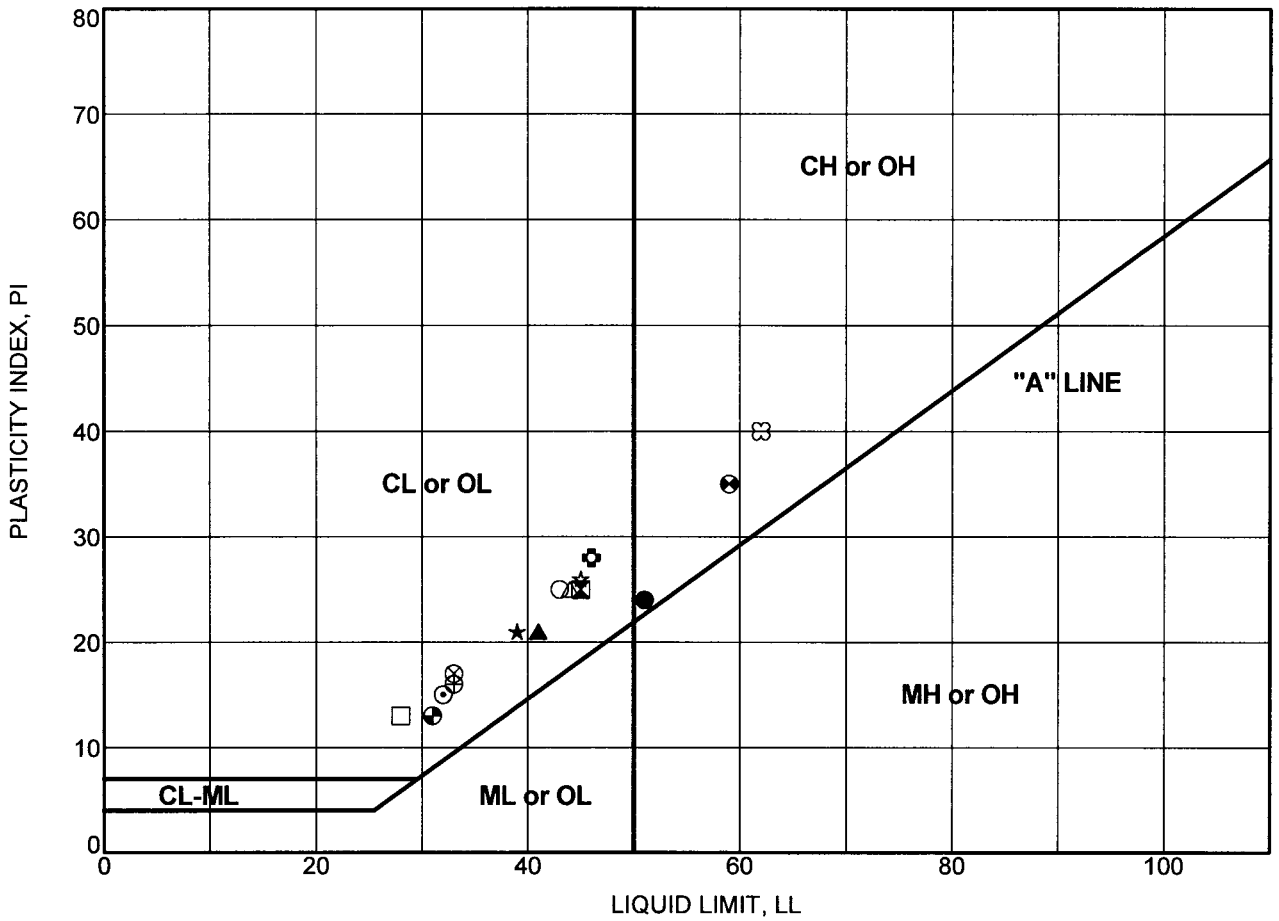
Atterberg Limits
The Atterberg Limits were determined for selected samples of the fine-grained materials. These results were used to classify the soils, as well as to obtain an indication of the effective strength characteristics and expansion potential with variations in moisture content. The Atterberg Limits were determined in general accordance with ASTM Test Method D 4318-93. The results of these tests are presented on Plates B-2A and B-2B, "Plasticity Chart".

Grain Size Classification
Grain size classification tests (ASTM Test Method D 422-63) were performed on selected samples of granular soil to aid in the classification. The results are presented on Plates B-3A to B-3C, "Grain Size Distribution Curves".

Corrosion Tests
Corrosion tests were performed on selected samples to determine the corrosion potential of the soils. The pH and minimum resistively tests were performed according to California Test Method 643 by Sunland Analytical. The test results are presented on Plates B-4A to B-4K.

Rock Compressive Strength Tests
Compressive strength tests were performed on selected samples in accordance with ASTM Test Method D 2938 by Dynamic Consultants, Inc. The test results are presented on the Plate B-5.

Direct Shear Tests
Direct Shear tests were performed on selected samples in accordance with ASTM Test Method D 3080 by Cooper Testing. The test results are presented on the Plates B-6A to B-6D.



PLASTICITY CHART

Boring Number	Sample Number	Depth (feet)	Test Symbol	Moisture Content (%)	LL	PL	PI	Description
A-08-026	MC-2	5.0	●	26	51	27	24	FAT CLAY (CH)
A-08-033	MC-6	25.0	⊠	22	45	20	25	LEAN CLAY (CL)
A-08-033	MC-12	55.0	▲	26	41	20	21	LEAN CLAY (CL)
A-08-034	MC-2	5.0	★	16	39	18	21	LEAN CLAY (CL)
A-08-034	MC-5	20.0	⊙	23	32	17	15	LEAN CLAY (CL)
A-08-035	MC-3	9.5	✿	27	46	18	28	LEAN CLAY WITH SAND (CL)
A-08-036	MC-4	14.5	○	22	43	18	25	LEAN CLAY WITH SAND (CL)
A-08-036	MC-6	24.5	△	36	44	19	25	LEAN CLAY WITH SAND (CL)
A-08-041	MC-2	5.0	⊗	12	33	16	17	LEAN CLAY (CL)
A-08-041	MC-6	25.0	⊕	22	33	17	16	LEAN CLAY (CL)
A-08-041	MC-8	35.0	□	23	28	15	13	LEAN CLAY (CL)
A-08-042	MC-4	15.0	⊗	28	59	24	35	FAT CLAY (CH)
A-08-042	MC-7	30.0	◕	22	31	18	13	LEAN CLAY (CL)
A-08-045A	MC-1	3.0	☆	14	45	19	26	LEAN CLAY (CL)
A-08-052	MC-2	5.0	✿	17	62	22	40	FAT CLAY (CH)

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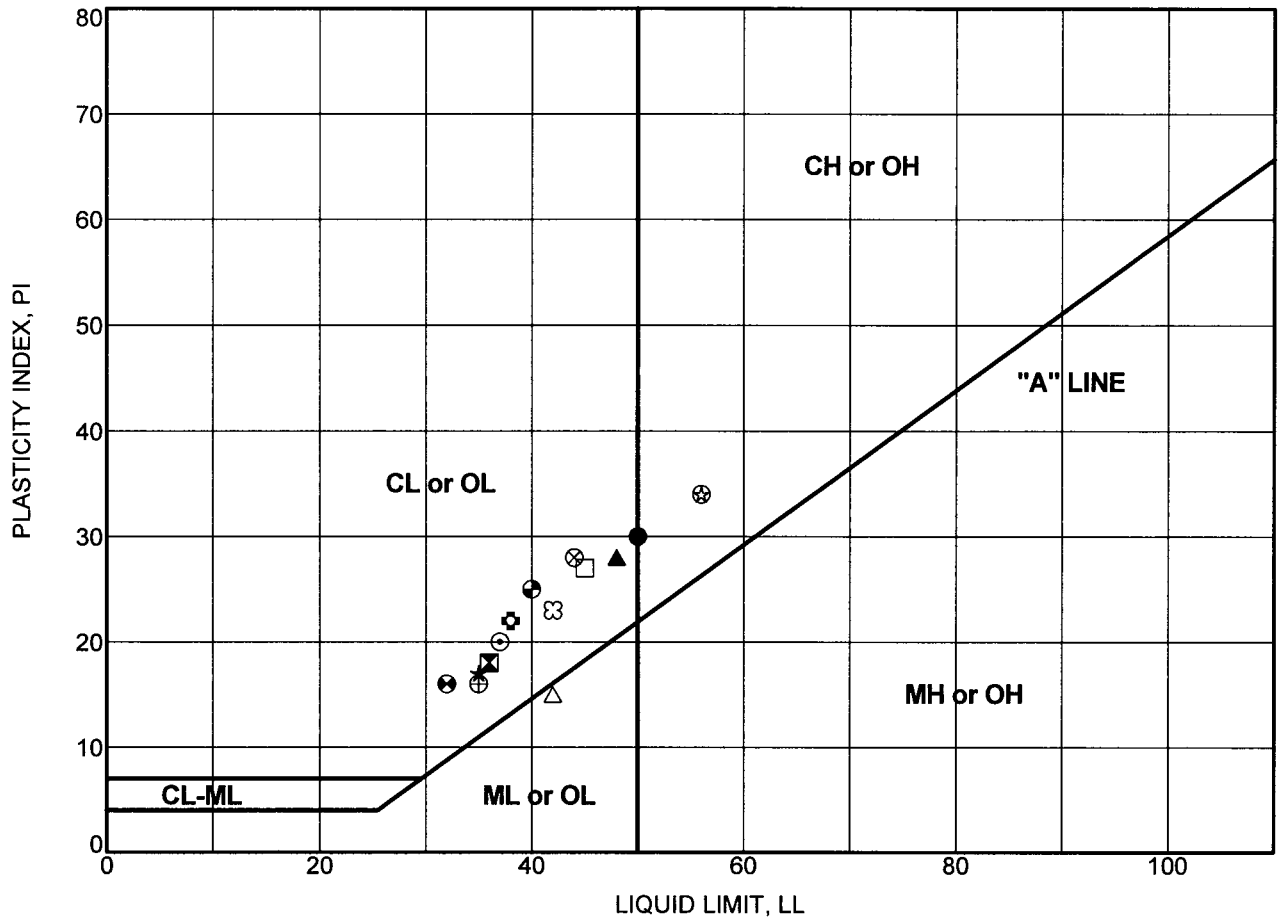
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

ROUTE 12/JAMESON CANYON ROAD PROJECT
SOLANO COUNTY, CALIFORNIA

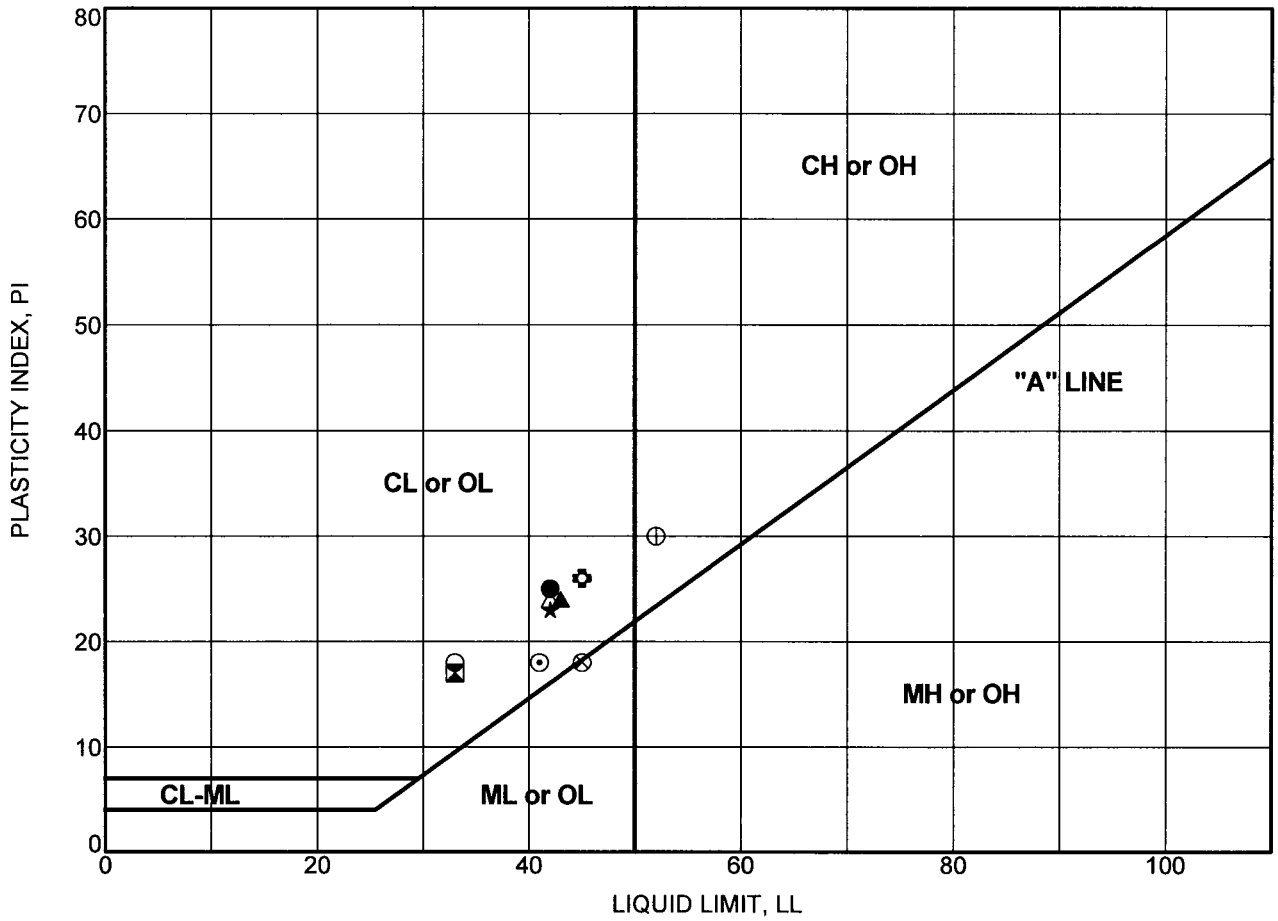
JOB NO: 208117.FDN

PLATE NO: B-2A



PLASTICITY CHART

Boring Number	Sample Number	Depth (feet)	Test Symbol	Moisture Content (%)	LL	PL	PI	Description
A-08-052	MC-4	15.0	●	26	50	20	30	FAT CLAY (CH)
A-08-052	MC-6	25.0	⊠	27	36	18	18	LEAN CLAY (CL)
A-08-052	MC-8	35.0	▲	31	48	20	28	LEAN CLAY (CL)
A-08-052	MC-11	50.0	★	28	35	18	17	LEAN CLAY (CL)
A-08-053	MC-2	5.0	⊙	14	37	17	20	LEAN CLAY (CL)
A-08-053	MC-5	20.0	✿	18	38	16	22	LEAN CLAY (CL)
A-08-057	MC-2	5.0	○	23	56	22	34	FAT CLAY (CH)
A-08-057	MC-6	25.0	△	14	42	27	15	SILT (ML)
A-09-028	MC-2	6.0	⊗	20	44	16	28	LEAN CLAY (CL)
A-09-029	MC-9	19.5	⊕	19	35	19	16	LEAN CLAY (CL)
A-09-032	MC-4	14.5	□	21	45	18	27	LEAN CLAY (CL)
A-09-032	MC-6	24.5	⊛	23	32	16	16	LEAN CLAY (CL)
A-09-058	MC-4	19.5	◕	17	40	15	25	LEAN CLAY (CL)
R-08-030	MC-2	10.0	☆	22	56	22	34	FAT CLAY (CH)
R-08-031	MC-1	5.0	✿	17	42	19	23	LEAN CLAY (CL)



PLASTICITY CHART

Boring Number	Sample Number	Depth (feet)	Test Symbol	Moisture Content (%)	LL	PL	PI	Description
R-08-039	MC-2	6.0	●	17	42	17	25	SANDY LEAN CLAY (CL)
R-08-039	MC-4	16.0	⊠	20	33	16	17	SANDY LEAN CLAY (CL)
R-08-040	MC-2	6.0	▲	16	43	19	24	LEAN CLAY (CL)
R-08-043	MC-2	11.0	★	22	42	19	23	LEAN CLAY (CL)
R-09-037	MC-8	36.0	⊙	26	41	23	18	LEAN CLAY (CL)
R-09-038	MC-2	6.0	✿	18	45	19	26	LEAN CLAY (CL)
R-09-038	MC-6	26.0	○	18	33	15	18	LEAN CLAY (CL)
R-09-068	MC-2	6.0	△	15	42	18	24	LEAN CLAY (CL)
R-09-068	MC-5	20.5	⊗	19	45	27	18	LEAN CLAY (CL)
R-09-070	MC-3	11.0	⊕	23	52	22	30	FAT CLAY (CH)

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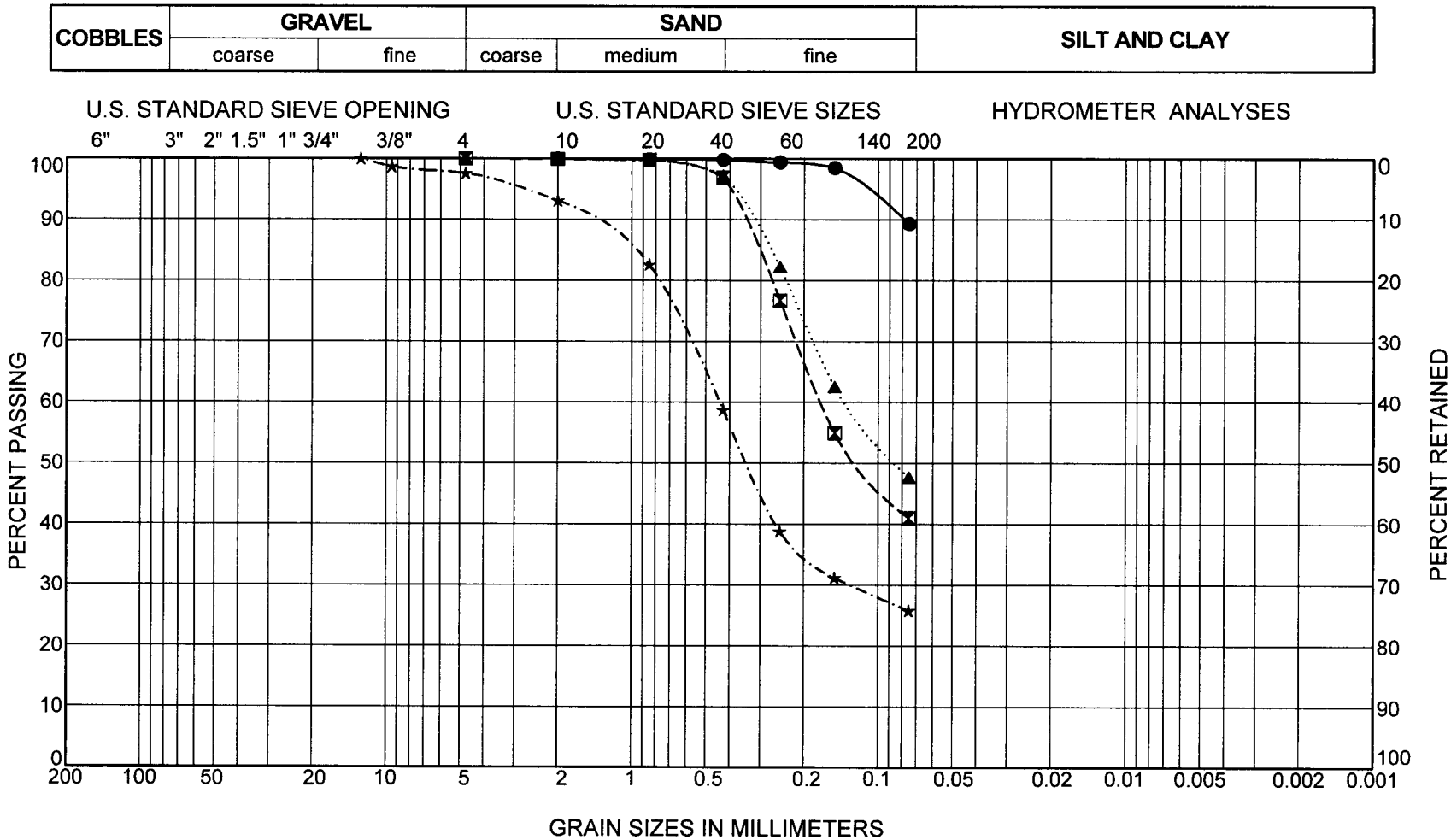
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

ROUTE 12/JAMESON CANYON ROAD PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO: 208117.FDN

PLATE NO: B-2C

GRAIN SIZE DISTRIBUTION CURVES



Boring Number	Sample Number	Depth (feet)	Symbol	LL	PI	Description
A-08-027	MC-1	2.5	●			SILT (ML)
A-08-033	MC-3	10.0	⊠			CLAYEY SAND (SC)
A-08-033	MC-7	30.0	▲			CLAYEY SAND (SC)
A-08-033	MC-10	45.0	★			SILTY SAND (SM)

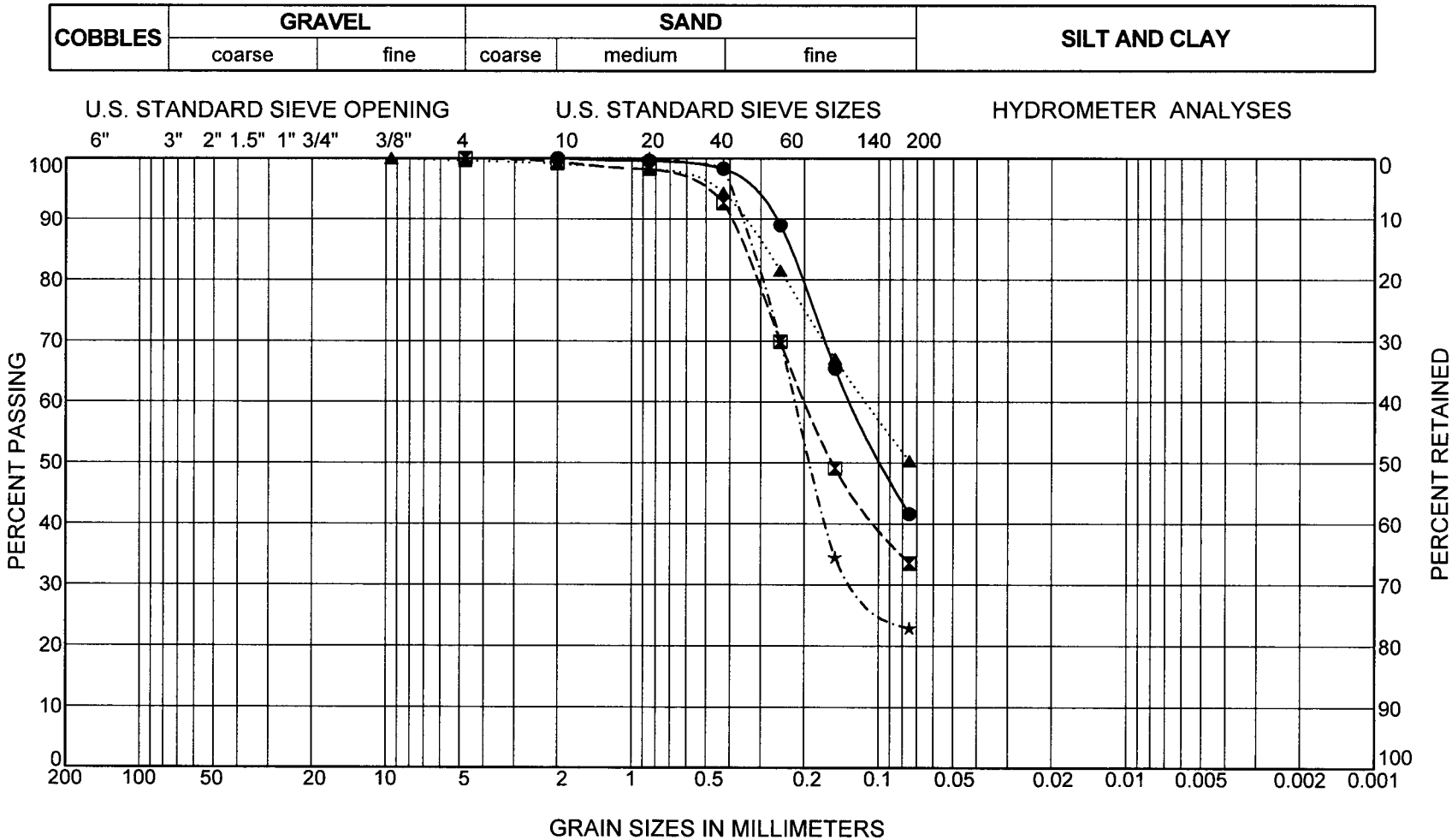
PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

ROUTE 12/JAMESON CANYON ROAD PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO: 208117.FDN

PLATE NO: B-3A

GRAIN SIZE DISTRIBUTION CURVES



Boring Number	Sample Number	Depth (feet)	Symbol	LL	PI	Description
A-08-034	MC-8	35.0	●			CLAYEY SAND (SC)
A-08-035	MC-5	19.5	⊠			CLAYEY SAND (SC)
A-08-035	MC-6	24.5	▲			SANDY LEAN CLAY (CL)
A-08-041	MC-10	45.0	★			SILTY SAND (SM)

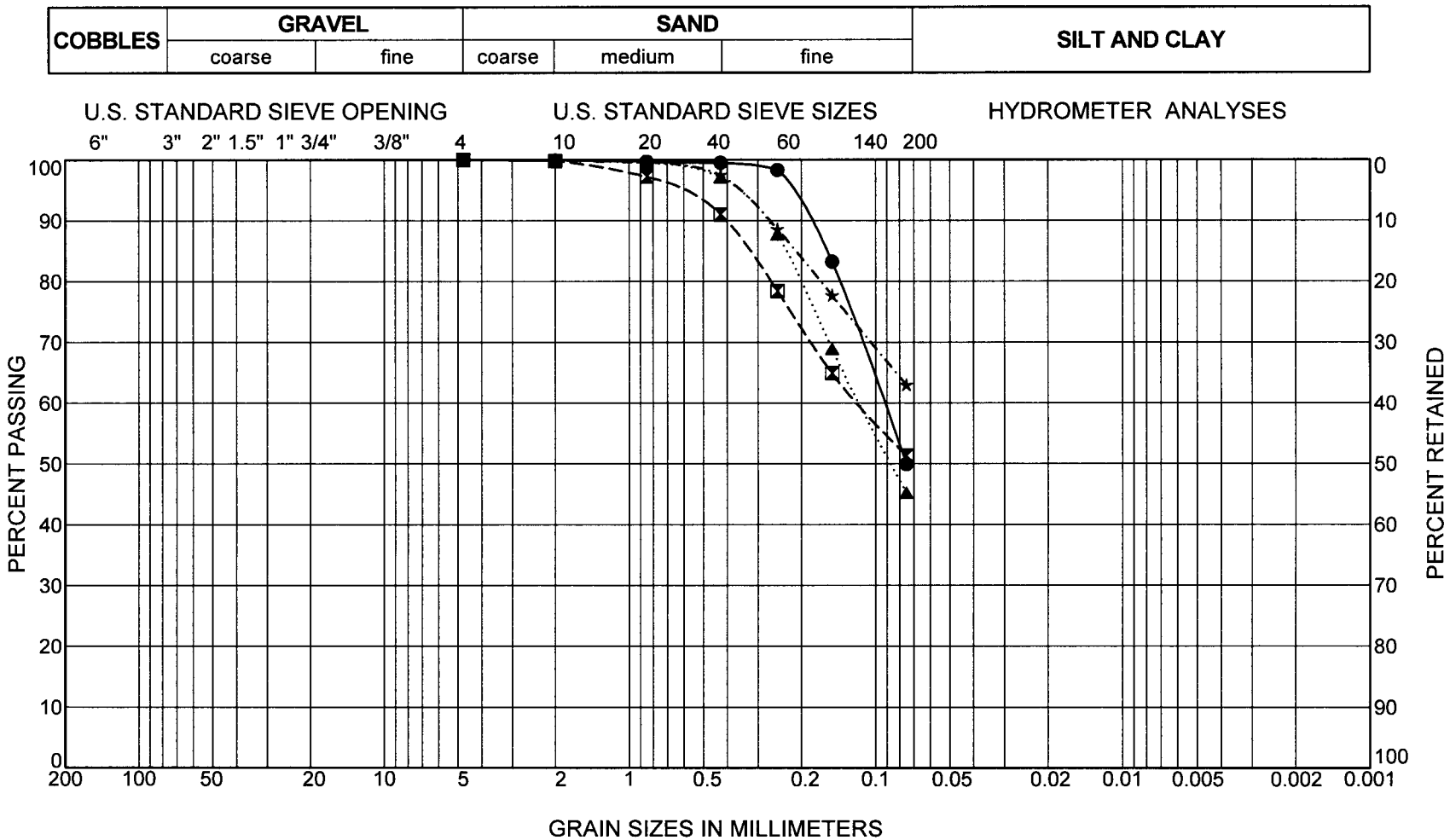
PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

ROUTE 12/JAMESON CANYON ROAD PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO: 208117.FDN

PLATE NO: B-3B

GRAIN SIZE DISTRIBUTION CURVES



Boring Number	Sample Number	Depth (feet)	Symbol	LL	PI	Description
A-08-041	MC-13	60.0	●			SILTY SAND (SM)
A-08-042	MC-10	45.0	⊠			SANDY SILT (ML)
A-08-057	MC-3	10.0	▲			CLAYEY SAND (SC)
A-09-058	MC-2	2.0	★			SANDY LEAN CLAY (CL)

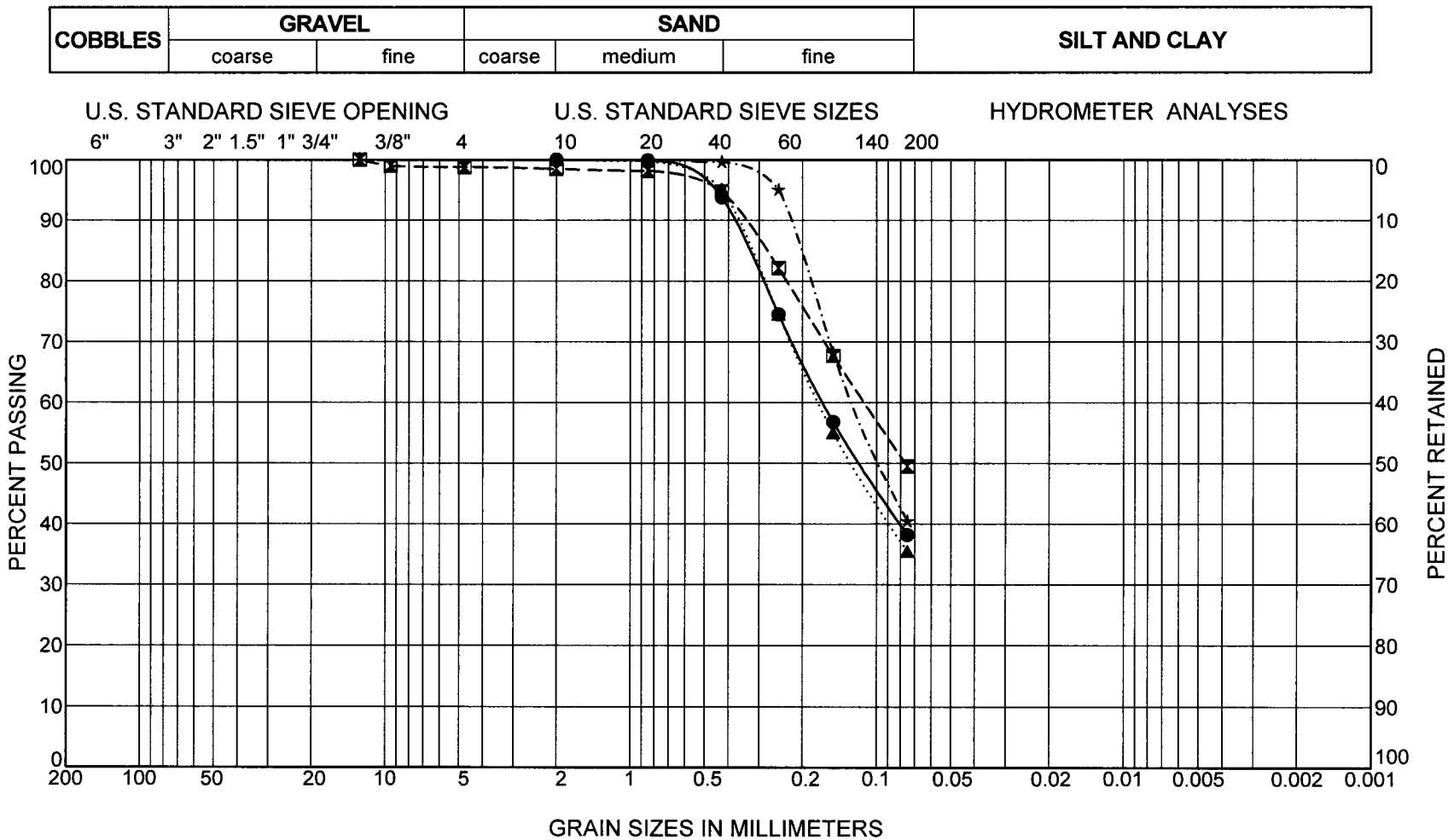
PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

JOB NO: 208117.FDN

ROUTE 12/JAMESON CANYON ROAD PROJECT
SOLANO COUNTY, CALIFORNIA

PLATE NO: B-3C

GRAIN SIZE DISTRIBUTION CURVES



Boring Number	Sample Number	Depth (feet)	Symbol	LL	PI	Description
A-09-058	MC-7	34.5	●			SILTY SAND (SM)
A-09-059	MC-4	14.5	⊠			CLAYEY SAND (SC)
A-09-059	MC-8	34.5	▲			SILTY SAND (SM)
R-08-030	MC-4	20.0	★			SILTY SAND (SM)

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

ROUTE 12/JAMESON CANYON ROAD PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO: 208117.FDN

PLATE NO: B-3D

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 10/29/2008
Date Submitted 10/23/2008

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, CA 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN/JAMESON Site ID : RW3#2 @ 10'.
Thank you for your business. (R-08-030)

* For future reference to this analysis please use SUN # 54663-109813.

EVALUATION FOR SOIL CORROSION

Soil pH	7.95	
Minimum Resistivity	1.31 ohm-cm (x1000)	
Chloride	80.2 ppm	00.00802 %
Sulfate	95.7 ppm	00.00957 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

OCT 29 2008

PLATE NO.: B-4A

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 10/10/2008
Date Submitted 10/07/2008

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, CA 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN-JAMESON Site ID : RW6#2@5'.
Thank you for your business. (A-08-034)

* For future reference to this analysis please use SUN # 54549-109523.

EVALUATION FOR SOIL CORROSION

Soil pH	6.56		
Minimum Resistivity	2.65 ohm-cm (x1000)		
Chloride	8.8 ppm	00.00088	%
Sulfate	3.0 ppm	00.00030	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 10/10/2008
Date Submitted 10/07/2008

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, CA 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN-JAMESON Site ID : RW7-2@5'.
Thank you for your business. (A-08-041)

* For future reference to this analysis please use SUN # 54549-109524.

EVALUATION FOR SOIL CORROSION

Soil pH	6.40	
Minimum Resistivity	2.39 ohm-cm (x1000)	
Chloride	11.7 ppm	00.00117 %
Sulfate	5.6 ppm	00.00056 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 10/10/2008
Date Submitted 10/07/2008

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, CA 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN-JAMESON Site ID : RW9#2@5'
Thank you for your business. (A-08-052)

* For future reference to this analysis please use SUN # 54549-109525.

EVALUATION FOR SOIL CORROSION

Soil pH	7.32		
Minimum Resistivity	0.56 ohm-cm (x1000)		
Chloride	25.6 ppm	00.00256	%
Sulfate	3.4 ppm	00.00034	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 11/26/2008
Date Submitted 11/20/2008

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, CA 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN Site ID : RW-14 #1@6'.
Thank you for your business. (R-08-043)

* For future reference to this analysis please use SUN # 54831-110188.

EVALUATION FOR SOIL CORROSION

Soil pH	7.68		
Minimum Resistivity	0.86 ohm-cm (x1000)		
Chloride	204.7 ppm	00.02047	%
Sulfate	373.9 ppm	00.03739	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 10/10/2008
Date Submitted 10/07/2008

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, CA 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN-JAMESON Site ID : RW26#1@2'.
Thank you for your business. (A-08-057)

* For future reference to this analysis please use SUN # 54549-109526.

EVALUATION FOR SOIL CORROSION

Soil pH	7.31		
Minimum Resistivity	1.23 ohm-cm (x1000)		
Chloride	12.9 ppm	00.00129	%
Sulfate	27.6 ppm	00.00276	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 08/05/2009
Date Submitted 07/29/2009

To: Prav Dayah
Parikh Consultants, Inc.
2360 Qume Dr, Ste.A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN JAMESON C Site ID : B227 #3@9.5'.
Thank you for your business. (A-09-032)

* For future reference to this analysis please use SUN # 56359-113792.

EVALUATION FOR SOIL CORROSION

Soil pH	7.75		
Minimum Resistivity	0.94 ohm-cm (x1000)		
Chloride	61.3 ppm	00.00613	%
Sulfate	124.0 ppm	00.01240	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 04/15/2009
Date Submitted 04/08/2009

To: Prav Dayah
Parikh Consultants, Inc.
2360 Qume Dr, Ste.A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN Site ID : B216 #2@4.5'.
Thank you for your business. (A-08-035)

* For future reference to this analysis please use SUN # 55448-111569.

EVALUATION FOR SOIL CORROSION

Soil pH	7.77	
Minimum Resistivity	1.02 ohm-cm (x1000)	
Chloride	34.7 ppm	00.00347 %
Sulfate	77.8 ppm	00.00778 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 04/15/2009
Date Submitted 04/08/2009

To: Prav Dayah
Parikh Consultants, Inc.
2360 Qume Dr, Ste.A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN Site ID : B217 #4@14.5'.
Thank you for your business. (A-08-036)

* For future reference to this analysis please use SUN # 55448-111567.

EVALUATION FOR SOIL CORROSION

Soil pH	6.93		
Minimum Resistivity	1.07 ohm-cm (x1000)		
Chloride	30.9 ppm	00.00309	%
Sulfate	83.2 ppm	00.00832	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

RECEIVED
APR 17 2009
By

Date Reported 04/15/2009
Date Submitted 04/08/2009

To: Prav Dayah
Parikh Consultants, Inc.
2360 Qume Dr, Ste.A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN JAMESON Site ID : B219 #2@6'.
Thank you for your business. (R-09-038)

* For future reference to this analysis please use SUN # 55448-111566.

EVALUATION FOR SOIL CORROSION

Soil pH	7.30	
Minimum Resistivity	0.38 ohm-cm (x1000)	
Chloride	484.5 ppm	00.04845 %
Sulfate	364.6 ppm	00.03646 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 04/15/2009
Date Submitted 04/08/2009

To: Prav Dayah
Parikh Consultants, Inc.
2360 Qume Dr, Ste.A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN Site ID : B220 #3@11'.
Thank you for your business. (R-08-039)

* For future reference to this analysis please use SUN # 55448-111568.

EVALUATION FOR SOIL CORROSION

Soil pH	6.18	
Minimum Resistivity	1.61 ohm-cm (x1000)	
Chloride	26.5 ppm	00.00265 %
Sulfate	12.6 ppm	00.00126 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Corporate Offices
Materials Laboratory
1300 Space Park Way
Mountain View, California 94043-1343
Telephone: (650) 967-6982
Facsimile: (650) 967-6955

DCI

DYNAMIC CONSULTANTS, INC.
Testing & Inspection Services

Branch Office
Watsonville, California

December 18, 2008/br

Parikh Consultants, Inc.
356 South Milpitas Blvd.
Milpitas, California 95035

DCI No.: 5103-M02
Lab No.: 8M-534668

Attention: Prav Dayah

PROJECT: **ROUTE 12, JAMESTOWN CANYON ROAD WIDENING No. 207117, FDN**

SUBJECT: **Rock/Soil Core Test Results**

Four (4) samples of rock/soil cores were submitted to our laboratory by your representative on December 16, 2008, and were tested in accordance with California Test Method 382.

SUMMARY OF TEST RESULTS:

Compressive Strength – Rock Cores – ASTM D2938-02

Core ID	Moist. Cond.	Specimen Diameter, in.	Capped Height, in.	Temp., deg. F	Time to Ultimate Load	Area, sq. in.	Ultimate Load, lbf	Strength, psi
RW-19 52'-53-	Air-dry	2.37	4.60	72	2 min.	4.41	4,960	1,120
RW-19 68'-69-	Air-dry	2.37	4.62	72	2 min.	4.41	4,920	1,120
RW-19 91'-92-	Air-dry	2.37	4.61	72	2 min.	4.41	3,940	890
RW-19 105.5'-106'	Air-dry	2.37	4.60	72	2 min.	4.41	8,300	1,880

(R-08-048)

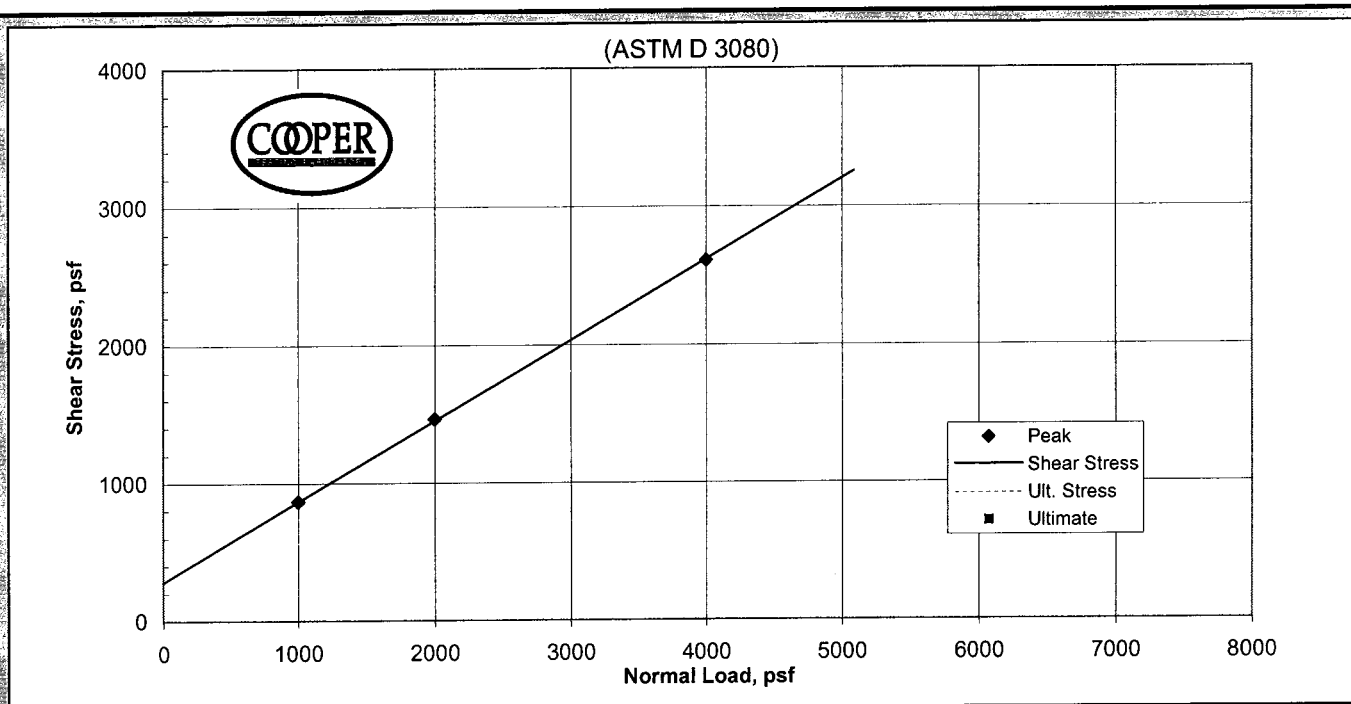
Respectfully submitted,
DYNAMIC CONSULTANTS, INC.

Bill Rodriguez

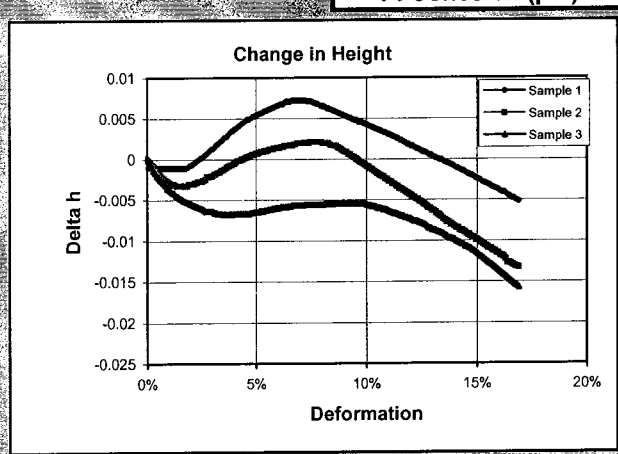
Bill Rodriguez
Laboratory Supervisor

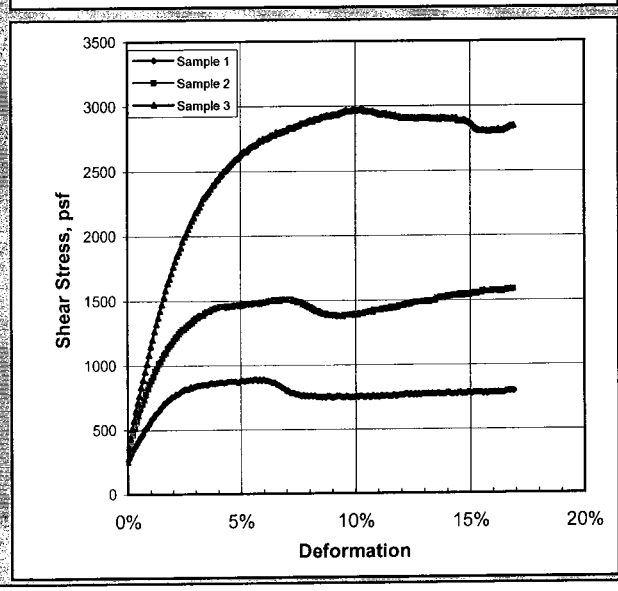
2 2 2008

Direct Shear



P. Phi (degrees)	30.3	Ult. phi (degrees)	
P. Cohesion (psf)	280	Ult.Cohesion (psf)	





Sample Data: Initial				
Initial	1	2	3	4
Moisture	24.1%	23.8%	23.7%	
Dry Density, pcf	99.7	101.0	101.0	
Void Ratio	0.6899	0.6689	0.6695	
Saturation	94.4%	96.0%	95.8%	
Diameter, in.	2.43	2.43	2.43	
Height, in.	1.00	1.00	1.00	
Sample Data: At Test				
Moisture	24.4%	23.9%	23.8%	
Dry Density, pcf	101.8	102.9	103.1	
Void Ratio	0.6576	0.6335	0.6302	
Saturation	100.0%	100.0%	100.0%	
Diameter, in.	2.43	2.43	2.43	
Height, in.	0.98	0.98	0.98	
Normal Stress, psf	1000	2000	4000	
Shear Stress, psf	866	1462	2608	
Deformation	5%	5%	5%	
Ultimate Stress, psf	0	0	0	
Rate in/min.	0	0	0	

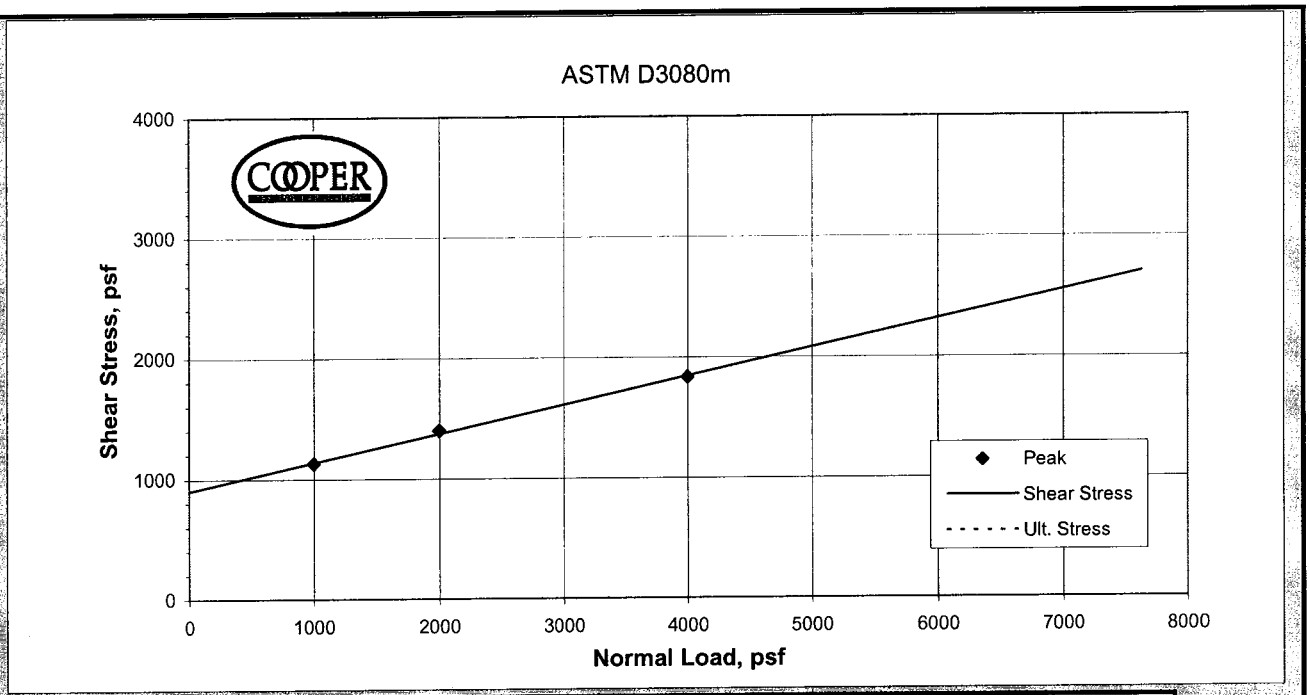
CTL #	157-264	Date:	11/11/2008	
Client:	Parikh Consultants			
Project Name:				
Project Number:	208117.FDN		Reduced by:	MD
Sample #	Boring	Sample	Depth, ft.	
1	RW-3	3	15	
2	RW-3	3	15	
3	RW-3	3	15	
4				
Visual Soil Classification				
1	Yellow-Brown Clayey SAND			
2	Yellow-Brown Clayey SAND			
3	Yellow-Brown Clayey SAND			
4				

Remarks:

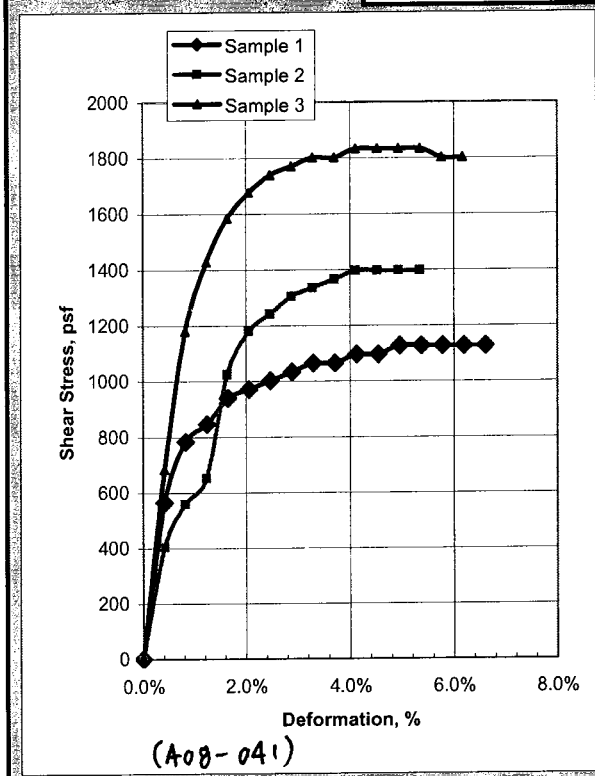
(R-08-030)

PLATE NO. B-6A

Direct Shear



P. Phi (degrees)	13.3	Ult. Phi (degrees)	
P. Cohesion(psf)	900	Ult. Cohesion (psf)	



	Sample Data: Initial			
	1	2	3	4
Moisture %	34.1	32.3	29.9	
Dry Dens., pcf	85.9	87.8	89.7	
Void Ratio	0.961	0.919	0.879	
Saturation %	95.7	94.9	91.8	
Diameter	2.42	2.43	2.43	
Height	1.01	1.01	1.02	
	Sample Data: At Test			
Moisture %	34.8	32.7	29.4	
Dry Dens., pcf	86.2	89.5	93.1	
Void Ratio	0.956	0.883	0.810	
Saturation %	98.3	99.9	97.8	
Diameter	2.42	2.43	2.43	
Height	1.01	0.99	0.98	
Normal Stress, psf	1000	2000	4000	
Shear Stress, psf	1127	1397	1832	
Strengths picked at	6.6%	5.3%	5.3%	
Ult. Stress, psf				
Strain Rate, in/min	0.020	0.020	0.020	

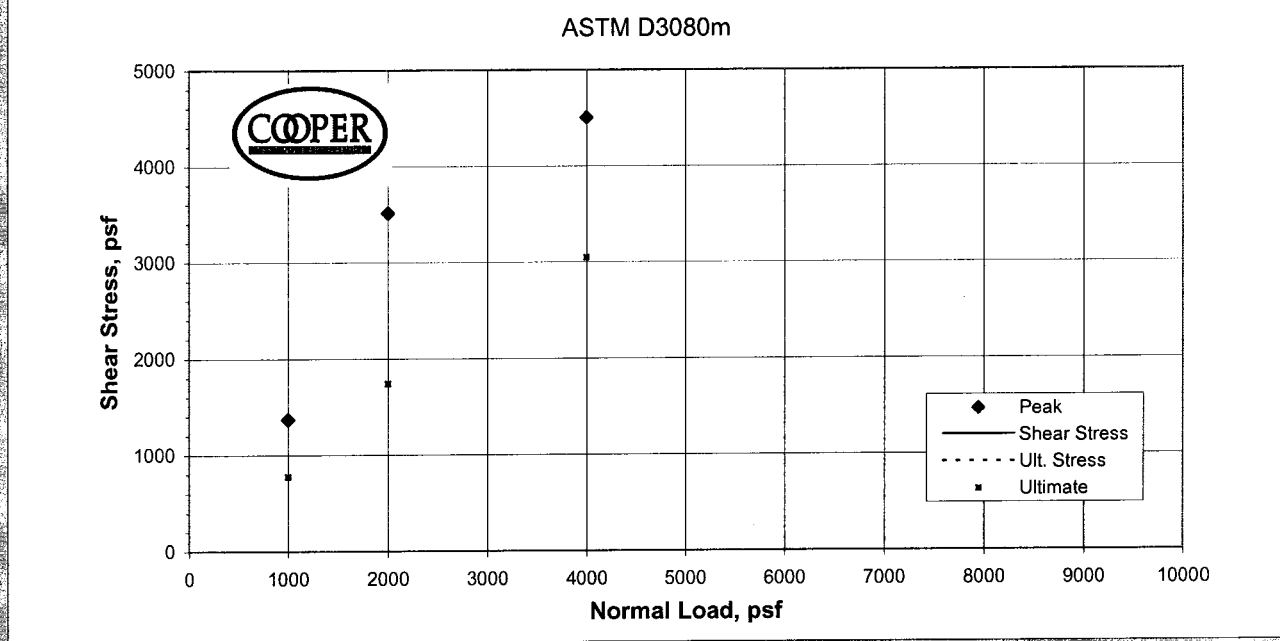
CTL #	157-263
Client:	Parikh Consultants, Inc.
Project	208117-FDW
Tested By:	MD
Reduced By:	RU
Date:	10/7/2008

Specimen #	Boring:	Sample:	Depth, ft:	Visual Soil Classification
1	RW-7	5	20	Dark Brown Sandy CLAY
2	RW-7	5	20	Dark Brown Sandy CLAY
3	RW-7	5	20	Dark Brown Sandy CLAY
4				

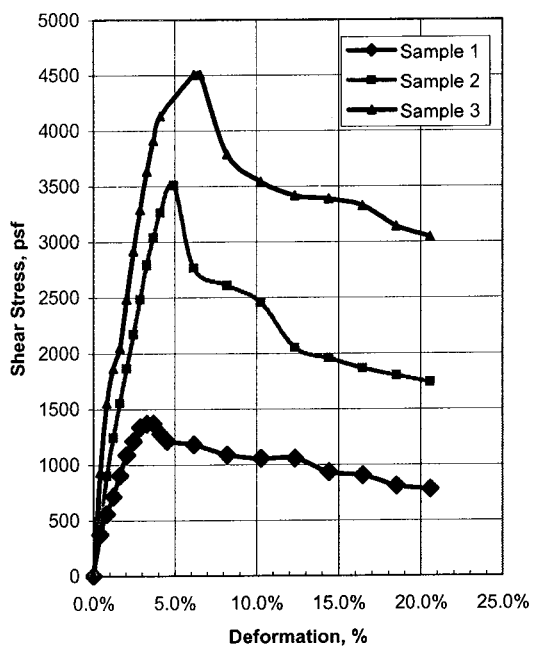
Remarks: *DS-CU* A fully undrained condition may not be attained in this test.

PLATE NO.: B-6B

Direct Shear



P. Phi (degrees)		Ult. Phi (degrees)	
P. Cohesion(psf)		Ult. Cohesion (psf)	



(A-08-042)

	Sample Data: Initial			
	1	2	3	4
Moisture %	19.6	19.1	18.7	
Dry Dens., pcf	107.5	108.2	107.8	
Void Ratio	0.568	0.557	0.564	
Saturation %	93.3	92.5	89.4	
Diameter	2.43	2.43	2.43	
Height	1.00	1.01	1.02	
	Sample Data: At Test			
Moisture %	19.9	19.1	18.5	
Dry Dens., pcf	108.7	110.7	111.3	
Void Ratio	0.551	0.522	0.515	
Saturation %	97.6	98.7	97.2	
Diameter	2.43	2.43	2.43	
Height	0.99	0.99	0.99	
Normal Stress, psf	1000	2000	4000	
Shear Stress, psf	1366	3509	4502	
Strengths picked at	3.7%	4.9%	6.6%	
Ult. Stress, psf	776	1739	3043	
Strain Rate, in/min	0.020	0.020	0.020	

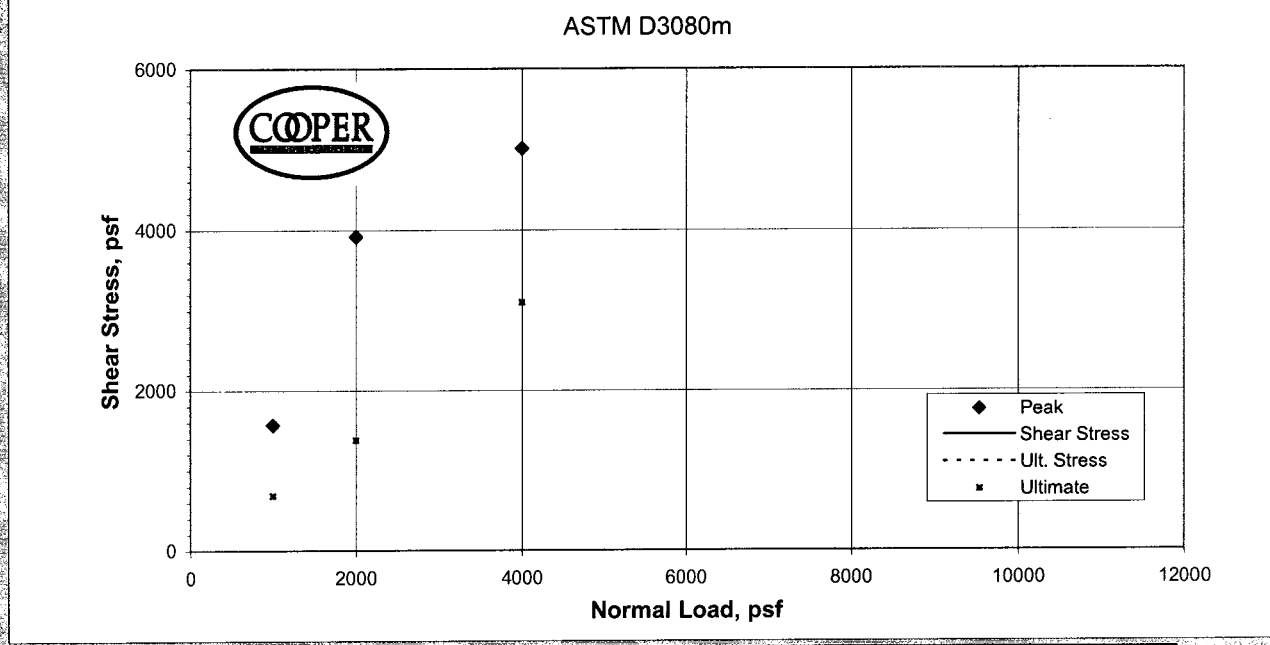
CTL #	157-263
Client:	Parikh Consultants, Inc.
Project	208117-FDW
Tested By:	MD
Reduced By:	RU
Date:	10/7/2008

Specimen #	Boring:	Sample:	Depth, ft:	Visual Soil Classification
1	RW-8	9	40	Yellowish Brown Clayey SAND (Silty)
2	RW-8	9	40	Yellowish Brown Clayey SAND (Silty)
3	RW-8	9	40	Yellowish Brown Clayey SAND (Silty)
4				

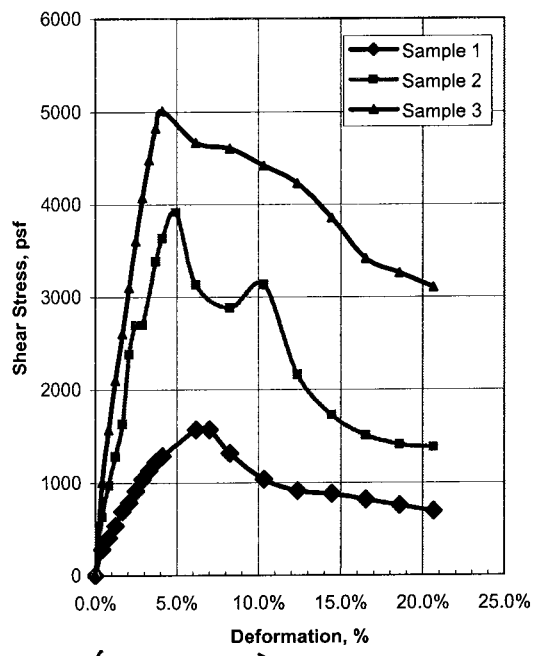
Remarks: *DS-CU* A fully undrained condition may not be attained in this test.

PLATE NO.: B-6C

Direct Shear



P. Phi (degrees)		Ult. Phi (degrees)	
P. Cohesion(psf)		Ult. Cohesion (psf)	



(A-08-053)

	Sample Data: Initial			
	1	2	3	4
Moisture %	14.5	14.1	14.1	
Dry Dens., pcf	105.7	108.9	110.7	
Void Ratio	0.595	0.548	0.522	
Saturation %	65.8	69.4	73.1	
Diameter	2.42	2.42	2.42	
Height	1.00	1.00	1.00	
	Sample Data: At Test			
Moisture %	19.7	18.2	17.6	
Dry Dens., pcf	106.5	110.7	113.6	
Void Ratio	0.583	0.522	0.483	
Saturation %	91.1	94.0	98.2	
Diameter	2.42	2.42	2.42	
Height	0.99	0.98	0.97	
Normal Stress, psf	1000	2000	4000	
Shear Stress, psf	1565	3913	5009	
Strengths picked at	7.0%	5.0%	4.1%	
Ult. Stress, psf	689	1378	3099	
Strain Rate, in/min	0.020	0.020	0.020	

CTL #	157-263
Client:	Parikh Consultants, Inc.
Project	208117-FDW
Tested By:	MD
Reduced By:	RU
Date:	10/6/2008

Specimen #	Boring:	Sample:	Depth, ft:	Visual Soil Classification
1	RW-10	6	25	Yellowish Brown Clayey SAND (Silty)
2	RW-10	6	25	Yellowish Brown Clayey SAND (Silty)
3	RW-10	6	25	Yellowish Brown Clayey SAND (Silty)
4				

Remarks: *DS-CU* A fully undrained condition may not be attained in this test.

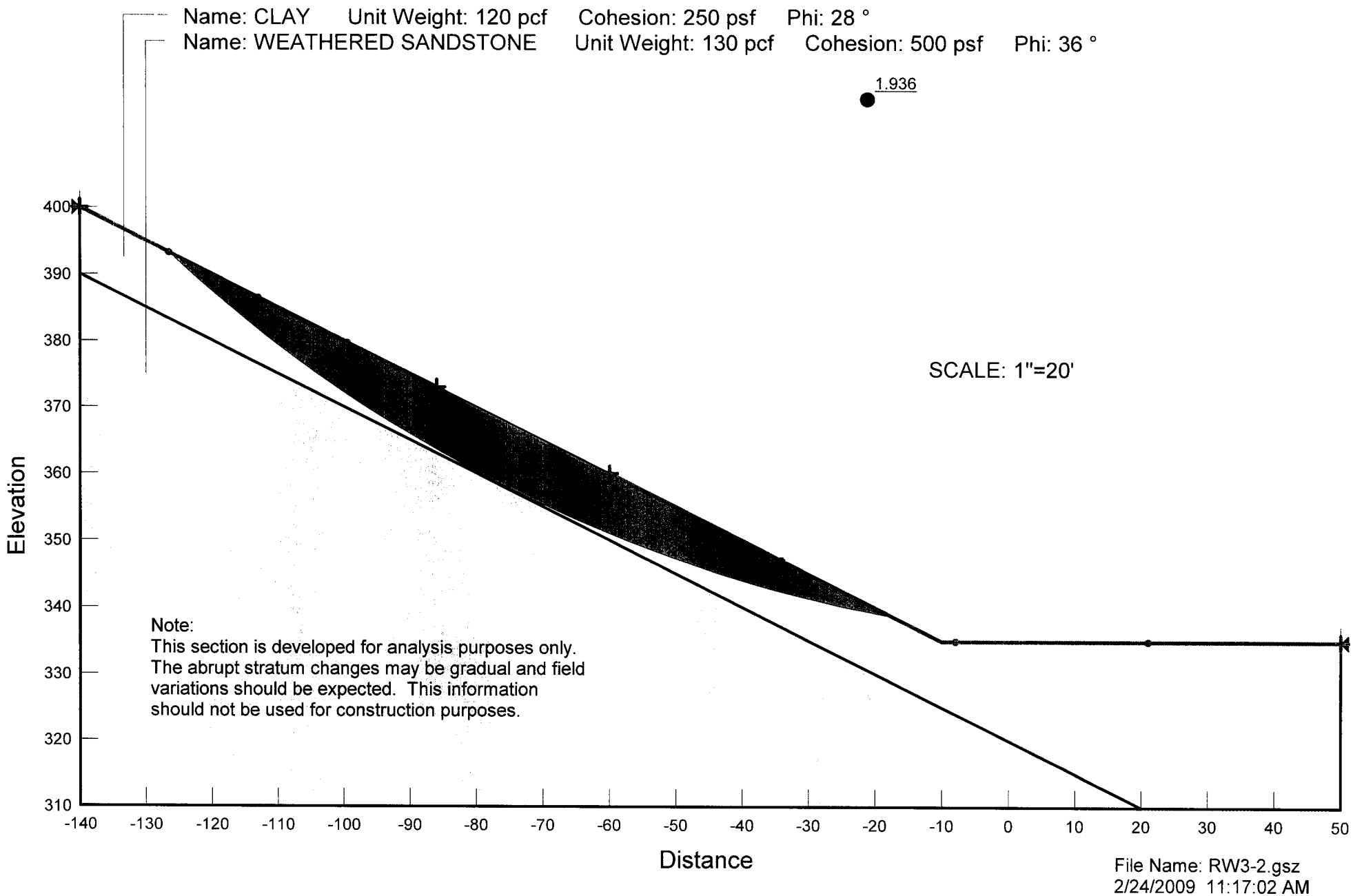
PLATE NO.: B-6D

APPENDIX C

SLOPE STABILITY ANALYSIS

ROUTE 12/JAMESON CANYON ROAD

RETAINING WALL NO. 3 (STA. 266+50)

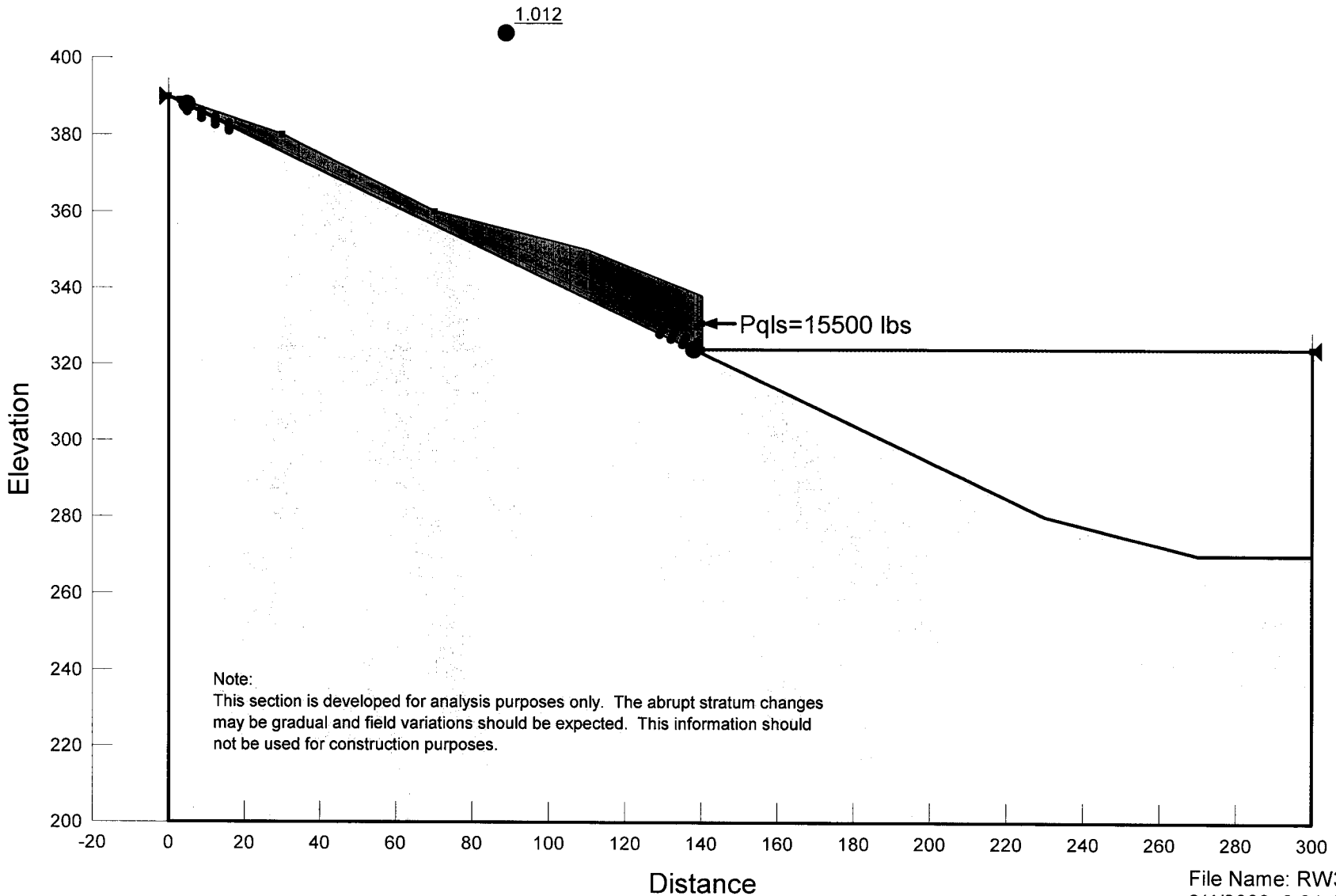


File Name: RW3-2.gsz
2/24/2009 11:17:02 AM

ROUTE 12/JAMESON CANYON ROAD WIDENING

RETAINING WALL NO. 3B - TIEBACK WALL

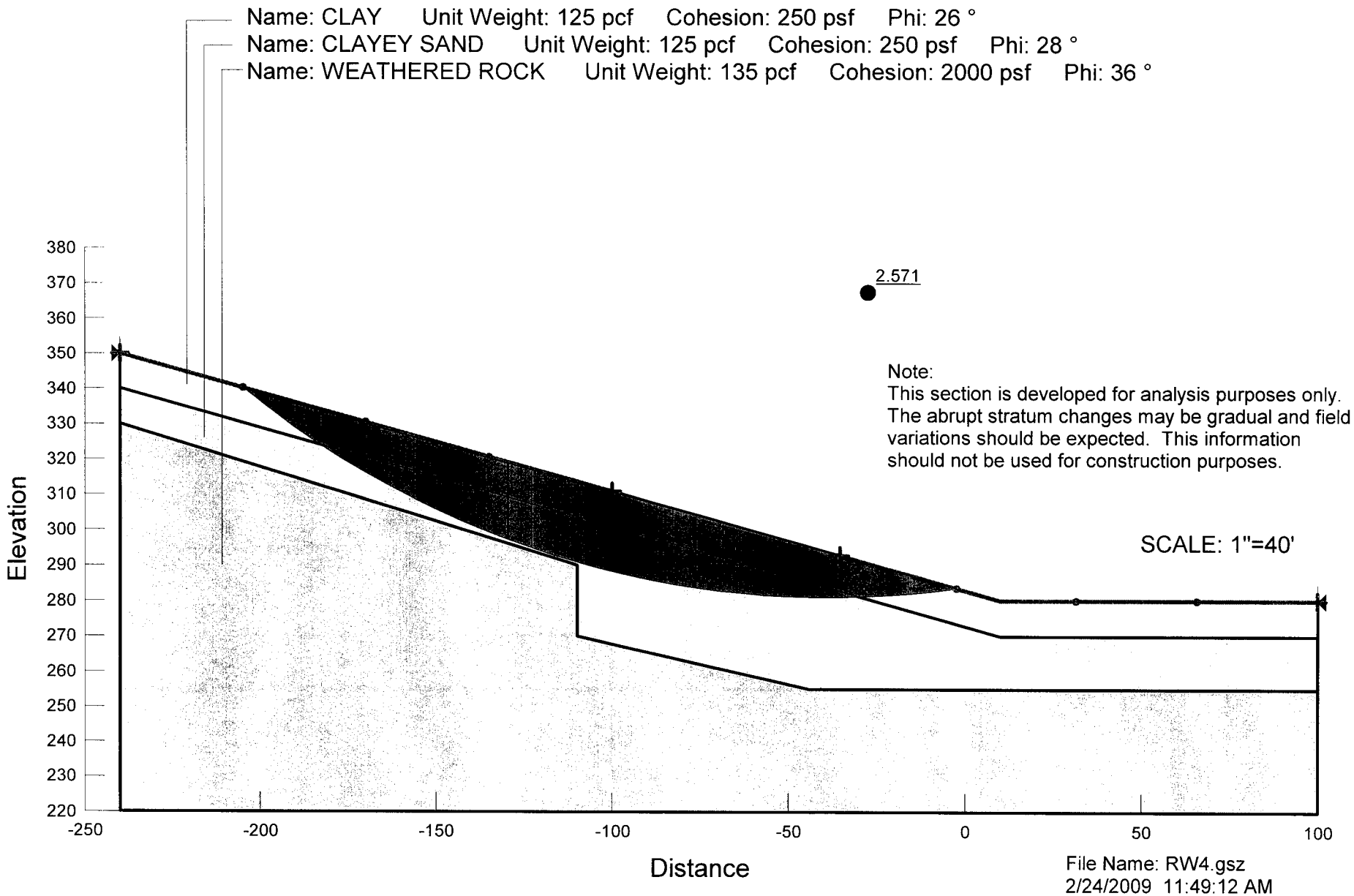
Name: CLAY Unit Weight: 120 pcf Cohesion: 300 psf Phi: 28 ° Piezometric Line: 1
Name: BEDROCK Unit Weight: 135 pcf Cohesion: 500 psf Phi: 36 ° Piezometric Line: 1
Name: POTENTIAL SLIDE PLANE Unit Weight: 120 pcf Cohesion: 0 psf Phi: 25 ° Piezometric Line: 1



File Name: RW3 (SLIDE).gsz
9/4/2009 3:31:14 PM

ROUTE 12/JAMESON CANYON ROAD

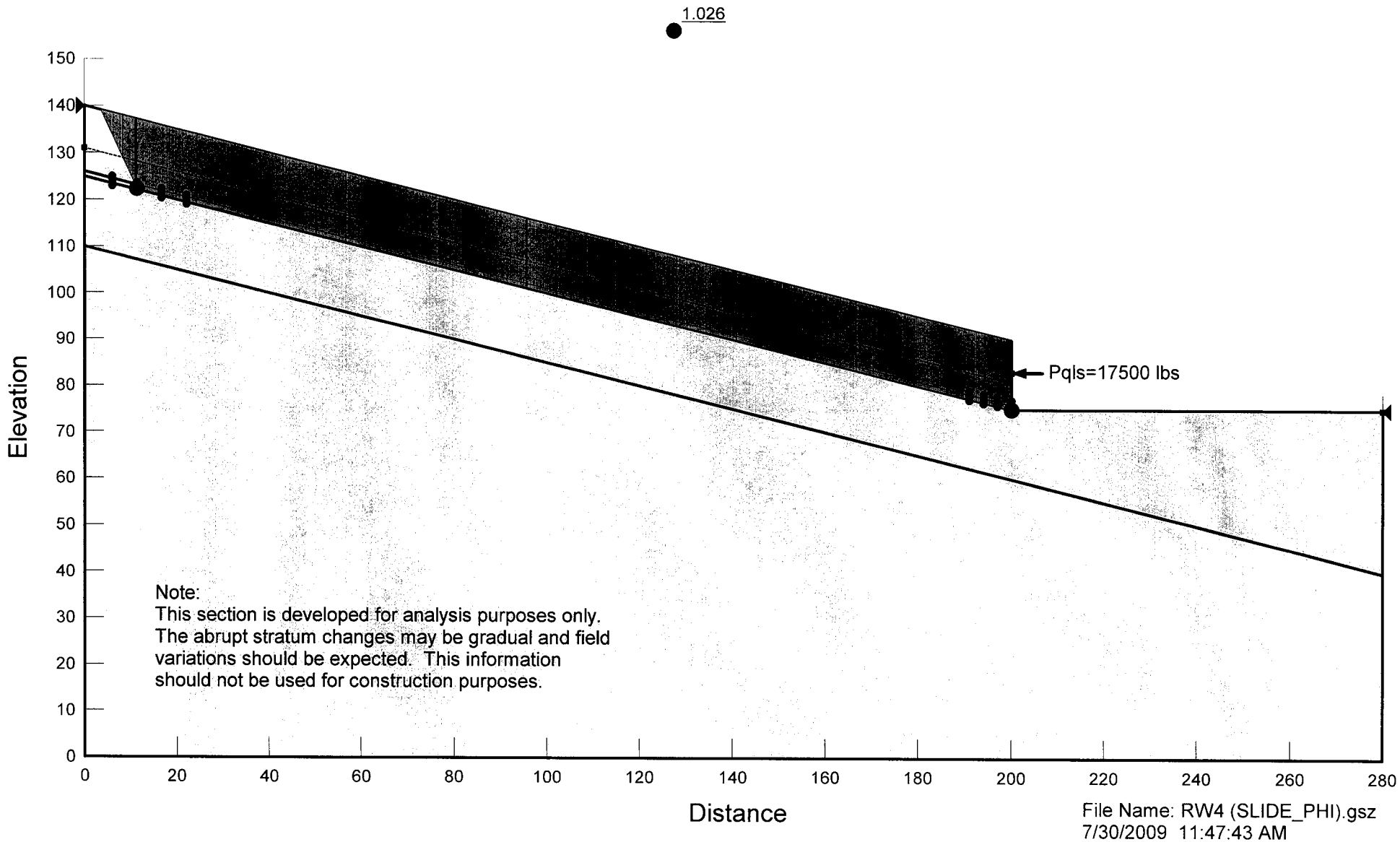
RETAINING WALL NO. 4 (STA. 293+50)



ROUTE 12/JAMESON CANYON ROAD

RETAINING WALL NO. 4 (LANDSLIDE, Qls)

Name: SLIDE Unit Weight: 120 pcf Cohesion: 0 psf Phi: 14.5 ° Piezometric Line: 1
Name: CLAY Unit Weight: 125 pcf Cohesion: 300 psf Phi: 28 ° Piezometric Line: 1
Name: OX. BEDROCK Unit Weight: 135 pcf Cohesion: 750 psf Phi: 36 ° Piezometric Line: 1

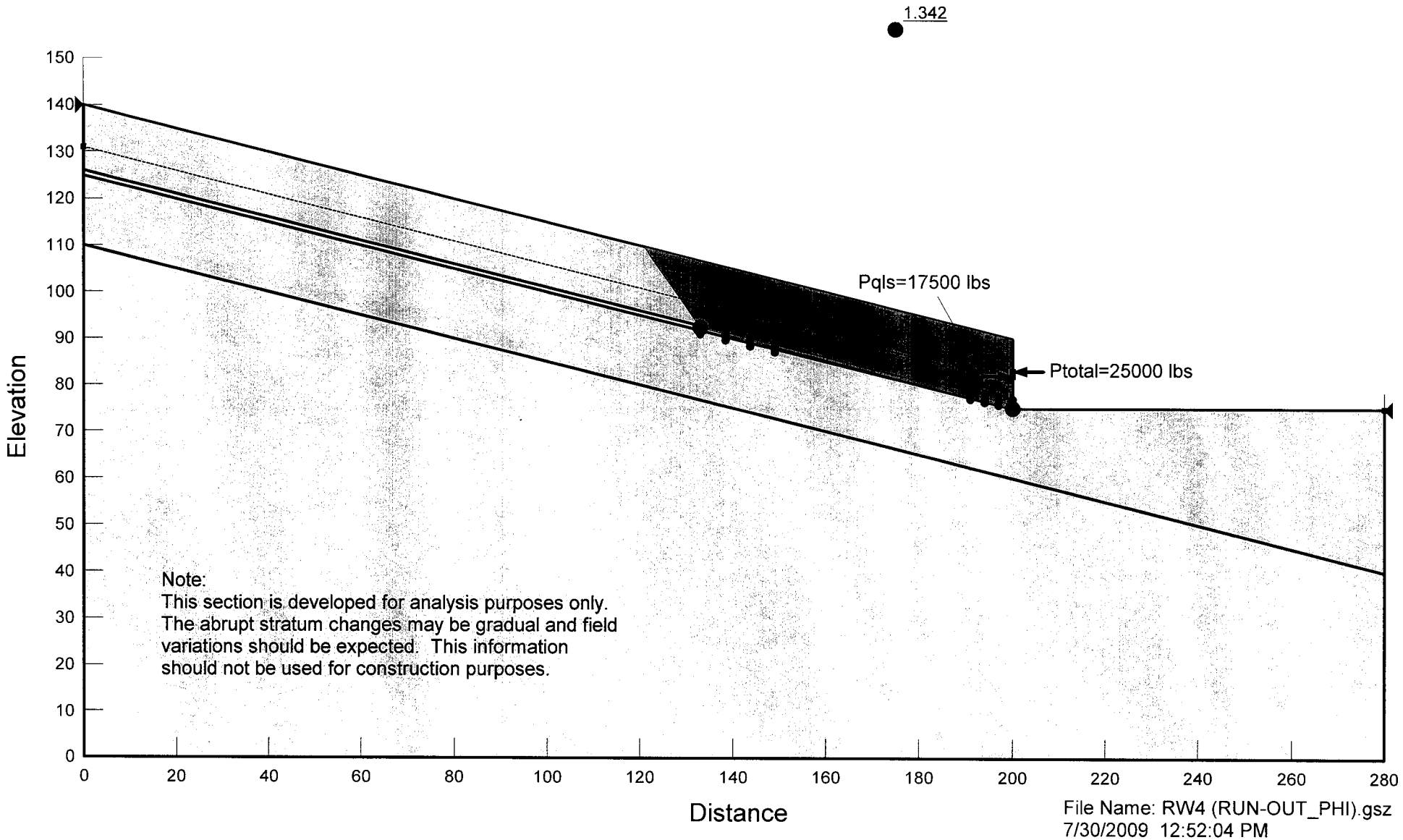


File Name: RW4 (SLIDE_PHI).gsz
7/30/2009 11:47:43 AM

ROUTE 12/JAMESON CANYON ROAD

RETAINING WALL NO. 4 (LANDSLIDE RUN-OUT DEPOSITS, Qlsro)

Name: SLIDE Unit Weight: 120 pcf Cohesion: 0 psf Phi: 20 ° Piezometric Line: 1
Name: CLAY Unit Weight: 125 pcf Cohesion: 300 psf Phi: 28 ° Piezometric Line: 1
Name: OX. BEDROCK Unit Weight: 135 pcf Cohesion: 750 psf Phi: 36 ° Piezometric Line: 1



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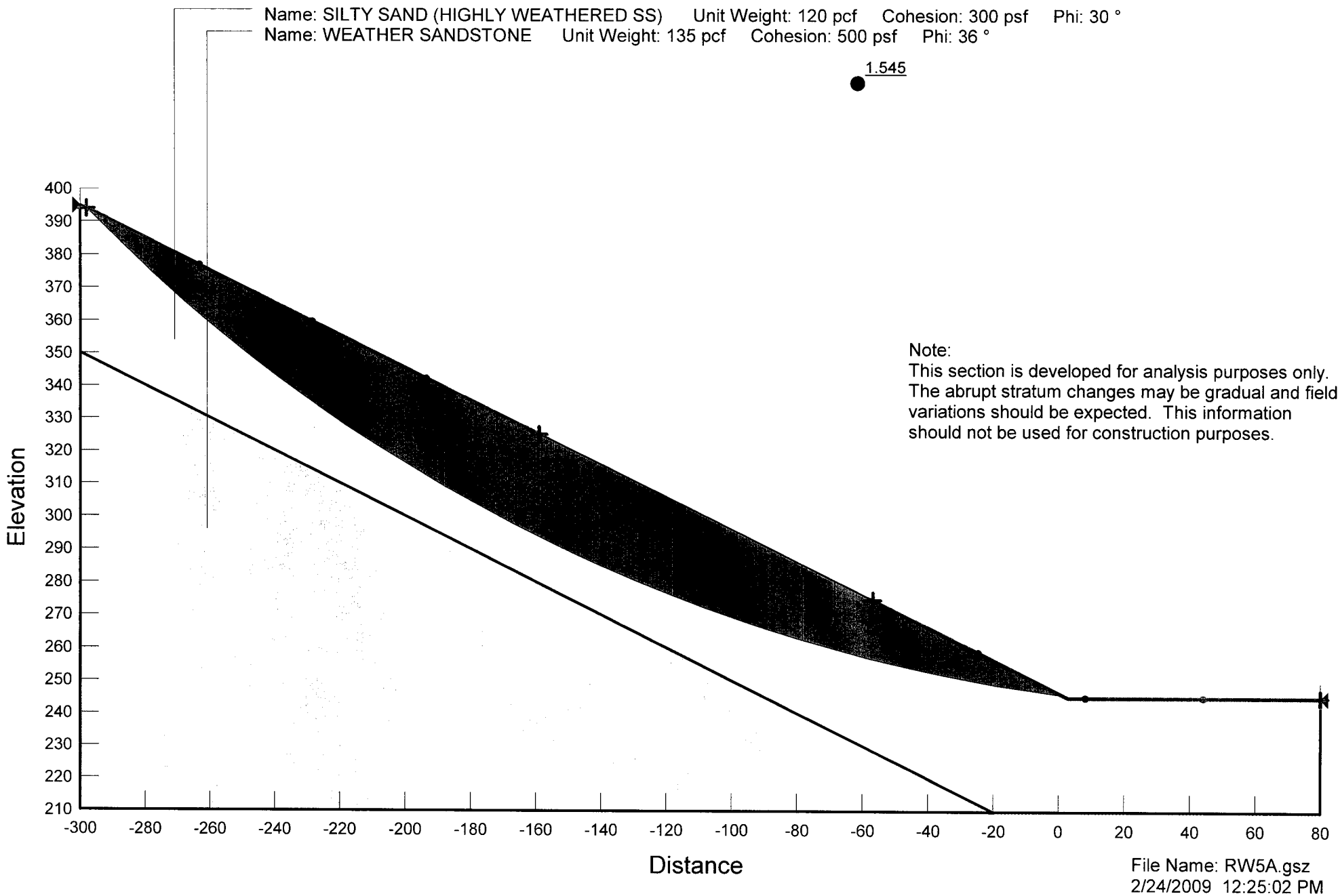
ROUTE 12/JAMESON CANYON ROAD

RETAINING WALL NO. 5A (STA. 314+00)

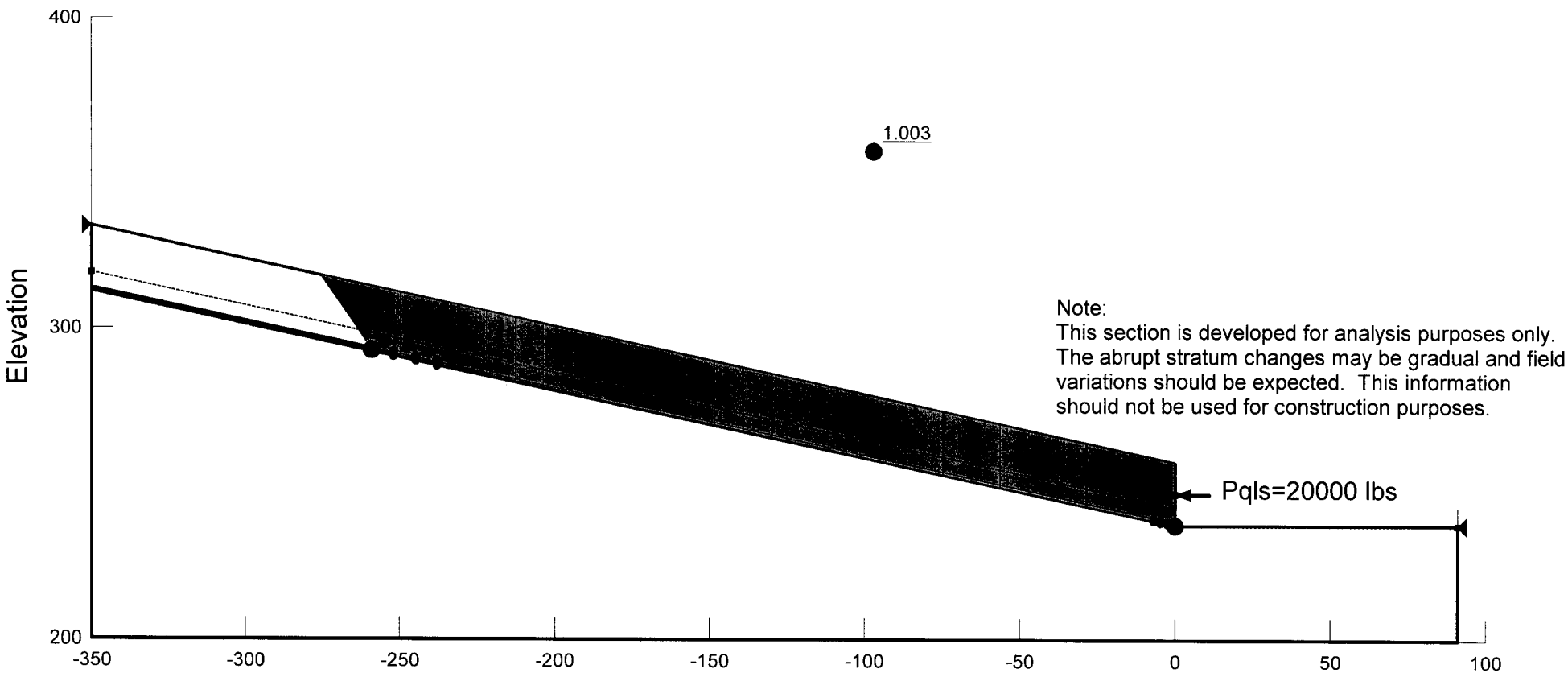


File Name: RW5A.gsz
2/24/2009 12:25:02 PM

ROUTE 12/JAMESON CANYON ROAD WIDENING

RETAINING WALL NO. 5B - TIEBACK WALL (STA. 320+00)

Name: CLAY Unit Weight: 120 pcf Cohesion: 300 psf Phi: 28 ° Piezometric Line: 1
Name: SLIDE PLANE Unit Weight: 120 pcf Cohesion: 0 psf Phi: 12.5 ° Piezometric Line: 1



SCALE: 1"=50'

File Name: RW5 (SLIDE_PHI).gsz
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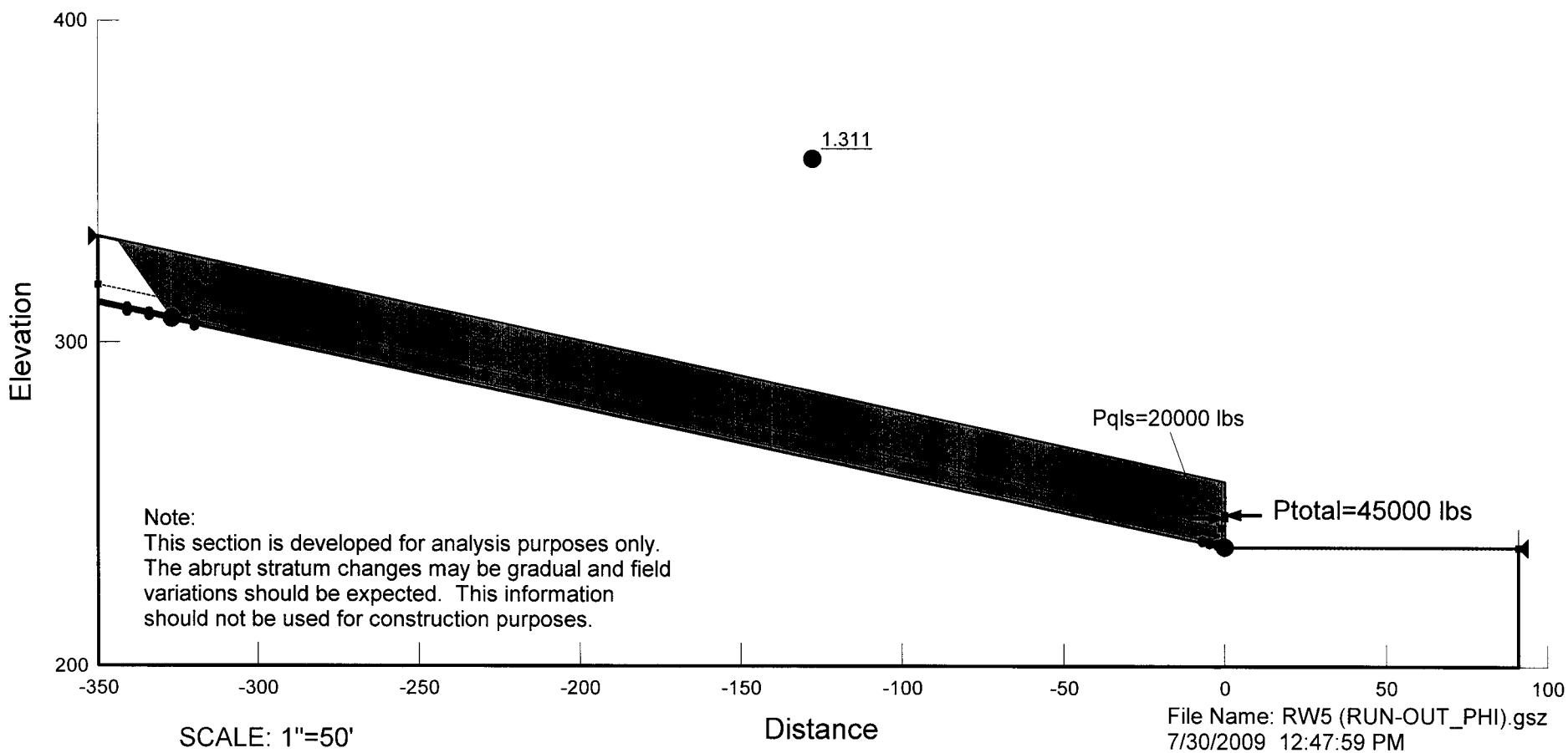
ROUTE 12/JAMESON CANYON ROAD WIDENING

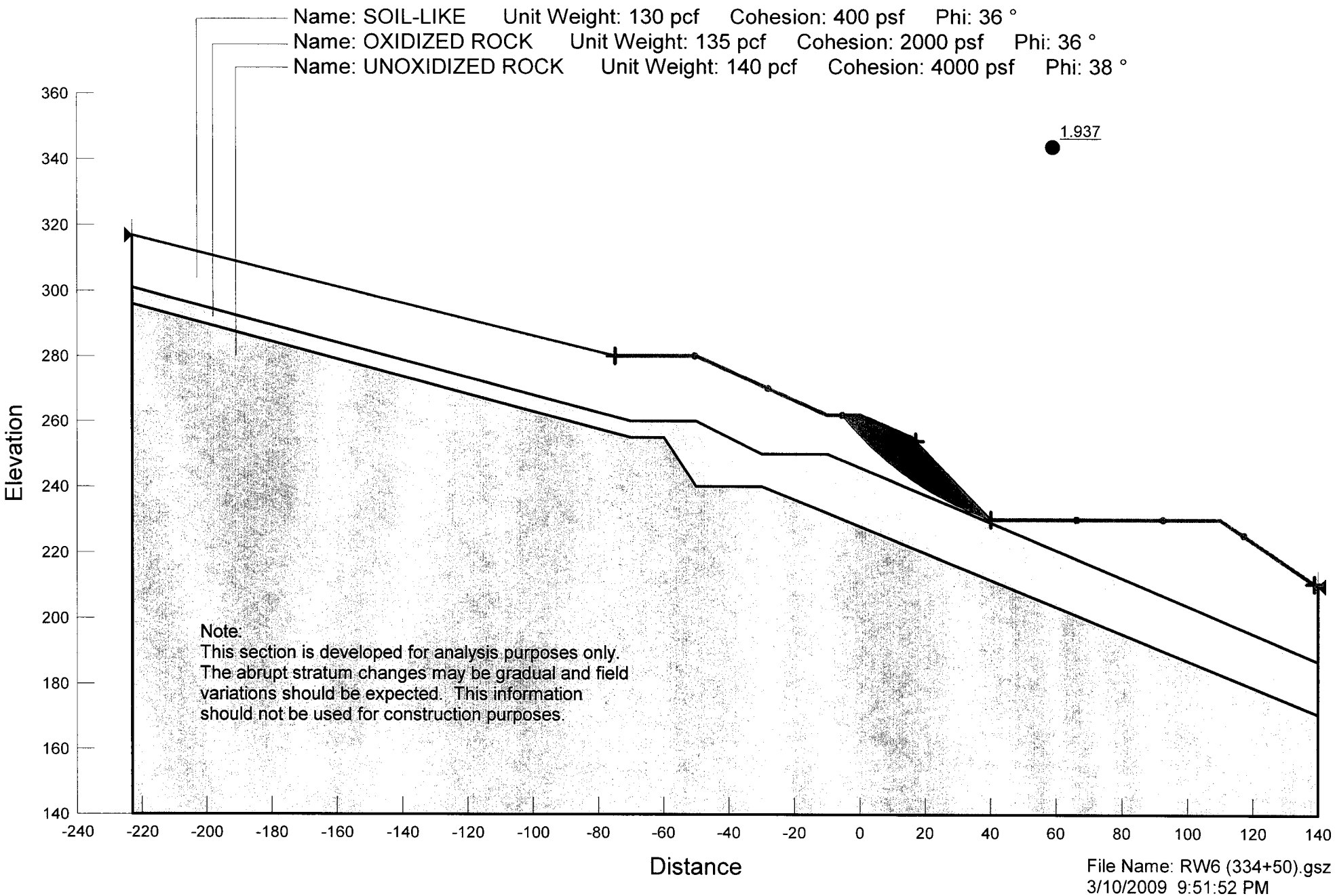
RETAINING WALL NO. 5B - TIEBACK WALL (STA. 320+00)

Name: CLAY Unit Weight: 120 pcf Cohesion: 300 psf Phi: 28 ° Piezometric Line: 1
Name: SLIDE PLANE Unit Weight: 120 pcf Cohesion: 0 psf Phi: 16.5 ° Piezometric Line: 1



ROUTE 12/JAMESON CANYON ROAD

RETAINING WALLS NO. 6, 7A & 7B (STA. 334+50)



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ROUTE 12/JAMESON CANYON ROAD

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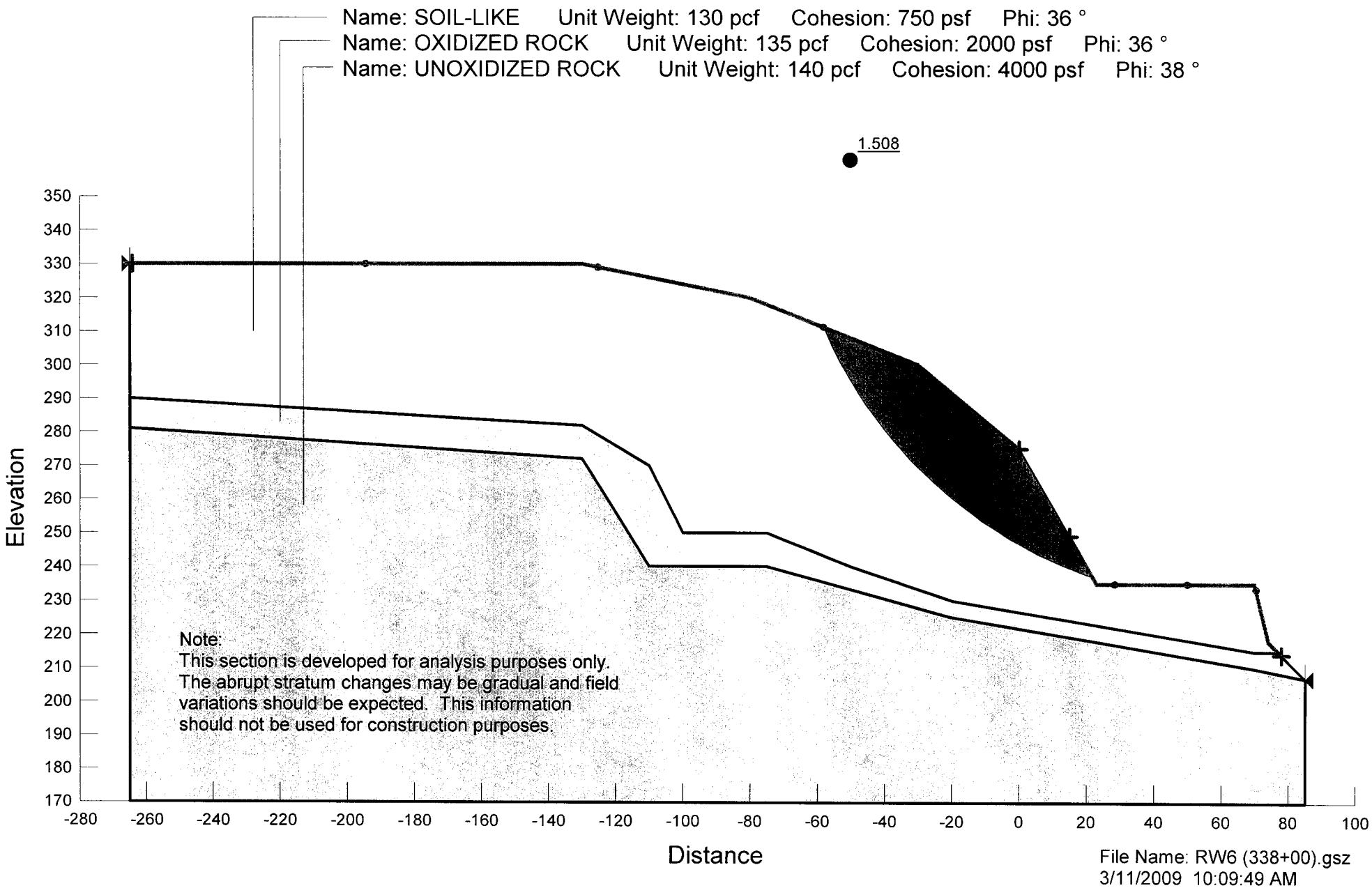

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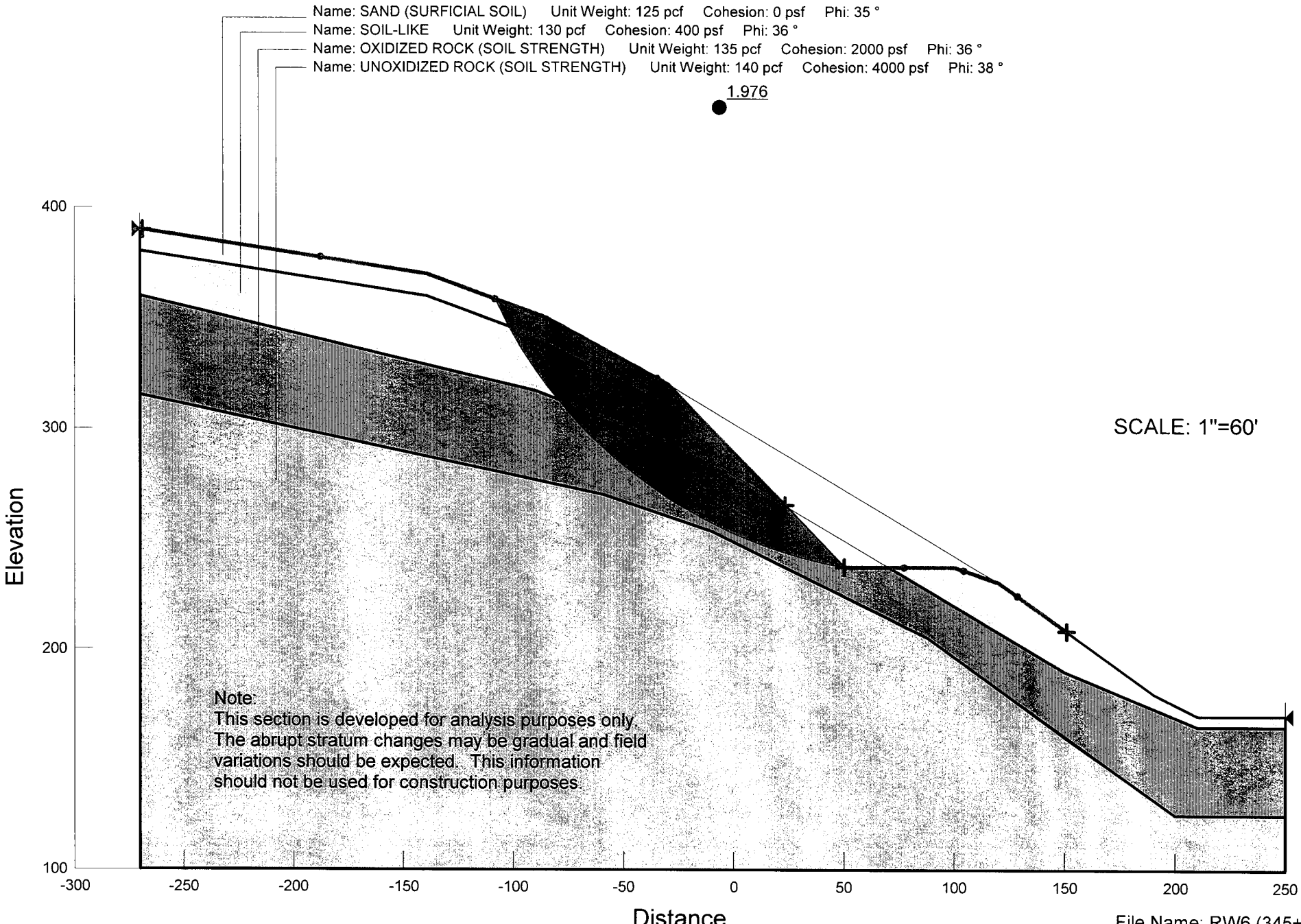

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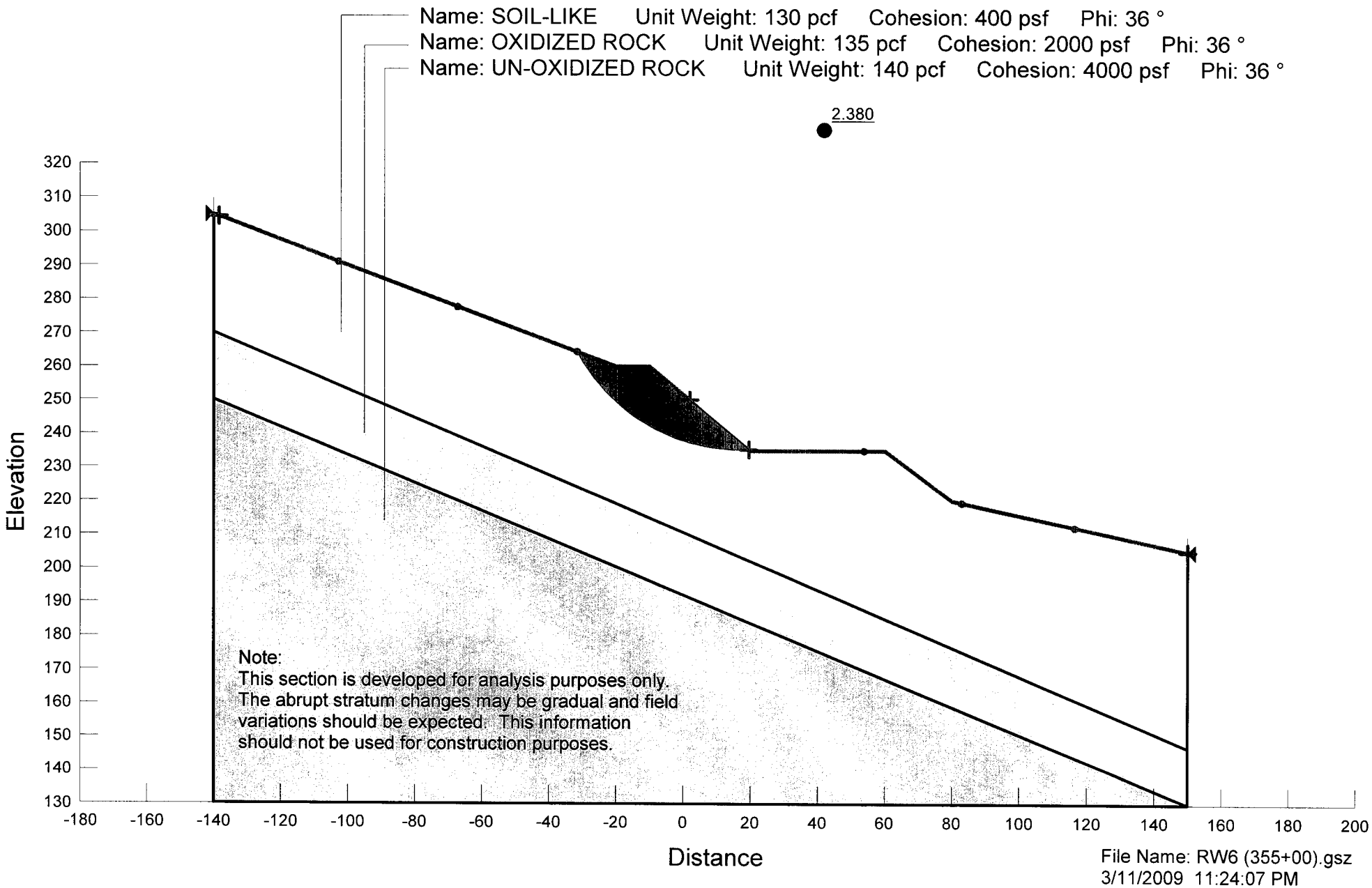
ROUTE 12/JAMESON CANYON ROAD

RETAINING WALLS NO. 6, 7A & 7B (STA. 355+00)



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3/11/2009 11:24:07 PM

APPENDIX D

NORCAL GEOPHYSICAL CONSULTANTS, INC.

November 3, 2008

Mr. Gary Parikh
Parikh Consultants, Inc.
356 South Milpitas Boulevard
Milpitas, California 95035

Subject: Seismic Refraction Survey
Jameson Canyon – Highway 12
Solano County, California

NORCAL Project No. 08-426.11

Dear Mr. Parikh:

This report presents the findings of a seismic refraction survey performed by NORCAL Geophysical Consultants, Inc. along the Jameson Canyon corridor of Highway 12, in Solano County, California. The geophysical survey was conducted during the period September 29th through October 3rd, 2008 by the following NORCAL personnel:

- David T. Hagin PGp 1033
- Senior Geophysical Technician Travis W. Black
- Geophysical Technician Ken McGuire

Site orientation, background information and logistical support were provided by Mr. Frank Wang of Parikh.

SITE DESCRIPTION and PURPOSE

The site lies on the northern side of the Jameson Canyon corridor, Highway 12, Solano County, California. This narrow section of road is planned for improvement, and deep cuts will be required to widen the roadway. The purpose of this seismic refraction survey was to measure seismic p-wave velocities to aid in characterizing the underlying rock, and to quantify seismic compressional wave velocities as they pertain to rippability.

The general conditions along Jameson Canyon can be characterized as moderate to steep slopes with occasional relatively local slope failures. The bedrock is predominantly sandstone.

321A BLODGETT STREET • COTATI, CA 94931 • TELEPHONE (707) 796-7170 • FAX (707) 796-7175
www.norcalgeophysical.com

METHODOLOGY and RIPPABILITY

The seismic refraction method provides a measure of the velocity of compressional (p)-waves as they propagate through soil and rock. Quantification of these values within rock provides an estimation of the rock hardness and degree of weathering and/or fracturing. Generally, low seismic velocities are indicative of fill, soil or recently deposited materials. Moderate velocity material can include both older alluvium and highly weathered and fractured bedrock. The highest velocities are typically measured in less weathered and less fractured rock. An assessment of rippability can be made by comparing the measured velocities to published rippability tables.

A more detailed discussion of the seismic refraction method and its inherent limitations, geophysical instrumentation, data analysis, interpretation and rippability is presented in Appendix A.

FIELD SURVEY and EQUIPMENT

The seismic survey consisted of nine seismic lines located in planned cut areas designated as Area "A" through Area "D", progressing from west to east, as shown on Plate 1; line locations and orientations were specified by Parikh personnel. All lines were comprised of one geophone array (spread) containing 24 geophones distributed in a collinear array. An exception was Line C1, which had two 24-channel arrays overlapped by 12 geophones for a total of 36 stations. All lines employed 10-foot geophone station intervals yielding total line lengths of 240 feet, except Line C1 with a line length of 360 feet.

A Geometrics Geode, 24-bit digital instrument with 8 Hertz digital-grade geophones was used for data acquisition. Multiple impacts with an AWD200 (200-pound, Accelerated Weight Drop) provided the energy source for generation of seismic waves. Energy source points (shots) were placed equidistant between geophone stations at regular intervals, and off both ends of each spread for a total of 7 shots per spread. A hand level was used to determine relative elevations of the geophone stations. Locations of line endpoints were also recorded with a Trimble GPS system.

DATA PROCESSING

The seismic refraction data were processed in-house with software developed by Optim. This software uses a modeling technique which derives detailed velocity models that are capable of defining strong lateral velocity gradients, even with extreme variations in topography or complex geologic structure.

A color-coded seismic velocity cross-section of the subsurface has been generated for each seismic line (profile), where cool colors (blues) indicate lower seismic velocities and warm colors (reds) indicate higher velocities. Color scaling for all profiles has been normalized based on the overall range of measured seismic velocity values. Additionally, the axes have been scaled 1:1, vertical to horizontal.

RESULTS AND INTERPRETATION

The measured seismic velocities range in value from less than 1,000 to over 10,000 feet per second (ft/s). Based on our experience working in a similar geologic environment, velocities less than about 4,000 ft/s (low velocities) are typical of fill and/or soil materials; however, highly weathered to decomposed rock can have similar velocities. The moderate velocities of about 4,000 to 8,000 ft/s probably represent highly to moderately weathered and fractured bedrock; however, the lower end of this velocity range can also include alluvium. Velocities in excess of 8,000 ft/s (high velocities) represent less weathered and less fractured rock.

For the purposes of discussion regarding the results at the four survey areas, materials less than 4,000 ft/s will be referred to as overburden, velocities from 4,000 to 8,000 ft/s referred to as weathered rock and velocities greater than 8,000 ft/s as hard rock.

Area A

The maximum seismic velocities measured in Area A are greater than 10,000 ft/s. Overburden ranges in thickness from 15 to 50 feet. Line A2 extends directly uphill, and shows a thin weathered zone above the hard rock. Line A1 shows a thicker weathered rock zone as measured along contour. The depth to the hard rock surface varies considerably along both profiles.

Area B

Overburden appears irregular in thickness, and ranges from about 5 to 25 feet. Below the overburden layer, seismic velocities increase gradually with increasing depth to weathered rock velocities. The maximum seismic velocities are about 6,500 ft/s, as measured along all 3 lines.

Area C

Seismic profiles in Area C indicate a range in the thickness of overburden from 10 to over 30 feet. As in Area A, the weathered zone appears as a thin layer above hard rock, except for the upper portion of Line C1, where the hard rock zone is not present. Maximum seismic velocities are greater than 10,000 ft/s in Area C. The profiles illustrate a discontinuous hard rock zone with an irregular and undulating surface.

Area D

Seismic profiles in Area D show a thick section of overburden ranging from 25 to over 50 feet in thickness. In some locations, the overburden extends to the full depth of investigation. Where higher velocities are present, seismic velocities increase gradually with increasing depth to weathered rock velocities. Maximum seismic velocities in Area D are slightly over 6,000 ft/s.

EXCAVATION CHARACTERISTICS (Rippability)

Seismic velocity charts relating seismic velocity to excavation characteristics have been developed from field tests by others. These charts list the seismic velocity of various types of rock and soils and their relative ease of excavation using different types of rippers. Caterpillar Tractor Company publishes a performance manual that lists ripper performance charts for the D8R, D9R, D10T and D11T tractors. The following information in Table A was obtained from a performance chart for a D9R ripper in sandstone, the primary rock found on site (Caterpillar Performance Handbook, Edition 36, April 2006).

Table A: CAT D9R Ripper Performance in Sandstone Rock

PERFORMANCE	VELOCITY RANGE (FT/S)
Rippable	Less than 7,400
Marginally Rippable	7,400 to 9,600
Non-Rippable	Greater than 9,600

This information should only be used as a general guide, however, as many other factors should also be considered. These factors include rock jointing and fracture patterns, the experience of the equipment operator, and the equipment and excavation methods selected. Also, the computed velocities measured along each line are an average; therefore, there may be localized zones where the velocities may be higher or lower than indicated. Since the accuracy of our findings is subject to these limitations, it should be noted that subsurface conditions may vary from those depicted in the final results. A more detailed discussion of the limitations with regard to the seismic refraction method is presented in Appendix A.

SUMMARY

The maximum seismic velocities measured varied considerably from site to site. In Areas A and C, maximum seismic velocities were greater than 10,000 ft/s, whereas in Areas B and D maximum velocities were in the range of 6,000 ft/s. Overburden is found in thick accumulations in some locations, and as a thin layer in others. Where hard rock is present, the weathered layer appears thin; however, where hard rock is absent the

weathered layer appears thicker, with a gradual increase in seismic velocities. The underlying hard rock in Areas A and C can be characterized as undulating and discontinuous.

Our investigation revealed seismic velocities suggesting the presence of non-rippable (by a CAT D9R) rock at depths of 12 to 60 feet in locations A and C. Depths to higher velocities are highly variable laterally on the seismic profiles. In areas B and D, seismic velocities all fall within the rippable category, as defined by Caterpillar.

STANDARD CARE AND WARRANTY

The scope of NORCAL's services for this project consisted of using geophysical methods to characterize the shallow subsurface. The accuracy of our findings is subject to specific site conditions and limitations inherent to the techniques used. We performed our services in a manner consistent with the level of skill ordinarily exercised by members of the profession currently employing similar methods. No warranty, with respect to the performance of services or products delivered under this agreement, expressed or implied, is made by NORCAL.

We appreciate having the opportunity to provide our services to Parikh Consultants.

Sincerely,

NORCAL Geophysical Consultants, Inc.

David T. Hagin

David T. Hagin
Geophysicist GP-1033

DTH/KGB/tt

Enclosures: Plates 1- 10
Appendix A - Geophysical Methodology, Instrumentation, Data Analysis, and Limitations

Appendix A

GEOPHYSICAL METHODOLOGY

Appendix A

SEISMIC REFRACTION

Methodology

The seismic refraction (SR) method provides information regarding the seismic velocity structure of the subsurface. An impulsive (mechanical or explosive) source is used to produce compressional (p) wave seismic energy. The p-waves propagate into the earth and are refracted along interfaces representing an increase in velocity. A portion of the p-wave energy is refracted back to the surface where it is detected by sensors (geophones) that are coupled to the ground surface in a collinear array (spread). The detected signals are recorded on a multi-channel seismograph and are analyzed to determine the shot point-to-geophone travel times. These data can be used along with the corresponding shot point-to-geophone distances to determine the depth, thickness, and velocity of subsurface seismic layers.

The seismic refraction technique is based on several assumptions. Paramount among these are that seismic velocity increases with depth. In cases where this assumption is invalid, the accuracy of the technique decreases. For example, if a low velocity layer occurs between two layers of higher velocity, the low velocity layer will not be detected and the depth to the underlying high velocity layer will be erroneously large.

Instrumentation

Data acquisition is initiated along each SR line by producing seismic energy using either an explosive or mechanical source. Explosive sources are typically buried from 2 to 4 feet beneath the ground surface and are detonated by electric blasting caps. The detonation is initiated by a blaster that is connected to a seismograph. Mechanical sources produce energy by impacting a metal strike plate on the ground surface with either a 12-16 pound sledge hammer or an elastic-band or hydraulically driven weight drop.

The resulting seismic wave forms are recorded using a Geometrics 24-channel digital, engineering seismograph and Mark Products geophones with a natural frequency of 8 or 10 Hz. The data may be recorded on hard copy records (seismograms) as well as on magnetic or optical media for future processing. The seismograms can be analyzed to determine the amount of time it takes for a p-wave to travel from a given shot point to each geophone in a spread.

Data Analysis

The seismic data are downloaded to a computer and processed using software by Optim. Picker is used to define the shot point to geophone travel times, and geophone geometry, including elevations as picked from topography maps, hand-level techniques and/or a global positioning system (GPS). Models are created from this information through

inversion processing using a non-linear forward modeling optimization technique called adaptive simulated annealing.

The final output consists of a color coded seismic velocity cross-section showing the surface topography, the elevation and configuration of the seismic layers, the corresponding velocity of each colored layer, and the locations of the shot points.

Rippability

Rippability (excavatibility) is dependent on the physical condition of the rock masses to be excavated. In addition to the rock type and degree of weathering, structural features in the rock, such as bedding planes, cleavage planes, joints, fractures and shear zones also influence rippability. Rock masses tend to be more easily ripped if they have well defined, closely-spaced fractures, joints, or other planes of weakness. Massive rock bodies which lack discontinuities may exhibit marginal rippability, even where partially weathered, and may require blasting for efficient removal. The association between the rippability of various earth materials and their seismic velocity is most recently detailed in the Caterpillar Performance Handbook, Edition 36, October 2006.

The charts of ripper performance should be considered as being only one indicator of rippability. Ripper tooth penetration is usually the key to successful ripping, regardless of seismic velocity. This is particularly true in finer-grained, homogeneous materials and in tightly cemented formations. Ripping success may ultimately be determined by the operator finding the proper combination of factors, such as: number of shanks used, length and depth of shank, tooth angle and direction, and use of throttle. Although low seismic velocities in any rock type indicate probable rippability, if the fractures, bedding and/or joints do not allow tooth penetration, the material may not be ripped efficiently. In some cases, pre-blasting may be required to induce sufficient fracturing to allow tooth penetration for excavation.

Limitations

There are limitations unique to the SR method. The basic physics involved in refraction of acoustic waves dictates certain physical parameters for any survey. For example, if a layer has a lower velocity than that of the overlying layer, the low velocity layer will be invisible or improperly resolved. Furthermore, the computed depth of the next layer down will be erroneously large. Also, a velocity layer may simply be too thin to be detected. Due to these and other limitations inherent to the SR method, the results of the SR survey should be considered only as approximations of the subsurface conditions. The actual conditions may vary locally.

Additionally, there is inherent ambiguity involved with inversion processing. Models created through the inversion process are non-unique, and therefore must be evaluated carefully based upon site geology and data values.

LEGEND	
	SEISMIC REFRACTION PROFILE

SCALE

0 400 800 1600

(1 inch = 800 feet)

NORCAL

SITE LOCATION MAP
JAMESON CANYON – HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

NORCAL GEOPHYSICAL CONSULTANTS INC.

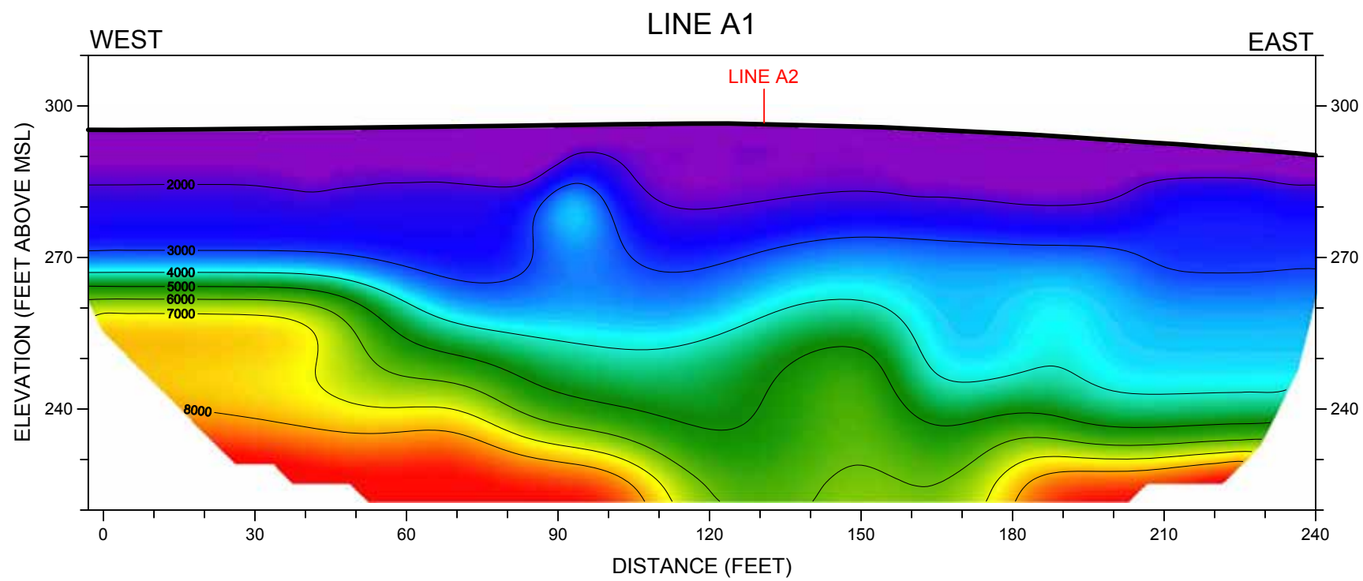
JOB #: 08–428.11

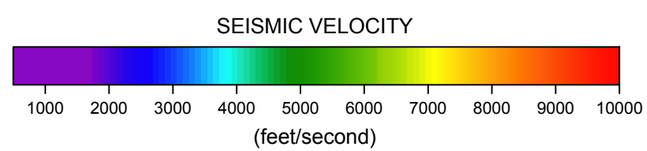
DATE: OCT. 2008

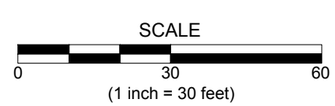
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE 1







NORCAL

SEISMIC REFRACTION PROFILE
LINE A1
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

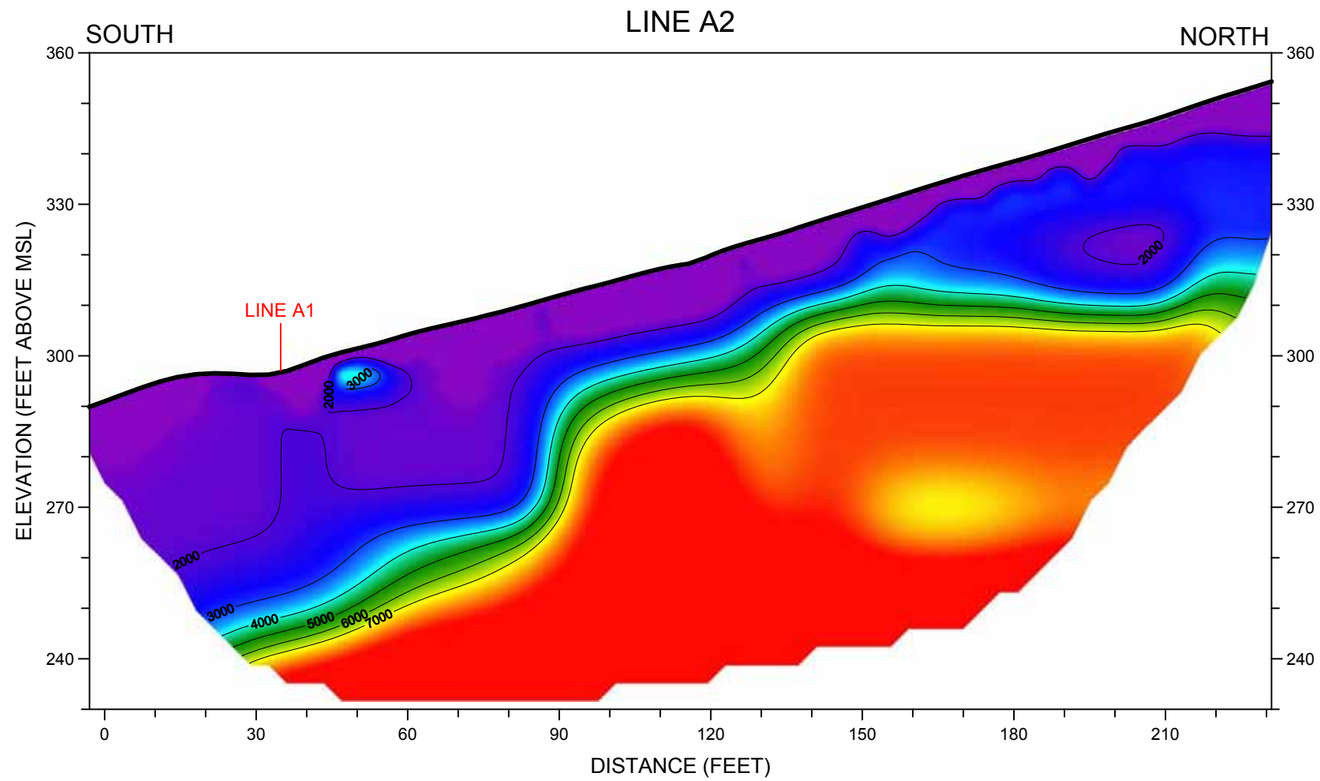
NORCAL GEOPHYSICAL CONSULTANTS INC.

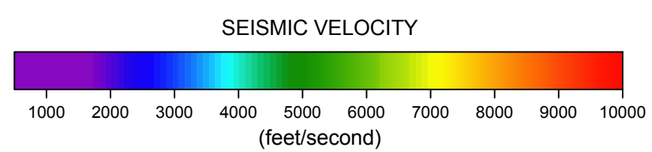
DATE: OCT. 2008

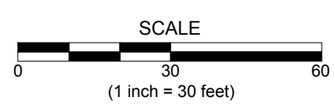
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE
2







NORCAL

SEISMIC REFRACTION PROFILE
LINE A2
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

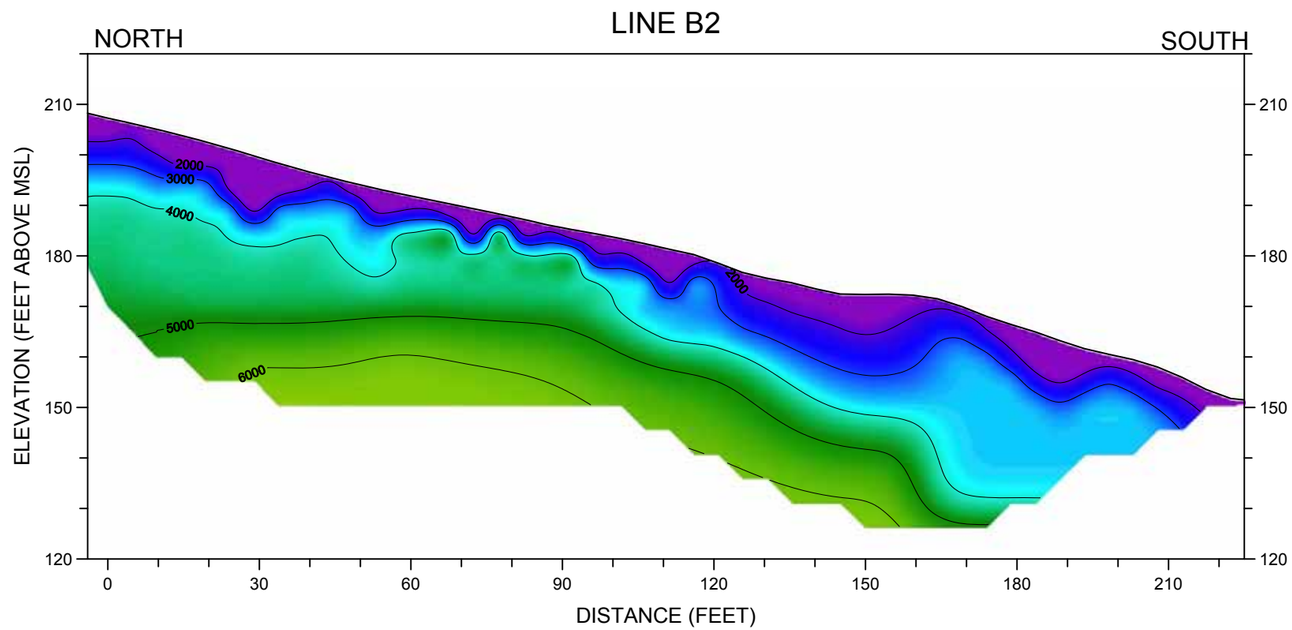
NORCAL GEOPHYSICAL CONSULTANTS INC.

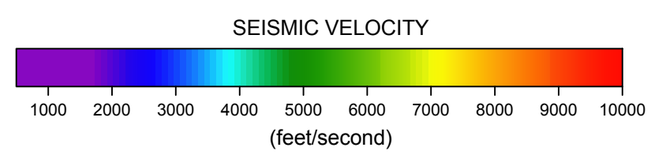
DATE: OCT. 2008

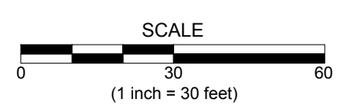
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE 3







NORCAL

SEISMIC REFRACTION PROFILE
LINE B2
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

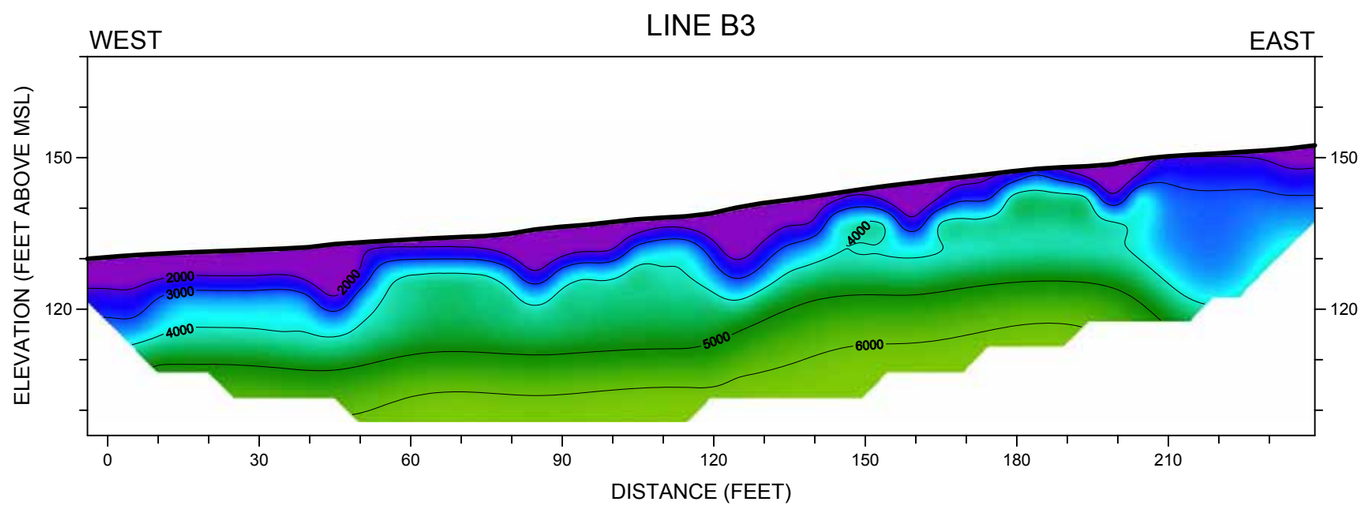
NORCAL GEOPHYSICAL CONSULTANTS INC.

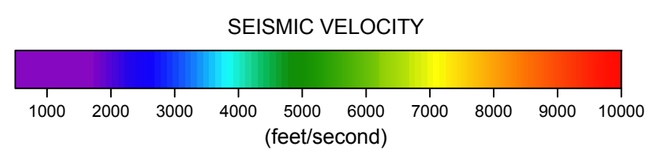
DATE: OCT. 2008

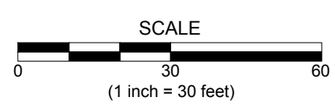
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE
4







NORCAL

SEISMIC REFRACTION PROFILE
LINE B3
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

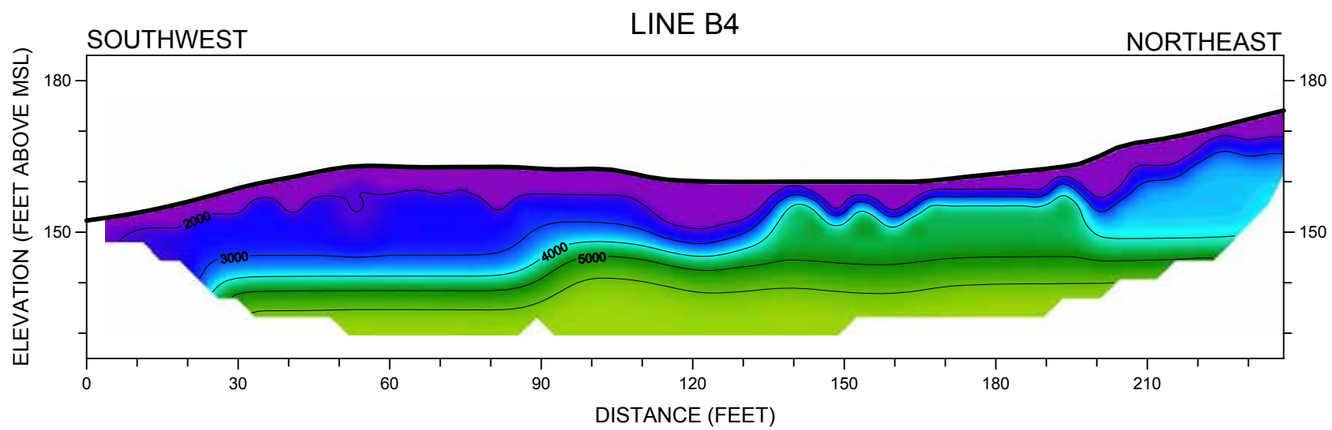
NORCAL GEOPHYSICAL CONSULTANTS INC.

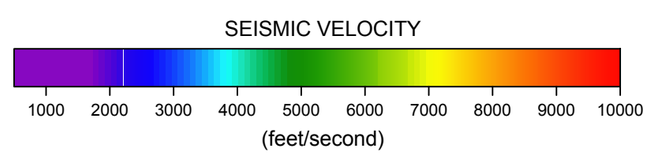
DATE: OCT. 2008

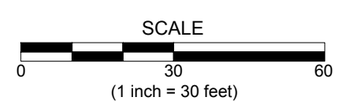
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE
5







NORCAL

SEISMIC REFRACTION PROFILE
LINE B4
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

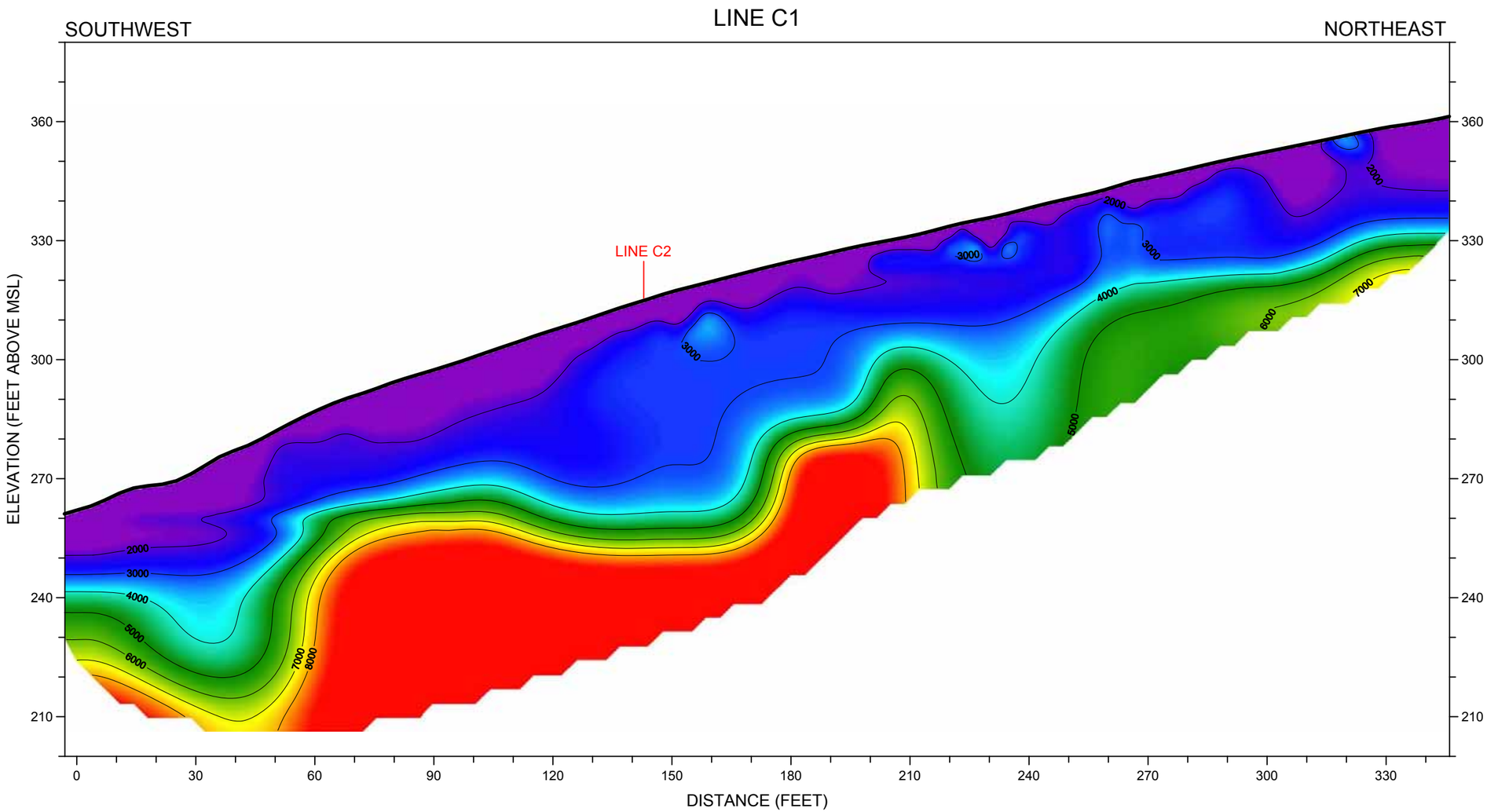
NORCAL GEOPHYSICAL CONSULTANTS INC.

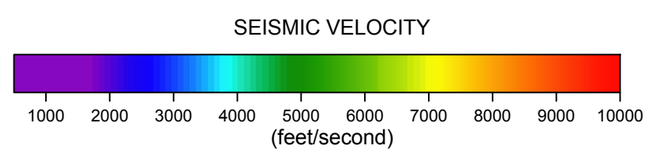
DATE: OCT. 2008

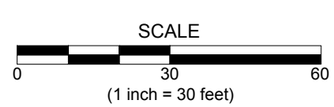
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE 6







NORCAL

SEISMIC REFRACTION PROFILE
LINE C1
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

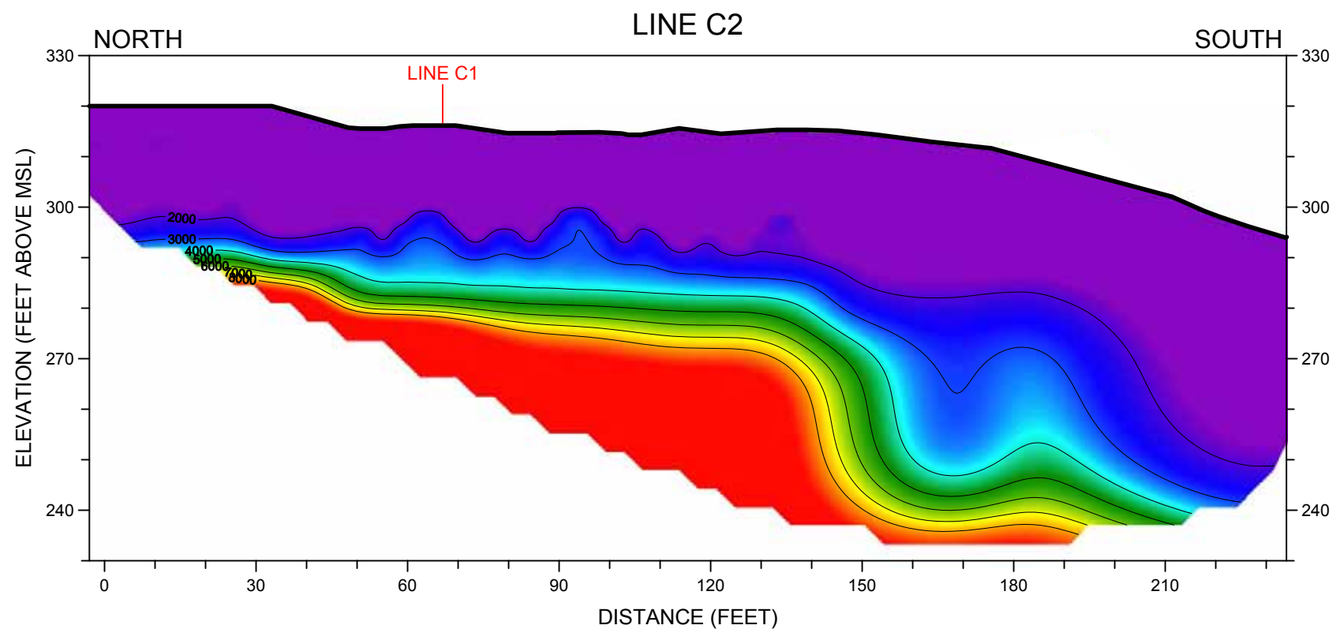
NORCAL GEOPHYSICAL CONSULTANTS INC.

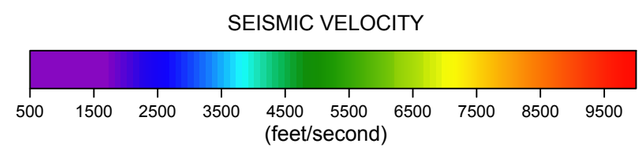
DATE: OCT. 2008

DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE 7





NORCAL

SEISMIC REFRACTION PROFILE
LINE C2
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

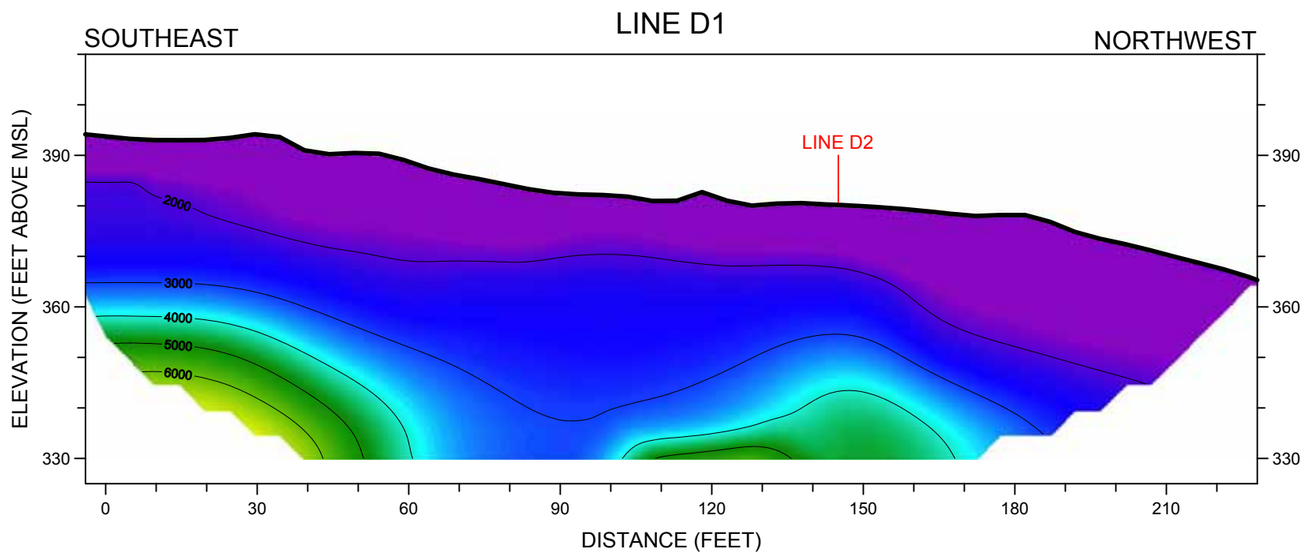
NORCAL GEOPHYSICAL CONSULTANTS INC.

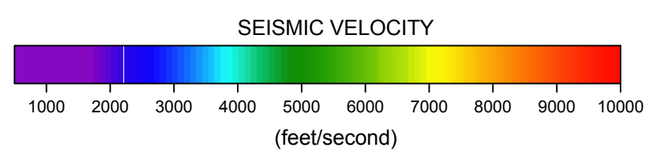
DATE: OCT. 2008

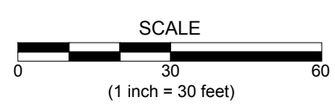
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE
8







NORCAL

SEISMIC REFRACTION PROFILE
LINE D1
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

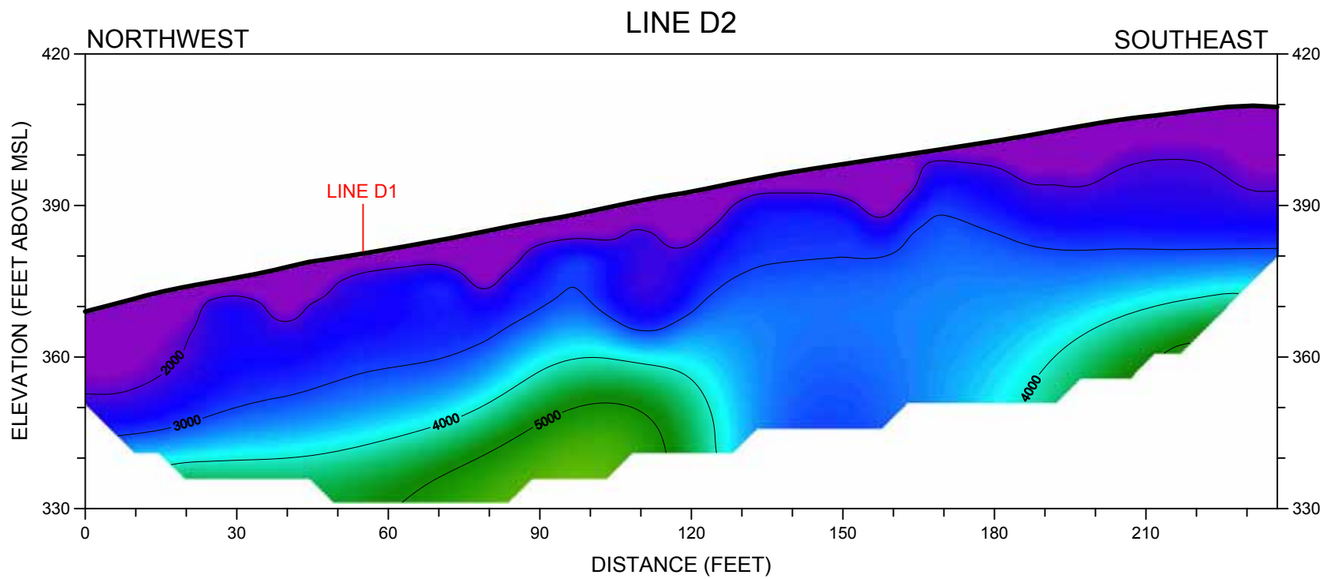
NORCAL GEOPHYSICAL CONSULTANTS INC.

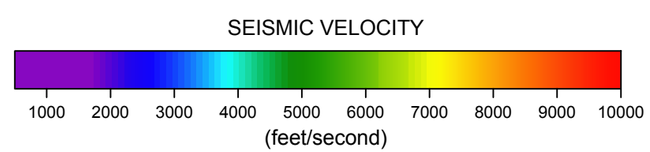
DATE: OCT. 2008

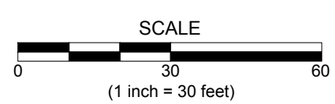
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE 9







NORCAL

SEISMIC REFRACTION PROFILE
LINE D2
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

NORCAL GEOPHYSICAL CONSULTANTS INC.

DATE: OCT. 2008

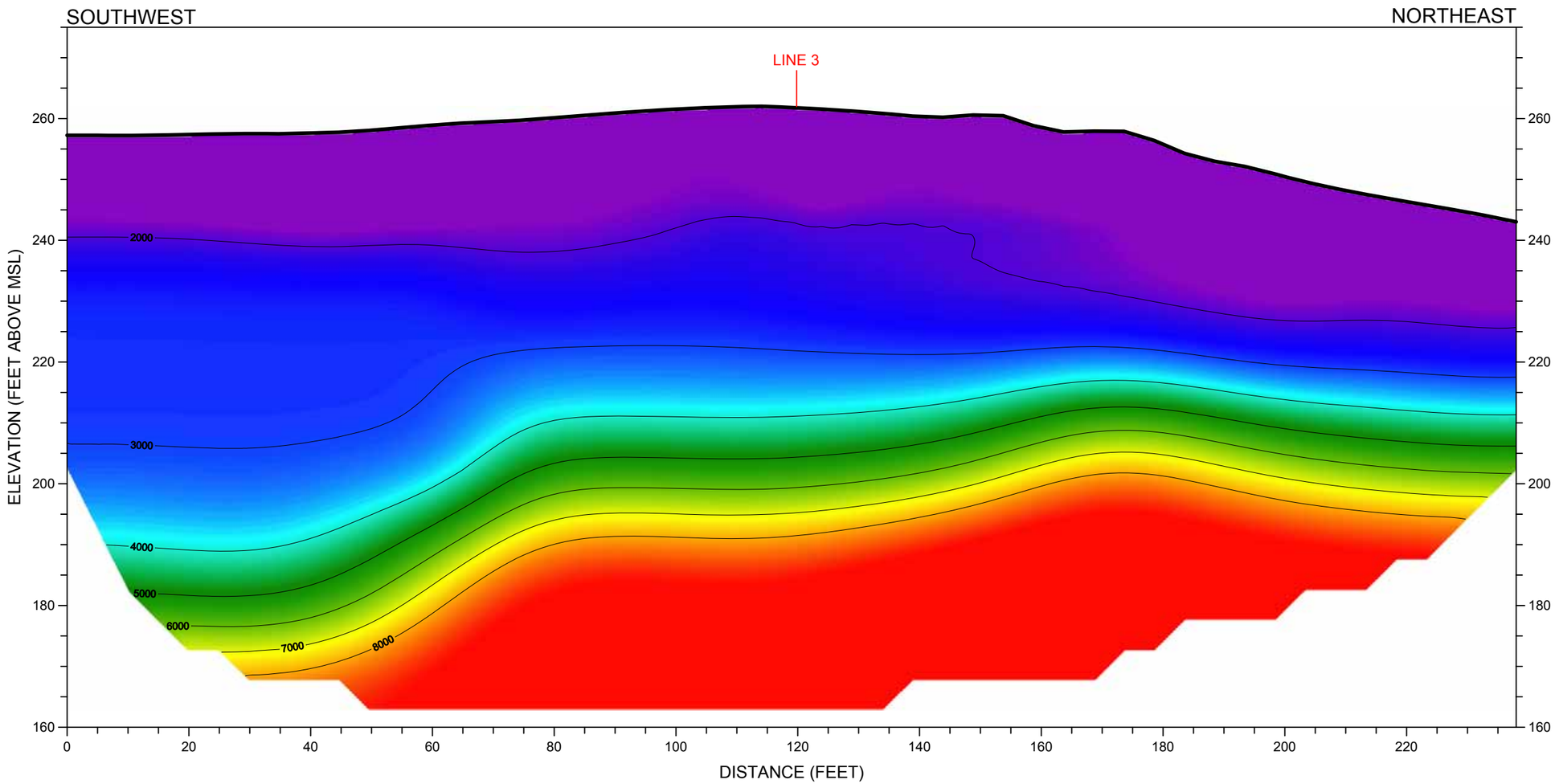
DRAWN BY: G.RANDALL

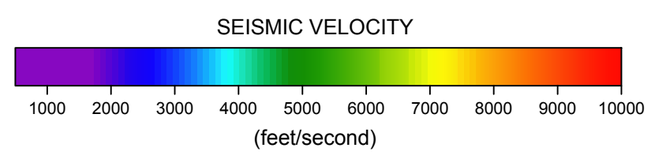
APPROVED BY: DTH

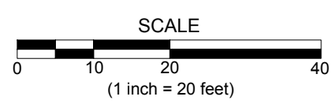
PLATE 10

RECENTLY PERFORMED PROFILES

(LINES 1 TO 5, NORCAL GEOPHYSICAL)







DRAFT

NORCAL

SEISMIC REFRACTION PROFILE
LINE 1 - SR:355+00
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 09-428.12

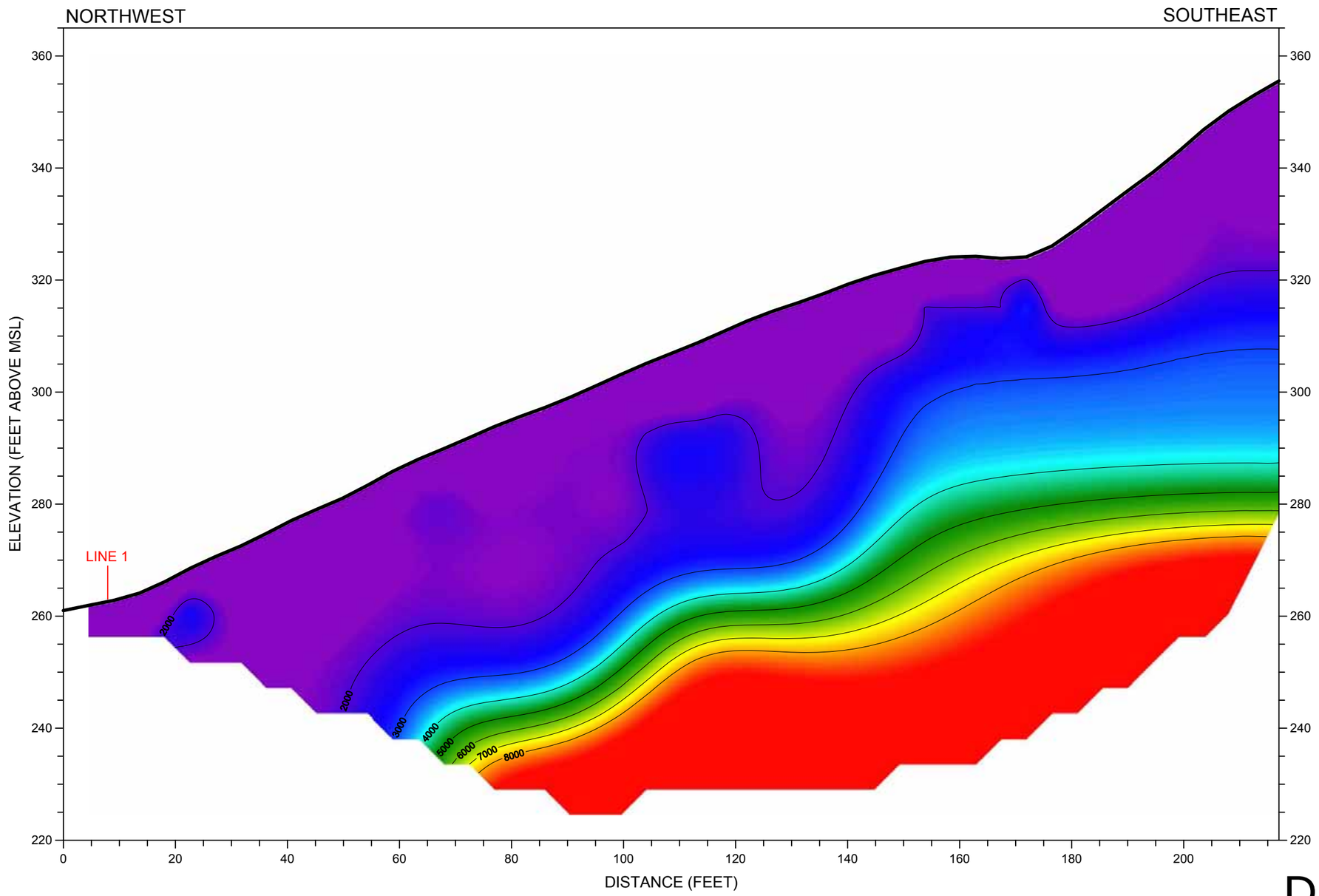
NORCAL GEOPHYSICAL CONSULTANTS INC.

DATE: MAR. 2009

DRAWN BY: G.RANDALL

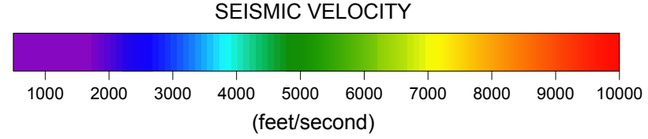
APPROVED BY: DTH

PLATE 2

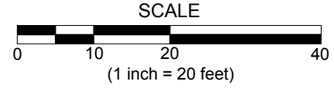


DRAFT

SEISMIC VELOCITY



SCALE



NORCAL

SEISMIC REFRACTION PROFILE
LINE 2 - SR:355+00
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 09-428.12

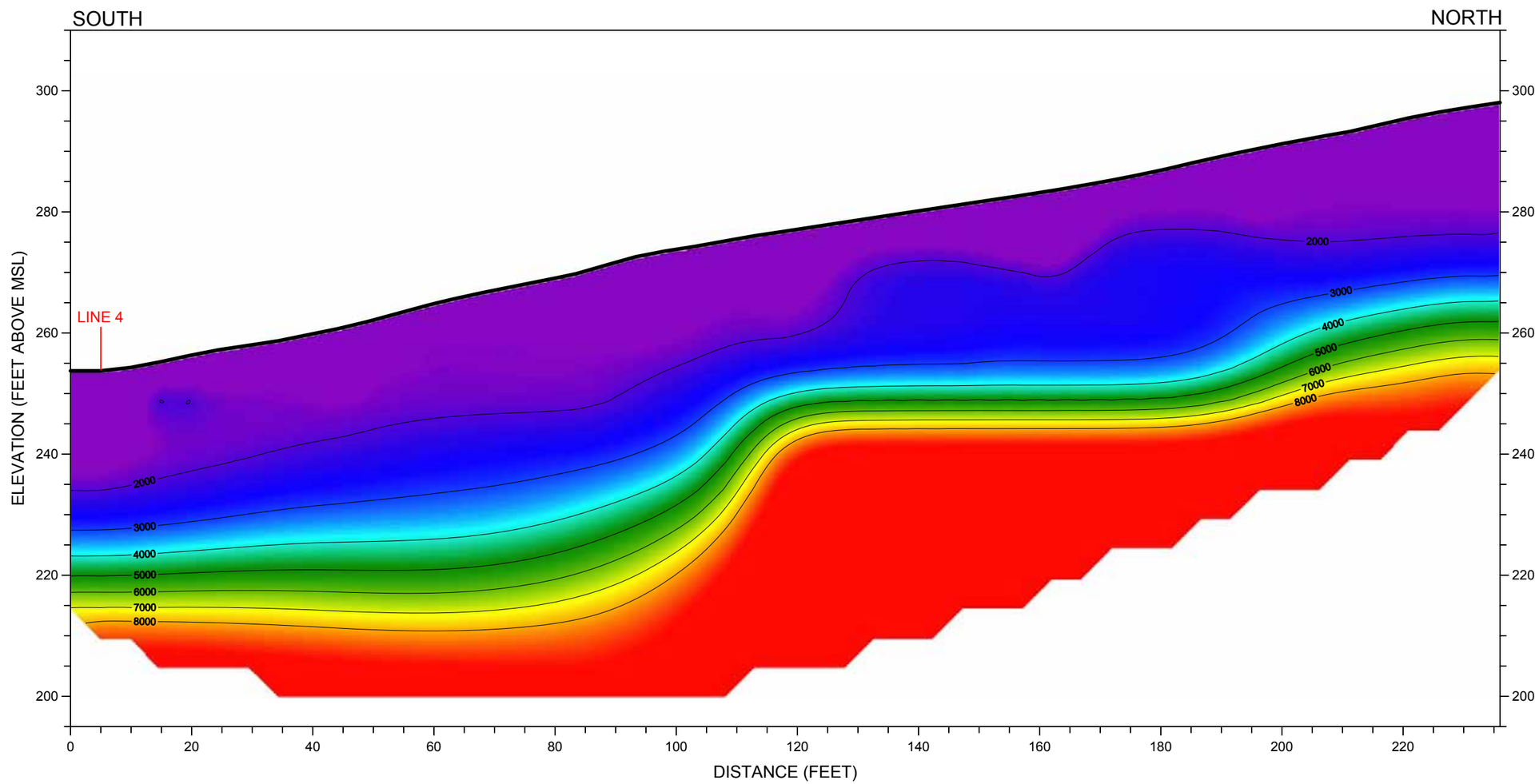
NORCAL GEOPHYSICAL CONSULTANTS INC.

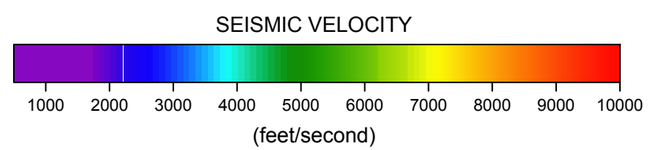
DATE: MAR. 2009

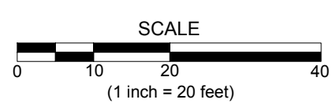
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE 3







DRAFT

NORCAL

SEISMIC REFRACTION PROFILE
LINE 3 - SR:321+25
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 09-428.12

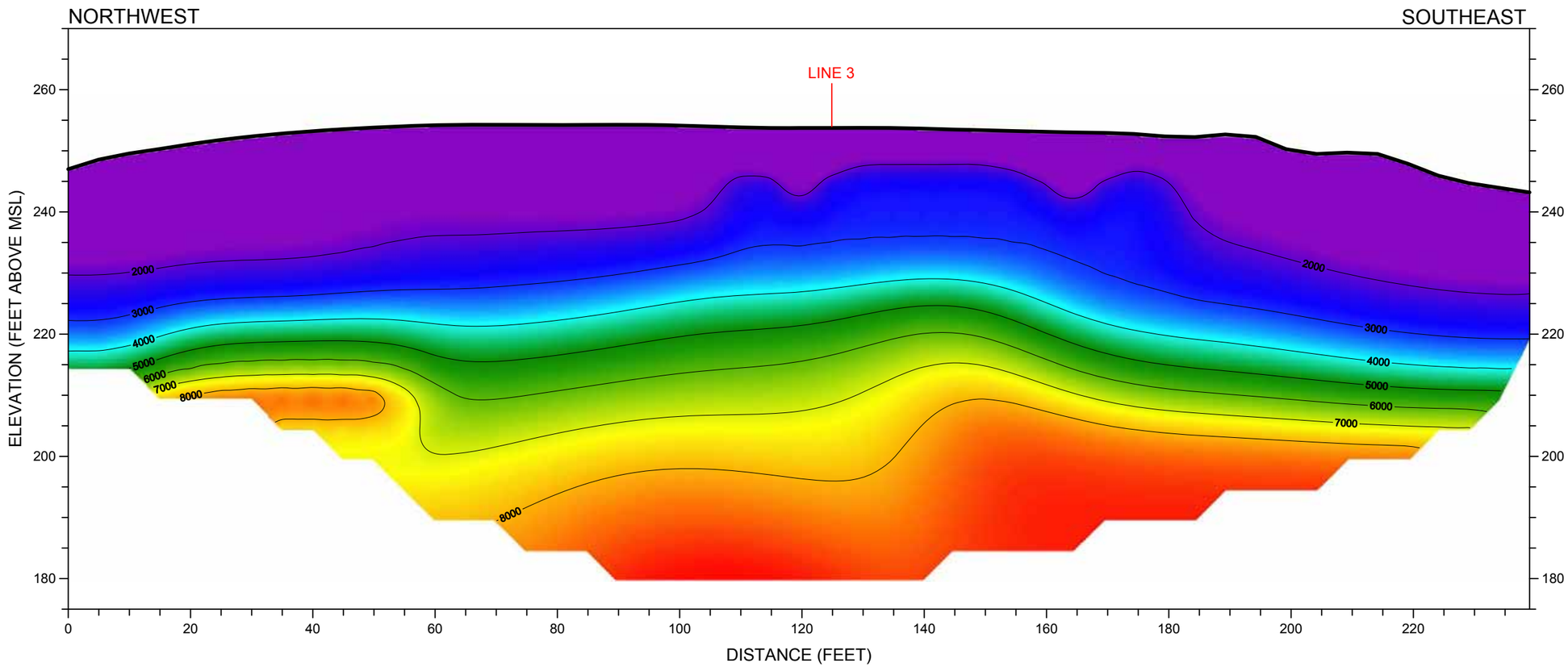
NORCAL GEOPHYSICAL CONSULTANTS INC.

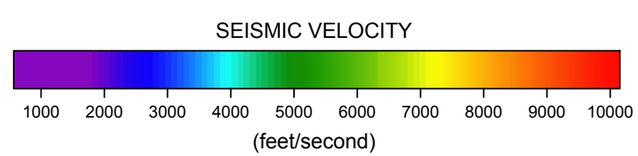
DATE: MAR. 2009

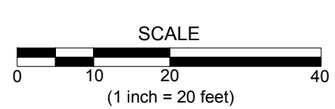
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE 4

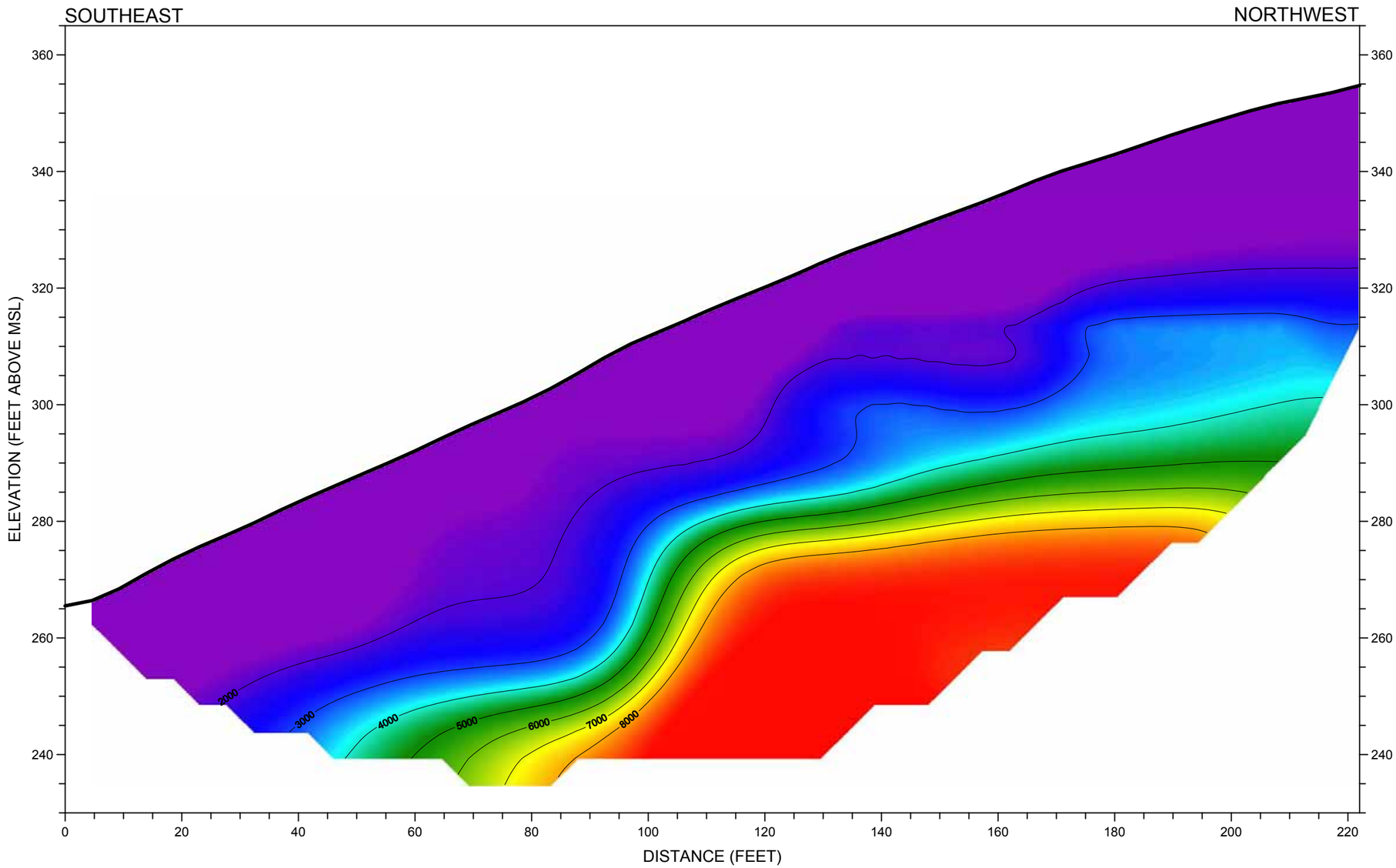






DRAFT

NORCAL	SEISMIC REFRACTION PROFILE LINE 4 - SR:321+25 JAMESON CANYON - HIGHWAY 12		
	LOCATION: NAPA COUNTY, CALIFORNIA		
	CLIENT: PARIKH CONSULTANTS		PLATE
JOB #: 09-428.12	NORCAL GEOPHYSICAL CONSULTANTS INC.		5
DATE: MAR. 2009	DRAWN BY: G.RANDALL	APPROVED BY: DTH	



SEISMIC VELOCITY

1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

(feet/second)

SCALE

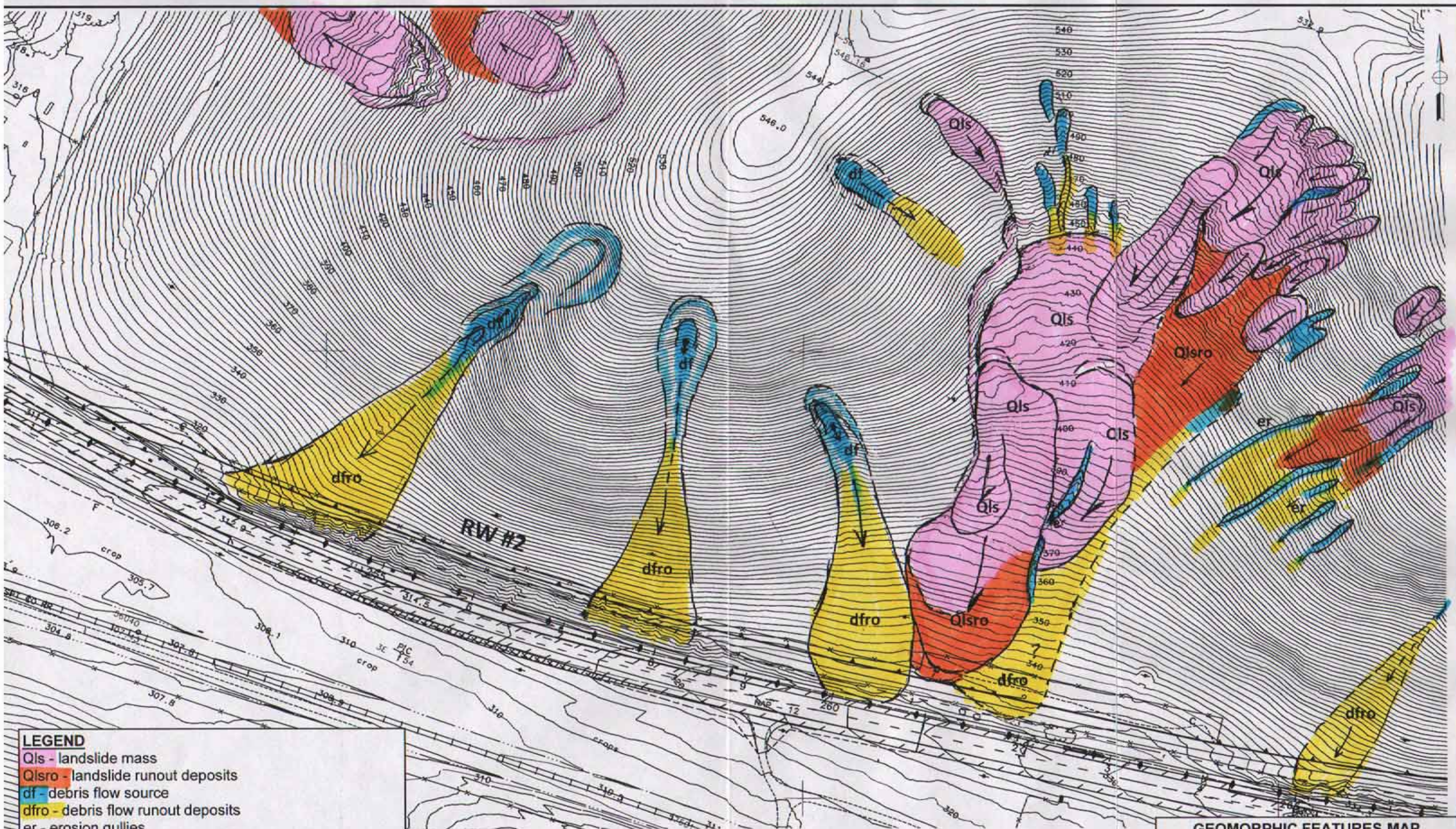
0 10 20 40

(1 inch = 20 feet)

DRAFT

NORCAL	SEISMIC REFRACTION PROFILE LINE 5 - SR:314+50 JAMESON CANYON - HIGHWAY 12		
	LOCATION: NAPA COUNTY, CALIFORNIA		
	CLIENT: PARIKH CONSULTANTS		PLATE
JOB #: 09-428.12	NORCAL GEOPHYSICAL CONSULTANTS INC.		6
DATE: MAR. 2009	DRAWN BY: G.RANDALL	APPROVED BY: DTH	

APPENDIX E



LEGEND

Qls - landslide mass
Qlsro - landslide runout deposits
df - debris flow source
dfro - debris flow runout deposits
er - erosion gullies

SOURCE

Topography data provided by Mark Thomas & Co.

0 100 200 300 400 500 Feet

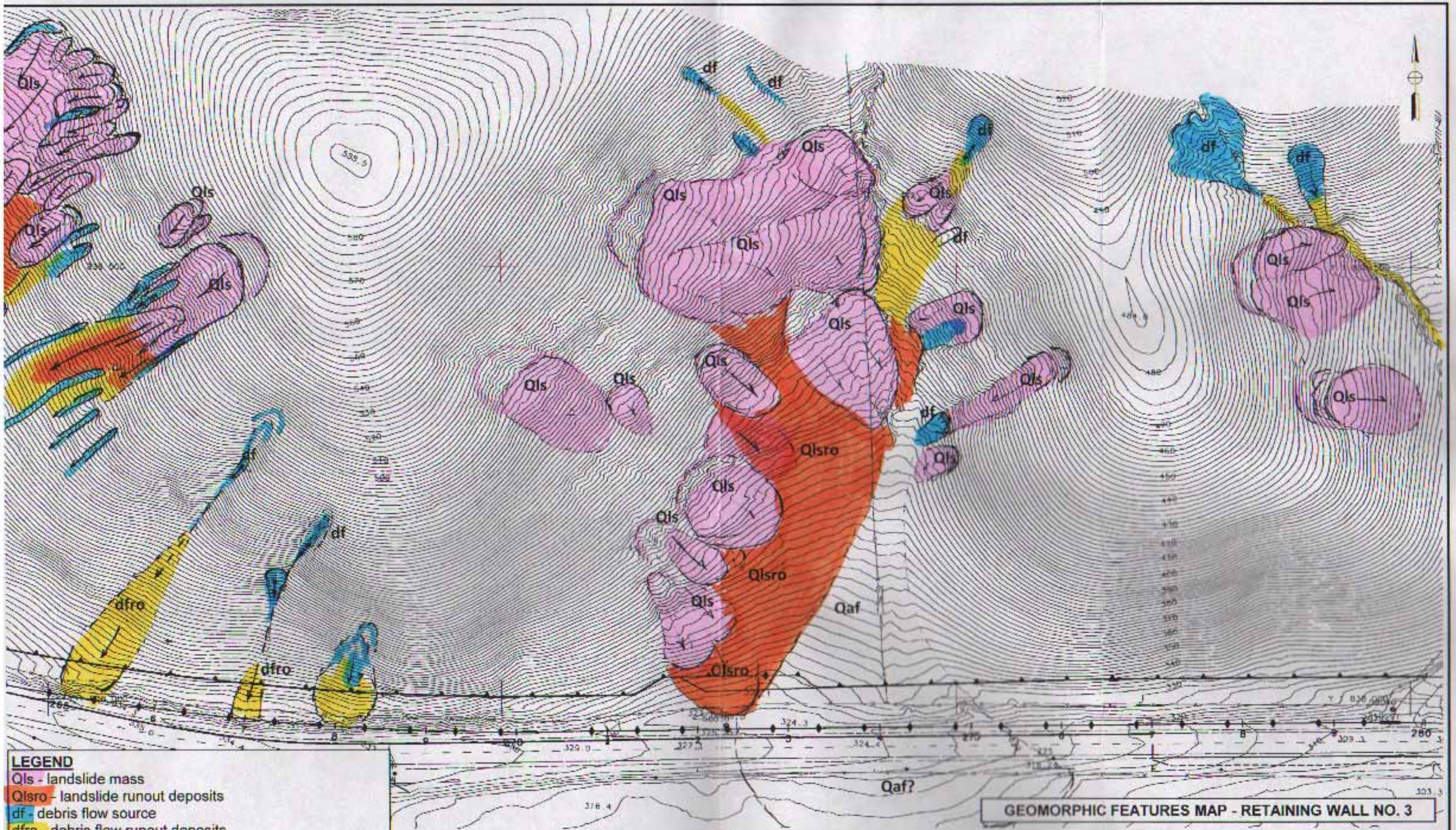
GEOMORPHIC FEATURES MAP

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA COUNTY, CALIFORNIA

208117.MAT

PLATE NO.: E-1



LEGEND

Qls - landslide mass
Qlsro - landslide runout deposits
df - debris flow source
dfro - debris flow runout deposits
er - erosion gullies
Qaf - alluvial fan deposits

SOURCE

Topography data provided by Mark Thomas & Co.

SCALE: 1" = 100'

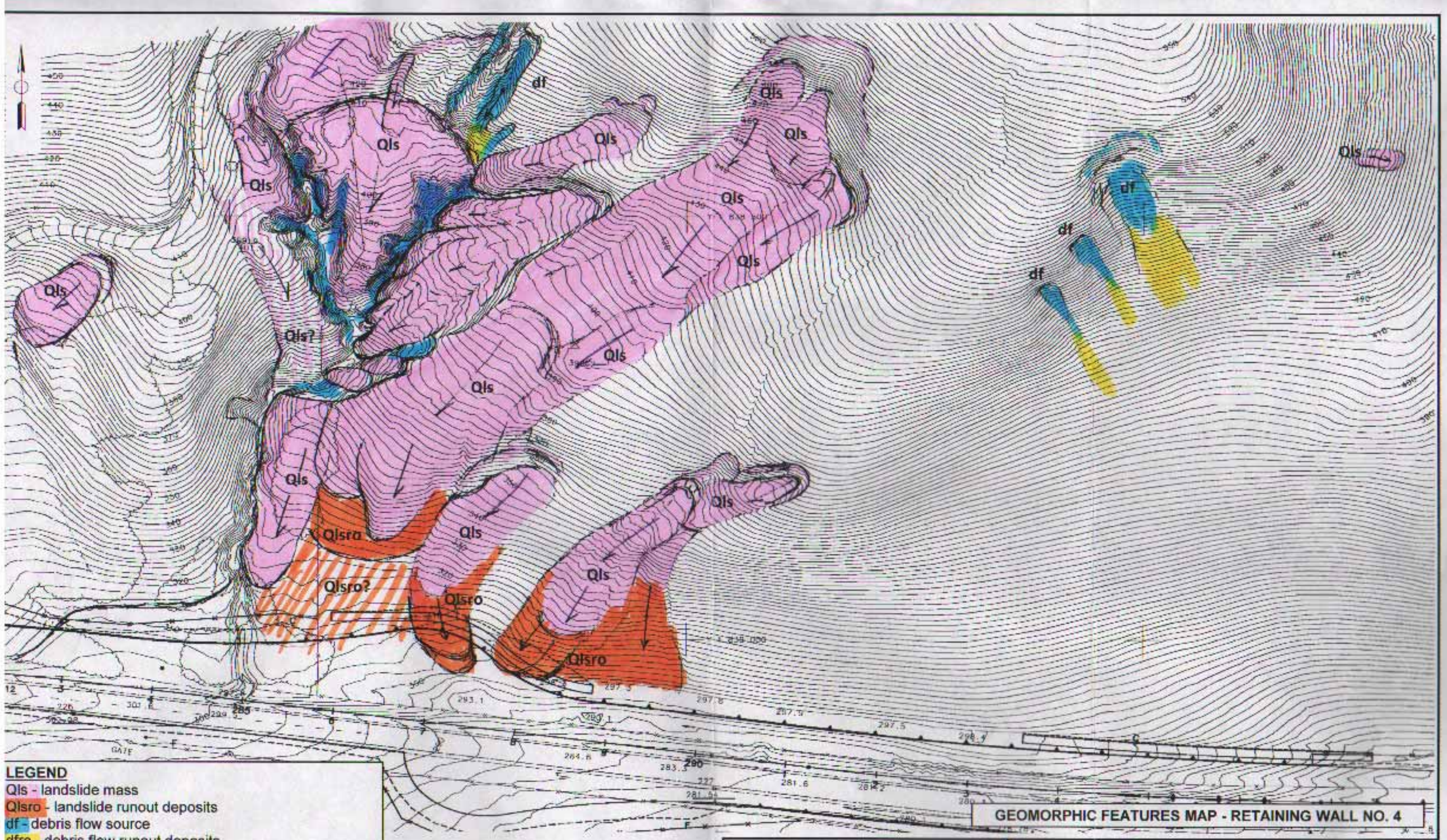
GEOMORPHIC FEATURES MAP - RETAINING WALL NO. 3

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: E-2



LEGEND

Qls - landslide mass
Qlsro - landslide runout deposits
df - debris flow source
dfro - debris flow runout deposits
er - erosion gullies

SOURCE

Topography data provided by Mark Thomas & Co.

SCALE: 1" = 100'

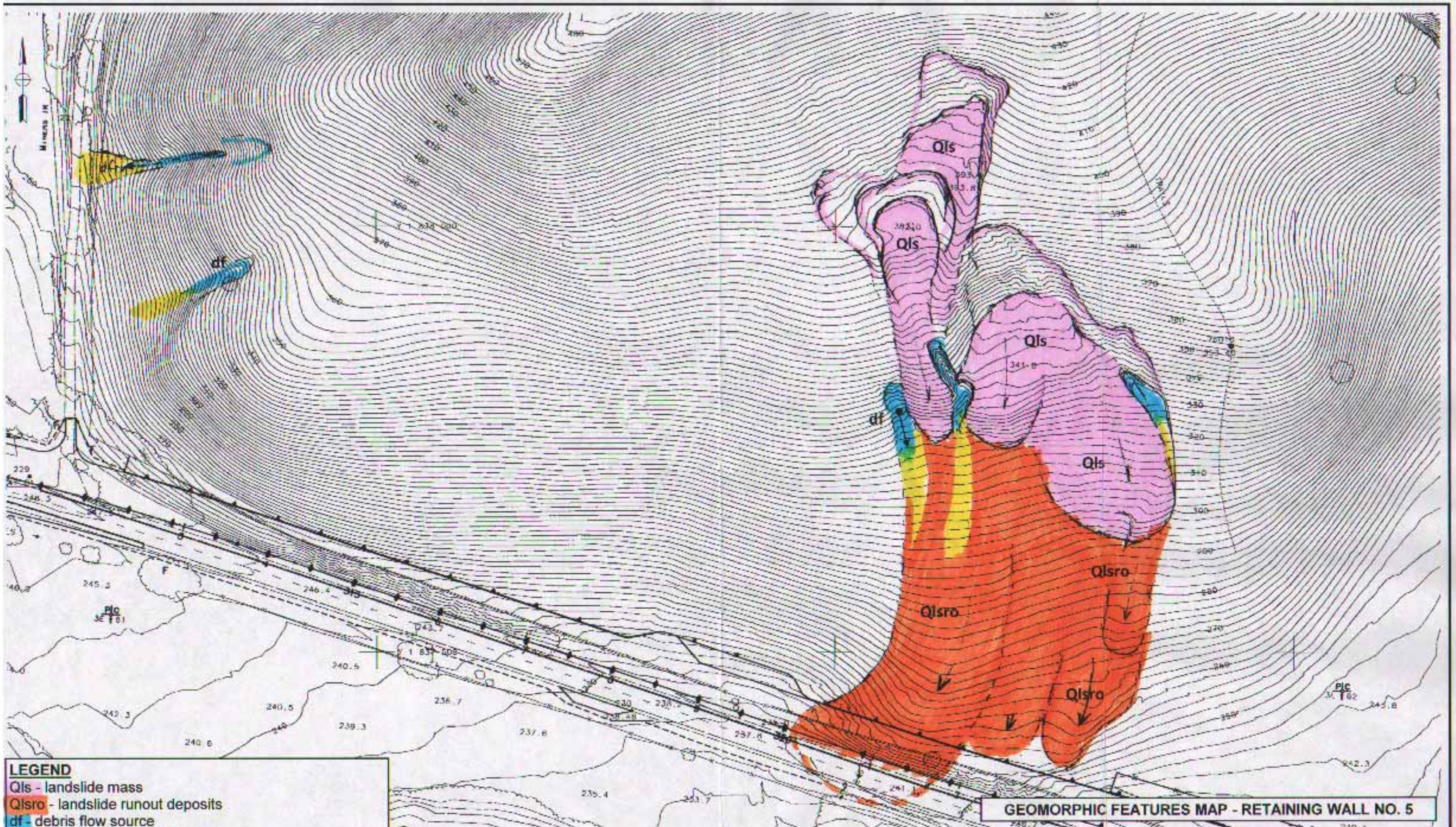
GEOMORPHIC FEATURES MAP - RETAINING WALL NO. 4

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: E-3



LEGEND

Qls - landslide mass
Qlsro - landslide runout deposits
df - debris flow source
dfro - debris flow runout deposits
er - erosion gullies

SOURCE

Topography data provided by Mark Thomas & Co.

SCALE: 1" = 100'

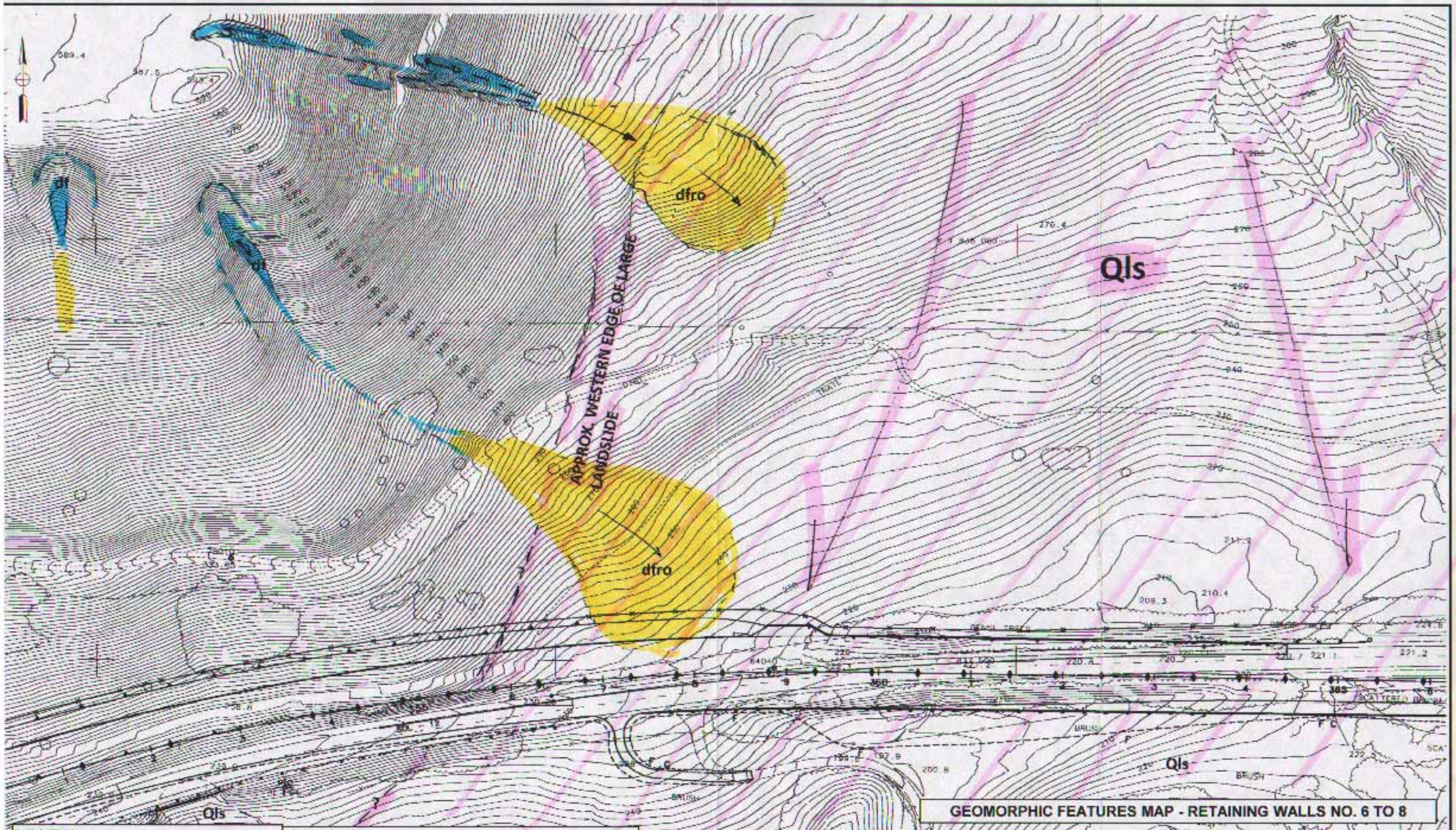
GEOMORPHIC FEATURES MAP - RETAINING WALL NO. 5

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: E-4



GEOMORPHIC FEATURES MAP - RETAINING WALLS NO. 6 TO 8

LEGEND
Qls - landslide mass
Qlsro - landslide runout deposits
df - debris flow source
dfro - debris flow runout deposits
er - erosion gullies

SOURCE
Topography data provided by Mark Thomas & Co.

SCALE: 1" = 100'

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: E-5

APPENDIX F

Stability Test Zones

RW#3A

Wall Zone	Beginning Stationing	End Stationing	Upper Elevation (ft)	Lower Elevation (ft)
1	263+85	265+50	357.83	328.53
2	265+50	267+50	361.71	340.00
3	265+50	267+50	340.00	329.58
4	267+50	269+50	373.92	345.00
5	267+50	269+50	345.00	327.82
6	269+50	271+33	366.93	325.96

RW#3C

Wall Zone	Beginning Stationing	End Stationing	Upper Elevation (ft)	Lower Elevation (ft)
1	273+16	275+50	342.55	318.54
2	275+50	278+00	341.13	325.00
3	275+50	278+00	325.00	311.92
4	278+00	280+40	329.65	309.25

RW#4B

Wall Zone	Beginning Stationing	End Stationing	Upper Elevation (ft)	Lower Elevation (ft)
1	290+04	292+00	296.93	279.98
2	292+00	294+50	297.87	285.00
3	292+00	294+50	285.00	274.05
4	294+50	296+92	292.96	265.19

RW#5A

Wall Zone	Beginning Stationing	End Stationing	Upper Elevation (ft)	Lower Elevation (ft)
1	312+20	314+00	269.39	246.21
2	314+00	316+00	270.72	255.00
3	314+00	316+00	255.00	241.81
4	316+00	317+50	262.09	238.50
5	317+50	320+23	251.45	235.24

RW#6

Wall Zone	Beginning Stationing	End Stationing	Upper Elevation (ft)	Lower Elevation (ft)
1	327+57	335+00	242.15	230.07
2	335+00	337+50	246.62	231.16
3	337+50	339+00	249.31	232.55
4	339+00	341+00	252.89	233.42
5	341+00	343+50	255.11	234.59
6	343+50	345+50	256.65	236.04
7	345+50	347+00	255.96	237.21
8	347+00	349+00	255.96	238.08
9	349+00	351+00	253.53	239.25
10	351+00	353+57	249.37	236.81

Stability Test Zones

RW#7A

Wall Zone	Beginning Stationing	End Stationing	Upper Elevation (ft)	Lower Elevation (ft)
1	331+49	333+00	253.37	232.24
2	333+00	335+50	255.00	234.60
3	333+00	335+50	275.35	225.00
4	335+50	337+50	273.38	242.00
5	337+50	340+50	291.01	260.00
6	337+50	340+50	260.00	242.55
7	340+50	342+50	291.01	270.00
8	340+50	342+50	270.00	248.73
9	342+50	344+25	289.21	253.00
10	344+25	347+00	307.33	285.00
11	344+25	347+00	285.00	252.89
12	347+00	350+00	305.00	270.00
13	347+00	350+00	270.00	251.16
14	350+00	355+50	271.81	255.00
15	350+00	355+50	255.00	236.71
16	355+50	358+10	260.90	228.03

RW#7B

Wall Zone	Beginning Stationing	End Stationing	Upper Elevation (ft)	Lower Elevation (ft)
1	335+47	337+50	280	262
2	336+50	337+50	303.4	280
3	337+50	339+00	324.42	295
4	337+50	339+00	295	270.96
5	339+00	342+25	331.58	305
6	339+00	342+50	305	281.29
7	342+50	344+00	314.59	273.87
8	344+00	347+00	356.63	320
9	344+00	347+00	320	283.05
10	347+00	349+30	345.45	293.94
11	348+00	350+00	293.94	269.41
12	350+00	354+00	283.63	262.87
13	354+00	355+50	285.14	270
14	354+00	355+50	270	258.5
15	355+50	357+45	281.46	236.2

APPENDIX G

OSFP Review Comment & Response Form

General Project Information	Review Phase	Reviewer Information
Dist: 04 EA: 264141 Project Name: Jemeson Canyon OSFP Liaison: Tracy Bertram Phone: 227-8397 e-mail: Tracy_Bertram@dot.ca.gov	☐ PSR/PDS (Review No. _) ☐ APS/PSR (Review No. _) ☐ APS/PR (Review No. _) ☐ Type Selection ☐ 65% PS&E Unchecked Details ☐ PS&E (Review No. 1) ☐ Construction Support ☒ Other: FR **Structure Information** (Use when necessary to document comments by individual structure) Structure Name:_____ Br No: _____	Reviewer Name: M. Zabolzadeh Functional Unit: GS Phone Number: (510) 286-4831 e-mail: Mohammad_Zabolzadeh@dot.ca.gov Date of Review: 11/17/09

Consultant Information (to be filled in by Consultant)

Consultant Structure Lead (First and Last Name)	Structure Consultant Firm	Phone Number	e-mail	Response Date

#	Doc. (See Note 1)	Page, Section, or SSP	Review Comments	Consultant Responses	
1	FR	p. 29	The ultimate bond strength value listed in the report should be removed. See attached guidelines for soil nail walls. Instead, design pull out resistance should be specified in the report and in the plans. This should be applied to all the proposed soil nail walls.	Will comply. The bond strengths will be removed from the report.	
2	FR	p. 34	P_{tota} for the proposed tieback wall is shown to be 25 kips. Appendix C shows two P_{total} of 12.5 kips and 25 kips. Check discrepancy.	For Retaining Wall No. 4A, the external force on the first sheet should be "Pqls" of 15.5 kips, the estimated force exerted from the landslide, and the Ptotal of 25 kips shown on the second sheet will be used for tieback wall design. The notation will be revised.	
3	FR	Appendix C	Snail Z program shows the length of the first top nail for the proposed Soil Nail Wall 3 to be 10' for schedules G and H where the wall height is max (41') while the bottom nail is un-necessarily appears to be too long (30'). Because of the lengthy cut slope above the wall, this may cause	The SNAILZ analysis will be revised and updated.	

Note 1: Abbreviations for Typical Documents (if Abbr. is not below, type in the document type)					
P=Structure Plans	SP=Special Provisions	FR=Foundation Rpt	DC=Design Calcs	TS=Type Sel. Report	QCC=Quant. Check Calcs
RP=Road Plans	E=Estimate	H=Hydraulics Rpt	CC=Check Calcs	QC=Quant. Calcs	

✓= Comment Resolved (for Reviewer's use)

			instability for the design. Revise, or explain your reasoning. This was one of previous comments.		
4	FR	Appendix C	Fore the proposed Soil Nail Wall 3A, yield strength (FY) and the punching shear capacity are shown to be 200 Ksi and 200 kips, respectively, in the Snail Z analysis. Plans show these values to be 60 Ksi and 40 kips, respectively. Using the later values in the design reduces the factor of safety significantly. Check discrepancy. The values of 200 ksi , 100 ksi, etc. are used for all the proposed soil nail walls in this project. Explain your reasoning.	The SNAILZ analysis will be revised and updated.	
5	FR	Appendix F	The stability wall zones are different from those shown on the plans.	Will revise.	
6			C3-Not Approved, resubmit required		

Note 1: Abbreviations for Typical Documents (if Abbr. is not below, type in the document type)					
P=Structure Plans	SP=Special Provisions	FR=Foundation Rpt	DC=Design Calcs	TS=Type Sel. Report	QCC=Quant. Check Calcs
RP=Road Plans	E=Estimate	H=Hydraulics Rpt	CC=Check Calcs	QC=Quant. Calcs	

✓= Comment Resolved
(for Reviewer's use)

OSFP Review Comment & Response Form

General Project Information	Review Phase	Reviewer Information
Dist: 04 EA: 264111 Project Name:_____ OSFP Liaison: Tracy Bertram Phone: 227-8397 e-mail: Tracy_Bertram@dot.ca.gov	☐ PSR/PDS (Review No. _) ☐ APS/PSR (Review No. _) ☐ APS/PR (Review No. _) ☐ Type Selection ☐ 65% PS&E Unchecked Details ☐ PS&E (Review No. _) ☐ Construction Support ☐ Other:95% FR (Solano County) **Structure Information** (Use when necessary to document comments by individual structure) Structure Name:_____ Br No: 21 rw03 through 21 rw10	Reviewer Name: M. Zabolzadeh/C. Risden Functional Unit:GS Phone Number: (510) 286-4831 e-mail: Mohammad_Zabolzadeh@dot.ca.gov Date of Review: 5/20/09

Consultant Information (to be filled in by Consultant)

Consultant Structure Lead (First and Last Name)	Structure Consultant Firm	Phone Number	e-mail	Response Date
_____	_____	_____	_____	_____

#	Doc. (See Note 1)	Page, Section, or SSP	Review Comments	Consultant Responses	
1	FR	General	FR prepared by Parikh Consultant, Inc. dated Aug 6, 2009.		
2	FR	Pages 11-19	For all the proposed retaining walls, include their corresponding beginning and end stations as well as their type. This will facilitate determining the location of the slides in reference with the proposed walls.	Will comply.	
3	FR	Page 12 & 14	The proposed Retaining Walls #4 should be changed to Retaining Wall # 4A, #4B.	Will comply.	
4	FR	Page 13 & 15	The proposed Retaining Walls #5 should be changed to Retaining Wall # 5A, #5B.	Will comply.	
5		Page 23	Under foundations, it is referred to seven retaining walls are planned… List the seven walls.	Will comply.	
6		Page 24	It is referred to Caltrans Standard Type 1 and Type 5 for the proposed Retaining Wall #1 and #5. The plan sheets RW8 and RW10 and the table on sheet 25 of this report shows Type 1 and Type 5 Modified. Check discrepancy. If they are	Modified walls are planned where the walls cross existing culverts due to additional loads. Standard retaining walls will be used for majority of the walls.	

Note 1: Abbreviations for Typical Documents (if Abbr. is not below, type in the document type)					
P=Structure Plans	SP=Special Provisions	FR=Foundation Rpt	DC=Design Calcs	TS=Type Sel. Report	QCC=Quant. Check Calcs
RP=Road Plans	E=Estimate	H=Hydraulics Rpt	CC=Check Calcs	QC=Quant. Calcs	

✓= Comment Resolved (for Reviewer's use)

			modified, they become special design and they should be included in the Foundation Report (FR) not the Geotechnical Design Report (GDR).		
7		Page 28	It is stated that two borings were explored from the existing roadway for the proposed Wall #3 (Soil Nail Wall). While we understand that horizontal drilling was determined not to be feasible along the alignment, and this was conveyed to all of the stakeholders, it should be reiterated that drilling either vertically above the proposed wall or horizontally at the proposed wall location is necessary. Without these boreholes, no data exist for the contractor to properly bid the job, nor for the designer to clearly articulate to the contractor existing conditions. This situation exposes the owner to claims by the contractor during construction, and provides no information necessary to refute such claims.	The right-of-entry was recently granted. Additional borings have been conducted at the planned locations of Retaining Wall No. 3. Previous design assumptions have been verified with the new boring data.	
8		Page 38	For all the proposed soil nail walls, the input/ output results from SNAILZ program should be included in this report.	Will comply. However, it is our understanding that the SNAILZ analysis will also be conducted by the structure engineers. The detail design and calculation will be prepared by Mark Thomas & Co.	
9		Page 42	Type 1 wall should be referred to as Type 1 modified.	Will comply.	
10		Page 42	It is recommended that the Subgrade be over-excavated 2 feet below the bottom of the footing and.... Plans do not show this over-excavation. Please make sure that this recommendation is implemented into the plans. Also, a typical section should be provided in the report.	Will inform the designer.	
11		Page 43	The same as comment #10. The recommended 3 feet over-excavation below the wall footing between Stations 297+00 and 297+50 should also be implemented into the plans.	Will inform the designer.	
12		Page 43	The required bearing pressure should be specified.	Will include the required bearing pressure into the report.	
13		Page 43	The recommendation for the foundation of the proposed culvert at Station 290+80 should be	Will comply.	

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			covered under a separate section (Culvert).		
14		Appendix A	The attached plan sheets should be updated with the most recent plans showing the limits and the type of the proposed walls.	Will comply.	
15		Appendix A	The LOTBs should comply with the June 2007 Caltrans Soil and Rock Logging Manual. For example, the boring # do not comply with the said manual.	Will comply.	
16		General	Because of the common geology of the Napa and the Solano counties in this project, most of our comments for the Foundation Report for the Napa portion (dated 9/ 03/ 2009), should be applied to this report as well.	Will comply.	
15	FR	N/A	C3-Not Approved, resubmit required		

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OSFP Review Comment & Response Form

General Project Information	Review Phase	Reviewer Information
Dist: 04 EA: 264111 Project Name:_____ OSFP Liaison: Tracy Bertram Phone: 227-8397 e-mail: Tracy_Bertram@dot.ca.gov	☐ PSR/PDS (Review No. _) ☐ APS/PSR (Review No. _) ☐ APS/PR (Review No. _) ☒ Type Selection ☐ 65% PS&E Unchecked Details ☐ PS&E (Review No. _) ☐ Construction Support ☐ Other:_____ **Structure Information** (Use when necessary to document comments by individual structure) Structure Name:_____ Br No: 21 rw01 through 23 rw07	Reviewer Name: M. Zabolzadeh/C. Risden Functional Unit: GS Phone Number: (510) 286-4831 e-mail: Mohammad_Zabolzadeh@dot.ca.gov Date of Review: 5/20/09

Consultant Information (to be filled in by Consultant)

Consultant Structure Lead (First and Last Name)	Structure Consultant Firm	Phone Number	e-mail	Response Date
Gary Parikh/Frank Wang	Parikh Consultants, Inc.	(408) 452-9000	fwang@parikhnet.com	6/17/09

#	Doc. (See Note 1)	Page, Section, or SSP	Review Comments	Consultant Responses	
1	FR	General	FR prepared by Parikh Consultant, Inc. dated March 19, 2009.		
2	FR	Page 4	Include rippability tables in the report.	Will comply. The standard Caltrans rippability table is included in the report.	
3	FR	Page 5	Provide thickness range for firm to stiff clay at the top of the rock.	Will comply.	
4		Page 9	The Landslide Hazard Mapping section references a California Division of Mines and Geology Map by Mason (1988), however, this map can not be found in the text or as an appendix. Please include the plates mentioned in your text within the report.	The landslide and small earthflows identified by Manson (1988) were traced and shown (pink overlay) on each plate. Legend will be provided and an overall landslides and related features map of Manson (1988) will be prepared.	
5		Page 9	Correct Manson to Mason in second paragraph	Will comply.	
6		Page 10	Landslides were identified by comparing topographic maps with air-photos. This comparison should be provided in the report as an appendix	Will comply. Geomorphic maps at each wall locations will be prepared.	
7		Page 10	In the section for Retaining Wall #2, there is reference to stationing along the wall on Plate 2C,	This was addressed in the Foundation Report, prepared for the retaining walls in Napa County (dated	

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			however, this stationing is not evident on the Plate. The Plates should all include stationing so as to better identify wall limits and landslide locations as they are identified in the text.	June 17, 2009).	
8		Page 10	Retaining Wall #3: see above comment	This was addressed in the Foundation Report, prepared for the retaining walls in Napa County (dated June 17, 2009).	
9		Page 10	In the section for Retaining Wall #4, you state that the landslides at this location "appear to be a relatively thin (less than 10 feet thick) run-out deposit". What is your evidence for this? Based on Boring RW-3, soil at this location is almost 30' deep.	Based on the geomorphic interpretations of the project topography, there are no landslides or other slope failures identified east of Sta. 290+00 (Appendix E). Due to the alignment change during the 95% design phase, the wall location has shifted, and the portion of the wall west of Sta. 290+00 (truck turn-around) will cut into landslide run-out deposits, and tieback wall is recommended within this section.	
10		Page 11	Under the section for Site Specific Geology, adverse jointing is only discussed at RW #6. A discussion of joint surface orientation should be discussed for each wall. Such information should have been gathered during field mapping of the wall locations. If bedrock is not exposed at the surface, this should be indicated.	1. Will comply. However, other than Retaining Wall No. 6, 7A & 7B, oxidation and weathering has advanced and resulted in a significant weakening of the rock mass such that its mechanical behavior is more soil-like and the presence of discontinuities are less significant. 2. Other than area around Retaining Walls No. 6, 7A & 7B, bedrock is not exposed at most of the locations.	
11		Page 12	In the discussion of RW #4, you indicate that bedding planes or joint orientations were not obtainable in the core. This would be consistent with a boring that was taken through a landslide. The published maps that you have overlaid on the geology map indicate a relatively large landslide at this location. The seismic refraction survey indicates very poor quality rock at 40' below ground surface. Does this mean that you have 40' of soil at this location? All of this seems consistent with a landslide deposit. Please indicate why you feel that a soil nail wall is prudent here, while you have a tie-back wall for RW #5B.	1. For Boring RW-4, the lack of bedding planes or joint orientation measurement was mainly due to poor recovery during rock coring. 2. Based on the geomorphic interpretation at the planned location of Retaining Wall No. 4, there are no landslides or other slope failures identified east of Sta. 290+00. The portion of the wall west of Sta. 290+00 (truck turn-around) will cut into landslide run-out deposits, which is similar to Retaining Wall No. 5B, and tieback wall is also recommended along this section. (Please see Appendix E for the geomorphic interpretation maps.)	

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12		Page 13	The evidence for a tie-back wall is inconclusive. There is a tremendous amount of data for RW #4 that suggests material as bad as the foundation material at RW #5B. Is there evidence that this is an active landslide? Is the roadway distressed in any way suggesting instabilities?	Based on the geomorphic interpretation, the portion of the Retaining Wall No. 4 (west of Sta. 290+00) and Retaining Wall No. 5B will both cut into landslide run-out deposits. The boring data also confirmed repeated episodes of deposition within these areas. These are not landslides but run-out materials that have been deposited over the years. No obvious signs of recent movement (eg. displaced cracks in roadway pavement) was noted per our field observation.	
13		Page 16	In the paragraph beginning "In general" please provide a basis for the ease of rippability. Remove information suggesting the contractor confirm rippability.	More discussions regarding rippability will be provided.	
14		Page 16	This last paragraph is inconsistent with information provided in other sections of the report. At walls 1, 2, and 3 you state that "hard sandstone" underlies soil-like cover anywhere from 10 to 20 feet thick. If this material is weathered as you suggest, this needs to be indicated in the report.	Will clarify.	
15	FR	Page 28	The P-total for the design of Wall # 5B is estimated to be about 32.5 kips. Based on our experience the P-total for the walls in an active landslide zones is usually calculated to be about 10% of the total moving mass of the landslide. Based on the provided geometry included in the slope stability analysis in Appendix C of this report, the 10% of the total moving mass is estimated to be about 60 Kips, which is slightly less than twice the P-total of 32.5 Kips. Please, verify your P-total.	Based on the geomorphic mapping and our discussion with the designer, we have re-evaluated the design of Retaining Wall No. 5B. The updated recommendations are provided in the report.	
16	FR	Page 34	It is referred to non-rippable rock in the limits of the proposed Walls #4 and #6. Because rippability is significantly important item (due to the differing site condition claims) in this project, please clearly	Will comply. More discussion regarding rock rippability will be included in the report. Per Caltrans standard chart, non-rippable rocks (Vs	

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			state whether rippability within the **limits of the excavation for the entire project** is a concern, or not. In addition, rippability is also dependent on other factors (such as degree of weathering, joints, etc.), rather than just wave velocity of the rock, that need to be discussed in this section and derive a conclusive statement from it.	greater than 6000 ft/sec) should be expected in the lower portions of the excavations necessary for the construction of Retaining Walls No. 6, 7A, and 7B.	
17	FR	Appendix A	LOTB sheets should show the limits of the proposed walls.	Will comply.	
18	FR	Appendix A	LOTB sheets should including their numbering system should be revised according to the new Caltrans guidelines.	Will comply.	
20	FR	Appendix D	Page 3 of 5, refer to Area A, B, C, and D. Where are these areas?	The locations of these locations are shown on Site Plans, Plate 3B, 3D, 3E & 3F, respectively. Approximate station numbers will be provided in the subsequent submittal.	
29	FR	N/A	C3-Not Approved, resubmit required		

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GEOTECHNICAL DESIGN & MATERIALS REPORT
ROUTE 12/JAMESON CANYON ROAD WIDENING PROJECT
NAPA & SOLANO COUNTIES, CALIFORNIA
04-Nap-12-0.0/3.3 & 04-Sol-12-0.0/2.6 EA 04-264111

For

MARK THOMAS & CO., INC.
1960 Zanker Road
San Jose, CA 95112

PARIKH CONSULTANTS, INC.
2360 Qume Drive, Suite A
San Jose, CA 95131
(408) 452-9000

November 25, 2009

Job No. 208117.MAT

PARIKH
Practicing in the Geosciences

Geotechnical ■
Environmental ■
Materials Testing ■
Construction Inspection ■

MARK THOMAS & CO., INC.
1960 Zanker Road
San Jose, CA 95112

Job No.: 208117.MAT
November 25, 2009

Attn: Mr. Richard Tanaka

Sub: GEOTECHNICAL DESIGN & MATERIALS REPORT
ROUTE 12/JAMESON CANYON ROAD WIDENING PROJECT
NAPA & SOLANO COUNTIES, CALIFORNIA
04-Nap-12-0.0/3.3 & 04-Sol-12-0.0/2.6 EA 04-264111

Dear Mr. Tanaka:

Transmitted herewith are the Geotechnical Design and Materials Report for the subject project. The report was prepared in accordance with the scope of work outlined in our proposal.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning our findings or conclusions, please feel free to contact this office at (408) 452-9000.

Very truly yours,
PARIKH Consultants, Inc.

Gary Parikh, P.E., G.E.
President

Attachment: Geotechnical Design & Materials Report

"Approved as to impact on State facilities and conformance with applicable State standards and practices, and the technical oversight were performed as described in the California Department of Transportation A&E Consultant Services Manual."

Caltrans_____

Title_____

Date_____

Caltrans_____

Title_____

Date_____

TABLE OF CONTENTS **page**

1. INTRODUCTION 1
2. EXISTING FACILITIES AND PROPOSED IMPROVEMENTS 2
3. PERTINENT REPORTS AND INVESTIGATION 3
4. PHYSICAL SETTING 4
4.1 Climate 4
4.2 Topography and drainage 4
4.3 Man-Made and Natural Features of Engineering and Construction Significance 5
4.4 Regional Geology and Seismicity 5
5. EXPLORATION 6
5.1 Drilling and Sampling 6
5.2 Geologic Mapping 10
5.3 Geophysical Studies 17
5.4 Instrumentation 18
5.5 Exploration Notes 18
6. GEOTECHNICAL TESTING 18
6.1 In-Situ Testing 18
6.2 Laboratory Testing 18
7. GEOTECHNICAL CONDITIONS 19
7.1 Site Geology 19
7.1.1 Lithology 22
7.1.2 Structure 23
7.1.3 Existing Slope Stability 25
7.2 Subsurface Soil Conditions 27
7.3 Water 28
7.3.1 Surface Water 28
7.3.2 Groundwater 29
7.4 Project Site Seismicity 30
7.4.1 Ground Motions 30
7.4.2 Ground Rupture 30
8. GEOTECHNICAL ANALYSIS AND DESIGN 30
8.1 Dynamic Analysis 30
8.1.1 Parameter Selection 30
8.1.2 Analysis 31
8.1.3 Liquefaction Potential 31
8.2 Cuts and Excavations 33
8.2.1 Stability 35
8.2.2 Rippability 35
8.2.3 Grading Factor 37
8.3 Embankments 38
8.3.1 Evaluation of Embankment Settlements 38
8.3.2 Evaluation of Embankment Stability 38
8.4 Earth Retaining Systems 38
8.5 Culverts 45

8.5.1 New Culverts at Cattle Creek *45*
8.5.2 Corrosion Investigation *46*
8.6 Minor Structures 49
9. STRUCTURAL PAVEMENT 49
10. MATERIAL SOURCES 51
11. MATERIAL DISPOSAL 52
12. CONSTRUCTION CONSIDERATIONS 52
12.1 Construction Advisories 52
12.2 Hazardous Waste Considerations 53
12.3 Differing Site Conditions 53
13. RECOMMENDATIONS AND SPECIFICATIONS 53
13.1 Summary of Recommendations 53
13.2 Recommended Materials Specifications 54
13.2.1 Standard Specifications *54*
13.2.2 Special Provisions *54*
14. INVESTIGATION LIMITATIONS 56
REFERENCES 58

Appendix A
Log of Test Borings

Appendix B
Laboratory Tests Results

Appendix C
Culvert 4 Results
Pavement Calculation
Post-Liquefaction Settlement Calculation
Slope Stability of Proposed Retaining Walls

Appendix D
"Seismic Refraction Survey Report", by NORCAL Geophysical, Nov. 2008
Recently Performed Seismic Refraction Results, Lines 1 to 5 (draft)

Appendix E
Geomorphic Features Maps

Appendix F
Geologic Structure: Bedding, Faults, & Folds

Appendix G
Caltrans Review Comments and Responses

LIST OF TABLES

TABLE 1 – Summary of Borings 7
TABLE 2 – Attitudes of Bedding Planes and Joints (Exposed in Existing Cut Slope) 10
TABLE 3 – Attitudes of Bedding Planes and Joint (in core samples) 12
TABLE 4 – Earthquake Data 31
TABLE 5 – Retaining Wall Summary 39
TABLE 6 – Summary of Corrosion Test Results 47
TABLE 7 – Recommended Minimum Thickness and Protective Measures for Culverts 48
TABLE 8 – Summary of R-value Test Results 49
TABLE 9 – Structural Pavement Sections 50
TABLE 10 – Sources of Imported Borrow 52

LIST OF FIGURES

Project Location ..... Plate 1
Geologic Maps ..... Plates 2A to 2I
Fault Map ..... Plate 3A
Alquist-Priolo Earthquake Fault Zone Map ..... Plate 3B
Seismic Refraction Survey Location Map ..... Plates 4A to 4G
Interpreted Geologic Section ..... Plates 5A to 5E
Stereonet Plots ..... Plates 6A to 6C
Site Pictures (existing rock slope) ..... Plates 7A to 7C
Typical Core Sample Pictures ..... Plates 8A to 8D

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1. INTRODUCTION

This report presents the results of our geotechnical investigation for the proposed widening along Route 12 between Highway 29 and Highway 80 in Napa and Solano Counties, California. The attached Project Location Map (Plate No. 1) shows the location and limits of the project.

This report mainly addresses design of pavement sections, cut slope, minor structures, standard retaining wall and corrosion investigation. The investigation included review of readily available soils and geologic literature and as-built pavement data pertaining to the site, obtaining representative samples and logging soil materials encountered in exploratory borings, laboratory testing of the representative samples, performing engineering analyses, and preparation of this report.

The purpose of this report is to document subsurface geotechnical conditions, provide analyses of anticipated site conditions as they pertain to the project described herein, and to recommend design and construction criteria for the roadway portions of the project. This report also establishes a geotechnical baseline to be used in assessing the existence and scope of changed site conditions, if any.

This report is intended for use by the project roadway design engineer, construction personnel, bidders, and contractors for information and reference purposes only and should not be construed directly as project specifications.

Due to limitations inherent in geotechnical investigations, it is neither uncommon to encounter unforeseen variations in the soil conditions during construction nor practical to determine all such variations during an acceptable program of drilling and sampling for a project of this scope. Such variations, when encountered, generally require additional engineering services to attain a properly

constructed project. We, therefore recommend that a contingency fund be provided to accommodate any additional charges resulting from technical services that may be required during construction.

2. EXISTING FACILITIES AND PROPOSED IMPROVEMENTS

Route 12 in Napa and Solano Counties serves as an important interregional east-west link between Napa Valley and the Fairfield/Suisun area. Within the project limits, Route 12 is mostly a two-lane undivided highway, and the existing lane widths are 12 feet with shoulder widths ranging from 2.4 to 10 feet. The Southern Pacific railroad line is located south and relatively parallel to Route 12. The general area along Route 12 is in a rural landscape, primarily used for agricultural and grazing purposes.

Based on the plans provided, the proposed project along Route 12 will widen the existing two-lane facility to a four-lane divided conventional highway from Route 29 to Red Top Road. The total length of the roadway widening project is approximately 5.8 miles.

The proposed widening will be mainly along the north side of the Route 12, and cut slopes will be made at various locations to accommodate the improvement. The newly constructed roadway will be used for the westbound direction, while the existing roadway will be upgraded to a standard shoulder width and will be used for the eastbound direction. These two road beds will be separated by a concrete median barrier with a minimum of 12-foot wide median.

Based on the existing terrain, a total of ten retaining walls are planned along Route 12 to accommodate the future widening. The proposed wall heights along the north side of the alignment are relatively tall; therefore, it is planned to use ground anchor systems (soil nail or tieback) for seven cut walls along the north side of the road (Retaining Walls No. 1 thru 7). A fill wall (Retaining Wall No. 8) is proposed along the north side of the alignment, located at the eastern most end of the project limit. It is planned to use Caltrans standard Type 1 (mod.) wall to support

the proposed widening. Two fill walls (Retaining Walls No. 9 & 10) are proposed along the south side of Route 12 because of the shift of planned alignment due to right-of-way issues. Therefore, it is planned to use Caltrans standard Type 5 (mod.) wall. It is our understanding that portions of these cantilever retaining walls will be specially design to accommodate the existing culvert. The recommendations will be provided in the Foundation Report, which will be submitted separately.

Based on our discussion with the designer and reference to the plans provided, it is planned to construct a new concrete box culvert, which will provide passage for the animals crossing under Route 12. The box culvert is expected to be 12 feet wide and 12 feet tall, located on the east side of the Cattle Creek.

Cut slopes along the north side of Route 12 are also proposed for the project at various locations (Sta. 215+00 to 219+40, Sta. 220+00 to 226+00, Sta. 229+20 to 234+00, Sta. 234+00 to 241+50, Sta. 250+25 to 252+50). The maximum heights of the slope range from approximately 25 feet to 50 feet tall. Based on the sections provided by the designer, the cut slopes will be 2(H):1(V).

Ten-foot wide access roads are proposed beyond the Caltrans' right-of-way at various locations (approximately from Sta. 216+03 to 245+53, Sta. 249+69 to 272+90, and Sta. 285+80 to 300+58), which will provide access for the property owners behind the future improvements. In order to minimize the impact to the existing slope, relatively minor cuts and fill are planned with use of gabion walls to accommodate the access road.

Site Plans (Appendix A) are attached with this report to show the existing facilities, proposed improvements, and boring and seismic refraction survey line locations.

3. PERTINENT REPORTS AND INVESTIGATION

In addition to the as-built information obtained from the designer, Mark Thomas & Co., Inc., the following investigation reports were also reviewed to supplement the subsurface information obtained for the project during this study.

- PARIKH Consultants, Inc., March 2009, "Preliminary Foundation Recommendations, Proposed Retaining Walls for Route 12/Jameson Canyon Road Widening Project", prepared for Mark Thomas & Company, Inc.
- Caltrans, February 2003, "Preliminary Geotechnical Report"
- Caltrans, July 2006, "Amended Preliminary Geotechnical Report"
- Caltrans, September 2006, "Geotechnical Recommendations for the Route 12 West Truck Climbing Lane"
- Caltrans, April 2008, "PS&E Pavement Design Recommendations"

4. PHYSICAL SETTING

4.1 Climate

The climate at American Canyon area is mild during summer when temperatures tend to be in the 60's (°F) and cold during winter when temperatures tend to be in the 40's (°F). The warmest month of the year is July with an average maximum temperature of 82.6°F, while the coldest month of the year is December with an average minimum temperature of 38.6°F. Temperature variations between night and day tend to be moderate during summer with a difference that can reach 28°F, and fairly limited during winter with an average difference of 19°F.

The annual average precipitation at American Canyon is approximately 26.5 inches. Winter months tend to be wetter than summer months. The wettest month of the year is January with an average rainfall of 5.35 inches.

4.2 Topography and drainage

The existing terrain along Route 12 varies from flat (western portion) to rolling terrain (eastern portion). The existing roadway elevations are at approximately Elev. 80 and 110 feet at the western and eastern ends of the project, respectively, and the maximum elevation is at

approximately Elev. 335 feet at Sta. 265+00, approximately half way between the end points. The existing alignment lies on the northern side of the canyon north of the stream channel. A portion of the cut slopes along the north side of the alignment consists of exposed bedrock. The rock slopes typically range from 3(H):1(V) to 1(H):1(V). Nearly vertical cut faces were noted at some local spots.

4.3 Man-Made and Natural Features of Engineering and Construction Significance

As discussed above, there are existing cut slopes located along the north side of a portion of the roadway. In some places, the existing cut slopes expose relatively un-weathered sandstone bedrock containing visually discernable bedding planes and joint surfaces. Inclinations of the cut slopes range from 1(H):1(V) to vertical. Localized failures have left notable scars from which large blocks of rock fell; the resulting debris has been removed from the right-of-way. However, the potential for future failures to occur in these cut slopes or the cuts planned to construct retaining walls is a significant issue for the design of the project and was a primary focus of this investigation.

4.4 Regional Geology and Seismicity

The project alignment is in the eastern portion of the San Francisco Bay Area in the Coast Range geomorphic province of California. The Coast Range forms a nearly continuous topographic barrier between the California coastline and the San Joaquin Valley. In general, the Coast Range in this region is double chain of mountain running north-northwest. Between the two chains of mountain lies the basin of San Francisco Bay, including the valleys at the end of the Bay, Petaluma on the north and Santa Clara on the south. Three prominent geologic blocks dominate the San Francisco Area: the Santa Cruz Mountains (western block), San Francisco Bay (central block), and the East Bay Hills/Diablo range (eastern block).

The project site is located within the northern portion of the Diablo Range. Geologic units within the region consist of:

- Jurassic age Franciscan Complex rocks (meta-greywacke, meta-shale, chert, limestone, serpentinite, and ultramaphics) that were juxtaposed by displacements associated with plate tectonics, buried by younger sedimentary units, metamorphosed by heat and pressure, and subsequently uplifted and exposed by erosion;

- Cretaceous and Tertiary age marine sedimentary rocks (sandstones, shales, etc.) that were deposited upon the eroded Franciscan rocks, subsequently uplifted and deformed by tectonic forces and displaced by older and active faults;

- Quaternary age terriginous sedimentary units (gravels, sands, silts, and clays) including older alluvial fans and younger valley in-fills and flood plain deposits that are flat-lying to slightly deformed and cut by recently active faults as well as landslide deposits.

Significant earthquakes, which have occurred in this area, are generally associated with crustal movements along well-defined active fault zones. Faults in the vicinity of the site with a moderate to high potential for surface rupture include the Green Valley fault (to the east) and the West Napa fault (to the west).

5. EXPLORATION

5.1 Drilling and Sampling

Based on the plans provided and the project scope, total 74 new borings were planned along Route 12. At this time, 72 borings have been drilled, which includes additional borings drilled in October 2009. Two of the planned borings (Borings B-201 for Retaining Wall No. 1 & B-214 for Retaining Wall No. 3C) were not conducted due to lack of right-of-entry permit. The borings will be performed after such permission is obtained.

Twenty shallow borings were drilled to 5 feet depth below the existing grade in order to collect the bulk samples for pavement study. The remaining 52 borings are for different structures along Route 12 and were drilled to depths ranging from 20 to 160 feet.

We utilized a truck-mounted drill rig using 8-inch diameter hollow stem augers, a track-mounted drill rig using rotary wash drilling method, a portable Minuteman using 4-inch diameter solid stem augers and jeep-mounted drill rig using 6-inch diameter solid stem augers to advance the borings. The Site Plans (Appendix A) shows the approximate locations of these borings. The borings were drilled under the technical supervision of one of our engineers/geologist, who classified and continuously logged the soils encountered during drilling and supervised the collection of soil samples at various depths for visual examination and laboratory testing.

Bulk samples were obtained from the soil cuttings, and other tube samples were obtained by driving a 1.4-inch I.D. Standard Penetration Test (SPT) sampler or a 2.4-inch I.D. Modified California (MC) sampler into the subsurface soils under the impact of a 140 lb hammer falling through 30 inches. The blow counts required to drive the sampler for the last 12 inches are presented on the "Log of Test Borings", Appendix A. Rock cores were obtained by 101-wireline geobarrel system and HQ diamond core barrels. Both sampling barrels are 2.4-inch I.D. and were advanced by hydraulic pressure. After visual examination, the collected samples were sealed and transported to our laboratory for further evaluation and testing. The locations, stations, and relevant information of the borings drilled for the current investigation are summarized in the following tables.

TABLE 1 – Summary of Borings

Boring No.	Station (ft)	Offset from "JC" line	Boring Depth (ft)	Approx. Ground Surface Elev. (ft)
A-08-101 (R-1)	100+00±	Lt. 42±	5.0	91.0±
A-08-102 (R-2)	110+00±	Lt. 45±	5.0	110.0±

Boring No.	Station (ft)	Offset from "JC" line	Boring Depth (ft)	Approx. Ground Surface Elev. (ft)
A-08-103 (R-3)	120+00±	Rt. 55±	5.0	105.5±
A-08-104 (R-4)	130+00±	Rt. 10±	5.0	115.5±
A-08-105 (R-5)	140+00±	Rt. 23±	5.0	135.0±
A-08-106 (R-6)	150+00±	Rt. 12±	5.0	160.0±
A-08-107 (R-7)	170+00±	Rt. 38±	5.0	190.0±
A-08-108 (R-8)	180+00±	Rt. 39±	5.0	202.0±
A-08-109 (R-9)	190+00±	Rt. 28±	5.0	239.0±
A-08-110 (R-10)	200+00±	Rt. 37±	5.0	239.0±
A-08-111 (R-11)	211+00±	Rt. 40±	5.0	250.0±
R-09-160 (B-202)	216+25±	Lt. 125±	33.0	295.0±
R-09-161 (B-203)	219+70±	Lt. 70±	30.5	265.0±
R-09-162 (B-204)	223+10±	Lt. 50±	36.0	280.0±
R-09-163 (B-205)	232+50±	Lt. 20±	36.5	290.0±
R-09-164 (B-206)	236+00±	Lt. 15±	30.0	300.0±
R-09-165 (B-207)	239+00±	Lt. 20±	40.0	310.0±
A-08-112 (R-12)	239+00±	Rt. 50±	5.0	300.0±
A-09-021 (B-224)	241+50±	Rt. 15±	49.5	302.0±
A-09-022 (B-225)	245+80±	Rt. 12±	49.0	306.0±
A-09-023 (B-226)	247+70±	Rt. 17±	49.0	308.0±
A-08-113 (R-13)	249+50±	Rt. 45±	5.0	308.0±
R-09-066 (B-208)	253+90±	Lt. 35±	46.5	330.0±
A-08-024 (RW-29)/A-08-114 (R-14)	254+00±	Rt. 10±	29.5	313.0±
A-08-025 (RW-30)	257+00±	Rt. 10±	29.5	317.0±
R-09-067 (B-210)	259+35±	Lt. 30±	36.0	330.0±
A-08-026 (RW-1)/A-08-115 (R-15)	266+00±	Rt. 20±	30.0	335.0±
A-08-027 (RW-2)	259+00±	Rt. 20±	30.0	331.0±
R-09-068 (B-212)	266+80±	Lt. 20±	35.0	347.0±
R-09-069 (B-211)	268+50±	Lt. 25±	35.5	354.0±
R-09-070 (B-213)	272+00±	Lt. 125±	40.0±	354.0±
A-09-032 (B-227)	280+60±	Rt. 40±	50.0	282.0±
A-08-116 (R-16)	285+15±	Rt. 42±	5.0	290.0±
A-09-028 (B-215A)	286+87±	Lt. 128±	49.0	302.0±
A-09-029 (B-215B)	287+93±	Lt. 75±	49.0	301.0±
A-08-030 (RW-3)	290+00±	Lt. 60±	57.0	298.0±
A-08-117 (R-17)	290+10±	Rt. 42±	5.0	281.5±
A-08-031 (RW-4)	293+36±	Lt. 46±	59.5	297.0±
A-08-033 (RW-5)	294+86±	Lt. 72±	60.5	279.0±
A-08-034 (RW-6)	295+80±	Rt. 60±	60.5	268.0±
A-08-118 (R-18)	300+00±	Rt. 51±	5.0	252.0±

Boring No.	Station (ft)	Offset from "JC" line	Boring Depth (ft)	Approx. Ground Surface Elev. (ft)
A-08-035 (B-216)	309+22±	Lt. 25±	40.0	248.5±
A-08-036 (B-217)	311+00±	Rt. 65±	45.0	246.2±
A-08-119 (R-19)	310+80±	Rt. 45±	5.0	246.0±
R-09-037 (B-218)	312+78±	Lt. 56±	41.5	264.0±
R-09-038 (B-219)	317+50±	Lt. 26±	31.5	248.0±
A-08-041 (RW-7)	320+02±	Rt. 40±	60.5	237.0±
R-08-039 (B-220)	321+10±	Lt. 100±	60.0	265.0±
A-08-042 (RW-8)	323+64±	Rt. 38±	60.5	237.0±
A-08-052 (RW-9)	330+30±	Rt. 52±	60.5	234.5±
R-08-043 (RW-14)	331+40±	Lt. 52±	32.5	238.0±
A-08-053 (RW-10)/A-08-120 (R-20)	334+31±	Rt. 80±	41.0	230.0±
R-08-044 (RW-15)	334+70±	Lt. 30±	82.0	266.0±
R-08-045 (RW-16)	335+84±	Lt. 22±	11.5	243.0±
R-08-045A (RW-16A)	336+00±	Lt. 76±	16.5	256.0±
R-08-046 (RW-17)	337+92±	Lt. 124±	114.0	325.0±
R-08-054 (RW-11)	338+64±	Rt. 32±	56.0	235.5±
R-08-047 (RW-18)	339+32±	Lt. 200±	138.0	359.0±
A-08-055 (RW-12)	342+00±	Rt.30±	45.0	342.0±
R-08-048 (RW-19)	345+28±	Lt. 180±	160.0	378.0±
R-08-049 (RW-20)	346+80±	Lt. 220±	50.0	402.0±
R-08-050 (RW-21)	350+72±	Lt. 48±	60.0	268.0±
A-08-056 (RW-13)	352+28±	Rt. 22±	20.0	239.2±
R-08-051 (RW-22)	353+06±	Lt. 38±	60.0	258.5±
A-08-057 (RW-26)	357+50±	Rt. 90±	47.5	222.0±
R-08-040 (B-221)	323+64±	Lt. 42±	50.5	241.0±
A-09-058 (B-222)	360+00±	Lt. 30±	50.0	220.0±
A-09-059 (B-223)	362+50±	Lt. 35±	50.0	220.0±

* The boring locations were not surveyed and are approximate based on the plans provided by the designer.

The descriptions of the soils encountered and relevant boring information are presented on the Logs of Test Borings attached in Appendix A. The laboratory test methods and results are presented in Appendix B. The logs presented in Appendix A were prepared from the field logs, which were edited after visual re-examination of the samples in the laboratory.

5.2 Geologic Mapping

The published geologic maps for the area indicate the bedrock beneath most of the Highway 12 alignment consists of Markley Formation sandstone and shale. A younger sandstone unit, San Pablo Formation, overlies the Markley Formation in the western-most portion of the project area. The dip and dip directions indicated on the published geologic maps vary along the extent of the project. (A discussion of the differences between various published maps is presented in Appendix F.)

The proposed widening at the planned location of Retaining Walls No. 6, 7A and 7B is expected to cut into the Markley Formation. The total wall height is on the order of 100 feet. Therefore, more geologic data and rock characteristics were collected along these wall locations.

Existing road cuts along the north side of a portion of the roadway expose bedrock. Some of these cut slopes (from Station 337+00 to 347+50) are covered with a drape of filter fabric and wire mesh, which obscures much of the bedrock structure. However, we were able to measure the attitudes of bedding planes and joint surfaces at a number of places where visible (between Stations 333+50 and 348+00). Refer to the following table for a list of dip angles and directions of bedding planes and joint surfaces measured in the road cuts.

TABLE 2 – Attitudes of Bedding Planes and Joints (Exposed in Existing Cut Slope)

Station	Bedding		Joint	
	Angle of Dip (deg)	Direction of Dip (deg)	Angle of Dip (deg)	Direction of Dip (deg)
333+90	22	290	-	-
334+25	19	290	29	100
334+50	14	290	75	130
337+50	-	-	42	200
337+75	32	270	61	170
338+00	20	290	55	120
338+80	18	290	-	-

Station	Bedding		Joint	
	Angle of Dip (deg)	Direction of Dip (deg)	Angle of Dip (deg)	Direction of Dip (deg)
339+20	20	290	55	120
340+00	20	270	65	130
340+25	17	270	-	-
340+50	-	-	70	160
340+90	18	290	67	140
341+50	-	-	72	150
341+70	-	-	60	170
343+75	20	290	-	-

Bedding planes dip at relatively shallow angles (10 to 25 degrees below horizontal) and dip in the northwesterly direction (approximately 290 degrees). Joint surfaces dip steeply (60 to 80 degrees below horizontal) toward the south (i.e. out-of-slope). Consequently, there are slip-out scars of past wedge-type rock fall failures in the higher cut slopes.

Along the planned location of Retaining Walls No. 6, 7A & 7B, rock cores were collected from Borings R-08-043, R-08-044, R-08-046 thru R-08-051. To determine the direction of dip of bedding planes and joint surfaces observed in the cores, we relied upon the strike and dip symbols on the published map as well as our engineering geologist's observations and measurements of surfaces exposed in the existing nearby rock cut slopes along the north side of Highway 12. Between Stations 333+90 and 343+75, we measured the dip and dip direction (perpendicular to strike) of 11 bedding planes and 11 joint surfaces exposed in the nearly vertical cut slope. The dips of bedding planes vary from 14 to 22 degrees below horizontal; the direction of dip of bedding planes is in the northwesterly direction (270 to 290 degrees). The dips of joint surfaces vary from 42 to 79 degrees below horizontal; the dip direction of joint surfaces is toward the southeast, south, and southwest (100 to 200 degrees).

A number of intact rock core samples recovered from the borings contain both bedding planes and joint surfaces. In those cases, the angular difference between the bedding dip direction and

the joint dip direction was used in combination with the "known" dip direction of bedding to calculate the dip direction of joint surfaces (See following table). We estimated the directions of dip of joints for which cores do not contain cohabitating bedding planes based upon the character and dip of joint surfaces found in samples which do have cohabitating bedding planes. Where there was little or no such control, we assumed the direction of dip of joint surfaces was directly toward the proposed cuts/walls.

TABLE 3 – Attitudes of Bedding Planes and Joint (in core samples)

Boring No.	Depth Interval (ft)	Angle of Dip (deg)		Angular Difference (deg)	Direction of Joint Dip (deg)
		Bedding	Joint		
R-08-046 (RW-17)	48	6	64	-95	195
	54.6	15	58	-140	150
	55	10	53	-158	132
	60	19	62	106	36
	61.7	13	68	-120	170
	68.5	8	57	-150	140
	82.5	14	57	88	18
	84.4	14	49	-90	200
	106.9	14	59	93	23
	107.8	16	84	84	14
	112.1	21	50	-112	178
R-08-047 (RW-18)	39.5	8	33	-106	184
	47.3	11	76	-105	185
	50.7	8	83	-110	180
	83.2	12	38	-122	168
	96.9	9	62	-180	110
R-08-048 (RW-19)	45.1 - 45.8	12.5	63	-104	186
	50.3 - 50.8	7	72	-78	212
	52.4	13.5	72	-79	211
	107.6 – 108	15	33	-96	194
R-08-049 (RW-20)	55.7	13	53	69	359
	102.8	16	38	-73	217
R-08-050 (RW-21)	35.5	25	72	85	15
	52.5	14	61	-63	227

We used the RockPack computer program to plot dips and dip directions of bedding planes and joint surfaces. All of the dips shown in the stereonet plots were measured in the rock cores recovered from our borings. The directions of the bedding dips were inferred from the dip

directions measured in the cut slope exposure or those shown on the published geologic map. The directions of joint dips were calculated as described above or conservatively assumed to dip toward the planned cut face.

Landslide Hazard Mapping. Landslide hazards were mapped in the Cordelia - Vallejo Area by M. W. Manson in 1988. The Division of Mines and Geology (DMG) Open-File Report 88-22 (Landslide Hazard Identification Map No. 13).

Manson's Geologic Map indicates all of the slopes located north of the project roadway are underlain by Markley Sandstone Member of the Eocene-age Kreyenhagen Formation, described as: "Massive, grayish- to yellowish-brown, medium- to coarse-grained, micaceous, feldspathic sandstone; locally cross-bedded and pebbly; indurated but not cemented; ... extremely susceptible to slope failures."

Several bedding plane attitudes and fold axes are shown on Manson's Geologic Map; however, the strike of bedding is general north/south and moderate dips toward the northwest predominate. A fault is shown crossing the highway just west of the planned location of Retaining Wall No. 2.

Manson's Relative Landslide Susceptibility Map shows all of the steep slopes located along the north side of the project roadway categorized as "Area A - Most Susceptible to Landslides - characterized by steep slopes and includes most mapped landslides, underlain by Markley Sandstone, should be considered naturally unstable, subject to failure even in the absence of the activities of man."

Manson's Relative Debris Flow Susceptibility Map shows all of the steep slopes located along the north side of the project roadway categorized as "Area 1 - Most Susceptible to Debris Flows - evidence of debris flows is relatively common ..."

We used the high-resolution topographic contours (2-foot interval) combined with air-photos to interpret the extent of landslide scarps and deposits. The landslide run-out deposits crossed by Retaining Walls No. 3B, 4A and 5B are shown on published geologic maps of the area and are conspicuous in the topographic contours. Other slides are less distinct, but apparent on the slopes above (north) of the highway. Plates 2B through 2I of this report show the mapped extent of landslide features as shown on portions of Plate 13B of DMG OFR 88-22. Appendix contains maps which show our interpretation of the geomorphic features (landslides, debris flows, and associated run-out deposits).

The following sections describe the similarities and differences between the landslides shown on Manson's 1988 map, those shown in the 1998 map by Berzore, et. al., and the slides we mapped based upon the project topography and air photos. More detail discussions at each wall location are provided in Foundation Report, which is submitted separately.

- *Retaining Wall No. 2*

  Manson's map shows large debris slide on the slope north (uphill) of Retaining wall No. 2 (at Station 254+70, Refer to Plate 2C). The project topographic contours and air-photos also indicate the presence of this slide. However, it does not appear to reach the planned wall location.

- *Retaining Walls No. 3A, 3B & 3C*

  The planned location of Retaining Walls No. 3A, 3B & 3C will cut across several debris flow run-out deposits and one landslide run-out deposits. Manson's landslide map shows several small earth flows on the slope north (uphill) of the proposed wall location (between Stations 265+20 and 271+80, Refer to Plate 2D). Our geomorphic interpretation of the project topographic contours and air-photos also indicate the presence of these slope features. The thickness of these debris flow run-out deposits is anticipated to be relatively thin.

For the landslide and landslide run-out deposits, Boring R-09-070 was drilled within the landslide deposits. The boring encountered approximately 15 feet of landslide deposits materials. Beneath the layered landslide deposits, the boring encountered weathered sandstone and claystone bedrock.

– *Retaining Walls No. 4A & 4B*

Manson's map shows three landslides crossing the highway (between Stations 284+80 and 296+50) that were not included on the geologic map by Bezore, et. al. The toes of these slides are mapped as extending to between 70 and 200 feet south of the highway (see Plate 2E). However, they appear to be relatively thin (less than 10 feet thick) run-out deposits.

According to our engineering geologist's geomorphic interpretations (Appendix E), the location of the proposed truck turn-around portion of Retaining Wall No. 4A will cross several potential landslide run-out deposits with various estimated thicknesses as follows:

Sta.	Features	Est. thickness (ft)
285+00 – 286+70	Qlsro? (uncertain)	35
286+70 – 288+00	Qlsro	25 – 35

Borings A-09-028 (B-215A) and A-09-029 (B-215B) were drilled at the planned location where Retaining Wall No. 4A will cross these mapped landslide run-out deposits. Continuous sampling resulted in a nearly continuous column of samples which were split and examined in our laboratory. We interpret the observed layering found in the samples as evidence of repeated episodes of deposition that are visible in the samples down to depths of 35 and 24.5 feet in Borings A-09-028 and A-09-029, respectively. Beneath the layered landslide run-out deposits the borings encountered weathered sandstone and shale bedrock.

- *Retaining Wall No. 5A & 5B*

  The location and extent of the landslide that is mapped between Stations 319+10 and 322+65 are approximately the same on both maps, except that the toe of the slide is shown as extending 100 feet south of the highway on Manson's map (Refer to Plate 2F). According to our engineering geologist's geomorphic interpretation (Appendix E), it appears to be a run-out deposit on the surface of the alluvial plain, and the planned location of Retaining Wall No. 5B will cut across this relatively large landslide run-out deposit between Sta. 320+00 and 322+00.

  Borings R-08-039 (B-220) and R-08-039A (B-220A) were drilled at the mid-line of the landslide run-out deposit where Retaining Wall No. 5B will cross it. Continuous sampling with Shelby tubes produced continuous cores that were split and examined in our lab. The bottom of the "tumbled" materials that we interpreted as landslide run-out deposits was found to a depth of 23 feet; weathered bedrock was found beneath that depth.

- *Retaining Walls No. 6, 7A, 7B & 8*

  The boundaries of the large landslide mass mapped between Stations 350+00 and 400+00 of Highway 12 are nearly the same on both maps (See Plate 2H). The project topographic contours suggest that the edge of this large slide is actually located east of the planned end of Retaining Wall No. 7B.

  This large landslide appears to be relatively old and shows no obvious signs of recent movement (eg. displaced cracks in roadway pavement) at its margins. This was also recognized by Caltrans in the Preliminary Geotechnical Report (dated February 2003).

- *Cut Slopes*

  Manson's map shows a small landslide ("filled arrowhead symbol indicates a slide too small to delineate at the scale of the map") on the slope above the planned cut slopes at Stations 231+50 and 237+00 (Refer to Plate 2I). The project topographic contours and air-photos also indicate the presence of these small slides.

Based on the above, most of the mapped landslides where the planned improvements cross are relatively thin (less than 10 feet thick), with exception of Retaining Walls No. 3Bm 4A & 5B. Therefore, tieback walls are considered and recommended for these walls.

5.3 Geophysical Studies

Seismic refraction profiles were collected and interpreted by NORCAL Geophysical Consultants, Inc. along lines located parallel and perpendicular to proposed retaining walls. The purpose of this seismic refraction survey was to measure seismic p-wave velocities to aid in characterizing the underlying rock and to quantify seismic compressional wave velocities as they pertain to rippability.

Seismic refraction survey has been conducted at several areas, including one area for Retaining Walls No. 4A & 4B, two areas for Retaining Walls No. 5A & 5B, respectively, and four areas for Retaining Walls No. 6, 7A and 7B. The locations of the seismic refraction are shown on Plates 4A to 4G, and the report prepared by NORCAL Geophysical Consultants, Inc. (dated November 3, 2008) and additional profiles (Lines 1 thru 5, draft) are attached in Appendix D of the report.

The interpreted cross sections indicate the velocities of the underlying layers. In general, the seismic refraction surveys revealed that the upper 5 to 30 feet consists of very weathered, soil-like materials with velocities ranging from 1000 to 4000 ft/sec. Beneath that, weathered rock to fresh hard rock (5000 to 10000 ft/sec) is indicated. Interpretations of the results are provided in the Foundation Report, prepared for the proposed non-standard retaining wall.

5.4 Instrumentation

The existing site condition along the project corridor appears to be relatively stable. Some slides were identified, but they are relatively shallow and do not pose significant impact to the proposed project. The potential impacts are planned to be mitigated by engineering approach, such as using tieback wall system to retain potential slide (Retaining Walls No. 3B, 4A & 5B).

The site conditions were evaluated based on the field explorations. Therefore, no instrumentation was proposed for geotechnical investigation. The subject was considered and was determined to be not applicable to the project.

5.5 Exploration Notes

The exploratory borings mainly encountered undivided surficial deposits overlying bedrock (Markley Formation). Drilling conditions using hollow/solid stem augers for the surficial deposits and rotary wash drilling method for rock coring were considered normal for this site.

6. GEOTECHNICAL TESTING

6.1 In-Situ Testing

In-situ testing consists of recording blow counts during sampling in the field. Based on our previous experience, when correlating standard penetration data in similar soils, the blow counts for the Modified California Sampler (2.4-inch I.D.) can be taken roughly 2 times that for the Standard Penetration Test sampler (1.4-inch I.D.) in similar soils.

6.2 Laboratory Testing

Laboratory tests performed for the study include the following: Laboratory determination of Moisture-Density (California Test Method 226), Atterberg Limits (California Test Method 204), Grain Size Analysis (California Test Method 202), Unconfined Compression Test (California Test Method 221), Direct Shear Test (ASTM D 3080), R-value Test (California

Test Method 301), and Corrosion Test (California Test Method 643). The laboratory test results are attached in Appendix B. Moisture-Density test and Unit Weight test results are summarized on the LOTBs attached in Appendix A.

7. GEOTECHNICAL CONDITIONS

7.1 Site Geology

The project is located on the Cordelia and Cuttings Wharf 7.5 minute quadrangles. For the Cutting Wharf quadrangle, we have presented the geologic map by Bezore (2002).

- Bezore, S.P., Randolph-Loar, C.E., and Witter, R.C.; 2002; Geologic Map of the Cuttings Wharf 7.5' Quadrangle, Solano and Napa Counties, California, California Geological Survey.

For the Cordelia quadrangle, four published geologic maps are available (at a scale of 1 inch equals 2000 feet), which show four different interpretations of the structural features (units, bedding, folds, and faults) in the Cordelia Quadrangle.

- Manson, M.W.; (1988; "Geologic Map" in Landslide Hazards in the Cordelia-Vallejo Area, Solano and Napa Counties, California; Division of Mines and Geology; Open-File Report 88-22.

- Graymer, R.W.; Brabb, E.E.; and Jones, D.L.; (1999); Geology of the Cordelia and the northern part of the Benicia 7.5 minute quadrangles, California: a digital map database; USGS Open-File Report 99-162.

- Bezore, S.P.; Randolph, C.E., Sowers, J.M., and Wagner, D.L.; (2002); Geologic Map of the Cordelia and Fairfield South 7.5' Quadrangles, Solano and Napa Counties, California; California Geological Survey CD 2002-07.

- Dibblee, T.W.; (2006*); Geologic Map of the Cordelia and Fairfield South Quadrangles, Napa and Solano Counties, California; (*published posthumously) edited by Minch, J.A. (based on original field mapping by Dibblee, T.W.; 1977); Santa Barbara Museum of Natural History; Dibblee Geology Center Map # DF-190.

We present the map by Bezore, et. al. as the primary source of our geology discussion and in Plates 2A thru 2F. However, in the western portion of the project area, the map by Bezore differs from the other three maps in several significant ways. These are further discussed in Appendix E of the report.

We have not attempted to resolve the different geologic relationships represented on these four published maps. We recognize that the author geologists have differing interpretations of the specific geologic structures that exist in this area, as well as use of differing stratigraphic nomenclature. However, there is a common interpretation expressed in the four maps that is significant to the project: the rock units are younger and stratigraphically higher beneath the western portion of the project area and bedding planes dip at moderate inclination primarily toward the west, southwest and south. In addition, all four maps show a large landslide (1600 to 2000 feet wide) beneath the eastern end of the project area. Although, they differ somewhat on the location of the western edge of the slide where Route 12 crosses it. Regardless of which geologic interpretation is correct, we do not expect bedrock structure to play a significant role in the behavior of the minor cut slopes that are planned to widen the highway in this portion of the western portion of the project area because topographic relief is low and the natural slopes are not steep (i.e. cut heights will be relatively low).

Beneath most of the area of the project, the near-surface bedrock consists of sandstones and claystone shales within the Eocene age Markley Formation ("Tmk"). The sandstones are described as:

> *"Grey to yellow-brown, micaceous marine arkosic sandstone. Massive to well-bedded; contains abundant muscovite."*

The Jameson Canyon Shale Member of the Markley Formation ("Tmkj") is described as:

> *"Well-bedded to laminated, light yellow to chalky shale." (The color described is based upon exposed rock that has been weathered. Fresh samples taken from depth are dark grey.)*

The western-most portion of the project is underlain by rocks of the Miocene age San Pablo Formation ("Tsp") described as:

> *"Brown, grey, and white marine sandstone and minor conglomerates."*

Beneath the eastern portion of the project, the map by Bezore (2002) indicates Miocene-age San Pablo Group ("Tsp"), to the west, is in depositional contact upon Eocene-age Markley Formation ("Tmk"), to the east. North of Station 129+00, the contact is indicated as inferred (dashed) and uncertain ("?"). South of Station 146+00, the contact is indicated as inferred. Between the two Stations, the contact is shown as displaced left-laterally (north side to the west) approximately 2000 feet along a thrust fault that is shown as dipping toward the north, crossing Highway 12 at Station 135+00, and extending toward the southeast where is crosses beneath Highway 12 again at Station 190+00. At that point, Bezore's map indicates that the bedrock is exposed in the creek channel south of the fault trace; that seems contrary to the direction of movement (north side up toward the southwest) suggested by the mapped absence of bedrock in the creek channel north of the fault. We did not observe any evidence of this fault in the field or in air-photos. Locally, within valleys, the project is underlain by Late Pleistocene to Holocene age (undivided) alluvium that includes:

"Flat, relatively undissected fan, terrace, and basin deposits, and small active stream channels."

"Undivided Alluvium" was mapped in small valleys where separate fan, basin, and terrace units could not be delineated at the scale of the map and where Holocene or Pleistocene age was uncertain. Landslide deposits ("Qls") of Holocene and Pleistocene age are mapped with arrows indicating the direction of movement. Geologic map of the entire project area and the area of each wall are shown on Plates 2A thru 2I.

7.1.1 Lithology

The bedrock beneath most of the Route 12 alignment consists of Markley Formation (Tmk) with some San Pablo Group (Tsp) beneath the western-most part. Existing road cuts along the north side of the eastern portion of the roadway expose bedrock. There are very few exposures of bedrock in other portions of the project areas. The bedrock is covered by colluviums, debris flow deposits, and landslide debris on sloping ground and by alluvium in gently sloping to nearly-level areas. Detailed description of these formations are presented in the previous section (Section 7.1).

Based on field observation by our engineering geologist and the core samples collected from the borings, the bedrock consists of:

Sandstone – light yellowish brown to medium orange-brown to gray, massive, fine to coarse grained, quartz-rich, micaceous, moderately well cemented to friable, with few joints (stained with iron-oxide), hard to very hard, containing some clay laminations; and

Claystone – olive brown to mottled orange-brown and gray to dark greenish gray, laminated to thinly bedded, fractured, soft to hard.

Discontinuities in the bedrock consist of bedding planes and joints. Weathering has occurred down to various depths (ranging from a few to several tens of feet), reducing the rock mass to clayey sand.

7.1.2 Structure

Bezore's (2002) geologic map shows a number of bedding plane attitudes, faults, and fold axes that strike across the alignment of the project. However, there are several other published geologic maps that do not show those features and include others that are not indicated on Bezore's map (see Appendix E for more discussion). These variations reflect different observations and interpretations made by several geologists. Where unconfirmed adverse orientations of planes of weakness in the bedrock have been inferred to exist, we have assumed that they dip toward the roadway.

The stereo-net plots summarize bedding and joint plane orientations at places where such information could be measured in boring cores. The stereo-net plots display the direction and angle of dip along with the great circles that represent the critical direction and angle combinations for the proposed cut slopes at specific locations (mainly at the locations of Retaining Walls No. 6, 7A & 7B).

A stereonet plot is a two-dimensional projection of planes and a three-dimensional reference sphere through which the planes might pass. Stereonets permit the three-dimensional analysis of discontinuities (such as bedding planes, joints, faults, or shears) within a rock mass. By accurately representing their angle of dip and dip direction, a stereonet plot enables the identification of specific planes of weakness within a rock mass that may have unfavorable orientations relative to a proposed cut slope.

The dip vector of a plane is plotted as a single point by passing a line along the plane, in the direction of its steepest inclination, through the center of the reference sphere; the point

where the line intersects the lower hemisphere is projected upward onto the stereonet. The closer the point is to the center of the stereonet, the steeper is the angle of dip of the plane represented by the point. A "great circle" arc is formed by the intersection of a weak plane or a slope face with the lower half of the reference sphere.

Potential rock slope failures (plane, wedge, and toppling-type) may be determined by plotting the dip vectors of the weak planes and their great circles on a stereonet. In Markland's Test, the "critical zone" for planar failure is the crescent-shaped area between the great circle representing the slope face and the actual circle representing the angle of friction acting along the weak plane. If the dip vector points fall within the critical zone, failures may occur. If two great circles representing intersecting planes of weakness intersect within the critical zone for planar failure, a wedge-type release may occur. The critical zone for toppling failure is the wedge-shaped area located opposite from the slope face between the friction angle circle and lines representing strikes within 30 degrees of parallel with the proposed slope face. However, not every discontinuity that plots within a critical zone will result in failure as there are many additional factors that can affect the stability of the rock mass situated above a discontinuity. Stereonet analysis is conservative because of several assumptions that may not be true in every case: discontinuities may not be continuous and cohesion may add strength along weak planes.

Stereonet plots showing the dip vectors of bedding planes and joint surfaces that we measured in cores recovered from Borings R-08-044 (RW-15), and R-08-046 (RW-17) through R-08-051 (RW-22) are included on Plates 6A trough 6D. Included on the stereonet plots (as shaded areas) are the critical zones within which planar and toppling-type failures are likely to occur. In general, all of the plots reveal that all of the bedding plane orientations we found in the cores (based upon our extrapolation of dip directions measured in the existing cut slopes) are not within the critical zones for either type of failure. In contrast, the orientations of most of the joints we found in the cores are within the critical

zones for either planar or toppling failure. We are uncertain about the vertical extent of such joint planes, as the cores could not provide that information. However, the joints exposed in the existing cut slopes do not appear to extend more than 20 to 30 feet vertically. In our opinion, soil nail wall is considered feasible to support the proposed cut. The wall design has taken the joints into consideration. Stability tests per Caltrans standard specifications should be performed before the wall construction.

In areas other than where Retaining Walls No. 6, 7A and 7B are planned, weathering and oxidation have dissolved the cementation between the individual grains in the bedrock so that the former rock mass has become more like soil. In those areas, the rock mass has been weakened to such a degree that the strength of the discontinuities no longer dictates the overall strength of the mass. As a result, the presence of discontinuities (bedding and joint planes) is less significant in deeply weathered areas. We did not observe planes of weakness in the cores collected from borings in such areas and therefore did not produce stereo-net plots for those areas.

7.1.3 Existing Slope Stability

The existing terrain along Route 12 varies from flat to steep hillsides. The terrain is generally level with minor slopes from HWY 29 to Lynch Road. East of Lynch Road, the natural slopes along the north side of the alignment are underlain by sandstone bedrock. The rock slopes typically range from 3(H):1(V) to 1(H):1(V). Nearly vertical cut faces were noted at some locations. Most of the rock cut slopes generally appear to be in good condition. However, rockfalls have originated in some of these cut slopes. Per the Amended Preliminary Geotechnical Report (Caltrans, July 2006), the drapery of geosynthetic fabric and wire mesh was installed in December 2004 in order to mitigate the rockfall hazard by keeping rock from falling onto the traffic lanes.

Our engineering geologist reviewed Manson's geologic map (1988) and prepared more detailed maps of landslide scarps, slump masses, and associated downhill run-out deposits by examining the project topographic contours and air-photos (see Appendix F). Arcuate depressions were identified as landslide or debris flow source areas while lobate features downhill of those sources were identified as areas of deposition and accumulation. Areas of apparently thicker soil located downhill of obvious landslides and debris flow sources were identified as "run-out" deposits. Sharp gullies were identified as erosion scars.

Most of the mapped lobate toes of the landslides do not appear to reach the planned improvements. The landslide crossed by Retaining Walls No. 3B, 4A & 5B is shown on published geologic maps of the area and is conspicuous in the topographic contours. Other slides are less distinct, but apparent on the slopes north of the highway.

Based on our field observation, a potentially active landslide was noted along the south side of Route 12 between Sta. 351+75 and 353+00. A retaining wall was previously constructed to support the roadway. Based on the Caltrans as-built plan provided by the designer, a "rubble masonry" wall was first built in 1972. However, our field observations indicate that the wall has been re-built as a soldier pile and lagging wall. However, information about the design details of this existing wall is not available.

The existing soldier pier retaining wall is situated uphill of an active landslide. The toe of the slide is located at the edge of the stream channel. Consequently, seasonal flows in the creek appear to undermine the landslide mass, resulting in additional downward movement. The proposed realignment of the highway further north will move the traffic lanes away from this wall. Therefore, the potential for the active slide to affect the existing wall will be less of a concern to the relocated highway than it is for the current configuration.

In general, most of the existing slopes along Route 12 are covered with vegetations and appear to be in relatively stable condition. However, there are localized landslides and debris flows on the slopes north of Route 12 that have produced run-out deposits that intersect the highway. However, there is no evidence that these deposits are actively moving.

Based on our study, the proposed Retaining Walls No. 3B, 4A & 5B will intersect a mapped landslide run-out deposits that is relatively thick. In order to maintain the stability of the slope, tieback walls are recommended at these wall locations.

7.2 Subsurface Soil Conditions

The relatively shallow borings, drilled to 5 feet below the existing grade, are for pavement study, and the deeper borings, drilled up to about 160 feet below grade, are for the evaluation of slope cuts and foundation design of the different structures along the alignment. Based on the boring data, the subsoils generally consist of firm to stiff clay with various thicknesses overlying the bedrock. Along the north side of Route 12, the surficial deposits are relatively thin, ranging from 10 to 40 feet. Along the south side of Route 12, the site is generally underlain by alluvium. The boring data indicate that the thickness of the alluvium is up to 60 feet, the maximum depths drilled.

Borings R-09-160 thru R-09-165 were drilled along the north side of Route 12 for the proposed cut slope between Sta. 215+00 to 240+00. The borings generally encountered approximately 5 feet to 15 feet of lean clay/sandy lean clay overlying weathered claystone and sandstone. Borings A-08-024 thru A-08-027 and R-09-066 thru R-09-070 were drilled in the vicinity of the proposed locations of Retaining Walls No. 2 & 3, and the borings encountered approximately 10 to 35 feet of firm to stiff clay overlying weathered bedrock. Another three borings (Boring A-09-021 thru A-09-023) were drilled along the planned location of Retaining Wall No. 9 on the south side of Route 12, and the borings encountered up to 40 feet of alluvium overlying weathered bedrock.

At the planned location of Retaining Walls No. 4A & 4B, the borings encountered approximately 10 feet to 35 feet thick of lean clay overlying weathered sandstone and shale bedrock. Three borings were drilled along the planned location of Retaining Wall No. 10. Based on the boring data (A-09-032, A-08-033 & A-08-034), the subgrade mainly consists of lean clay. Sand layers were encountered at various depths.

For Retaining Walls No. 5A, the subsoils mainly consist of "soil-like" highly weathered bedrock. For Retaining Wall No. 5B, the borings encountered up to approximately 45 feet of lean clay overlying weathered sandstone. Retaining walls No. 6, 7A & 7B are planned to be generally parallel with each other. The bedrock is mapped as Markley Formation by both Manson and Bezore at the planned locations of these walls.

Two borings were drilled in the vicinity of Cattle Creek. The boring data (A-08-035 & A-08-036) indicate that the subgrade mainly consists of firm to stiff lean clay. Sand pockets were encountered at various depths.

Detailed descriptions of the materials encountered in the exploratory borings are presented in Appendix A, "Log of Test Borings". It should be noted that these descriptions and related information depict subsurface conditions only at the locations indicated on logs and on the particular date noted on the logs. Because of the variability from place to place within soil strata in general, subsurface conditions at other locations may differ from conditions occurring at the locations explored. The passage of time may result in a change in the soil conditions at the locations due to environmental changes.

7.3 Water

7.3.1 Surface Water

The surface water/drainage generally follows the ground topography and is collected in local storm drainage system. Some of the proposed walls cut across the existing

drainage/erosion gulley, and it is recommended that the drainage system be properly designed.

7.3.1.1 Scour

The subject was considered and was determined to be not applicable for the roadway project.

7.3.1.2 Erosion

Erosion gullies have been developed by the runoff along the slope surface within the project limit. Erosion control facilities will be provided as part of the proposed improvement.

7.3.2 Groundwater

Groundwater was not encountered in the shallow borings drilled for the pavement study. Groundwater was not measured in some of the deeper borings due to rotary wash drilling method. Groundwater was measured (where encountered) in the borings that were advanced by hollow stem augers.

Based on the boring data, groundwater was encountered in Borings A-08-033 (Sta. 293+90, groundwater at Elev. 250± feet), A-08-041 (Sta. 320+00, groundwater at Elev. 203± feet), A-08-035 (Sta. 309+20, groundwater at Elev. 231± feet), A-08-036 (Sta. 311+00, groundwater at Elev. 227± feet), A-09-059 (Sta. 362+50, groundwater at Elev. 179± feet) and A-09-032 (Sta. 290+60, groundwater at Elev. 264± feet). These borings were drilled by hollow stem augers, located on the south side of Route 12 from the existing roadway elevation. Borings A-08-035 and A-08-036 are located in the proximity of Cattle Creek. It is expected the groundwater elevation could be primarily affected by the water level in the creek.

According to the site condition and the topography, groundwater level should be relatively low. Perched water may be expected between soil and rock interface. However, it is anticipated that groundwater level will vary with the passage of time due to seasonal runoff, groundwater fluctuations, surface and subsurface flow, ground surface run-off, and other factors that were not existent at the time of investigation.

7.4 Project Site Seismicity

7.4.1 Ground Motions

The project is located in a seismically active part of northern California. Many faults exist in the San Francisco Bay Area, which are capable of producing earthquakes, which may cause strong ground shaking at the site. The attached Fault Map (Plate 3A) presents the locations of the fault systems relative to the project site.

7.4.2 Ground Rupture

Potential seismic hazards may arise from three sources: surface fault rupture, ground shaking, and liquefaction. Based on available geological and seismic data, the possibility of the site to experience strong ground shaking may be considered moderate to high. However, the project is not located within the Alquist-Priolo Earthquake Fault Zones (formerly Special Studies Zone), adopted by the California State Geologist. The potential for fault rupture is considered low.

8. GEOTECHNICAL ANALYSIS AND DESIGN

8.1 Dynamic Analysis

8.1.1 Parameter Selection

Based on the 2007 Caltrans Deterministic PGA Map, the project is located in-between the Green Valley Fault (Fault ID: 213, Mmax=6.9, RLSS) and the West Napa fault zone (Fault ID: 416, Mmax=6.5, RLSS). Most of the proposed retaining walls are located closer to the Green Valley Fault, which is deemed the governing fault of this project, and the distances

between the fault and the walls range from approximately 0.6 miles (Retaining Walls No. 6, 7A &7B) to 3.2 miles (Retaining Wall No. 1), and the anticipated Peak Bedrock Accelerations (PBA) for earthquake originating on these faults range from 0.71g to 0.50g (per Sadigh, 1997). For design purpose, we have assumed a PBA of 0.5g for Retaining Wall No. 1, 0.55g for Retaining Wall No. 9, 0.6g for Retaining Walls No. 2 to 4 and 10, 0.65g for Retaining Wall No. 5, and 0.7g for Retaining Walls No. 6 to 8.

TABLE 4 – Earthquake Data

Retaining Wall No.	Estimated Closest Distance to the Fault (miles)		Peak Bedrock Acceleration (g)
	Green Valley Fault (RLSS, M_{max}=6.9)	West Napa Fault (RLSS, Mmax=6.5)	
1	3.22	3.08	0.50
9	2.40	3.62	0.55
2	2.27	3.72	0.57
3	2.04	3.74	0.58
4	1.85	3.88	0.60
10	1.85	3.88	0.60
5	1.33	4.26	0.64
6/7	0.99 (western end)/0.62 (eastern end)	4.50 (western end)/4.97 (eastern end)	0.67 (w)/0.71(e)
8	0.57	5.02	0.71

8.1.2 Analysis

Per Caltrans design guidelines (Guidelines for Structures Foundation Reports manual, Ver. 2.0, 2006), the stability under seismic loading condition should be analyzed by using a seismic factor, k, equals to one third of the horizontal peak acceleration and not exceeding 0.2g. Based on the table above, the expected PGAs at the project site range from 0.5g to 0.7g. The analysis should be conducted with various k values accordingly.

8.1.3 Liquefaction Potential

Liquefaction is a phenomenon in which saturated cohesionless soils are subject to a temporary but essentially total loss of shear strength under the reversing, cyclic shear stresses associated with earthquake shaking. Submerged cohesionless sands and silts of

low relative density are the type of soils, which usually are susceptible to liquefaction. Clays are generally not susceptible to liquefaction.

Based on the available boring data, the site is generally underlain by clayey materials overlying bedrock formation. Also, the groundwater is expected to be relatively deep. In general, the liquefaction potential along the project site should be low.

However, both Borings A-08-035 & A-08-036, drilled in the vicinity of Cattle Creek, encountered submerged, relatively loose sand lenses, which might be subject to liquefaction during earthquake. The sand lenses encountered are relatively thin (approximately 5 feet, between Elev. 225 and 230 feet in Boring A-08-035), and the laboratory test results indicate that the fines contents of those sand lenses appear to be relatively high (>30%). Therefore, surface manifestation of ground failure might not be anticipated. The extent and consequences of this liquefaction, in our opinion, could be limited to some post-liquefaction settlements of the ground surface. Based on the boring data, the estimated volumetric strain based on $(N_1)_{60}$ is approximately 2% per Tokimatsu and Seed (1987). Due to the high fines content, the volumetric strain is expected to be lower. The anticipated post-liquefaction may be on the order of 1 inch, and probably would be random and localized. The impact to the proposed culvert and the head walls is considered relatively insignificant.

Borings A-08-033 and A-08-034 were drilled in the vicinity of recently added Retaining Wall No. 10. Groundwater was encountered in A-08-033 at Elev. 250 feet, approximately 30 feet below grade. Submerged, loose to medium dense sand layer was encountered between Elev. 215 and 230 feet, which may be subject to liquefaction during a strong earthquake. However, the layer appears to be discontinuous, and it is located relatively deep (approximate 50 feet below existing grade). In our opinion, the upper clays are expected to bridge over, and the impact due to the potential liquefaction is considered relatively small.

8.2 Cuts and Excavations

Cut slopes along the north side of Route 12 are proposed for the project. Based on the sections provided by the designer, the cut slopes will be 2(H):1(V). Six borings, Borings R-09-160 thru R-09-165, were drilled in the vicinity of the cut slopes along the north side of Route 12 between Sta. 215+00 to 240+00. The borings generally encountered approximately 5 feet to 15 feet of lean clay/sandy lean clay overlying weathered claystone and sandstone. Based on the available geologic information and boring data, the existing conditions and recommendations for the proposed cut slopes are summarized in the following paragraphs.

- Between Sta. 215+00 and 219+40:

  At the planned cut area within this section, the bedrock is mapped as Markley Formation with bedding planes dipping at 45 degrees below horizontal toward the northwest. A former landslide repair exists between Stations 216+50 and 218+50 (Caltrans as-built, 1980). The repair consisted of installing subdrain trench and smoothing the slope. This repair work including the subdrain trench is expected to be completely removed as per the proposed plans.

  Boring R-09-160 encountered approximately 8 feet of lean clay/sandy lean clay overlying highly weathered claystone and sandstone formation. An oriented sample from Boring R-09-161 contained a bedding plane that dips at 28 to 32 degrees below horizontal toward the northwest (300 degree).

- Between Sta. 220+00 and 226+00

  At the planned cut area within this section, the bedrock is mapped as Markley Formation with bedding planes dipping 45 degrees below horizontal toward the northwest. Boring R-09-162 encountered approximately 5 feet of lean clay overlying weathered bedrock (sandstone and claystone). A bedding plane at a depth of 26 feet dips at 42 degrees (presumably toward the northwest).

- Between Sta. 229+20 and 234+00

  At the planned cut area within this section, the bedrock is mapped as Markley Formation with bedding planes dipping toward the northwest. Based on Manson's Landslide Hazard Identification Map, small earthflows ("filled arrowhead symbol indicates a slide too small to delineate at the scale of the map") on the slope above the planned cut slopes at Sta. 231+50 and 237+00 (Refer to Plate 2I). The project topographic contours and air-photos also indicate the presence of these small slides.

  Boring R-09-163, drilled at the location of proposed cut slope, encountered predominately clayey materials, including approximately 5 feet of lean clay overlying highly weathered claystone. The obtained sample contains bedding that dips at 49 degrees below horizontal.

- Between Sta. 234+00 and 241+50

  At the planned cut area within this section, the bedrock is mapped as Markley Formation with bedding planes dipping toward the northwest. A fault is mapped as crossing the right-of-way at Station 235+50; however, we did not observe evidence of it in the existing exposure. The eastern portion of the planned cut slope will cross a landslide run-out deposit east of Station 239+80; however, the deposit is not expected to exceed several feet in thickness.

  Borings R-09-164 encountered mostly weathered bedrock, and Boring R-09-165 encountered approximately 35 feet of clayey materials (including highly weathered claystone). An oriented sample from 6 feet deep contains a bedding plane that dips at 48 degrees towards southwest (225 degrees).

- Between Sta. 250+25 and 252+50

  At the planned cut area within this section, the bedrock is mapped as Markley Formation with bedding planes dipping toward the southeast. Based on the boring data in the vicinity (R-09-066), the subsoils consist of approximately 35 feet of clay overlying weathered sandstone and claystone. The extent of the proposed cut is relatively minor.

Based on the above, adverse bedding conditions are not anticipated at the proposed cut slopes. The proposed 2(H):1(V) cut slope is considered feasible at the planned locations.

8.2.1 Stability

Most of the cut within the project limit will be supported by soil nail/tieback walls. Cut slopes at 2(H):1(V) are proposed at various locations. Based on the subsoil condition and the bedding orientation, the stability of the proposed cut is considered satisfactory. We have conducted slope stability analysis on typical slope section at Sta. 232+00, and the slope is considered stable as per Caltrans guidelines for factor of safety.

8.2.2 Rippability

Based on the publication "Repeatability of Pre- and Post-Excavation Seismic Refraction Data at the New Benicia-Martinez Bridge Toll Plaza, Northern California", by Mr. Dennison Leeds (undated), we understand that Caltrans uses their own chart to correlate seismic velocity with rippability in lieu of other commonly-cited references (e.g. Caterpillar Handbooks). The standard Caltrans rippability correlation is as follows:

Velocity (m/s)	Velocity (ft/s)	Rippability
<1050	<3445	Easily Ripped
1050 – 1500	3445 – 4920	Moderately Difficult
1500 – 2000	4920 – 6560	Difficult Ripping/Light Blasting
> 2000	>6560	Blasting Required

Based on the available boring data within the wall vicinity, the bedrock is expected to be intensely weathered within the proposed cut area. In our opinion, blasting should not be expected in excavations for Retaining Walls No. 1 thru 3.

At the planned locations of Retaining Walls No. 4 thru 7, seismic refraction surveys have been performed by NORCAL Geophysical Consultants, Inc. Their report (dated November 3, 2008) explains how the data was collected and processed to produce the color-coded seismic velocity cross-sections which display layers of equal compressional wave velocities. (Refer to Appendix D for the NORCAL report.)

Due to the steepness of the existing terrain, access issues, and equipment limitations, the seismic refraction surveys could not reach downhill to the planned locations of Retaining Walls No. 6, 7A & 7B (between Sta. 338+00 and Sta. 352+00), and horizontal drilling from the existing roadway level was considered impractical along the proposed wall locations. Therefore, for the purpose of estimating rock rippability, we have extrapolated the velocity data downslope. (Refer to Cross-Section 345+00 in Plate 6F.) We have also correlated compressional wave velocity (Vp) with the unconfined compressive strength test results according to Sharma & Singh (2007). The unconfined compressive strengths and the correlated Vp velocities are summarized in the following table:

Boring No.	Depth (ft)	UCS (psi)	Correlated Vp (ft/s)
R-08-048 (RW-19)	52 – 53	1120	6425
	68 – 69	1120	6425
	91 – 92	890	6344
	105.5 – 106	1180	6692

Based upon currently available data, we anticipate that excavations necessary for construction of Retaining Walls No. 4A, 4B, 5A, 5B and a majority of No. 6, 7A & 7B have rippable rock conditions. The deepest portions of the excavations necessary to construct

Retaining Walls No. 6 and 7A may consist of materials that are considered difficult to rip per Caltrans rippability criteria (unweathered bedrock with p-wave velocities greater than 5000 ft/sec). The contractor should evaluate the available data and select proper equipment to mitigate such rock conditions.

8.2.3 Grading Factor

The on-site native soil meeting the project specifications may be used as engineered fill. For preliminary estimate, a grading factor of 1.0 may be assumed based on previous experience.

8.2.4 Access Road

Ten-foot wide access roads are proposed beyond the Caltrans' right-of-way at various locations (approximately from Sta. 216+03 to 245+53, Sta. 249+69 to 272+90, and Sta. 285+80 to 300+58). These areas are within private properties, which will provide vehicular access for the property owners behind some of the proposed improvements.

It is recommended that the future slope be 2(H):1(V) or flatter and reduce substantial under cutting of the upper slopes. Consequently, the road way profiles were strategically selected by the designer so that minimal cut is required and the existing slope conditions may be maintained. Based on the plans provided, the maximum height of the cut is expected on the order of 2 feet. Gabions are planned for supporting the cut where the existing slope is steeper than 2(H):1(V) to avoid removing excess materials along the slope.

Minor fill slope is planned for the proposed access road. Fill materials should be placed in accordance with the specification set forth in Caltrans Standard Specification, Section 19. The materials should be free of organic or other deleterious materials and have maximum PI of 15. It is not anticipated, however, if any of the soil nail is expected to be embedded within fill zone, the fill should also have minimum PI of 8. All the materials within the wall limit should be compacted to minimum 95% per project specification.

In our opinion, the minor cut with gabions and sliver fill for the proposed access road within the project limit are considered reasonable and should not have significant impact to the current design and the existing slopes. Like any other hillside slopes, raveling, slope wash, slumps and debris flows are common, have been occurring along the existing hillside, and should be expected in the future. Therefore, the access road will require regular maintenance.

8.3 Embankments

8.3.1 Evaluation of Embankment Settlements

There is no major fill embankment for the proposed widening. The subject was considered and was determined to be not applicable for the project.

8.3.2 Evaluation of Embankment Stability

There is no major fill embankment for the proposed widening. The subject was considered and was determined to be not applicable for the project.

8.4 Earth Retaining Systems

For the proposed project, a total of ten retaining walls are planned along Route 12 to accommodate the future widening. For Retaining Walls No. 1 to 7, the walls will support the cut slopes and the design wall heights are relatively tall. Therefore, it is planned to use ground anchor systems to support the cut slope at these locations. Per our discussion with the designer, it is planned to use soil nail walls at most of the locations. For Retaining Walls No. 3B, 4A & 5B, tieback walls are proposed due to the presence of apparent landslide deposits that originated from a source area located uphill of these wall locations. These retaining structures are non-standard walls (soil nail & tieback walls), and the recommendations will be submitted in separate foundation reports.

Retaining Wall No. 8 is proposed at the eastern end of the project along the north side of the alignment. This will be a fill wall, and it is planned to use Caltrans Standard Type 1 (mod.) wall to support the proposed widening, and the design wall heights vary from 8 to 12 feet. Two additional walls, Retaining Walls No. 9 & 10, were added into the project scope during the 95% design phase because of the alignment change. Caltrans standard Type 5 (mod.) retaining walls are planned at these two locations to minimize the impact on the right-of-way.

Per our discussion with the designer, Caltrans standard wall design will be applied to majority of these three walls. However, the configurations of the wall will be modified from the standard design at the locations where culvert/pipe crosses the walls, and additional loads are anticipated. These walls will be specially designed, and the recommendations will be presented in the foundation report. In this report, we have provided the recommendation for the proposed Retaining Walls No. 8 thru 10 where the Caltrans standard design applies. Information about wall locations, type of walls, and wall configurations are summarized below.

TABLE 5 – Retaining Wall Summary

Wall No.	Bridge Number	Wall Type	Station	Total Length (ft)	Max. Wall Height (ft)
RW No. 9A	21E0013	Type 5 (mod.)	(JCR1) 240+00 – (JCR1) 242+00	534±	8±
RW No. 9B			(JCR1) 246+07 – (JCR1) 249+87	382±	12±
RW No. 10	23E0015	Type 5 (mod.)	(JCR2) 290+05 – (JCR2) 299+20	1022±	12±
RW No. 8	23E0014	Type 1 (mod.)	(JC) 358+81 – (JC) 364+44	567.5±	20±

– ***Retaining Wall No. 8,*** *"JC" Sta. 358+81 to "JC" Sta. 364+44*

Retaining Wall No. 8 is located along the north side of westbound Route 12. The wall is approximately 567.5 feet long with maximum wall height of 20 feet. Based on the boring data, Boring A-09-058, located at the western end of the wall, encountered mainly sandy

lean clay with interbedded sand layers. Boring A-09-059, located at the eastern end of the wall, encountered more granular materials to 50 feet, the maximum depth drilled. Groundwater was encountered at approximate 40 feet below existing grade in Boring A-09-059.

According to the plans provided, the proposed wall will be cantilever wall. Majority of the wall designed based on Caltrans standard Type 1 wall, to support the proposed widening. The design wall heights range from 4 to 20 feet. There is an existing culvert located at approximate Sta. 360+60. On both sides of the existing culvert, the design wall height is up to 20 feet. Additional loads are anticipated to be transferred from the portion of the wall above the culvert. Therefore, these portions of the wall are expected to be specially designed.

Based on the planned footing elevations and boring data, the recommended allowable bearing capacities are shown as follows.

Location	Allowable Bearing Capacity
West of Sta. 359+88	3 ksf
Sta. 359+88 – Sta. 362+45	4.5 ksf
East of Sta. 362+45	3 ksf

Caltrans standard Type 1 wall supported on spread footings should be feasible for the proposed retaining wall. However, the design wall height between Sta. 359+88 and 362+45 are relatively tall, ranging from 12 to 20 feet. In order to provide uniform support and account for local irregularity, it is recommended that the subgrade be over-excavated 2 feet below the bottom of the footing and replaced with compacted Class 3 Aggregate Base rock (AB3) within this section. It is also recommended that a layer of geosynthetic reinforcement be placed at the bottom of the compacted AB3 layer to control bearing pressure and differential settlement.

In addition, the subgrade at the culvert may be relatively wet and soft. Should soft subgrade or groundwater be encountered during footing excavation, where it is difficult to achieve required compaction, Lean Concrete Base (LCB) may be considered as an alternative in lieu of AB3 with geosynthetic reinforcement.

- ***Retaining Wall No. 9A,*** *"JCR1" Sta. 240+00 to "JCR1" Sta. 242+00*
  Retaining Wall No. 9B, *"JCR1" Sta. 246+07 to "JCR1" Sta. 249+87*
  Retaining Wall No. 9 is located along the south side of eastbound Route 12. The wall was added into our project scope prior to the 95% submittal due to right-of-way issue. The wall is approximately 982 feet long with maximum wall height of 12 feet. Due to the limited right-of-way, it is planned to use Caltrans standard Type 5 wall to support the proposed widening. There is an existing culvert located at approximate Sta. 246+50. On both sides of the existing culvert, the design wall height is up to 12 feet. Additional loads are anticipated to be transferred from the portion of the wall above the culvert. Therefore, these portions of the wall are expected to be specially designed, which will be modified from Caltrans standard Type 5 wall.

  Based on the boring data (A-09-021 thru A-09-023), the subgrade mainly consists of lean clay to approximate Elev. 270 feet to 280 feet. Below this depth, the borings encountered weathered bedrock. Groundwater was encountered at approximate Elev. 289 feet in Boring A-09-023 and Elev. 267 feet in Boring A-09-021 during field exploration. However, groundwater was not encountered in Boring A-09-022. In our opinion, the groundwater may be perched water between the alluvium and bedrock.

  According to the proposed footing elevations and subsurface conditions, the recommended allowable bearing capacity is 2.5 ksf. Per Caltrans standard plan (Sheet B3-7), the bearing capacity is sufficient for design wall height up to 8 feet (Loading Case I).

In order to lower the footing contact pressure and account for the local irregularity at the footing subgrade, it is recommended that the subgrade be over-excavated 2 feet below the bottom of the footing and replaced with compacted Class 3 Aggregate Base rock (AB3). It is also recommended that a layer of geosynthetic reinforcement be placed at the bottom of the compacted AB3 layer to control bearing pressure and differential settlement for the design wall height of 10 feet. This pad should serve as a "load distribution bridge" for reducing loads and differential settlements. The contact pressures at the bottom of the pad is anticipated to be 2.4 ksf (footing pressure of 3.0 ksf for wall height of 10 feet, with 2-foot-thick pad), which is less than the recommended allowable pressure of 2.5 ksf. In our opinion, Caltrans Standard Type 5 wall supported on spread footing is considered feasible for Retaining Wall No. 9 with proposed subgrade improvement for design wall height equal or less than 10 feet.

On both sides of the existing culvert, the design wall height is 12 feet. Due to the additional loads transferred from the portion of the wall above the culvert, the anticipated footing pressure is approximately 3.7 ksf. Therefore, it is recommended that the subgrade be over-excavated 3 feet below the bottom of the footing and replaced with compacted Class 3 Aggregate Base rock (AB3) and a layer of geosynthetic reinforcement within these sections. This pad should serve as a "load distribution bridge" for reducing loads and differential settlements. Therefore, with consideration of the proposed pad, it is recommended that the footing be design based on an equivalent allowable bearing capacity of 3.7 ksf.

The contact pressures at the bottom of the pad is anticipated to be 2.4 ksf (footing pressure of 3.0 ksf for wall height of 10 feet, with 2-foot-thick pad) and 2.2 ksf (footing pressure of 3.6 ksf for wall height of 12 feet, with 3-foot-thick pad), which are less than the recommended allowable pressure of 2.5 ksf. Caltrans Standard Type 5 (mod.) wall

supported on spread footing is considered feasible for Retaining Wall No. 9 with proposed subgrade improvement. The wall should be designed according to the footing pressure per Caltrans standard plan.

It is expected that the subgrade at the culvert may be relatively wet and soft. Should soft subgrade or groundwater be encountered during footing excavation, where it is difficult to achieve the required compaction, Lean Concrete Base (LCB) may be considered as an alternative in lieu of compacted AB3 and geosynthetic reinforcement.

- ***Retaining Wall No. 10,*** *"JCR2" Sta. 290+05 to "JCR2" Sta. 299+20*

  Retaining Wall No. 10 is located along the south side of eastbound Route 12. The wall is approximately 1022 feet long with maximum wall height of 12 feet. According to our discussion with the designer, the majority of the wall will be cantilever wall, which will be designed based on Caltrans standard Type 5 wall, to support the proposed widening. The design wall heights range from 4 to 12 feet. However, there is an existing culvert located at approximate Sta. 290+75. For the wall portion located on both sides of the existing culvert, additional loads are anticipated to be transferred from the wall above the culvert. Therefore, the design of these wall segments will be specially designed, which is modified from Caltrans standard type 5 wall.

  Based on the boring data (A-09-032, A-08-033 & A-08-034), the subgrade mainly consists of lean clay. Sand layers were encountered at various depths. Groundwater was encountered at approximate Elev. 264 feet in Boring A-09-032 and Elev. 250 feet in Boring A-08-033 during field exploration. According to the proposed footing elevations and subsurface conditions, the recommended allowable bearing capacity is 3 ksf west of Sta. 291+00 and 2.75 ksf east of Sta. 290+00. The bearing capacity is slightly lower than the required number shown on the standard plans (Loading Case I, design toe pressure of 2.5 ksf, 3.0 ksf & 3.6 ksf for wall height of 8 feet, 10 feet & 12 feet, respectively).

In order to lower the footing contact pressure and account for the local irregularity at the footing subgrade, it is recommended that the subgrade be over-excavated 2 feet below the bottom of the footing and replaced with compacted Class 3 Aggregate Base rock (AB3) for the design wall height greater than 10 feet. It is also recommended that a layer of geosynthetic reinforcement be placed at the bottom of the compacted AB3 layer to control bearing pressure and differential settlement.

An existing culvert is located at approximate Sta. 290+80. The subgrade may be relatively wet and soft. Should soft subgrade or water be encountered during footing excavation, Lean Concrete Base (LCB) may be used instead of compacted AB3 and geosynthetic reinforcement. This pad should serve as a "load distribution bridge" for reducing loads and differential settlements. With the proposed over-excavation, the footing contact pressure can be reduced by approximately 20%.

However, between Sta. 297+00 and 297+50, it is recommended that the subgrade be over-excavated 3 feet below the bottom of the footing and replaced with compacted Class 3 Aggregate Base rock (AB3) and a layer of geosynthetic reinforcement for the design wall height of 12 feet. It is our opinion that Caltrans Standard Type 5 (mod.) wall supported on spread footing is considered feasible for Retaining Wall No. 10 with proposed subgrade improvement.

Submerged, loose silty sand pockets were encountered at about Elev. 245 to 250 feet and 225 to 240 feet in Borings A-08-033, which may be subject to liquefaction during earthquake. Liquefaction potential in the other two borings (A-09-032 & A-08-034) appears to be low. Those layers in Boring A-08-033 appear to be relatively deep and considered discontinuous based on the comparison of nearby borings.

The consequence may be limited to post-liquefaction settlement, which probably would be random and localized. With the recommended subgrade improvement, the impact due to the potential liquefiable layer may be reduced. In addition, the overlying clayey materials are relatively thick (greater than 20 feet), which may bridge over the liquefiable sand layer when volumetric change occurs. Therefore, the impact due to liquefaction is considered low at this wall location.

8.5 Culverts

8.5.1 New Culverts at Cattle Creek

Based on our discussion with the designer and the preliminary plans provided, it is planned to construct a new concrete box culvert, which will provide passage for the animals crossing through Route 12. Per our discussion with the designer, the box culvert is expected to be 12 feet wide and 12 feet tall, located on the east side of the Cattle Creek.

The boring data (A-08-035 & A-08-036) indicated that the subsoil consists of mainly firm lean clay with interbedded sand lenses. Groundwater was encountered at Elev. 225 feet, about 17 to 19 feet below existing grade. Based on the proposed dimension, the anticipated invert elevation is approximately 15 feet below grade. According to the footing elevation and the subsoil conditions, the estimated allowable bearing capacity is 2000 psf for the proposed culvert.

Both Borings A-08-035 & A-08-036 encountered submerged, loose sand lenses, which might be subject to liquefaction during earthquake. The sand lenses encountered are relatively thin, and the laboratory test results indicate that the fines contents of those sand lenses appears to be relatively high (>30%). Therefore, surface manifestation of ground failure might not be anticipated. The extent and consequences of this liquefaction, in our opinion, could be limited to some post-liquefaction settlements of the ground surface on the order of 1 inch, and probably would be random and localized. The impact to the proposed culvert is considered relatively insignificant.

Due to the presence of the liquefiable sand and high groundwater table, it is recommended to construct a working platform to stabilize the subgrade along the proposed culvert. The pad should also serve as a "load distribution bridge" for reducing loads and differential settlements. This platform should consist of a minimum of 24 inches of compacted Class 3 Aggregate Base (AB3) and a layer of geosynthetic reinforcement. Should soft subgrade or groundwater be encountered during footing excavation when required compaction cannot be achieved, Lean Concrete Base (LCB) may be used in lieu of compacted AB3 and geosynthetic reinforcement. With the recommended platform, the impact due to the potential liquefiable layer may be reduced. In addition, tremie concrete seal may be required if significant water is encountered during construction.

The recommendations of the head walls are provided in the Foundation Report, which is submitted separately.

8.5.2 Corrosion Investigation

During our investigation, corrosion tests were performed on selected samples along the project limit. The corrosion investigation for this project was performed in general accordance with the provisions of California Test Method 643. A summary of the corrosion test results is presented in Table 6. Based on the results obtained, corrosion analyses were carried out using Caltrans CULVERT4 program. The analysis results and general recommendations for culverts are presented in Table 6.

Based on CULVERT4 analysis, standard reinforced concrete pipe design is suitable with Type IP (MS) modified cement or Type II Modified cement. This is a minimum requirement as per Caltrans Bridge Design Specifications (Section 8.22). Based on the results from CULVERT4 analysis, the uncoated corrugated steel/Steel spiral rib pipes are generally feasible for the pipe design for the entire corridor. The thickness of the pipes may vary from location to location.

Based on the results, most area within the project is not suitable for corrugated aluminum and corrugated aluminized steel pipe. For steel pipes, 18-gage thick pipe can be used [50-yr., Galv. with polymeric coat. (90° invert)]. Thermoplastic pipe can be used as an alternative and should not have any corrosion concerns. However, the types of thermoplastic pipe that can be used will depend on the height of fill, available sizes and manufacturer's specifications.

We have performed the analyses by using CULVERT4 program, which relies on the test results of resistivity, pH, sulfate and chloride contents. It is our understanding that a new web-based program "Altpipe" has been developed by Caltrans, which allows the designer to perform more specific culvert/pipe design. The civil/hydraulic designer may verify the culvert design by using "Altpipe" during the subsequent design phase with the corrosion test results provided in this report.

TABLE 6 – Summary of Corrosion Test Results

Boring No.	Station (ft)	Offset From "JC" Line (ft)	Corrosion Test Results					
			Sample No.	Depth (ft)	pH	Resistivity (ohm-cm)	Chloride (ppm)	Sulfate (ppm)
A-09-022	245+80	Rt. 12±	3	9.5	6.31	1610	23.0	6.2
A-08-024	254+00	Rt. 10±	2	5	7.03	1150	13.9	8.3
A-08-030	290+00	Lt. 60±	2	10	7.95	1310	80.2	95.7
A-09-032	280+60	Rt. 40±	3	9.5	7.75	940	61.3	124.0
A-08-034	295+80	Rt. 60±	2	5	6.56	2650	8.8	3.0
A-08-035	309+22	Lt. 25±	2	4.5	7.77	1020	34.7	77.8
A-08-036	311+00	Rt. 65±	4	14.5	6.93	1070	30.9	83.2
R-09-038	317+50	Lt. 26±	2	6	7.30	380	484.5	364.6
R-08-039	321+10	Lt. 100±	3	11	6.18	1610	26.5	12.6
A-08-041	320+02	Rt. 40±	2	5	6.40	2390	11.7	5.6
A-08-052	330+30	Rt. 52±	2	5	7.32	560	25.6	3.4
R-08-043	331+40	Lt. 52±	1	6	7.68	860	204.7	373.9
A-08-057	357+50	Rt. 90±	1	2	7.31	1230	12.9	27.6
R-09-067	259+35	Lt. 30±	2	6	7.62	670	122.4	64.2

* The boring locations were not surveyed and are approximate based on the plans provided by the designer.

TABLE 7 – Recommended Minimum Thickness and Protective Measures for Culverts

Location			Culvert Type		Corrugated Steel / Steel Spiral Rib Pipe (Galv., gage)			Reinforced Concrete	Corrugated Aluminum (gage)	Corrugated Aluminized Steel (Type 2, gage)	Steel Pipe (Gal., gage)
			Est. Service Life (yr.)		25	50	50		50	50	50
Boring Number	Station & Offset*		Resistivity (ohms-cm)	PH	Galv.(57g)		Bit. Coat. (Soil Sides)				Polymeric Coat. (90° Invert)
A-09-022	245+80	Rt. 12±	1610	6.31	12	-	12	Note (1)**	16	16	18
A-08-024	254+00	Rt. 10±	1150	7.03	14	10	14	Note (1)	No	No	18
A-08-030	290+00	Lt. 60±	1310	7.95	18	12	12	Note (1)	No	No	18
A-09-032	280+60	Rt. 40±	940	7.75	16	12	16	Note (1)	No	No	18
A-08-034	295+80	Rt. 60±	2650	6.56	14	10	14	Note (1)**	16	16	18
A-08-035	309+22	Lt. 25±	1020	7.77	18	12	18	Note (1)*	No	No	18
A-08-036	311+00	Rt. 65±	1070	6.93	14	8	14	Note (1)**	No	No	18
R-09-038	317+50	Lt. 26±	380	7.30	14	8	14	Note (1)*	No	No	18
R-08-039	321+10	Lt. 100±	1610	6.18	12	-	12	Note (1)**	16	16	18
A-08-041	320+02	Rt. 40±	2390	6.40	14	8	14	Note (1)**	16	16	18
A-08-052	330+30	Rt. 52±	560	7.32	16	10	16	Note (1)	No	No	18
R-08-043	331+40	Lt. 52±	860	7.68	16	12	16	Note (1)	No	No	18
A-08-057	357+50	Rt. 90±	1230	7.31	18	12	18	Note (1)	No	No	18
R-09-067	259+35	Lt. 30±	670	7.62	16	10	14	Note (1)	No	No	18

Alternative Design: Thermoplastic pipe can be used as an alternative and should not have any corrosion concerns. However, the types of thermoplastic pipe can be used will depend on the height of fill, available sizes and manufacturer's specifications.

Note (1): Standard reinforced concrete pipe design is suitable with Type IP (MS) modified cement or Type II Modified cement, minimum required by Caltrans Std. Specs 90-1.01.

* Ref. Line: "JC" Line.
**Maximum W/C ratio of 0.45.

8.6 Minor Structures

No other minor structure is planned for the proposed widening project.

9. STRUCTURAL PAVEMENT

R-value tests were conducted on representative samples collected at proposed subgrade level. We have also reviewed the Caltrans internal design memorandum (dated April, 2008) and included the six test results (S-1 thru S-6) as the basis of our evaluation. The test results are summarized in the following table.

TABLE 8 – Summary of R-value Test Results

Boring No.	Station**	Offset From "JC" Line (ft)**	Soil Description	R-Value Test Results
A-08-101 (R-1)	100+00	Lt. 42±	Clay with gravel and roots, brown	11
A-08-102 (R-2)	110+00	Lt. 45±	Sandy lean clay, brown	12
A-08-103 (R-3)	120+00	Rt. 55±	Lean clay, brown	6
A-08-104 (R-4)	130+00	Rt. 10±	Clay with gravel, dark brown	4
A-08-105 (R-5)	140+00	Rt. 23±	Clay with gravel, brown	7
A-08-106 (R-6)	150+00	Rt. 12±	Lean clay, brown	<5
S-1*	159+18	Rt. 30±	(n/a)	17
A-08-107 (R-7)	170+00	Rt. 38±	Clay with gravel, brown	12
A-08-108 (R-8)	180+00	Rt. 39±	Sandy lean clay with gravel, brown	24
A-08-109 (R-9)	190+00	Rt. 28±	Sandy clay with gravel and roots, brown	18
A-08-110 (R-10)	200+00	Rt. 37±	Sandy clay with gravel and roots, brown	22
S-2*	222+00	Rt. 50±	(n/a, LL=55, PI=32)	7
A-08-114 (R-14)	254+00	Rt. 8±	Clay with gravel, brown	9
A-08-115 (R-15)	265+00	Rt. 20±	Clay, brown	<5
S-3*	271+00	Rt. 51±	(n/a)	31
A-08-116 (R-16)	285+15	Rt. 42±	Clayey silt, brown	28
A-08-117 (R-17)	290+10	Rt. 42±	Clay with gravel and roots, brown	9
A-08-118 (R-18)	300+00	Rt. 51±	Clay with some gravel and roots, brown	<5
A-08-119 (R-19)	310+80	Rt. 45±	Heavy clay with roots, brown	6
S-4*	323+00	Rt. 50±	(n/a, LL=50, PI=31)	11
A-08-120 (R-20)	334+32	Rt. 80±	Clay with gravels and roots, brown	16
S-5*	376+12	Rt. 41±	(n/a)	15
S-6*	395+25	Rt. 42±	(n/a)	36

* Note: The test results of S-1 to S-6 were quoted from Caltrans internal design memorandum (dated April, 2008), and the locations are approximate.

**The boring locations were not surveyed and are approximate based on the plans provided by the designer.

Traffic Index (TI) for design was provided by Caltrans. For the proposed widening, TI of 12.5 was provided for 20-year design. Based on the test results and the subgrade conditions, relatively low R-values are expected for the majority portion of the project. After reviewing the test results, lower R-values were used for the pavement design to account for the subgrade variation throughout the alignment. We have assumed an R-value of 5 for pavement design between Sta. 90+00 to 160+00 and 210+00 to 330+00, and R-value of 15 between Sta. 160+00 to 210+00 and 330+00 to 395+00.

Due to the relatively high design TI of 12.5, we have also provided structural pavement section that consists of Lean Concrete Base for better stability and performance. Per State of California Department of Transportation design procedures (Highway Design Manual - Section 600), the recommended structural pavement sections are tabulated in the following table

TABLE 9 – Structural Pavement Sections

TI	R-value	Sections	Structural Pavement Sections (ft)							
			Option 1				Option 2			
			RHMA	HMA	AB	AS	RHMA	HMA	LCB	AS
12.5	5	90+00 – 160+00 210+00 – 330+00	0.20	0.45	1.00	1.60	0.20	0.40	0.65	1.60
	15	160+00 – 210+00 330+00 – 395+00	0.20	0.45	1.00	1.20	0.20	0.40	0.65	1.20

Note: TI: Traffic Index; RHMA: Rubberized Hot Mix Asphalt; HMA: Hot Mix Asphalt; AB: Aggregate Base (Class 2 or 3) with R-value of 78; AS: Aggregate Sub-base (Class 4) with the R-value of 50.

Where the major excavation is planned, approximately between Sta. 330+00 and 360+00, bedrock should be exposed at the pavement subgrade. Based on the boring data and the site geology, the bedrock consists of sandstone with claystone beds. Claystone may shrink or swell due to moisture fluctuation. Therefore, it is recommended that the subbase or base materials should be placed as soon as possible to prevent the subgrade being dried out. In addition, prior to the construction of the pavement, the subgrade should be moisture conditioned at least 2% over optimum moisture content and compacted per project specification. Proper drainage features, such as toe drain, should be provided to reduce the moisture fluctuation of the subgrade.

Within the same section, ground heave may also occur due to stress relief. However, the anticipated heave should be in the elastic range and should happen relatively fast. Due to the uncertainty of the exposed rock, we have conservatively recommended the pavement sections based on R-value of 15 to provide reasonable coverage to account for the issues mentioned above.

The existing pavement subgrade has variable soil conditions. However, predominantly, the R-values are low. Some of the cuts may encounter sandy soil pockets which are not conducive to lime treatment. It should be noted that lime treatment is not considered appropriate for this project.

Toe Drains. Based on the existing terrain along the project corridor, hillside seepage may be encountered from the adjacent uphill slopes. Such moisture penetrations in pavement layers, when combined with heavy traffic load, could compromise the service life of the pavement.

Therefore, toe drains are recommended where the cut slopes or walls toe into the roadway. This a permanent feature and it is installed between the toe of the slope and the pavement improvement including shoulder and any future widening. It is recommended that the toe drains (underdrains) be installed where the cuts/slopes exceed 5 feet in height. This underdrain system is considered to be an interceptor drain to collect seepage from the uphill slopes before it reaches the pavement subgrade. The bottom of the trench is recommended to be minimum 12 inches below the pavement subgrade and 20 inches wide with an 8 inch diameter perforated pipe. The drain rock is to be wrapped in filter fabric. The design of the toe drains should conform to Caltrans standard plan (Sheet D102). Wherever applicable, pavement structural sections (beginning with the base layers) can be placed above the underdrain system.

10. MATERIAL SOURCES

There are several commercial sources of asphalt, concrete, and aggregate products in the area. The following table lists available commercial suppliers in the area.

TABLE 10 – Sources of Imported Borrow

Source	Location	Approx. Haul Dist. (one way, miles)
Syar Industries, Inc.	Vallejo, Lake Herman Rd	6.5
County Quarry Products LLC	Martinez, Imhoff Pl	15
Soils Plus	Sonoma, Stage Gulch Rd	17

11. MATERIAL DISPOSAL

Majority of the project will require off haul (cut) for the proposed widening. Prior to exporting, the materials should be tested for contamination in accordance with the recommendation of the environmental report.

12. CONSTRUCTION CONSIDERATIONS

12.1 Construction Advisories

The following sections of the report include comments related to footing excavation, earthwork and other geotechnical aspects of the proposed construction. The sections are written primarily for the engineer responsible for the preparation of plans and specifications. Since these sections identify potential construction issues related to the project, it may also be of use to the Agency's representatives involved in monitoring of construction activity. The field investigation performed by us primarily addresses design issues and was not planned specifically to identify construction issues.

Prospective contractors for the project must evaluate construction-related issues on the basis of their own knowledge and experience in the local area, on the basis of similar projects in other localities, or on the basis of field investigation on the sire performed by them, taking into account their proposed construction methods and procedures. In addition, construction activities related to excavation and lateral earth support must conform to safety requirements of OSHA and other applicable municipal and Stage regulatory agencies.

In our opinion, conventional equipment may be used to excavate the on-site soil materials. The materials to be excavated may consist loose to medium dense sand with varying amounts of silt and gravel followed by firm to very stiff clayey soils. Concrete slab was encountered in Boring A-08-103 (R-3) at station 125+00. Several underground utilities exist at the site. It is possible that unknown old buried utilities or abandoned structures, concrete rubble etc. are located along the alignment. It might require special equipment and additional efforts to remove these buried objects.

12.2 Hazardous Waste Considerations

The project environmental study report (if any) should be referred to for further details at this site.

12.3 Differing Site Conditions

The soil conditions described in this report are based on available boring data. It should be noted that these borings depict subsurface conditions only at the locations drilled. Because of the variability from place to place within soils in general, and the nature of geologic depositions, subsurface conditions could change between the explored locations.

Early communication should be made between the Resident Engineer, the Contractor, and the Geotechnical Engineer as soon as conditions that differ from those established in this report are recognized by any of the parties. Additional recommendations could be provided if such conditions arise.

13. RECOMMENDATIONS AND SPECIFICATIONS

13.1 Summary of Recommendations

If the designer has questions or concerns with any of these recommendations, or, if conditions are found to be different during construction, the Geotechnical Engineer who prepared this

report should be contacted. Additional fieldwork, analysis or changes in recommendations may be required. These services may be provided under a separate authorization, as necessary. A concise summary of the geotechnical recommendations is presented below:

- The subsoils generally consist of lean/fat clay (alluvium) and sand (highly weathered sandstone) overlying bedrock (Markley Formation) (Ref.: 7.2).
- For the proposed cut, adverse bedding condition is not anticipated. Based on the subsoil condition and bedding orientation, the proposed 2(H):1(V) slope is considered feasible.
- Based on our investigation, the proposed retaining walls appear to be feasible. (Ref.: Section 8.4)
- Pavement Sections (Ref: Section 9). For the recommended pavement sections refer to Table 8.

13.2 Recommended Materials Specifications

13.2.1 Standard Specifications

Unless otherwise stated in the special provisions, all materials specifications should conform to Caltrans Standard Specifications, May 2006 edition, including but not limited to the following: Earthwork, Structure Backfill, Pervious Backfill Material, Reinforcing Geofabric, Thermoplastic Pipes, Asphalt Concrete, Aggregate Base, Aggregate Subbase, Cement Treated Base, etc.

13.2.2 Special Provisions

<u>Imported Borrow:</u>

Imported material should be in accordance with the specifications set forth in Caltrans Standard Specifications, Section 19. In particular, for new embankment/roadway construction, the material placed within 4 feet of the finish pavement subgrade should meet the following requirements:

1. Free of organic or other deleterious materials.
2. An R-value of no less than 15.

Aggregate Base

Class 3 aggregate base shall conform to the provisions in Section 26 of the Standard Specifications and to these Special Provisions. It shall also be clean and free from organic matter and other deleterious substances. The percentage composition by weight of Class 3 aggregate base shall conform to the following grading as determined by California Test Method No. 202.

Gradation Requirement (Percent Passing)

Sieve Sizes	1-1/2 inch Maximum		¾ inch Maximum	
	Operating Range	Contract Compliance	Operating Range	Contract Compliance
2"	100	100		
1-1/2"	90 – 100	87 - 100		
1"	--	--	100	100
¾"	50 – 85	45 – 90	90 – 100	87 – 100
No. 4	24 - 45	20 – 50	35 – 60	30 – 65
No. 30	10 – 25	6 – 29	10 – 30	5 – 35
No. 200	2 – 11	0 – 14	2 – 11	0 – 14

Quality requirements

California Test Method	Operating Range	Contract Compliance
Sand Equivalent (217)	25 min.	22 min.
Resistance (R-value) (301)	-	78 min.
Durability Index	-	35 min.

Aggregate Subbase

Aggregate Subbase shall be Class 4 and shall conform to the provisions in Section 25 of the Standard Specifications and to these Special Provisions. Class 4 aggregate subbase shall be clean and free from organic matter and other deleterious substances. The percentage composition by weight of Class 4 aggregate subbase shall conform to the following grading as determined by California Test Method No. 202.

Gradation Requirement (Percent Passing)

Sieve Sizes	Operating Range	Contract Compliance
2-1/2"	100	100
No. 4	30 – 65	25 – 70
No. 200	0 – 15	0 – 18

Class 4 aggregate subbase shall also conform to the quality requirements given on the following table:

Quality requirements

California Test Method	Operating Range	Contract Compliance
Sand Equivalent (217)	21 min.	18 min.
Resistance (R-value) (301)	50	50 min.

14. INVESTIGATION LIMITATIONS

Our services consist of professional opinions and recommendations made in accordance with generally accepted geotechnical engineering principles and practices and are based on our field exploration and the assumption that the soil conditions do not deviate from observed conditions.

No warranty, expressed or implied, of merchantability or fitness, is made or intended in connection with our work or by the furnishing of oral or written reports or findings. The scope of our services did not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in structures, soil, surface water, groundwater or air, below or around this site. Unanticipated soil conditions are commonly encountered and cannot be fully determined by taking soil samples and excavating test borings; different soil conditions may require that additional expenditures be made during construction to attain a properly constructed project. Some contingency fund is thus recommended to accommodate these possible extra costs.

This report has been prepared for the proposed project as described earlier, to assist the engineer in the design of this project. In the event any changes in the design or location of the facilities are planned, or if any variations or undesirable conditions are encountered during construction, our

findings and recommendations shall not be considered valid unless the changes or variations are reviewed and our recommendations modified or approved by us in writing.

This report is issued with the understanding that it is the designer's responsibility to ensure that the information and recommendations contained herein are incorporated into the project and that necessary steps are also taken to see that the recommendations are carried out in the field.

The findings in this report are valid as of the present date. However, changes in the soil conditions can occur with the passage of time, whether they are due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or from the broadening of knowledge. Accordingly, the findings in this report might be invalidated, wholly or partially, by changes outside of our control.

Respectfully submitted,
PARIKH CONSULTANTS, INC.

REGISTERED PROFESSIONAL ENGINEER
GAURANG R. PARIKH
No. 666
EXP. 12-31-09
GEOTECHNICAL
STATE OF CALIFORNIA

Frank Y. Wang, P.E., 67751
Project Engineer

Gary Parikh, P.E., G.E., 666
Project Manager

James Baker, C.E.G., 1021 exp 10/2011
Engineering Geologist

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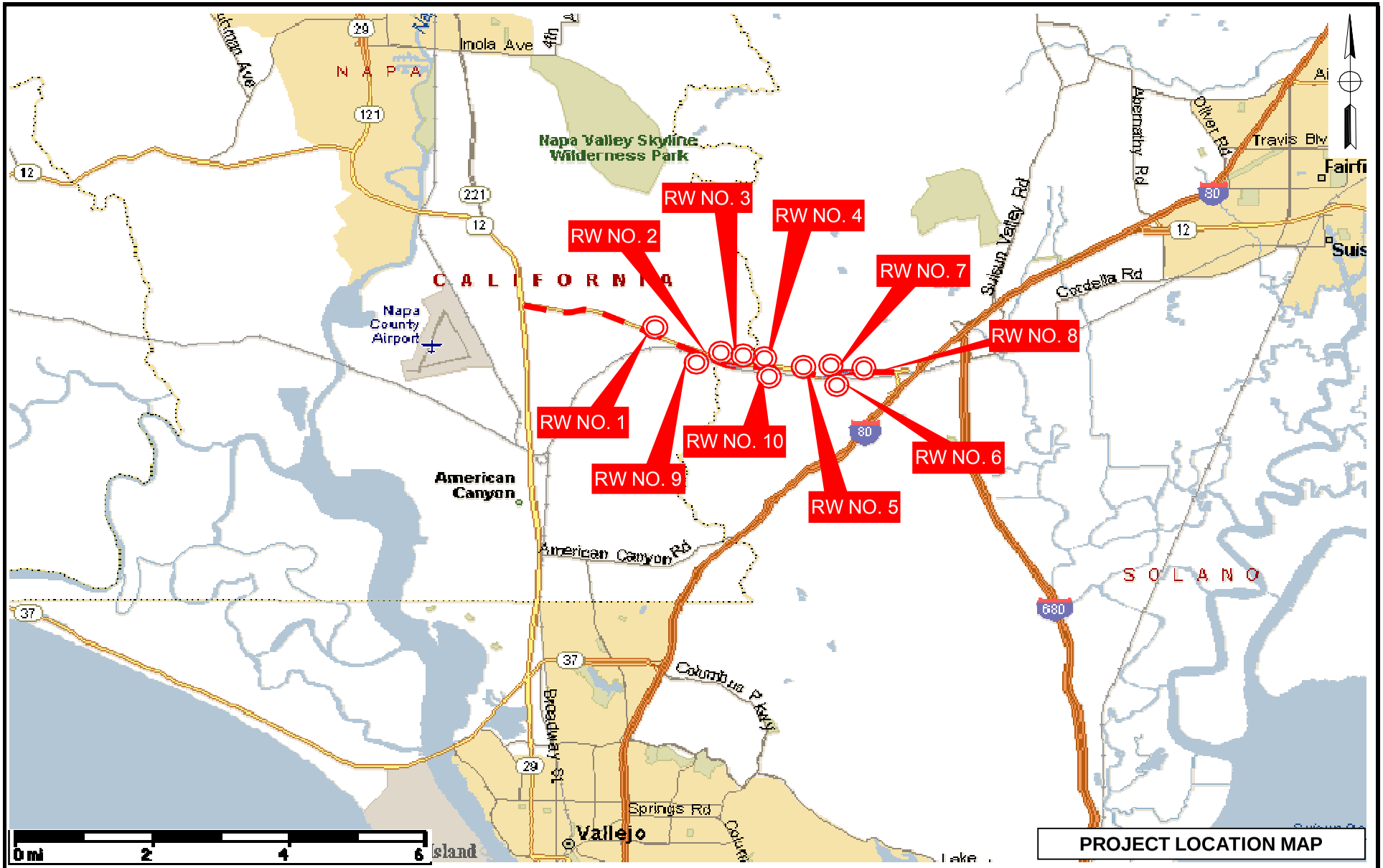


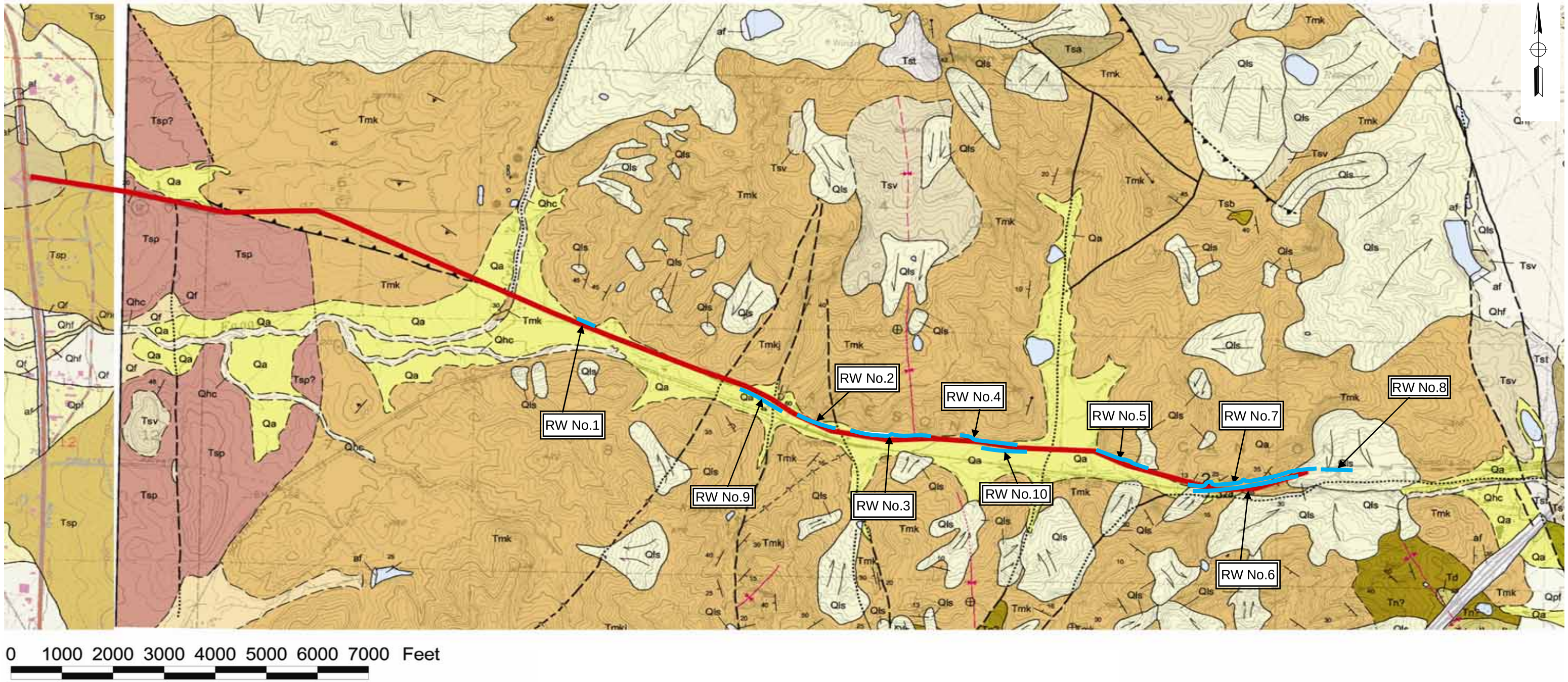
PROJECT LOCATION MAP

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 1



LEGEND

Qa - Late Pleistocene to Holocene alluvium
Qls - Landslide deposits
Tsp - San Pablo Group (Miocene)
Tmk - Markley Formation (Eocene)

SOURCE

Bezore, et al; 2002 & 2008

GEOLOGIC MAP

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 2A.1

LANDSLIDE DEPOSITS

A landslide is a mass of rock, soil, and debris that has been displaced downslope by sliding, flowing, or falling. Landslides include cohesive block glides and disrupted slumps that have formed by translation or rotation of the slope materials along one or more planar or curviplanar slip surfaces. Most of the landslides whose boundaries are delineated on the map are greater than 10 feet thick. Also shown are selected surficial features that typically involve only soil, colluvium, or other superficial debris that covers bedrock. The rates of movement of slope failures range from almost imperceptibly slow (as in earthflows) to extremely, even dangerously, rapid (as in debris flows).

DEFINITE LANDSLIDE. Exhibits all or nearly all of the diagnostic features, including but not limited to headwall scarps, cracks, rounded toes, well-defined benches, closed depressions, springs, and irregular or hummocky topography, that are common to landslides and indicative of downslope movement. Continuous, single-barbed arrows indicate general direction of movement. Scarp (headwall of slump or block glide) is indicated by hachures where mapped.

PROBABLE LANDSLIDE. Exhibits several diagnostic features that are common to landslides and relatively likely to have resulted from downslope movement, but that are not so clearly defined that the existence of the landslide is certain. Interrupted, single-barbed arrows indicate general direction of movement.

QUESTIONABLE LANDSLIDE. Exhibits one or a few, generally very subdued, diagnostic features that commonly are associated with landslides. Typically lacks distinct landslide morphology but may exhibit disrupted terrain or other abnormal features that strongly to vaguely imply the occurrence of downslope movement. Question mark signifies the uncertainty in the existence of the landslide.

SMALL LANDSLIDE. Filled arrowhead indicates a landslide too small to delineate at the scale of the map. Center of arrowhead corresponds to the location of the landslide; arrowhead points in the direction of movement (downhill). Question mark used where existence of the landslide is uncertain.

MULTIPLE SMALL LANDSLIDES. Two or more landslides too small to delineate at the scale of the map.

EARTHFLOW. A relatively shallow deposit of soil or other colluvial material that has moved downslope, commonly at a rate too slow to observe except over long duration. Head scarp shown by hachures where mapped. Area immediately upslope of failure typically unravels due to successive small slumps that occur in the oversteepened banks left by movement of the main body away from the source area. Wiggly arrow shows general direction of movement.

EARTHFLOW COMPLEX. A group of earthflows that are too numerous to delineate accurately at this map scale.

SMALL EARTHFLOW. Arrow with solid arrowhead shows earthflow too small to delineate at the scale of the map. Center of shaft corresponds to center of failure.

DEBRIS FLOW. (Also called mudflow, soil slip, or debris avalanche.) A short-lived phenomena resulting from the rapid failure of surficial slope materials. Typically leaves a train of debris in a scoured channel following runout of the flow. Curved line delineates channel. Scarp depicted by oval.

DEBRIS FLOW AMPHITHEATER/SLOPE. Area of multiple debris flows and flow scars.

CREEP. (Not a deposit.) Areas where shallow downslope movement of surficial materials, especially soil, is occuring under the influence of gravity. Creep generally is recognizable only on grassy or bare slopes. Slopes undergoing creep typically do not exhibit morphology indicative of specific types of slope failure such as landslides or earthflows. Creep is characterized by indirect evidence such as tilting trees, poles, and posts, and, locally, by terracettes created by animals grazing along slopes.

SOURCE
Landslide Hazard Identification Map No. 13, M. W. Manson, 1988 (Division of Mines and Geology (DMG), Open-File Report 88-22)

PARIKH CONSULTANTS, INC.
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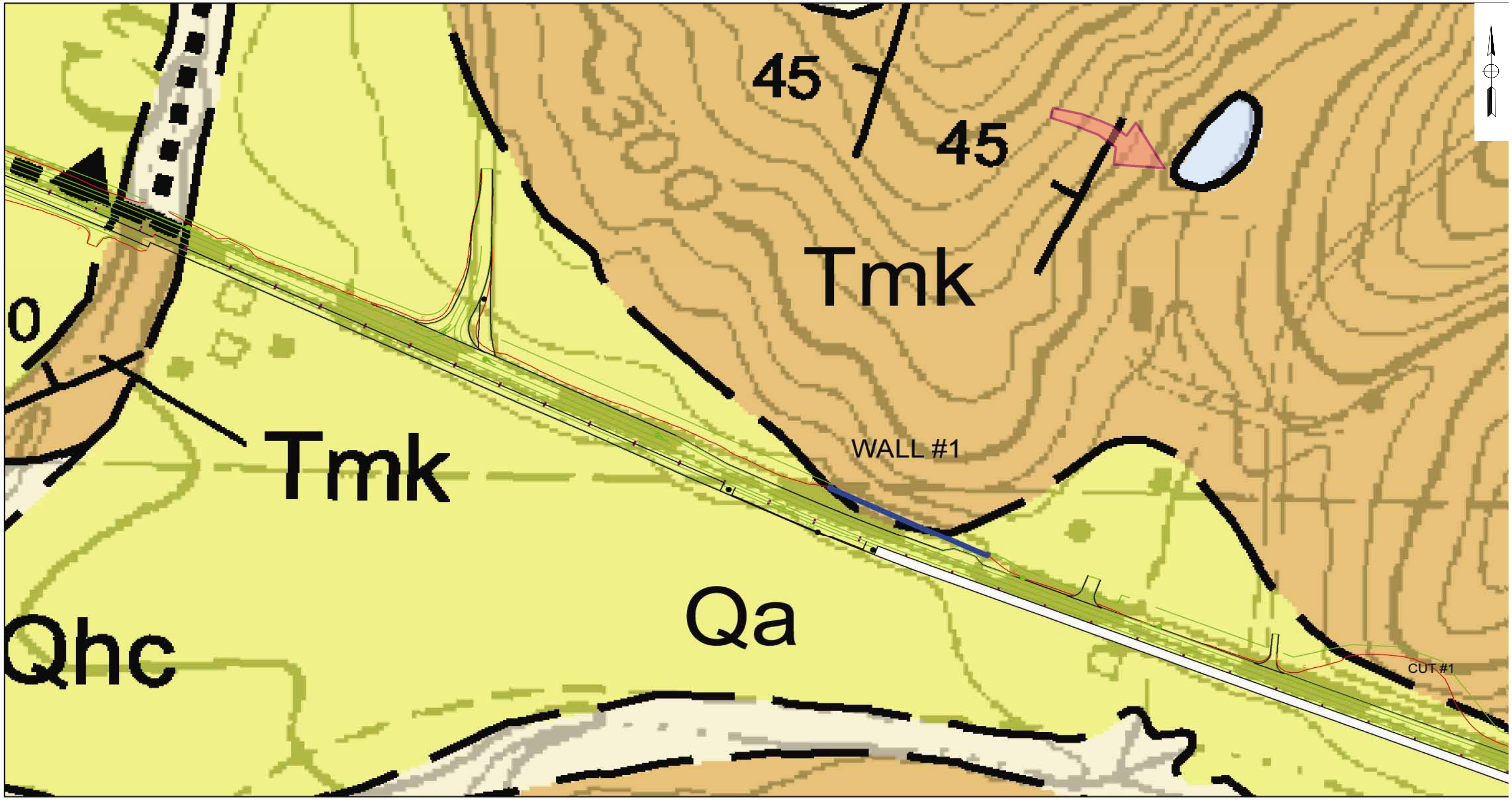
MATERIALS TESTING

LANDSLIDE AND RELATED FEATURES MAP

JAMESON CANYON ROAD WIDENING PROJECT
NAPA COUNTY, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 2A.2



0 100 200 400 600 800 1,000 Feet

GEOLOGIC MAP - RW #1

LEGEND

:Landslide* :Small earthflow*

See Plate 2A for other unit descriptions**

SOURCE:

* Mason, 1988 (DMG Open-File Report 88-22, Plate 13B)
** Bezore et al; 2002 & 2008

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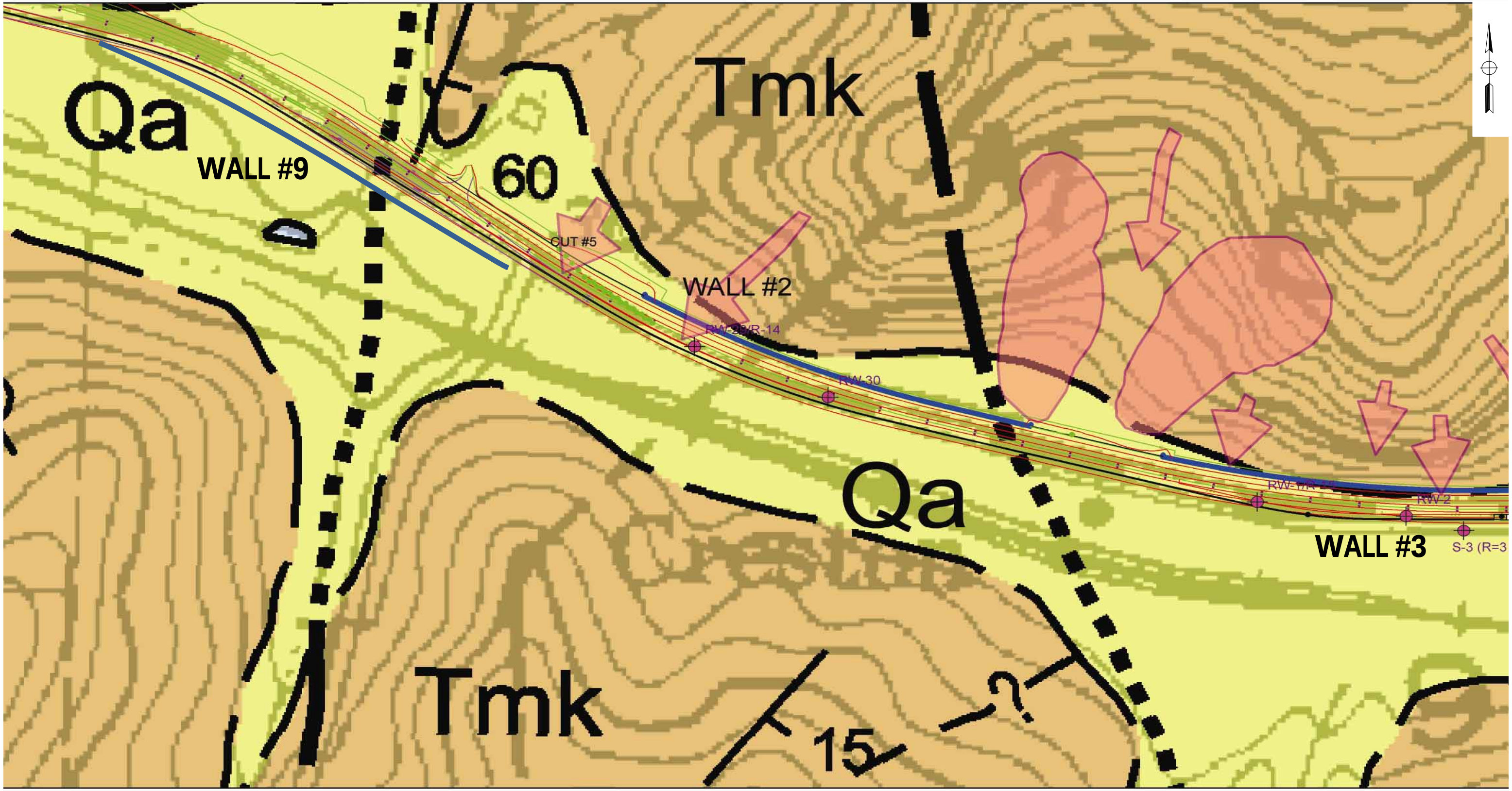
JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 2B



0 100 200 400 600 800 1,000 Feet

GEOLOGIC MAP - RW #2

LEGEND

:Landslide* :Small earthflow*

See Plate 2A for other unit descriptions**

SOURCE:

* Mason, 1988 (DMG Open-File Report 88-22, Plate 13B)
** Bezore et al; 2002 & 2008

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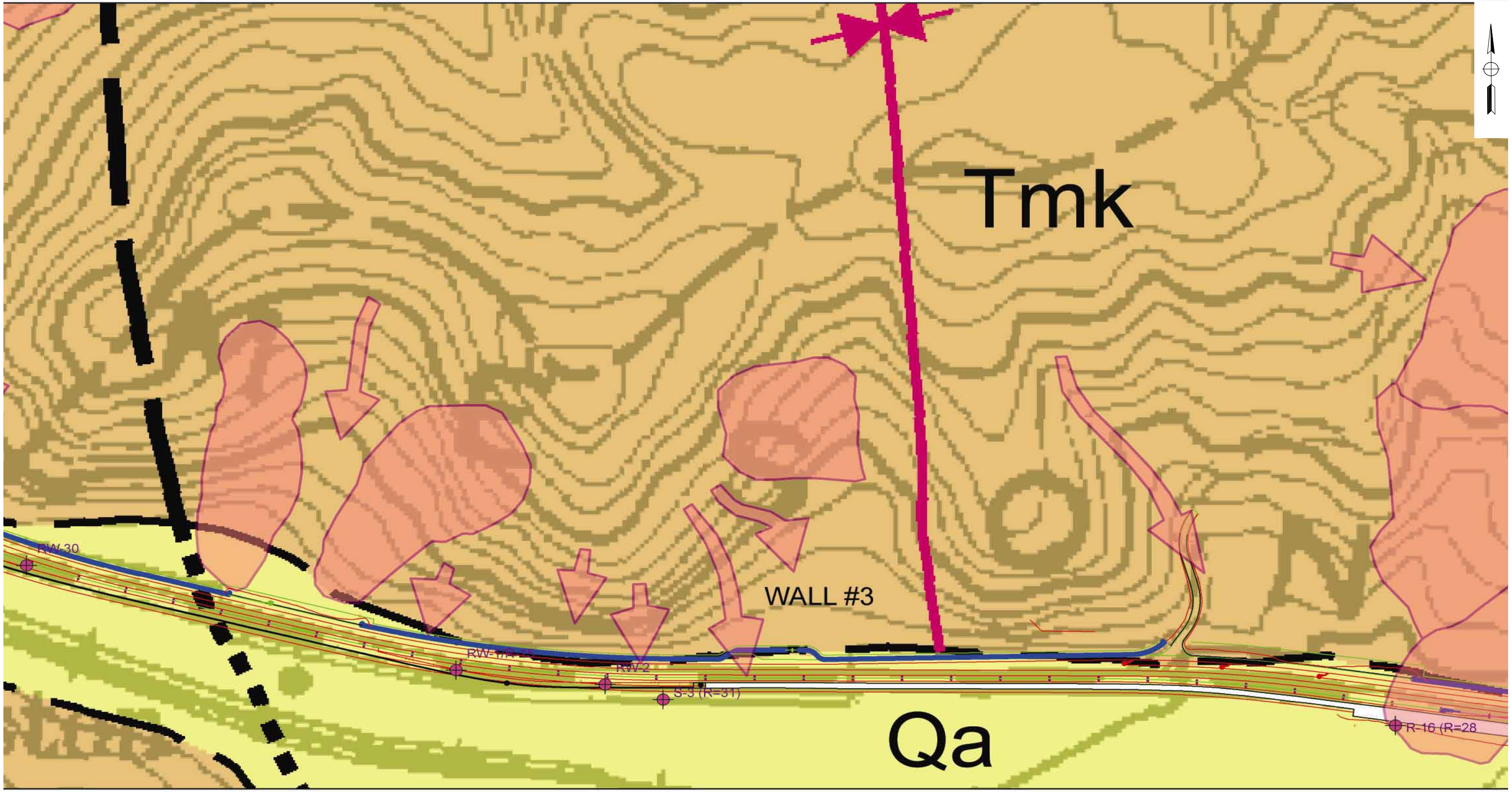
JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 2C



0 100 200 400 600 800 1,000 Feet

LEGEND

:Landslide* :Small earthflow*

See Plate 2A for other unit descriptions**

SOURCE:

* Mason, 1988 (DMG Open-File Report 88-22, Plate 13B)

** Bezore et al; 2002 & 2008

GEOLOGIC MAP - RW #3

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JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 2D

Tmk

WALL #4 (new alignment)

WALL #4 (old alignment)

RW-3

SR-A2

SR-A1

RW-4

R-16 (R=28

R-17 (R=9)

RW-6

RW-5

R-18 (R<5)

WALL #10

Qa

0 100 200 400 600 800 1,000 Feet

LEGEND

:Landslide* :Small earthflow*

See Plate 2A for other unit descriptions**

SOURCE:

* Mason, 1988 (DMG Open-File Report 88-22, Plate 13B)

** Bezore et al; 2002 & 2008

GEOLOGIC MAP - RW #4 & #10

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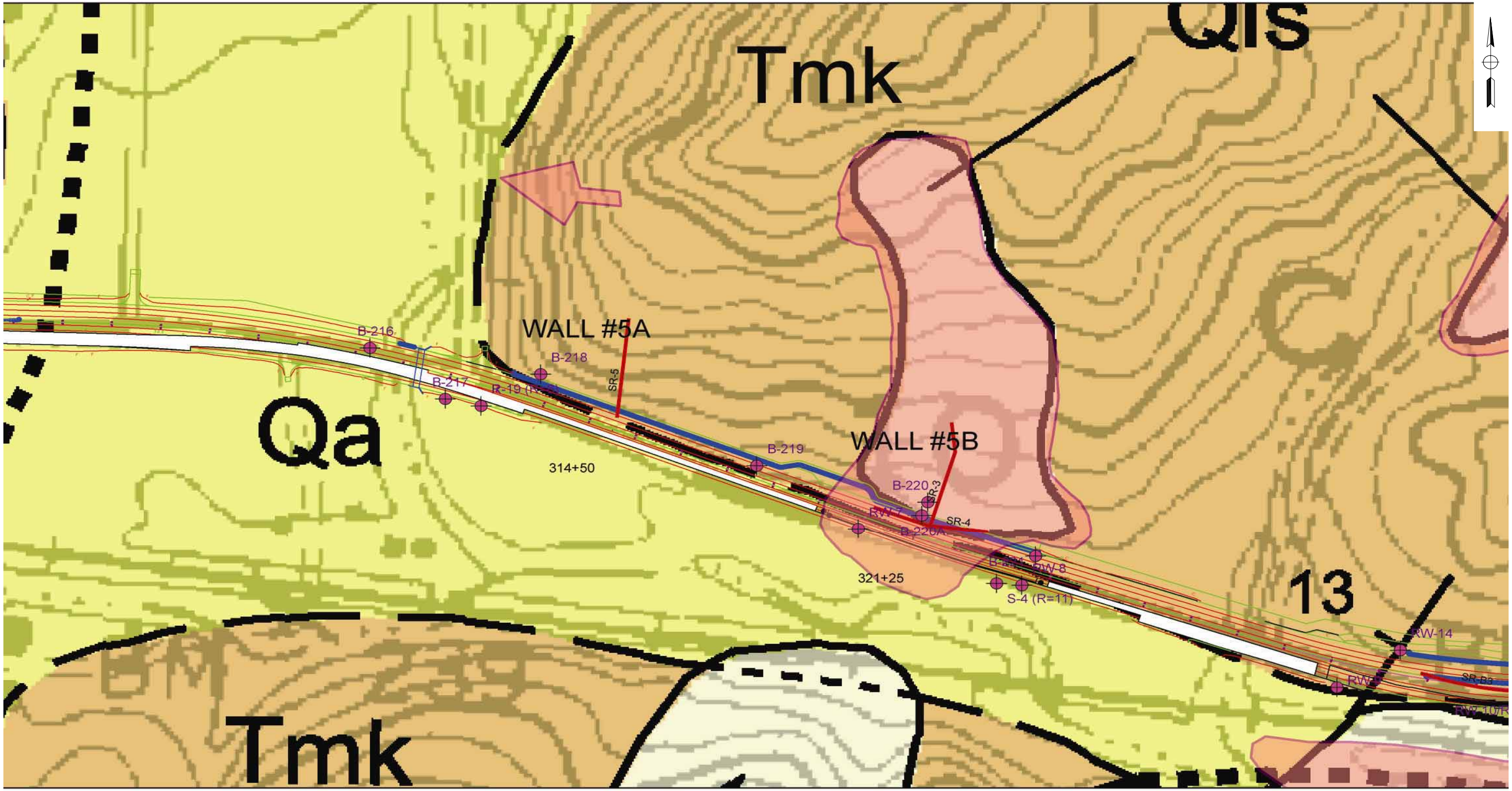
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT

NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 2E



0 100 200 400 600 800 1,000 Feet

GEOLOGIC MAP - RW #5

LEGEND

:Landslide* :Small earthflow*

See Plate 2A for other unit descriptions**

SOURCE:

* Mason, 1988 (DMG Open-File Report 88-22, Plate 13B)

** Bezore et al; 2002 & 2008

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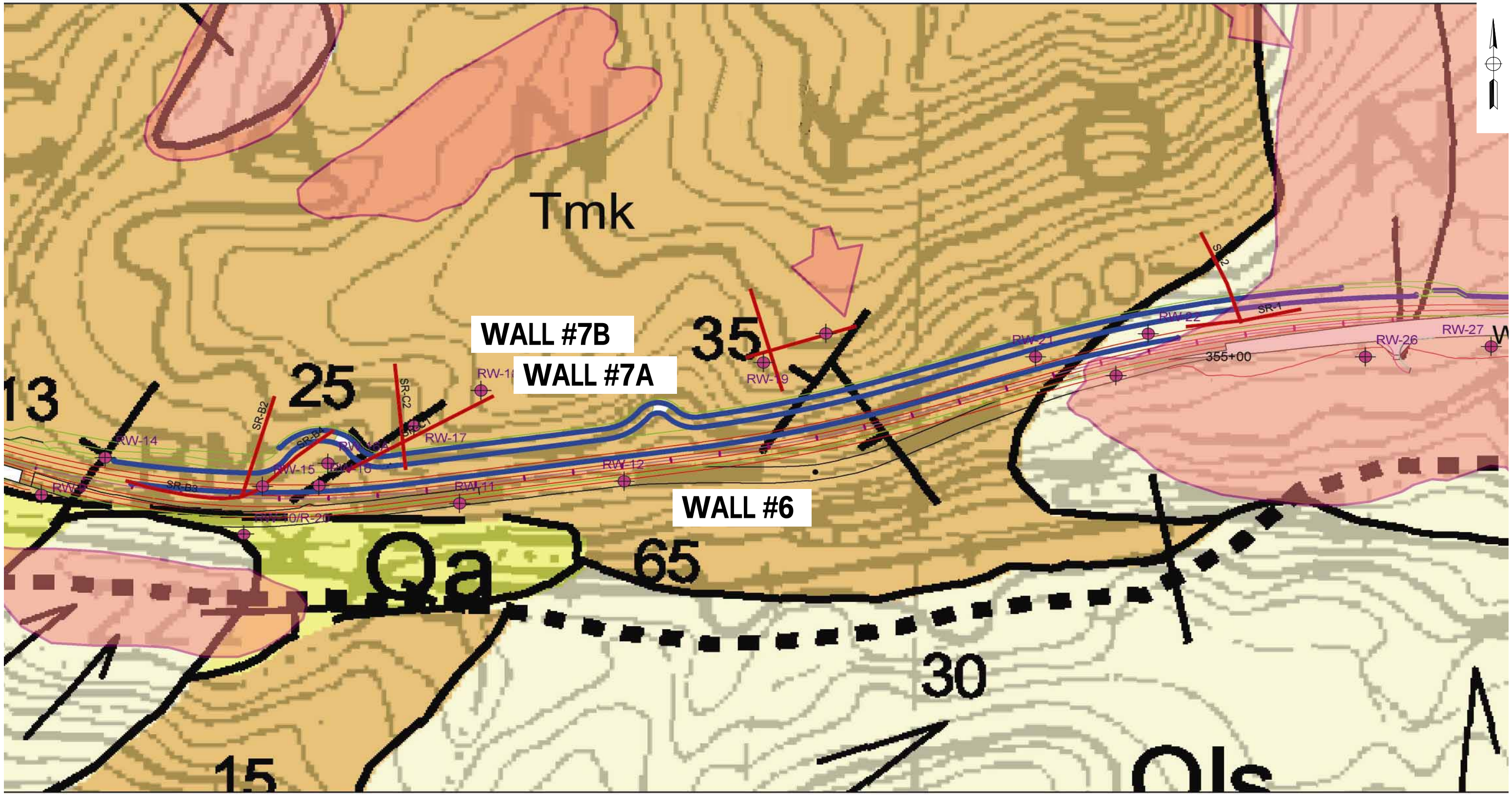
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT

NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 2F



0 100 200 400 600 800 1,000 Feet

LEGEND

:Landslide* :Small earthflow*

See Plate 2A for other unit descriptions**

SOURCE:

* Mason, 1988 (DMG Open-File Report 88-22, Plate 13B)

** Bezore et al; 2002 & 2008

GEOLOGIC MAP - RW #6 & #7

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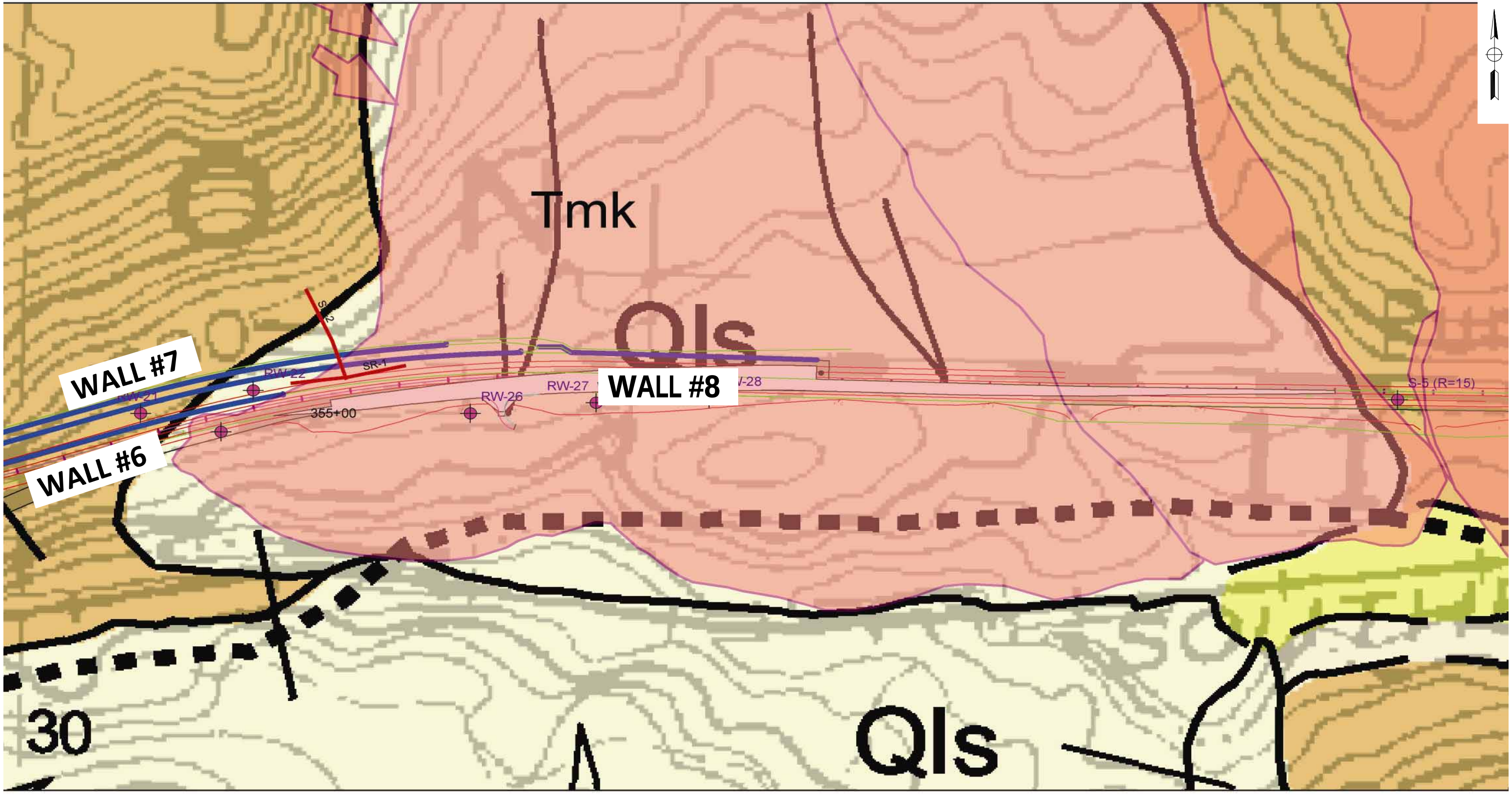
JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 2G



0 100 200 400 600 800 1,000 Feet

LEGEND

:Landslide* :Small earthflow*

See Plate 2A for other unit descriptions**

SOURCE:

* Mason, 1988 (DMG Open-File Report 88-22, Plate 13B)
** Bezore et al; 2002 & 2008

GEOLOGIC MAP - RW #9

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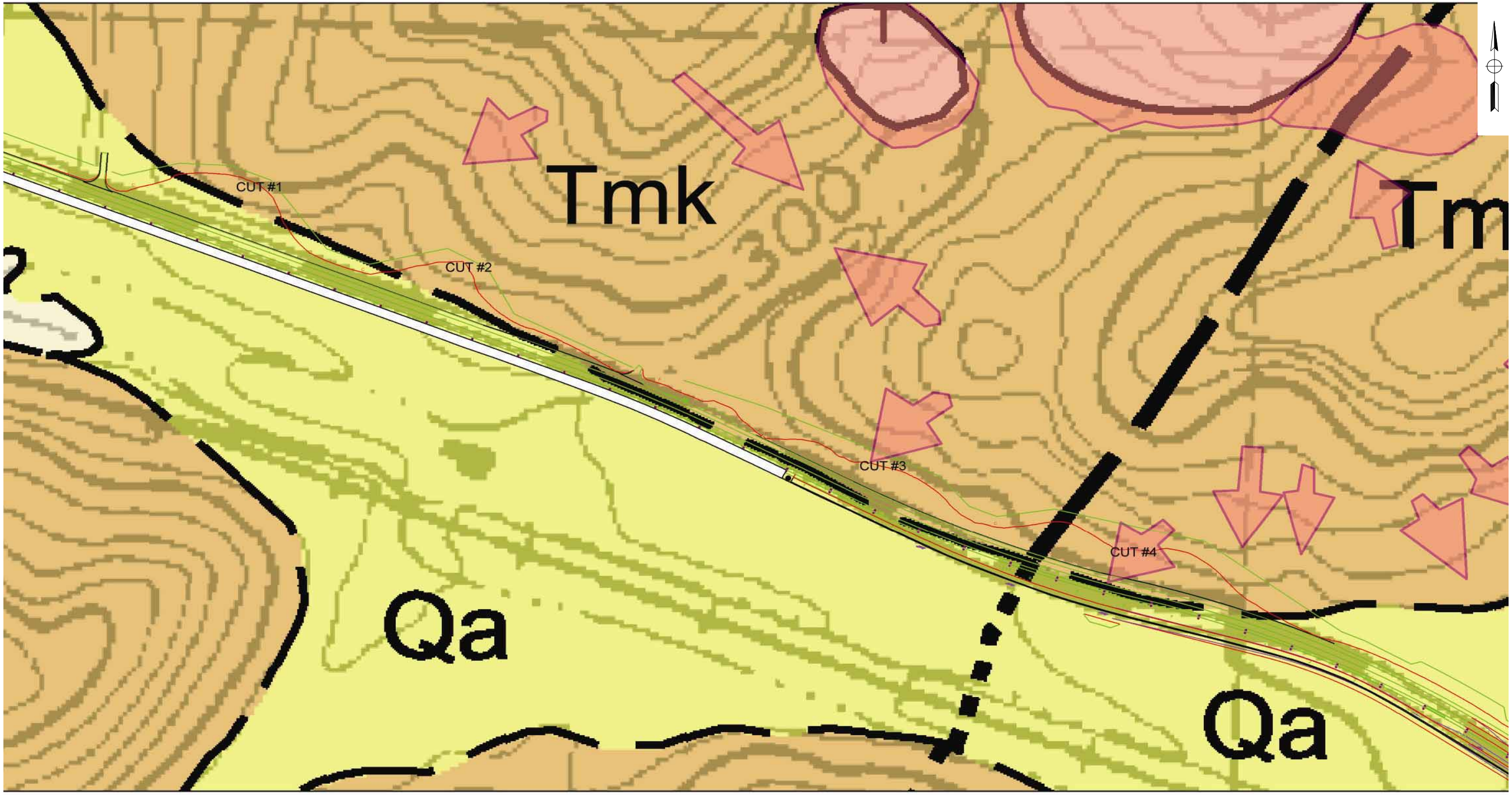
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 2H



0 100 200 400 600 800 1,000 Feet

LEGEND

:Landslide* :Small earthflow*

See Plate 2A for other unit descriptions**

SOURCE:

* Mason, 1988 (DMG Open-File Report 88-22, Plate 13B)
** Bezore et al; 2002 & 2008

GEOLOGIC MAP - CUT SLOPES

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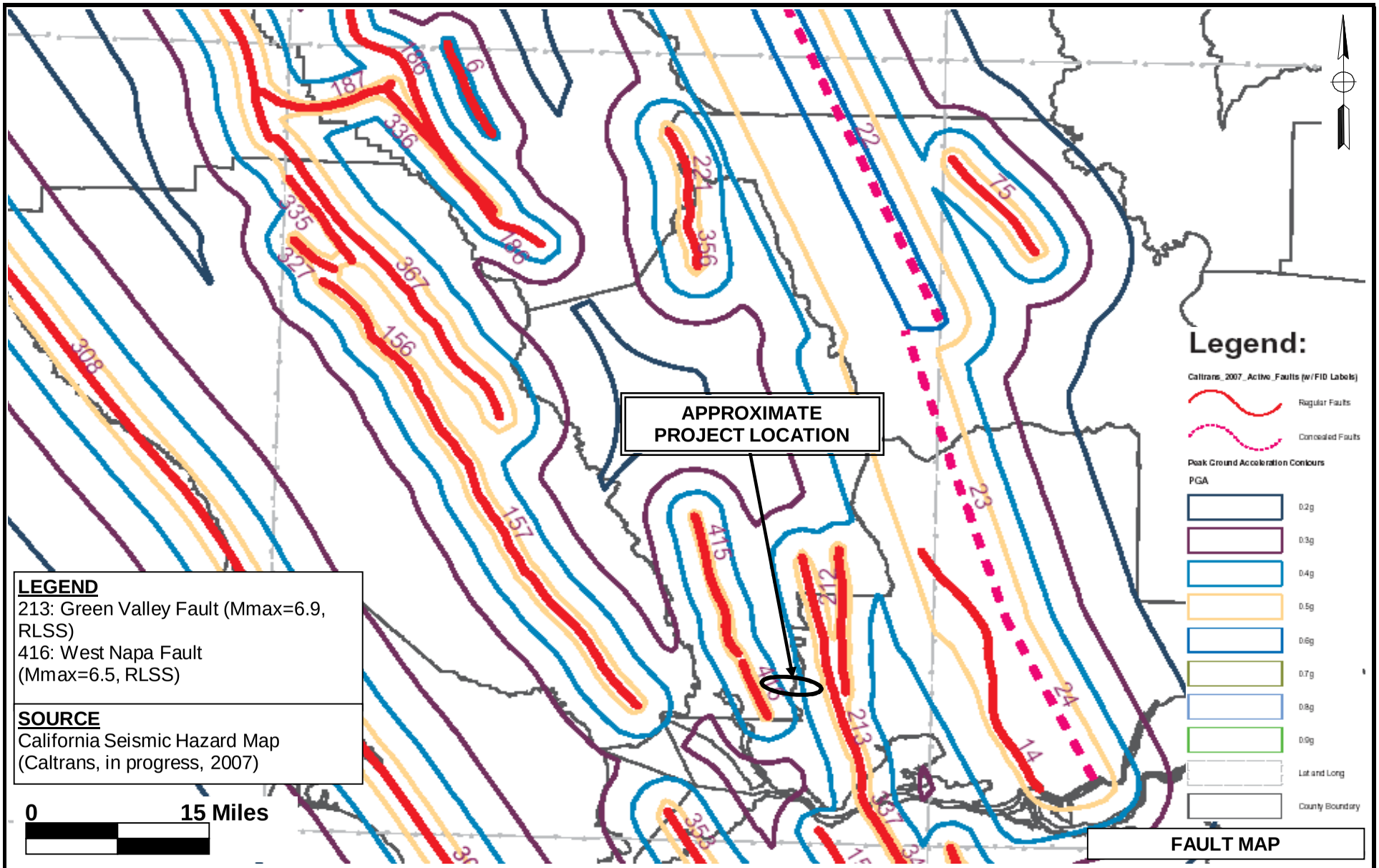
JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 2I



LEGEND
213: Green Valley Fault (Mmax=6.9, RLSS)
416: West Napa Fault (Mmax=6.5, RLSS)

SOURCE
California Seismic Hazard Map (Caltrans, in progress, 2007)

FAULT MAP

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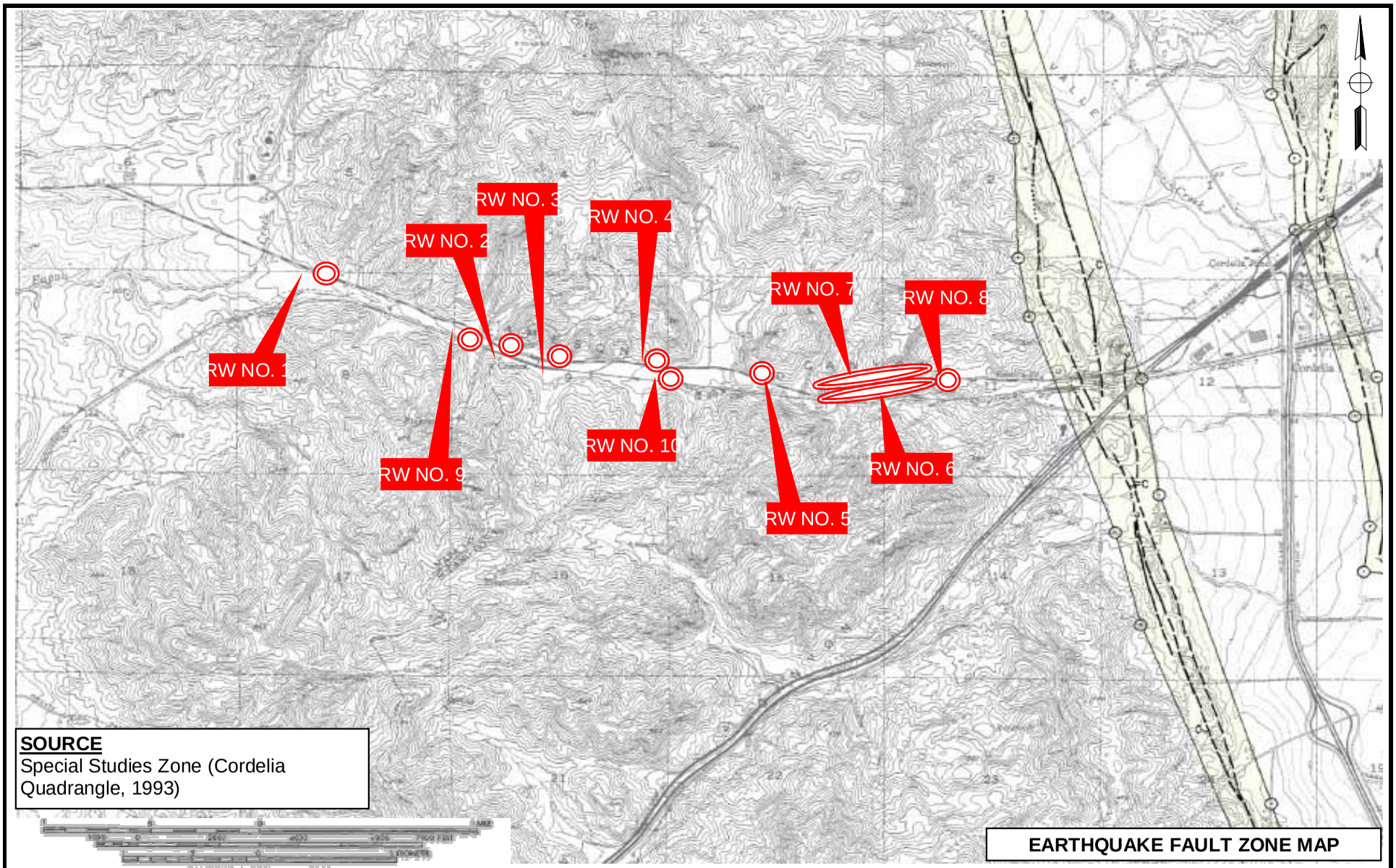
MATERIALS TESTING

JAMENSON CANYON ROAD WIDENING PROJECT
NAPA COUNTY, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 3A



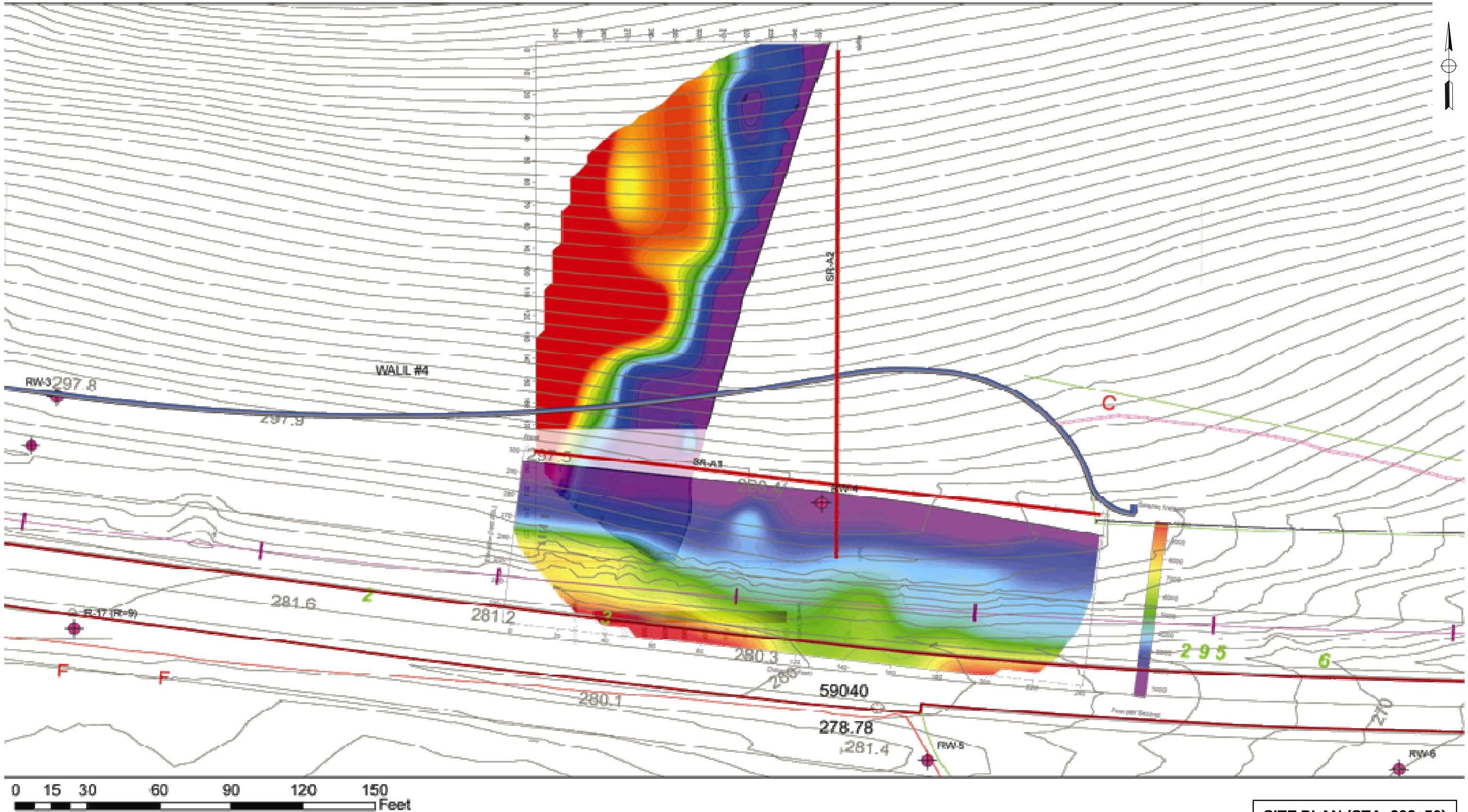
EARTHQUAKE FAULT ZONE MAP

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMENSON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 3B



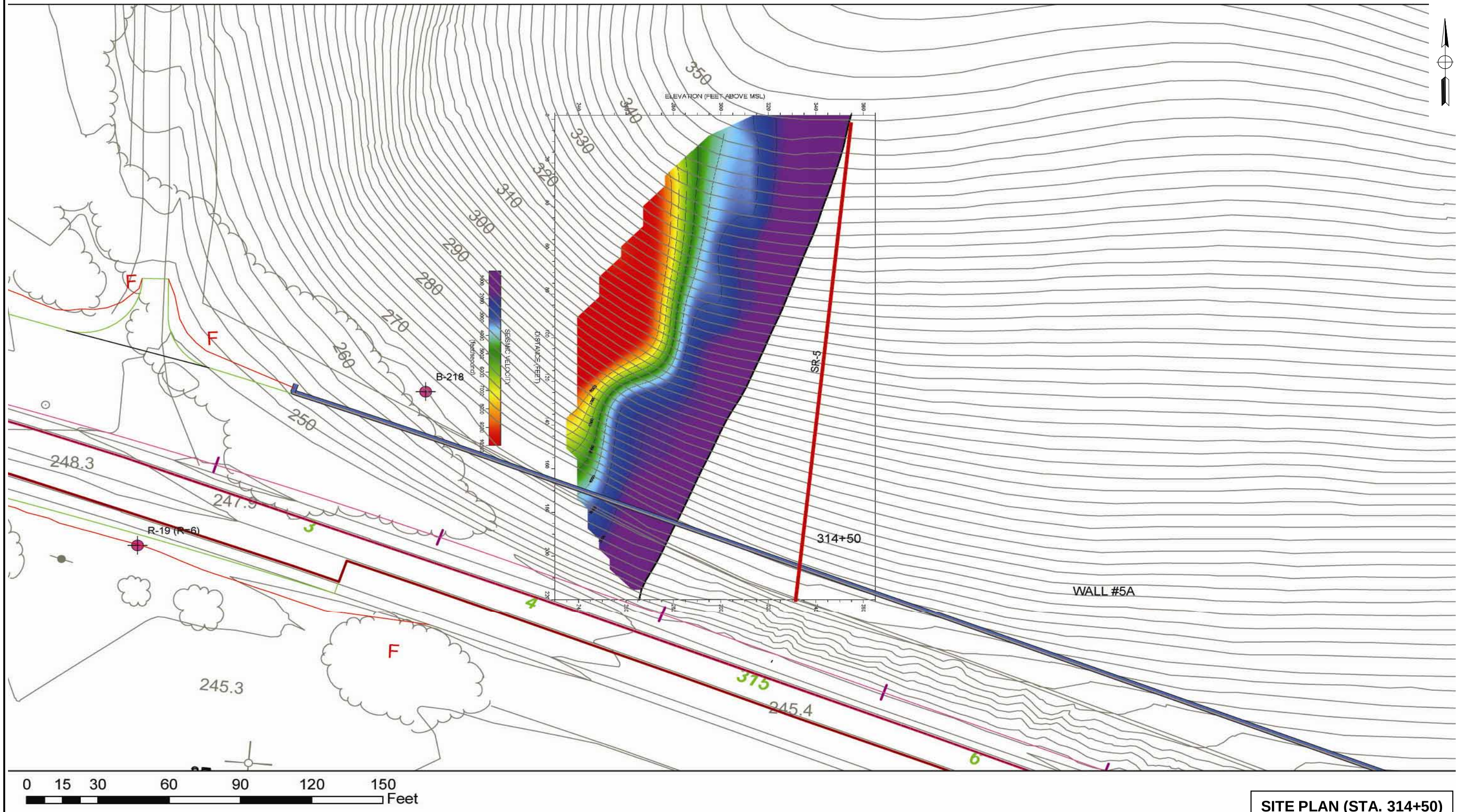
SITE PLAN (STA. 293+50)

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 4A



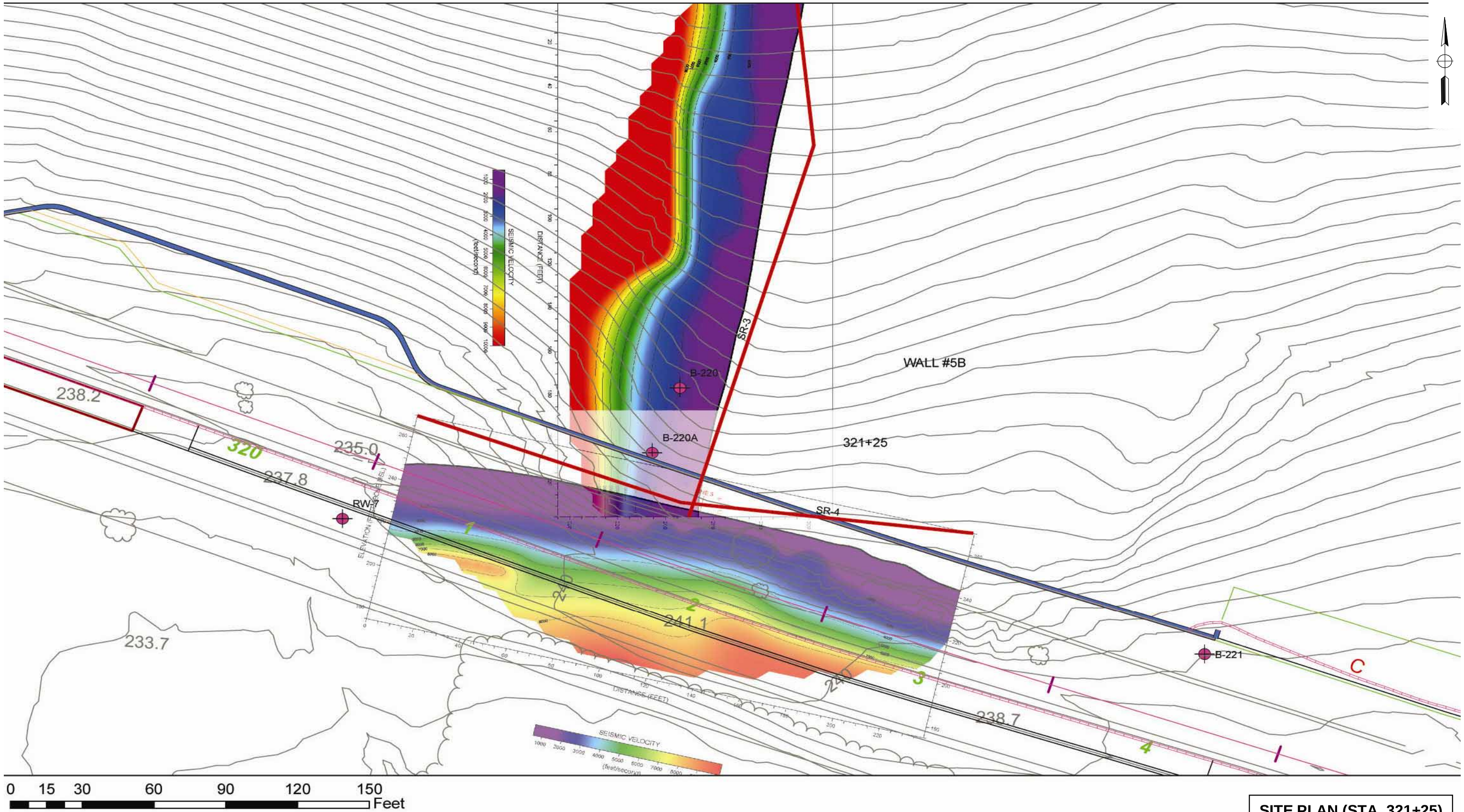
SITE PLAN (STA. 314+50)

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 4B

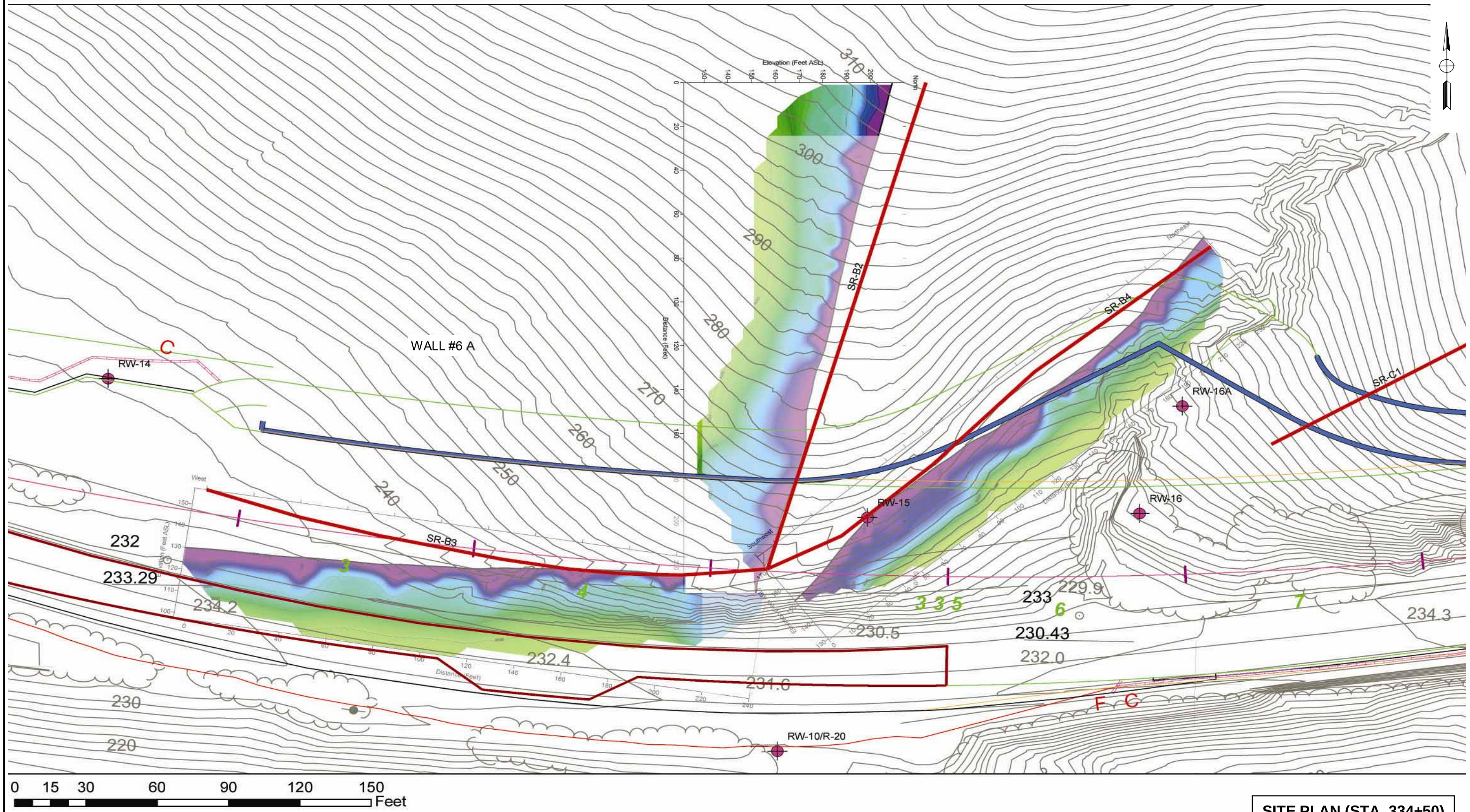


SITE PLAN (STA. 321+25)

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

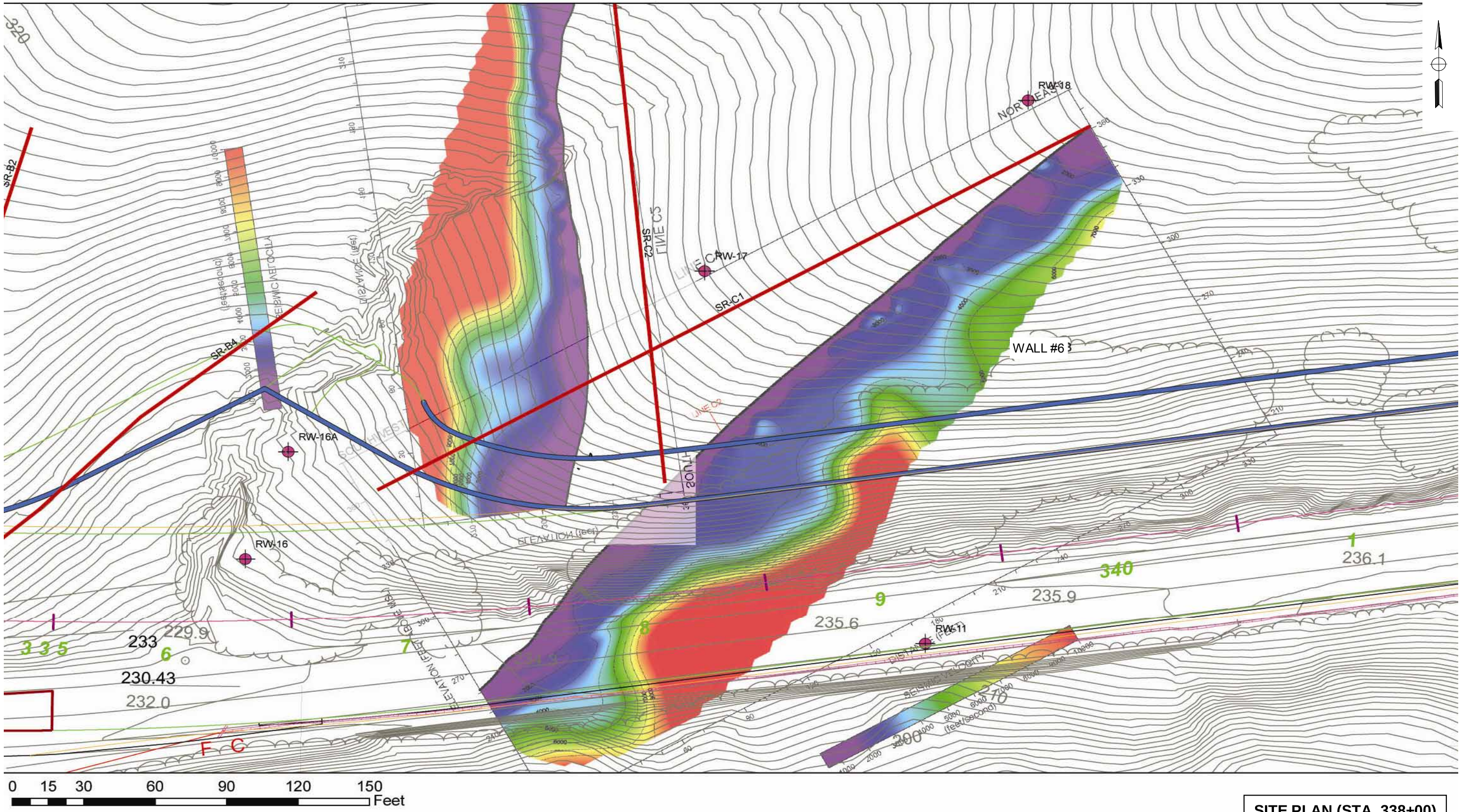
JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT | **PLATE NO.: 4C**



SITE PLAN (STA. 334+50)

PARIKH CONSULTANTS, INC. GEOTECHNICAL CONSULTANTS MATERIALS TESTING	**JAMESON CANYON ROAD WIDENING PROJECT** **NAPA/SOLANO COUNTIES, CALIFORNIA**	
	JOB NO.: 208117.MAT	**PLATE NO.: 4D**



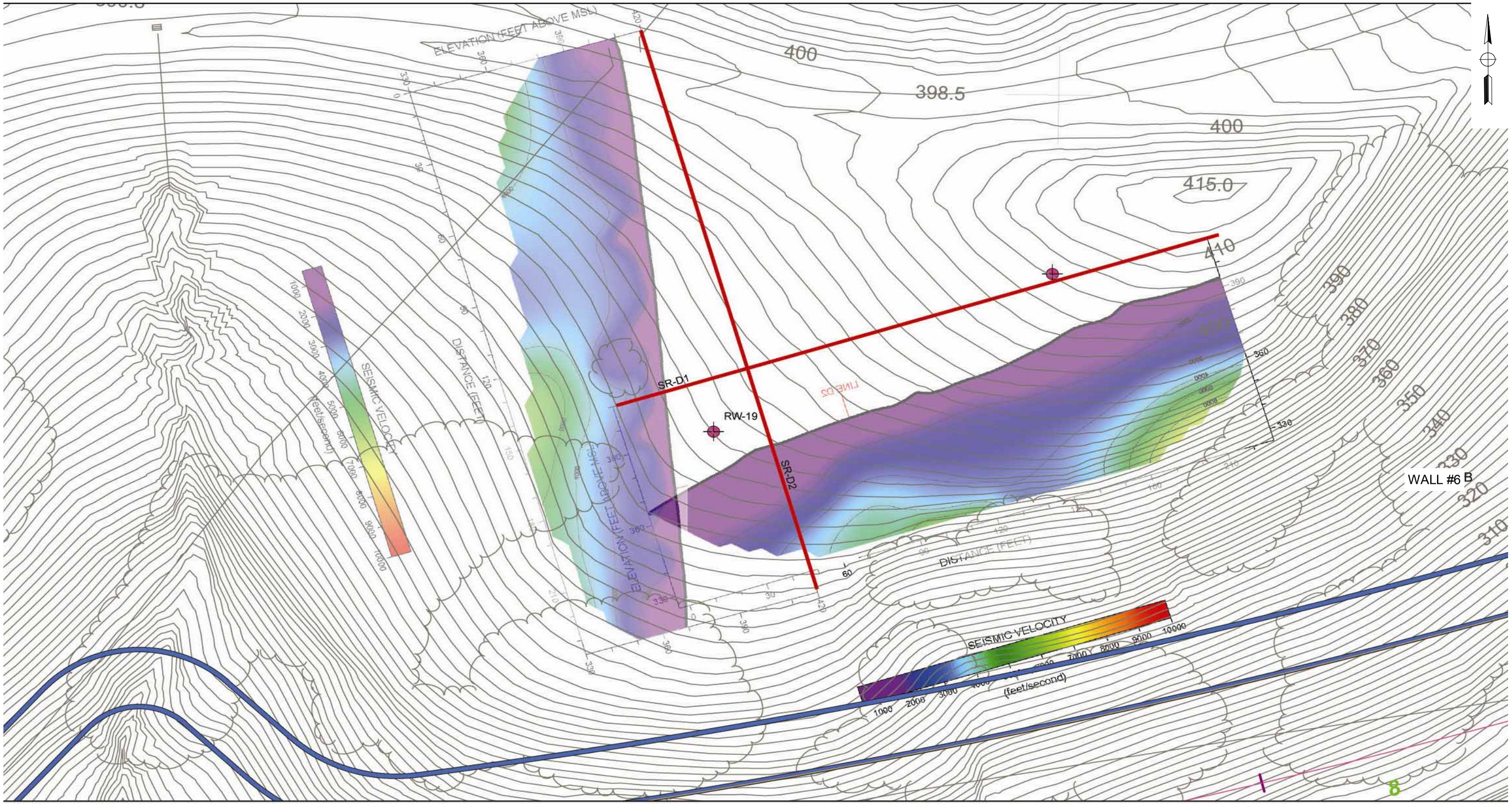
SITE PLAN (STA. 338+00)

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 4E



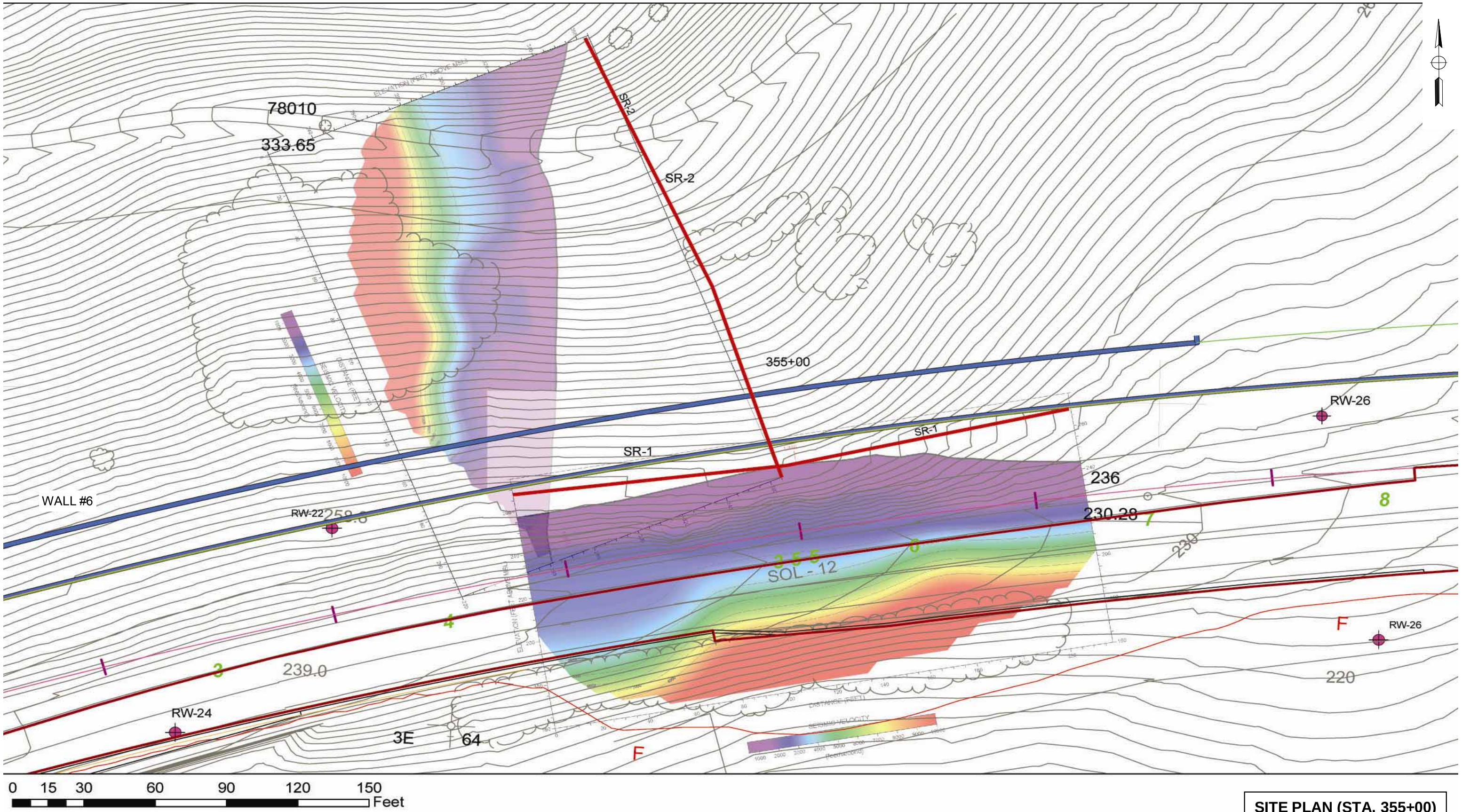
SITE PLAN (STA. 345+50)

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 4F



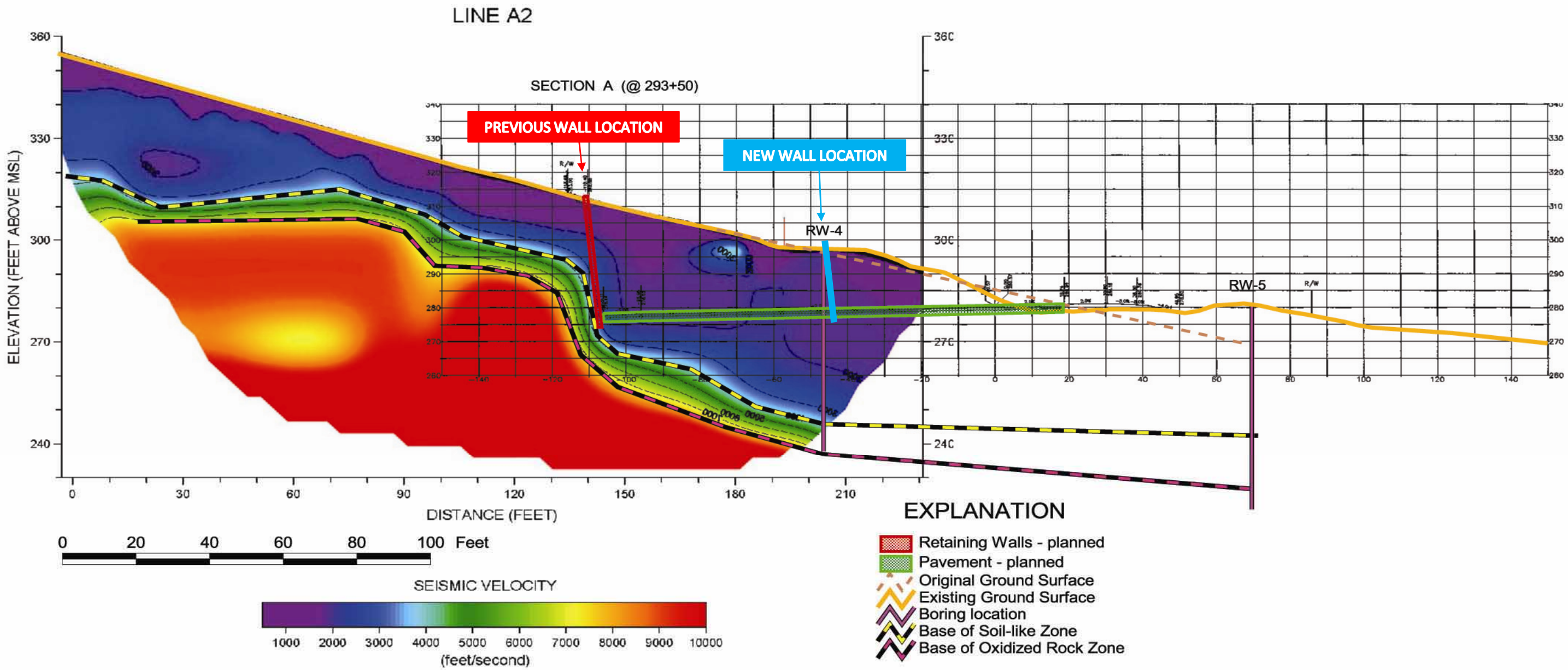
SITE PLAN (STA. 355+00)

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

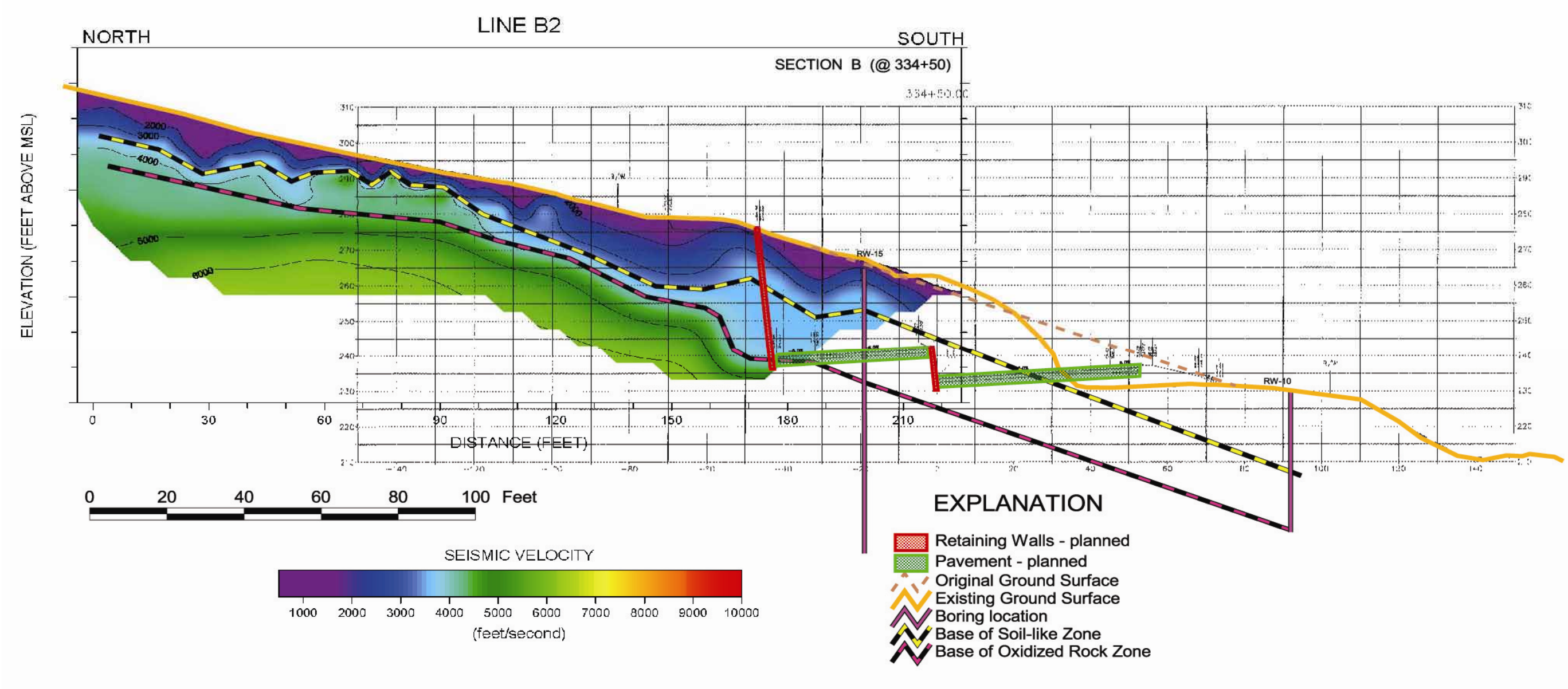
JOB NO.: 208117.MAT

PLATE NO.: 4G



CROSS-SECTION AT STA. 293+50

PARIKH CONSULTANTS, INC. GEOTECHNICAL CONSULTANTS MATERIALS TESTING	JAMESON CANYON ROAD WIDENING PROJECT NAPA/SOLANO COUNTIES, CALIFORNIA	
	JOB NO.: 208117.MAT	PLATE NO.: 5A

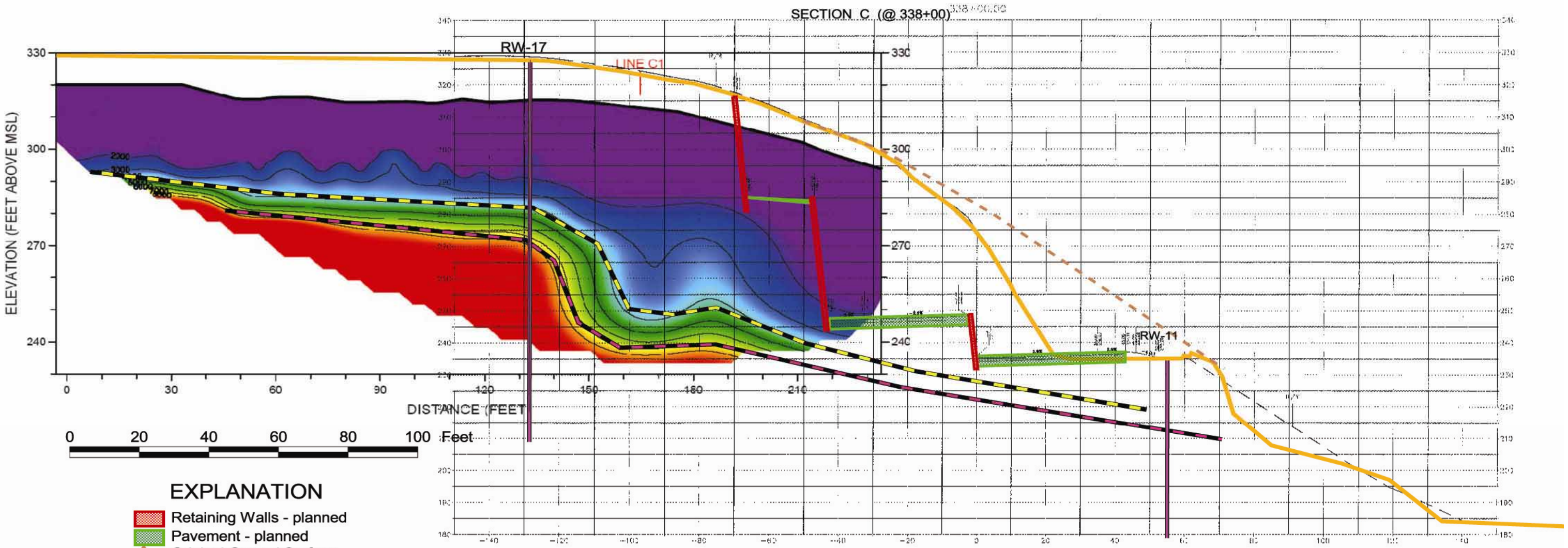


CROSS-SECTION AT STA. 334+50

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT | **PLATE NO.: 5B**



EXPLANATION

- Retaining Walls - planned
- Pavement - planned
- Original Ground Surface
- Existing Ground Surface
- Boring location
- Base of Soil-like Zone
- Base of Oxidized Rock Zone

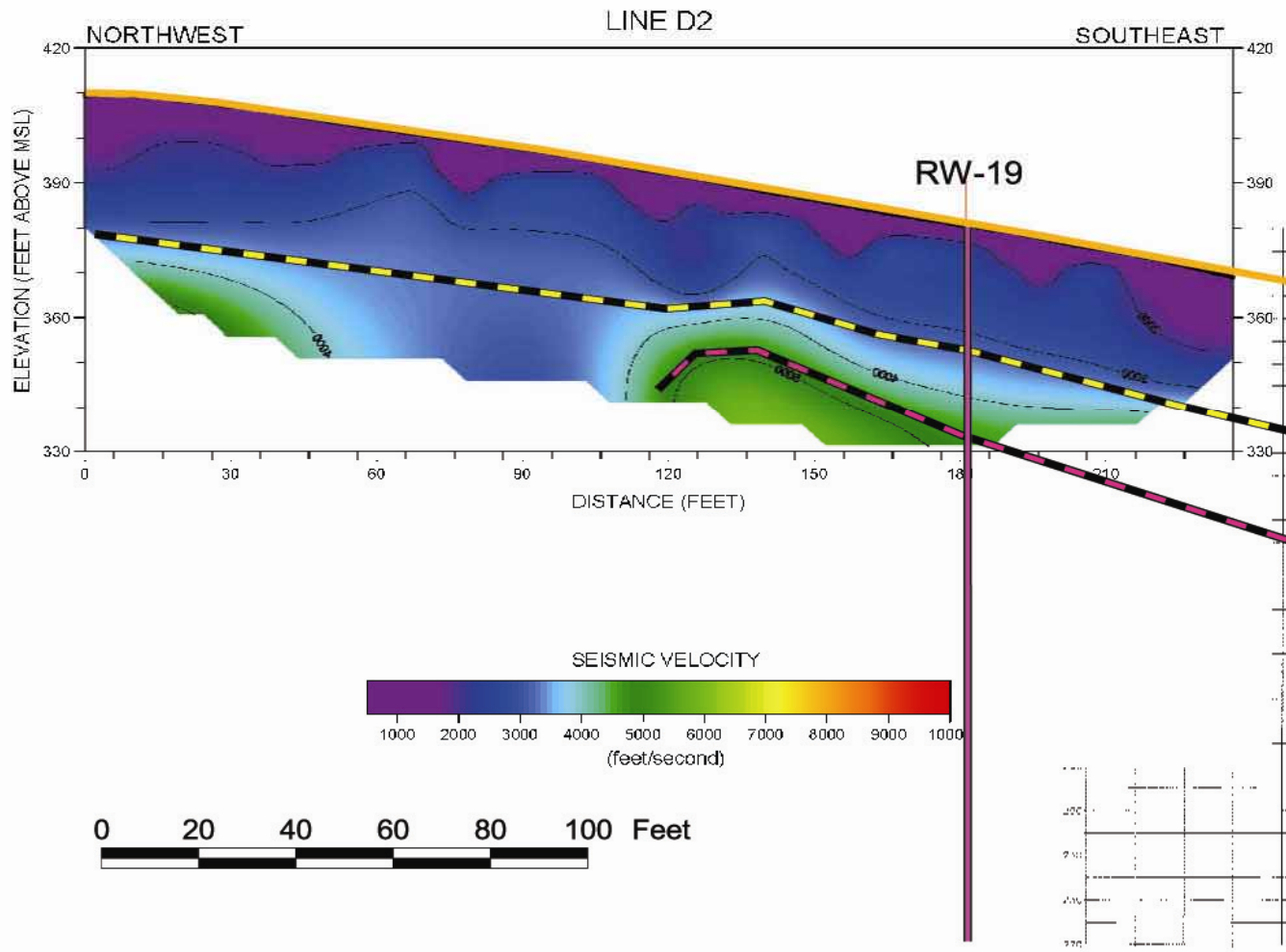
CROSS-SECTION AT STA. 338+00

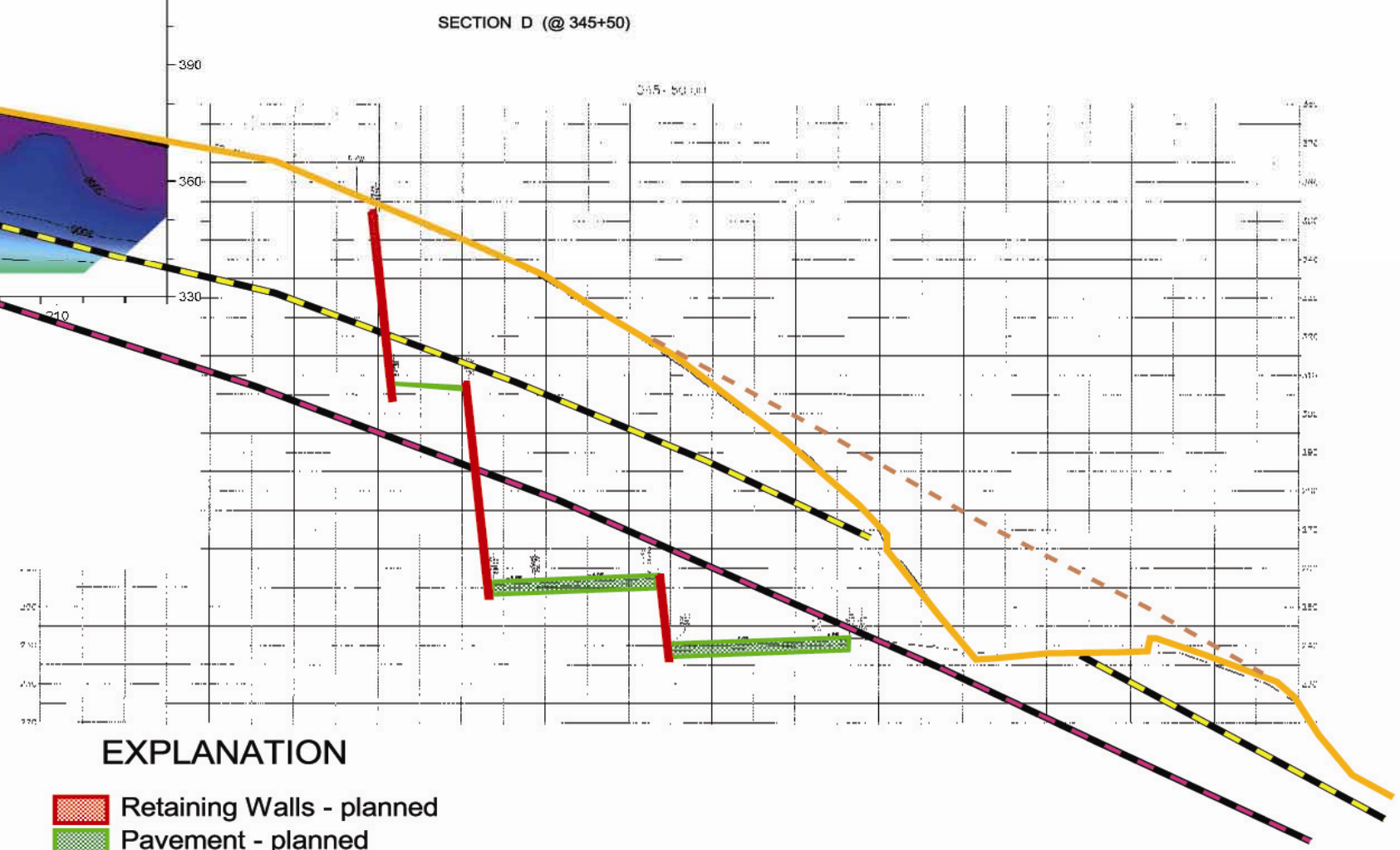
PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 5C



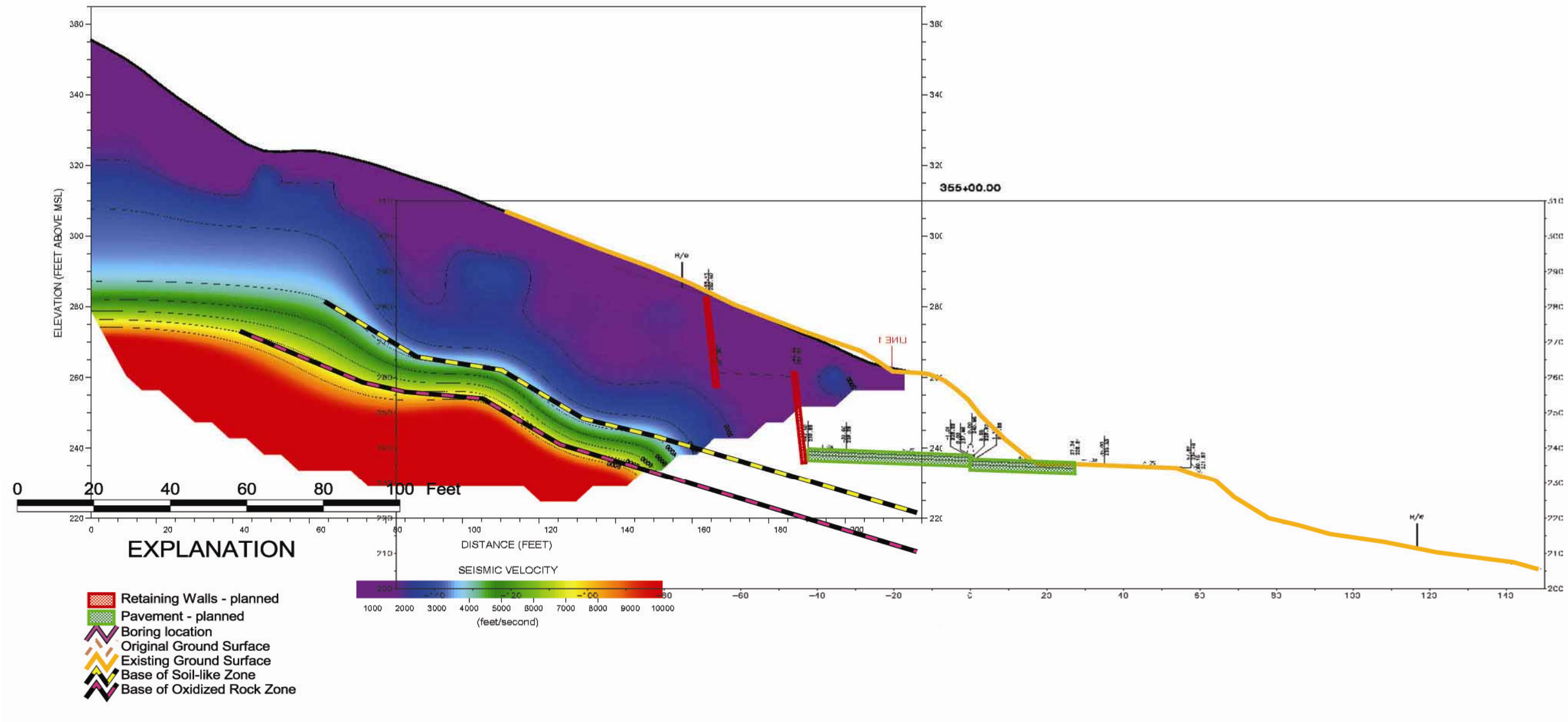


EXPLANATION

- Retaining Walls - planned
- Pavement - planned
- Original Ground Surface
- Existing Ground Surface
- Boring location
- Base of Soil-like Zone
- Base of Oxidized Rock Zone

CROSS-SECTION AT STA. 345+50

PARIKH CONSULTANTS, INC. GEOTECHNICAL CONSULTANTS MATERIALS TESTING	JAMESON CANYON ROAD WIDENING PROJECT NAPA/SOLANO COUNTIES, CALIFORNIA	
	JOB NO.: 208117.MAT	PLATE NO.: 5D

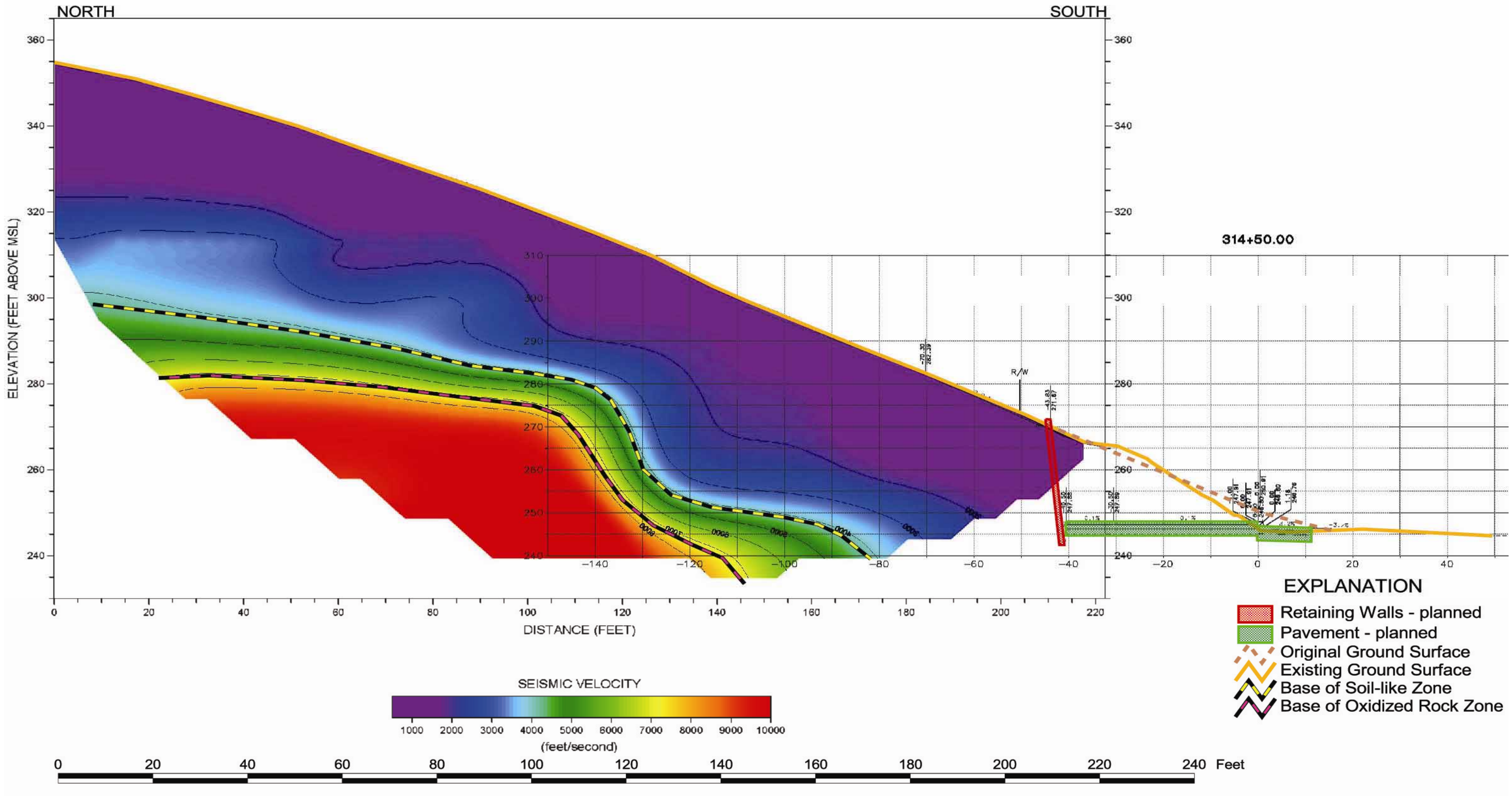


CROSS-SECTION AT STA. 355+00

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT | **PLATE NO.: 5E**



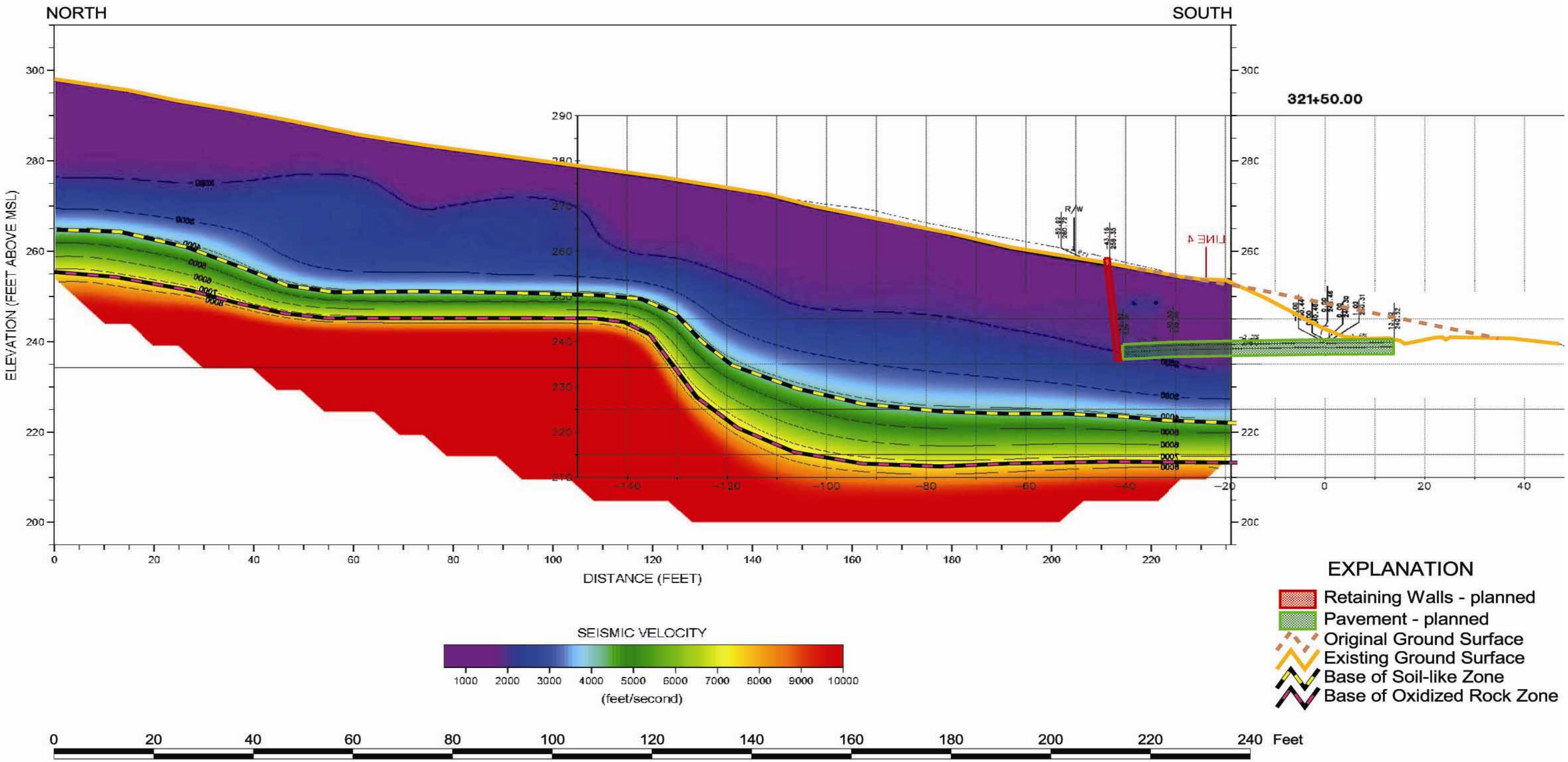
CROSS-SECTION AT STA. 314+50

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 5F



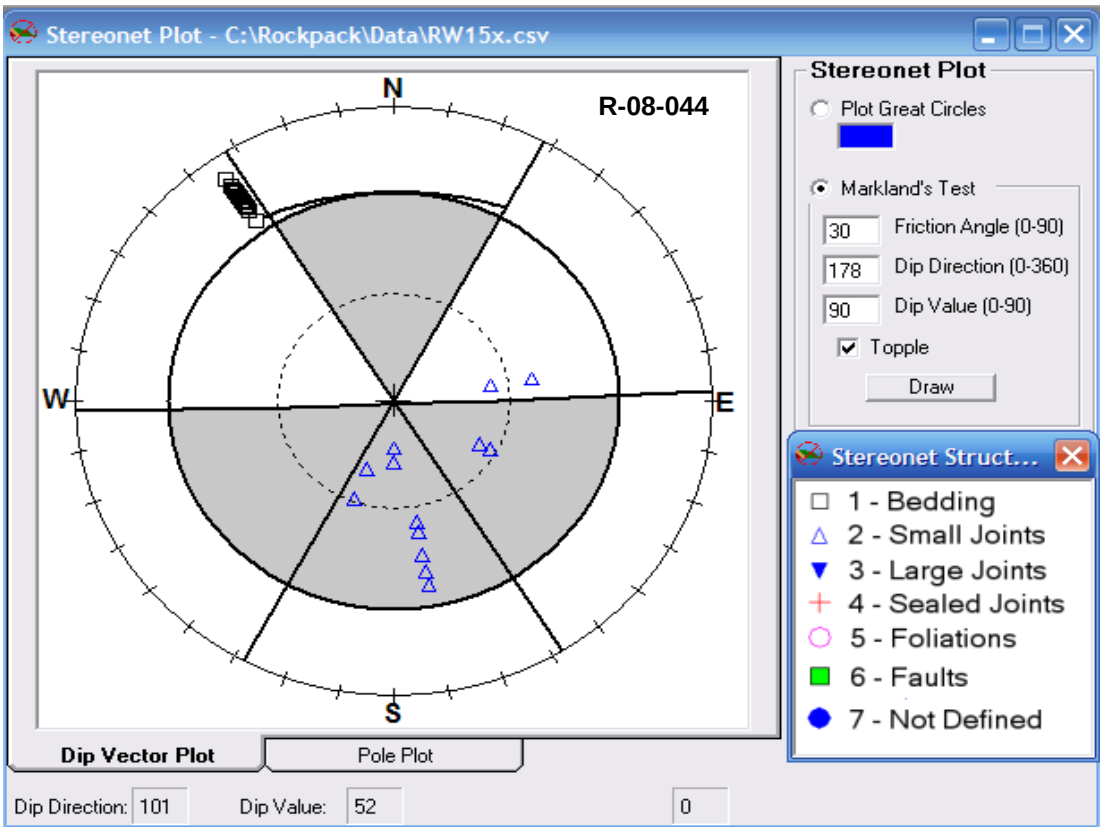
CROSS-SECTION AT STA. 321+50

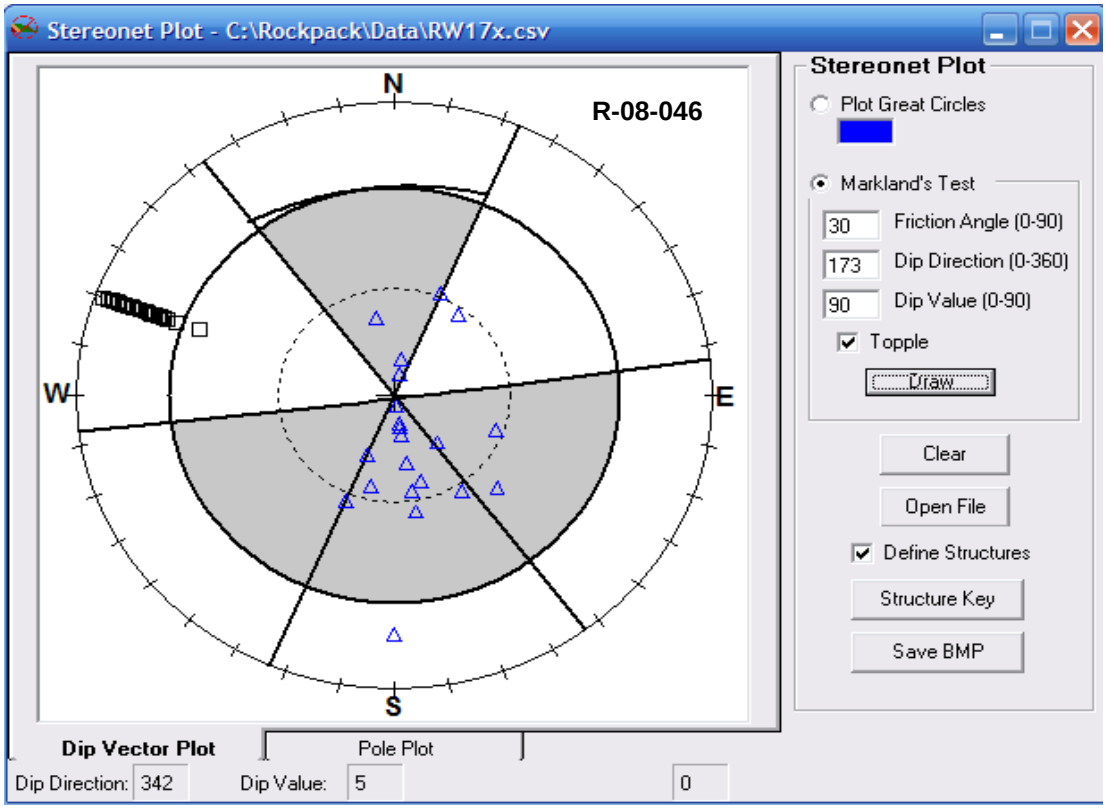
PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 5G





LEGEND:
- □ 1 - Bedding
- △ 2 - Small Joints

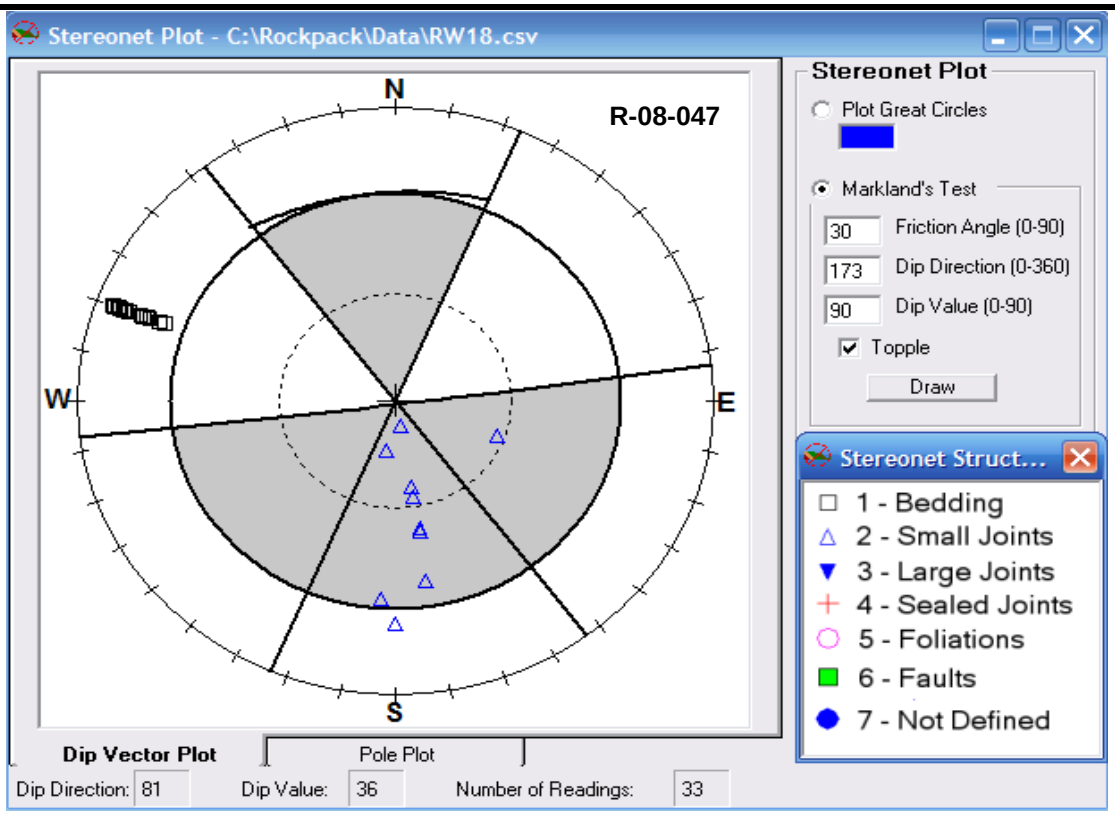
STEREONET PLOTS

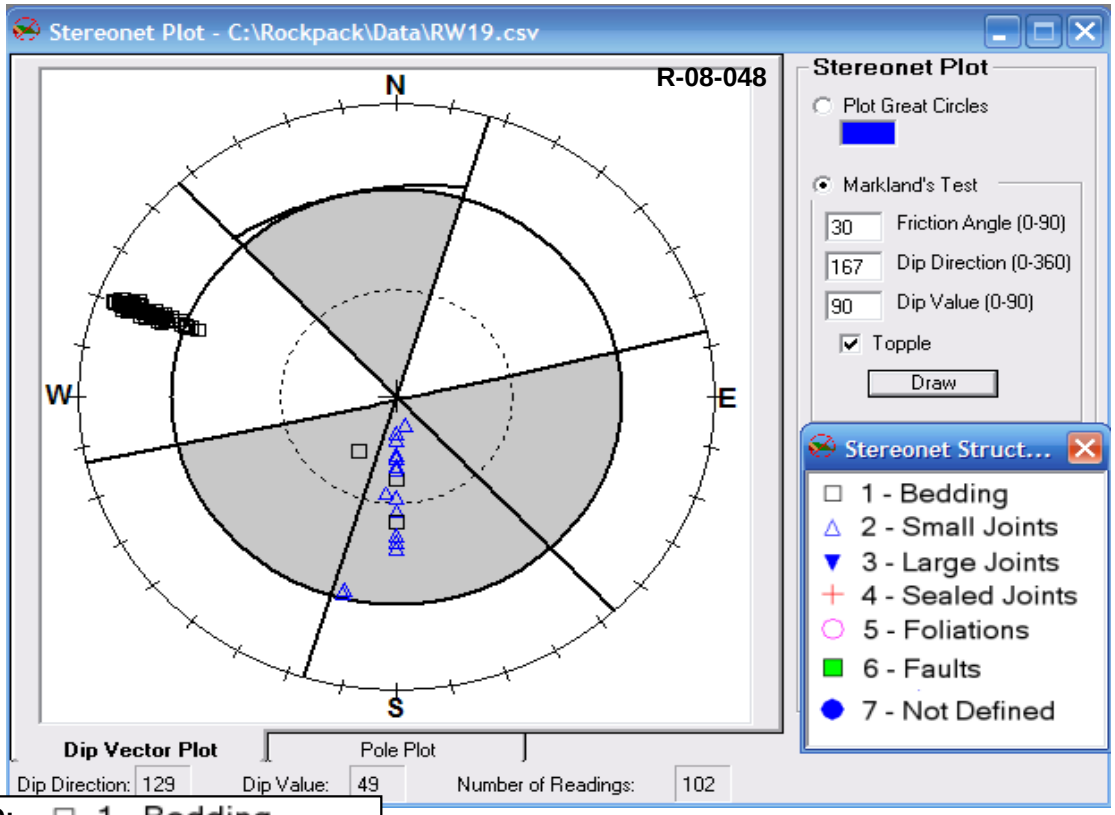
PARIKH CONSULTANTS, INC.

GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.MAT | PLATE NO.:6A

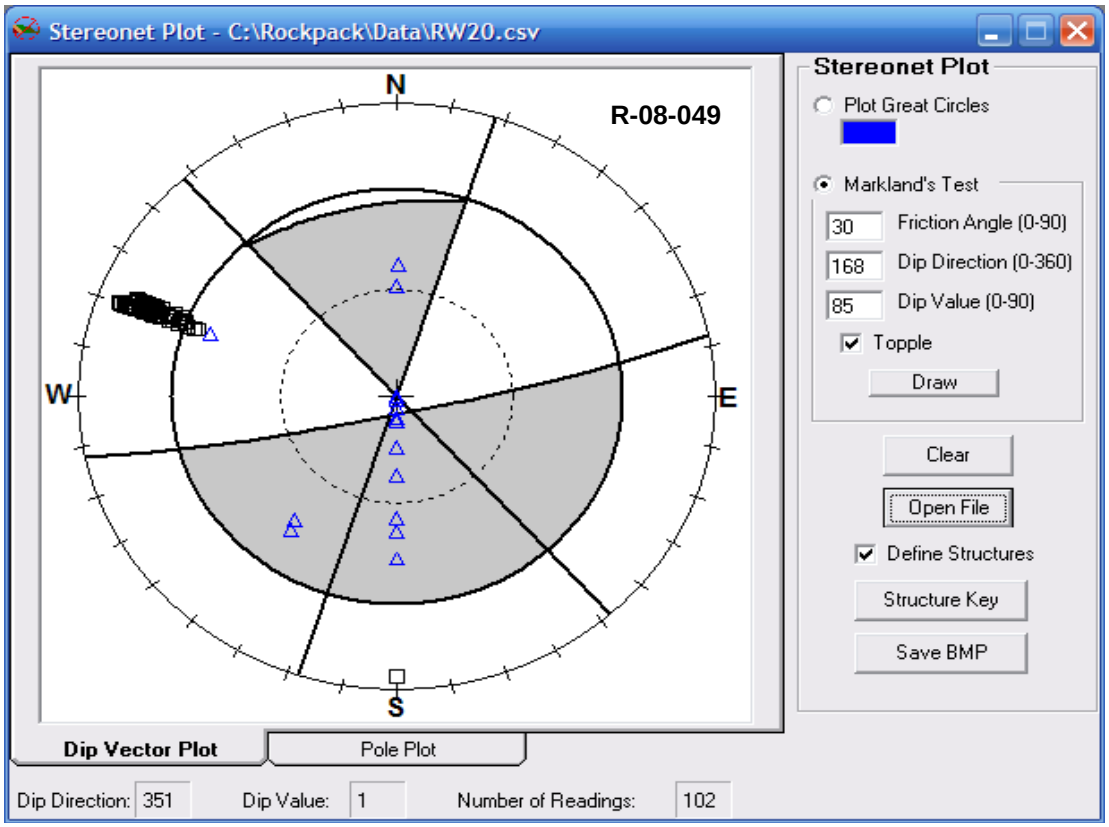


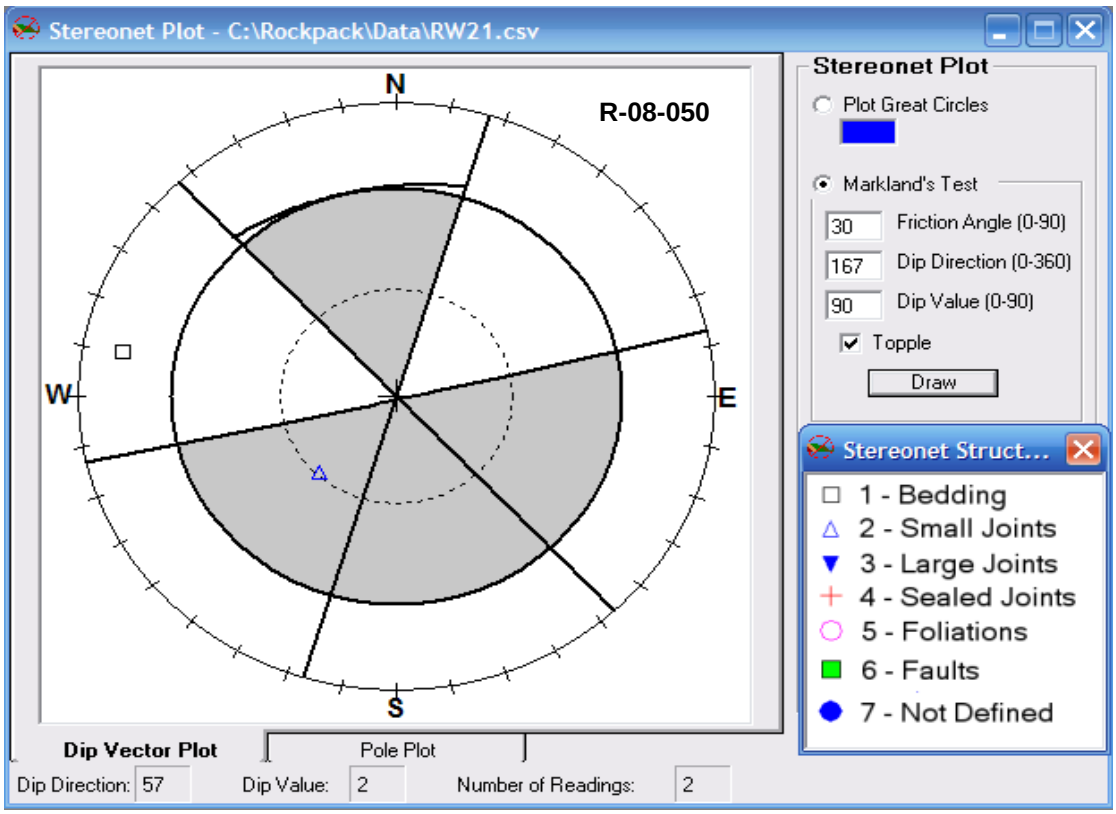


LEGEND:
- □ 1 - Bedding
- △ 2 - Small Joints

STEREONET PLOTS

PARIKH CONSULTANTS, INC. GEOTECHNICAL CONSULTANTS MATERIALS TESTING	**JAMESON CANYON ROAD WIDENING PROJECT** **SOLANO COUNTY, CALIFORNIA**	
	JOB NO.: 208117.MAT	**PLATE NO.:6B**





LEGEND:
- □ 1 - Bedding
- △ 2 - Small Joints

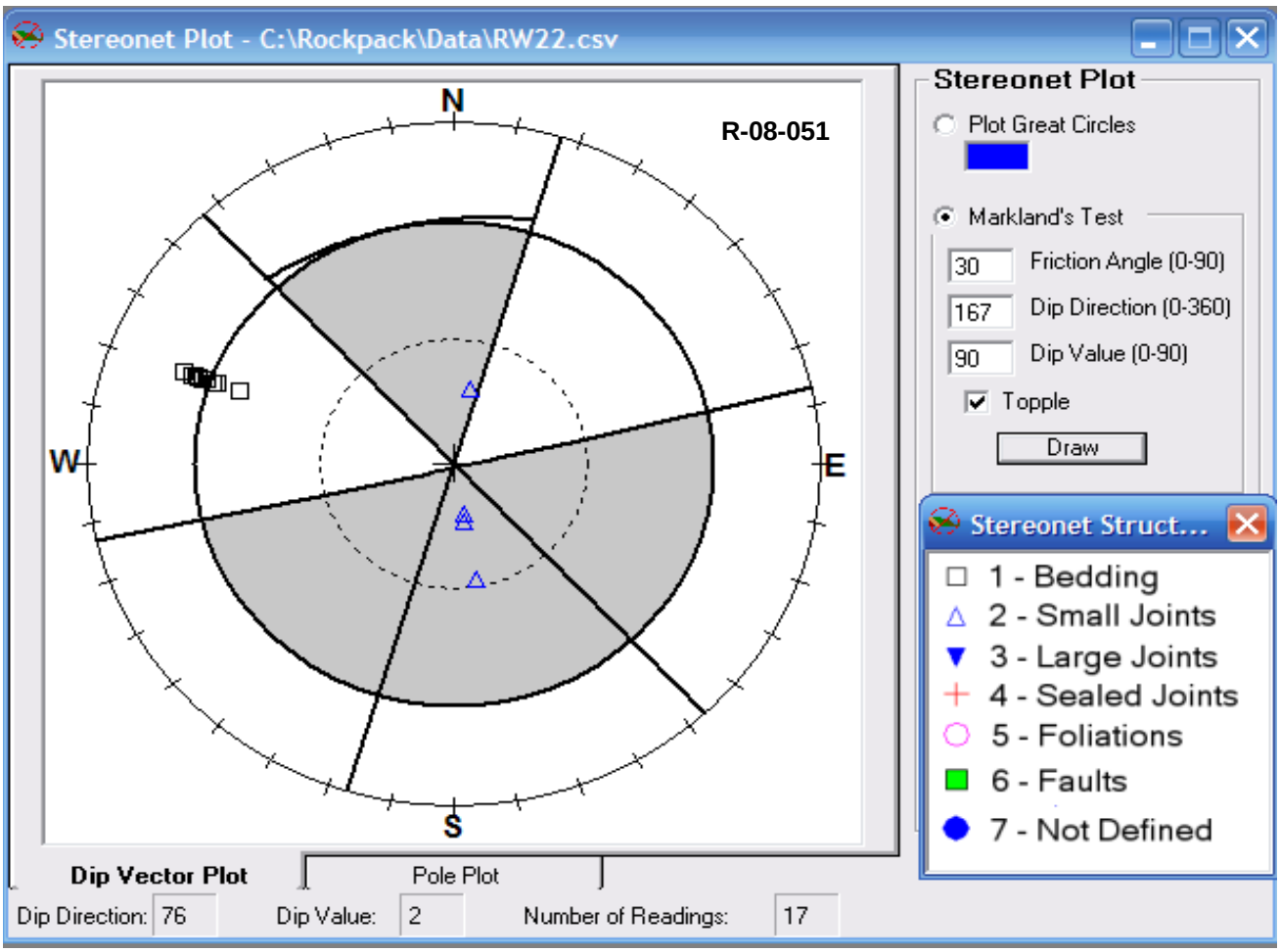
STEREONET PLOTS

PARIKH CONSULTANTS, INC.

GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.MAT | PLATE NO.:6C



LEGEND:
- □ 1 - Bedding
- △ 2 - Small Joints

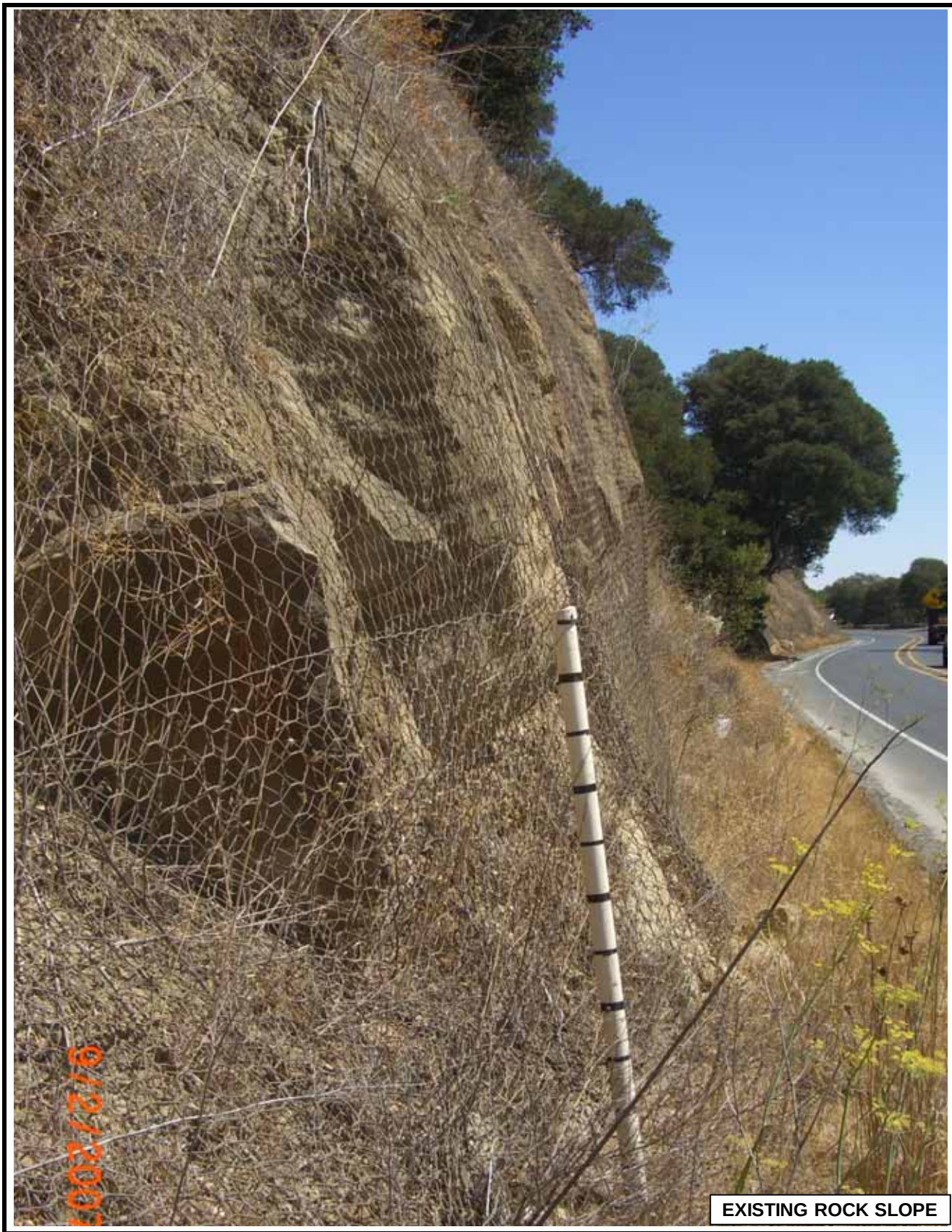
STEREONET PLOTS

PARIKH CONSULTANTS, INC.

GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.MAT | PLATE NO.:6D



EXISTING ROCK SLOPE

PARIKH CONSULTANTS, INC.

GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT	PLATE NO.: 7A

EXISTING ROCK SLOPE

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 7B

EXISTING ROCK SLOPE

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: 7C

Boring RW-19

Depth:

36 feet

Bedding Dip:
13 degrees

0 0.05 0.1 0.2 0.3 0.4 0.5 Feet

CORE SAMPLES

PARIKH CONSULTANTS, INC.

GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT | **PLATE NO.: 8A**

Boring RW-19

Depth:

Bedding Dip:
16 degrees

Bedding Dip:
18 degrees

Bedding Dip:
12 degrees

50 feet

0 0.05 0.1 0.2 0.3 0.4 0.5 Feet

CORE SAMPLES

PARIKH CONSULTANTS, INC.

GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT | **PLATE NO.: 8B**

Boring RW-20

Depth: 77 feet

Bedding Dip:
18 degrees

Bedding Dip:
20 degrees

0 0.05 0.1 0.2 0.3 0.4 0.5 Feet

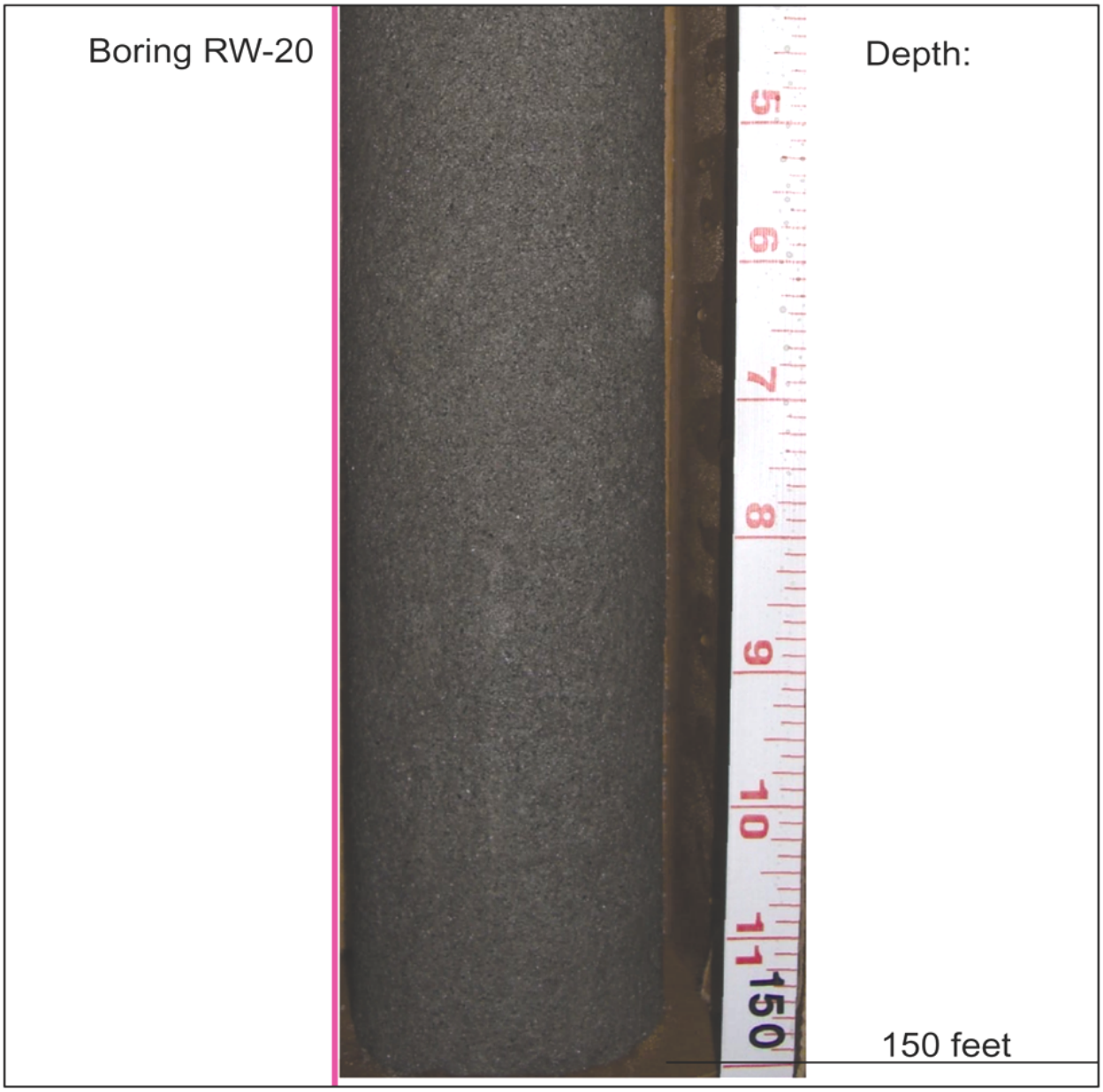
CORE SAMPLES

PARIKH CONSULTANTS, INC.

GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT | **PLATE NO.: 8C**



0 0.05 0.1 0.2 0.3 0.4 0.5 Feet

CORE SAMPLES

PARIKH CONSULTANTS, INC.

GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
SOLANO COUNTY, CALIFORNIA

JOB NO.: 208117.FDN | **PLATE NO.: 8D**

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	---	---

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

DESIGN OVERSIGHT	DRAWN BY L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER	BRIDGE NO. –
SIGN OFF DATE	CHECKED BY F. WANG	DATE: SEPTEMBER 2009			POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT

LOG OF TEST BORINGS

OGS CIVIL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/24/09 5/18/09 8/07/09 9/28/09 11/05/09

SHEET OF

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp.12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

CONSISTENCY OF COHESIVE SOILS

Description	Unconfined Compressive Strength (tsf)	Pocket Penetrometer Measurement (tsf)	Torvane Measurement (tsf)	Field Approximation
Very Soft	< 0.25	< 0.25	< 0.12	Easily penetrated several inches by fist
Soft	0.25 to 0.50	0.25 to 0.50	0.12 to 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 to 1.0	0.50 to 1.0	0.25 to 0.50	Penetrated several inches by thumb with moderate effort
Stiff	1 to 2	1 to 2	0.50 to 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2 to 4	2 to 4	1.0 to 2.0	Readily indented by thumbnail
Hard	> 4.0	> 4.0	> 2.0	Indented by thumbnail with difficulty

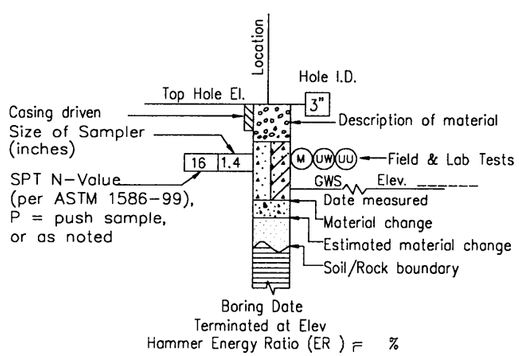
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring
Size	R P	Rotary drilled boring Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778-95)
□	O	Other

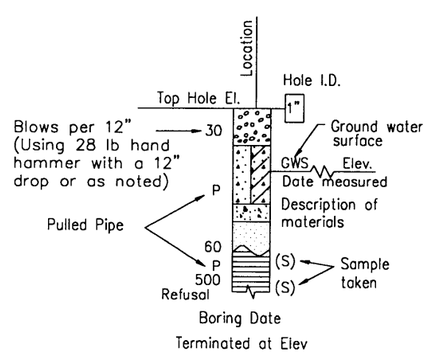
Note: Size in inches.

PLASTICITY OF FINE-GRAINED SOILS

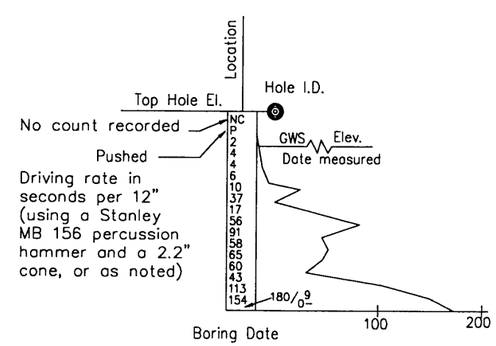
Description	Criteria
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.



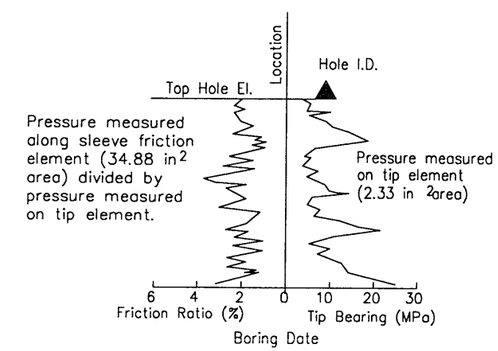
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) SOUNDING

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: SEPTEMBER 2009		

BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT

LOG OF TEST BORINGS

OGS CIVIL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/31/09 6/30/09 8/03/09 9/28/09 11/05/09

SHEET OF

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
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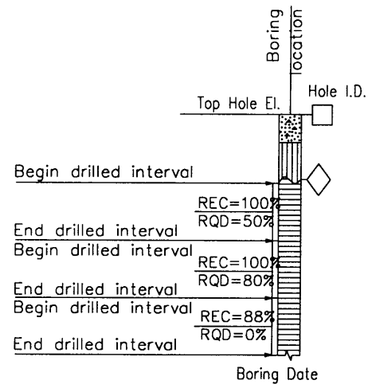
REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp.12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

PERCENT CORE RECOVERY (REC) + ROCK QUALITY DESIGNATION (RQD)

$$REC = \frac{\sum \text{Length of the recovered core pieces (inches)}}{\text{Total length of core run (inches)}} \times 100\%$$

$$RQD = \frac{\sum \text{Length of intact core pieces} \geq 4''}{\text{Total length of core run (inches)}} \times 100\%$$



RELATIVE STRENGTH OF INTACT ROCK

Term	Uniaxial Compressive Strength (PSI)
Extremely Strong	> 30,000
Very Strong	14,500 – 30,000
Strong	7,000 – 14,500
Medium Strong	3,500 – 7,000
Weak	700 – 3,500
Very Weak	150 – 700
Extremely Weak	< 150

BEDDING SPACING

Description	Thickness / Spacing
Massive	Greater than 10 ft
Very thickly bedded	3 to 10 ft
Thickly bedded	1 to 3 ft
Moderately bedded	3-5/8" to 1 ft
Thinly bedded	1-1/4" to 3-5/8"
Very thinly bedded	3/8" to 1-1/4"
Laminated	Less than 3/8"

LEGEND OF ROCK MATERIALS

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

ROCK HARDNESS

Description	Criteria
Extremely Hard	Specimen cannot be scratched with a pocket knife or sharp pick; can only be chipped with repeated heavy hammer blows.
Very Hard	Specimen cannot be scratched with a pocket knife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Specimen can be scratched with a pocket knife or sharp pick with difficulty (heavy pressure). Heavy hammer blows required to break specimen.
Moderately Hard	Specimen can be scratched with pocket knife or sharp pick with light or moderate pressure. Core breaks with moderate hammer pressure.
Moderately Soft	Specimen can be grooved 1/6" deep with a pocket knife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Specimen can be grooved or gouged easily by a pocket knife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Specimen can be readily indented, grooved or gouged with fingernail, or carved with a pocket knife. Breaks with light manual pressure.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures.
Very slightly fractured	Lengths greater than 3 feet.
Slightly fractured	Lengths from 1 to 3 feet with few lengths less than 1 foot or greater than 3 feet.
Moderately fractured	Lengths mostly in 4" to 1 foot range with most lengths about 8"
Intensely fractured	Lengths average from 1 to 4" with scattered fragmented intervals with lengths less than 4"
Very intensely fractured	Mostly chips and fragments with a few scattered short core lengths.

Combination descriptors (such as "Very intensely to intensely fractured") are used where equal distribution of both fracture density characteristics is present over a significant interval or exposure, or where characteristics are "in between" the descriptor definitions. Only two adjacent descriptors may be combined.

WEATHERING DESCRIPTORS FOR INTACT ROCK

Description	Diagnostic features					General Characteristics
	Chemical Weathering–Discoloration and/or oxidation		Mechanical Weathering–Grain boundary conditions (disaggregation) primarily for granitics and some coarse–grained sediments	Texture and Solutioning		
	Body of Rock	Fracture Surfaces		Texture	Solutioning	
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change.	No solutioning.	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved.	Minor leaching of some soluble minerals may be noted.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe–Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved.	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe–Mg minerals are altered to clay to some extent; or chemical alteration produces in–situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe–Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

Combination descriptors (such as "slightly weathered to fresh") are permissible where equal distribution of both weathering characteristics is present over significant intervals or where characteristics present are "in between" the diagnostic feature. However, combination descriptors should not be used where significant, identifiable zones can be delineated. Only two adjacent descriptors may be combined. "Very intensely weathered" is the combination descriptor for "intensely weathered to decomposed."

DESIGN OVERSIGHT

SIGN OFF DATE

DRAWN BY L. TRAN

CHECKED BY F. WANG

V. SANTOS
FIELD INVESTIGATION BY:
DATE: SEPTEMBER 2009

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

F. WANG
PROJECT ENGINEER

BRIDGE NO. –

POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT

LOG OF TEST BORINGS

OGS CIVIL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/18/09 6/18/09 8/03/09 9/28/09 11/05/09

SHEET OF

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. G.E. 666
Exp. 12/31/09
GEOTECHNICAL
STATE OF CALIFORNIA

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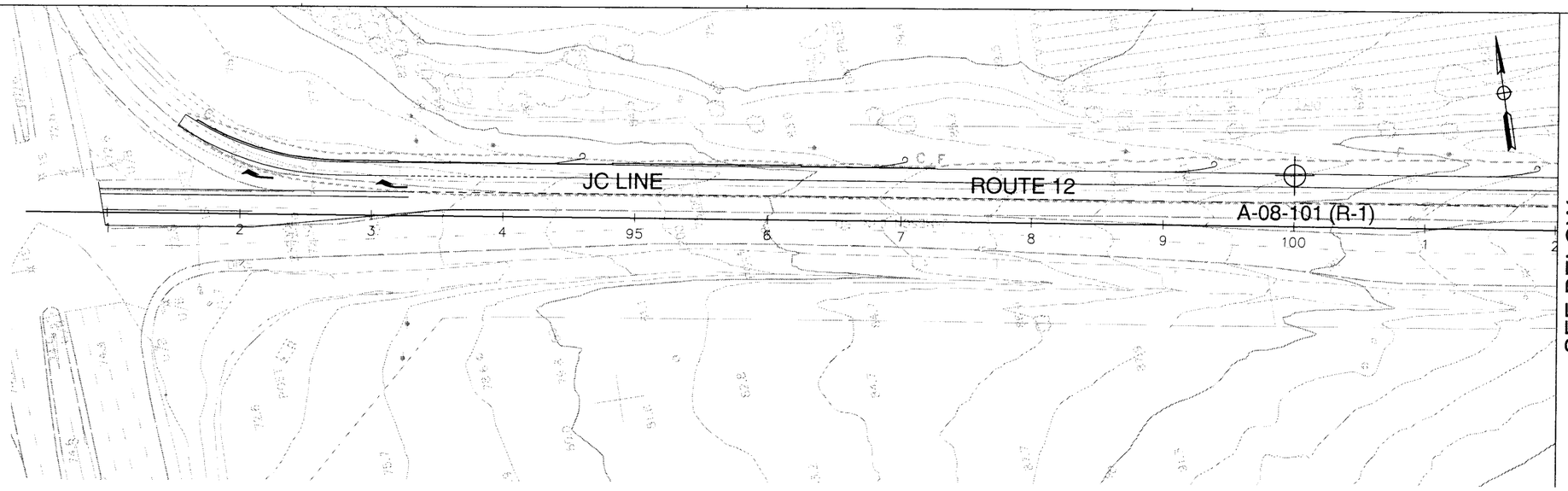

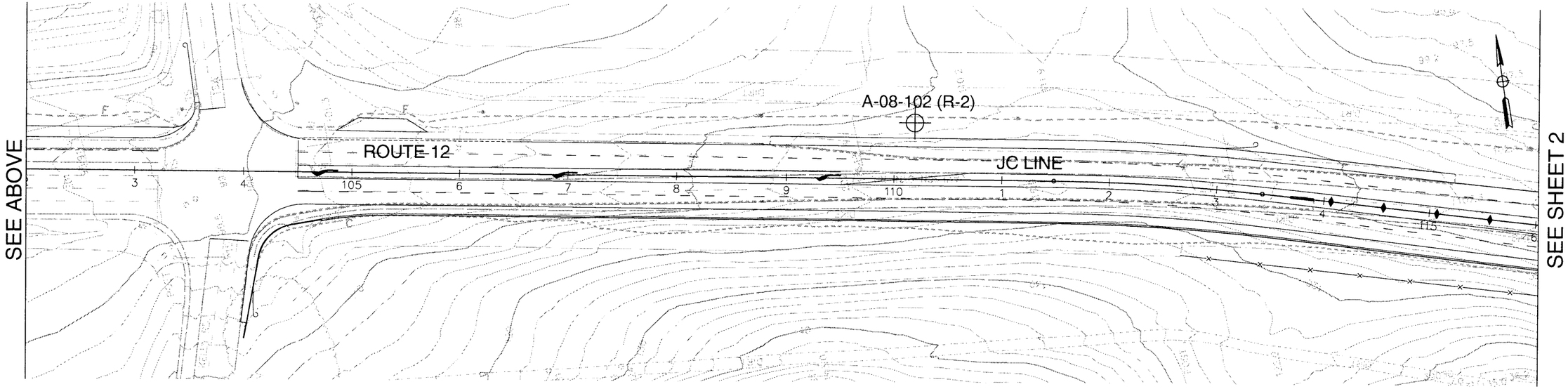

LEGEND

R-1
⊕ Approx. R-Value Boring Location

SCALE: 1 inch = 50 feet

Note: All units are in feet unless otherwise specified
Reference Map was provided by Mark Thomas & Company, Inc.

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: JULY 2009		

BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT
LOG OF TEST BORINGS 1 OF 30

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/24/09 6/08/09 8/03/09 9/28/09 11/05/09

SHEET OF

Nov 05, 2009 - 11:37am S:\ACAD\208117.FDN\Site Plan & Legend Sheets (GDWR).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
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Exp. 12/31/09
GEOTECHNICAL
STATE OF CALIFORNIA

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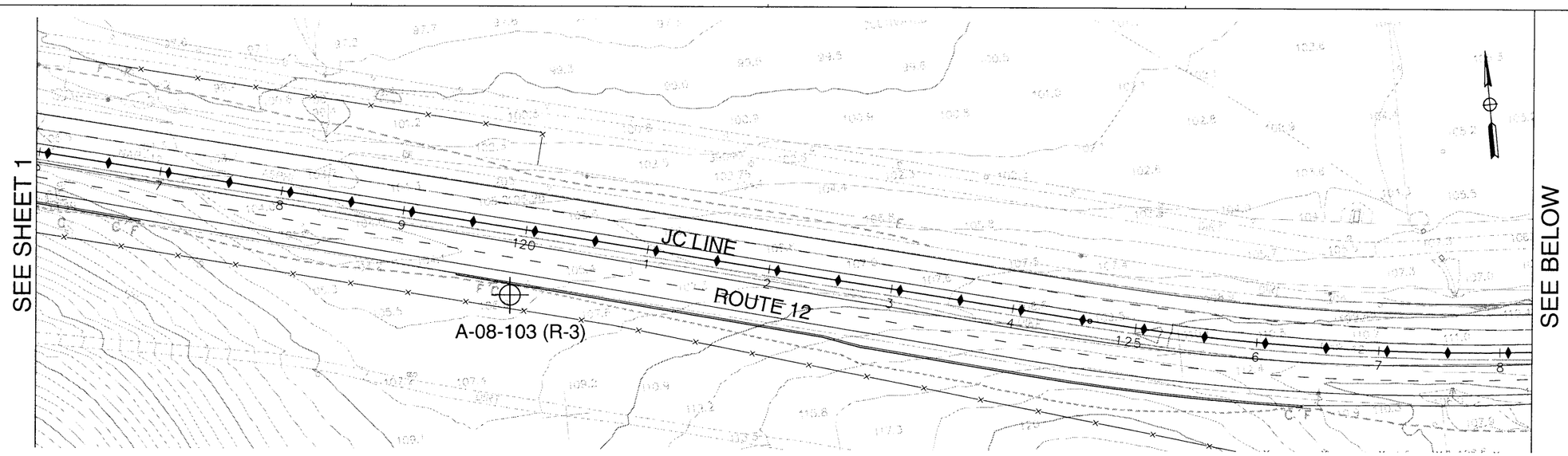

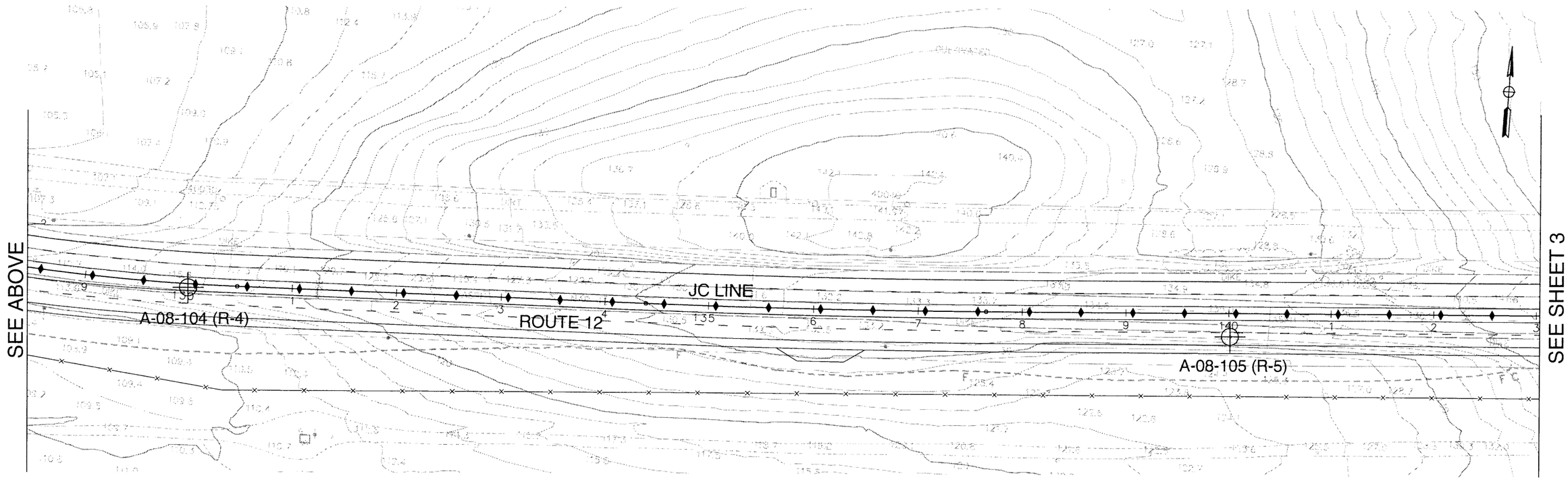

LEGEND

R-1
⊕ Approx. R-Value Boring Location

SCALE: 1 inch = 50 feet

Note: All units are in feet unless otherwise specified
Reference Map was provided by Mark Thomas & Company, Inc.

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SIGN OFF DATE	CHECKED BY	F. WANG	DATE: JULY 2009		

BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT
LOG OF TEST BORINGS 2 OF 30

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 3/24/09 5/18/09 8/07/09 9/28/09 11/05/09

SHEET OF

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
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GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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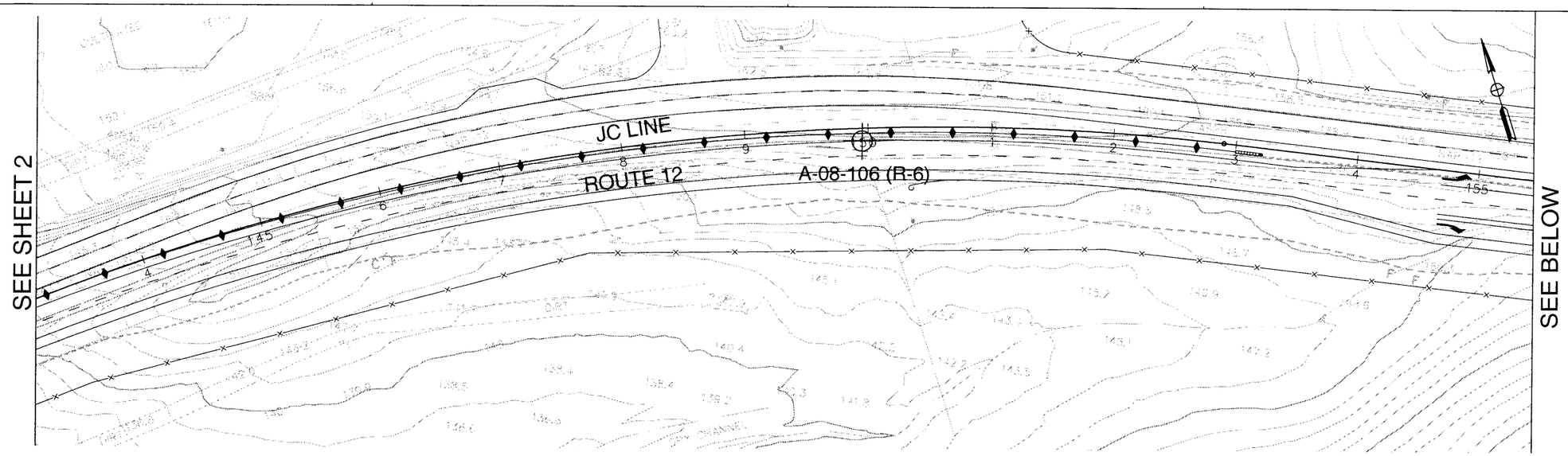

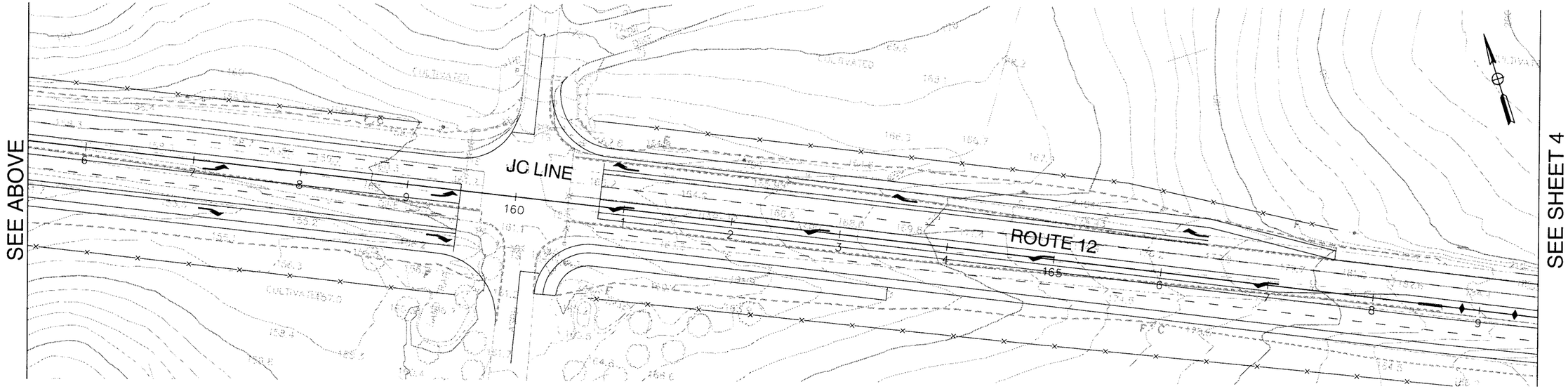

LEGEND

R-1 ⊕ Approx. R-Value Boring Location

SCALE: 1 inch = 50 feet

Note: All units are in feet unless otherwise specified
Reference Map was provided by Mark Thomas & Company, Inc.

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SIGN OFF DATE	CHECKED BY F. WANG	DATE: JULY 2009			POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT

LOG OF TEST BORINGS 3 OF 30

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES 3/24/09 5/28/09 8/07/09 9/28/09 11/05/09 SHEET OF

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. G.E. 666
Exp. 12/31/09
GEOTECHNICAL
STATE OF CALIFORNIA

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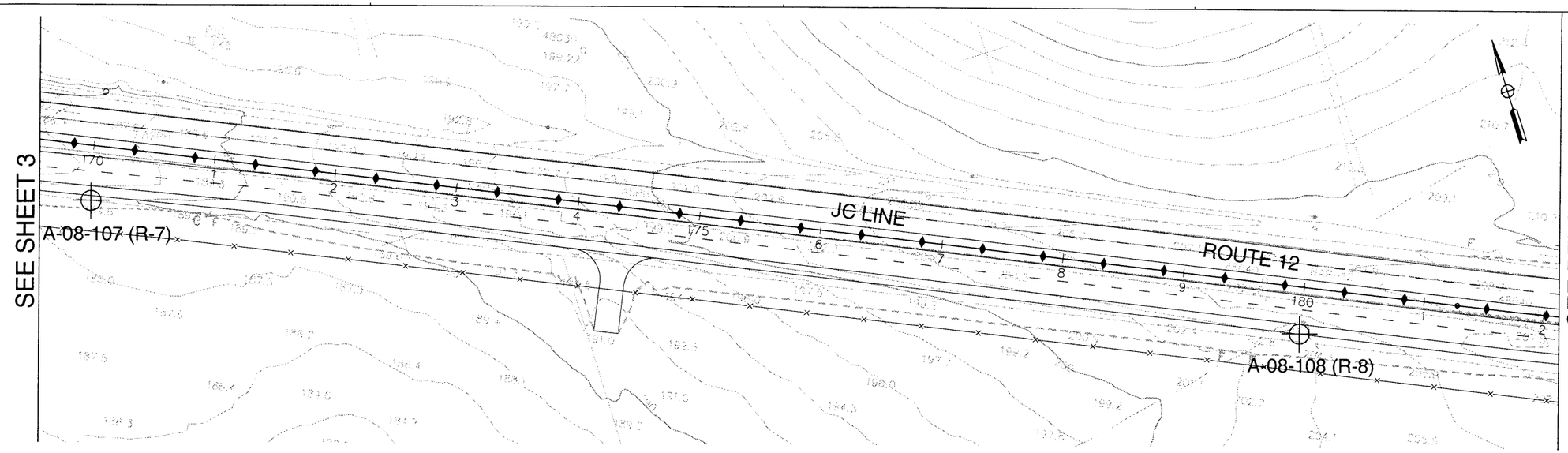

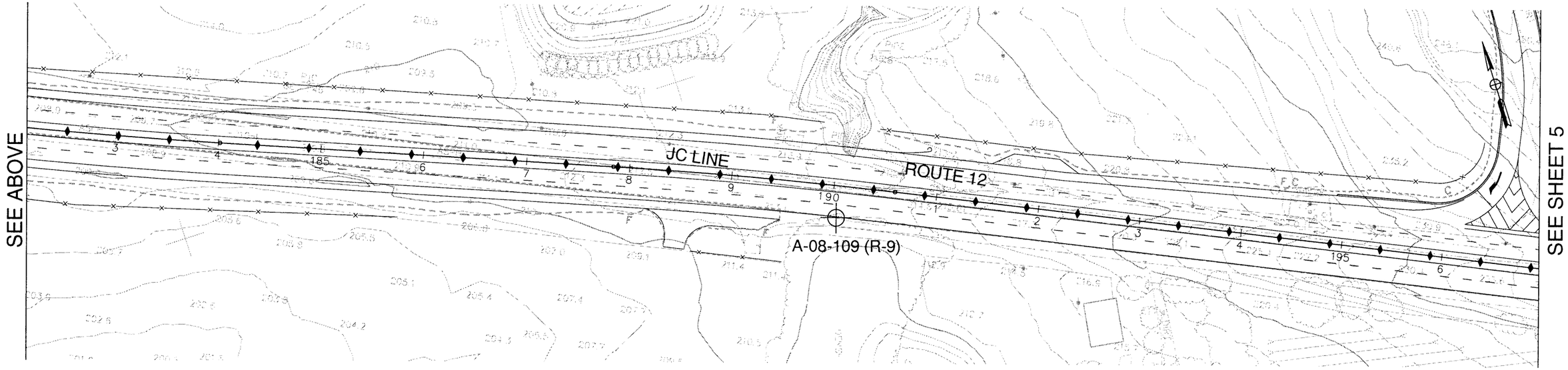

LEGEND

R-1
⊕ Approx. R-Value Boring Location

SCALE: 1 inch = 50 feet

Note: All units are in feet unless otherwise specified
Reference Map was provided by Mark Thomas & Company, Inc.

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SIGN OFF DATE	CHECKED BY	F. WANG	DATE: JULY 2009			POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT

LOG OF TEST BORINGS 4 OF 30

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/24/09 6/24/09 8/07/09 9/28/09 11/05/09

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap	12	3.2/3.3		

GEOTECHNICAL PROFESSIONAL DATE

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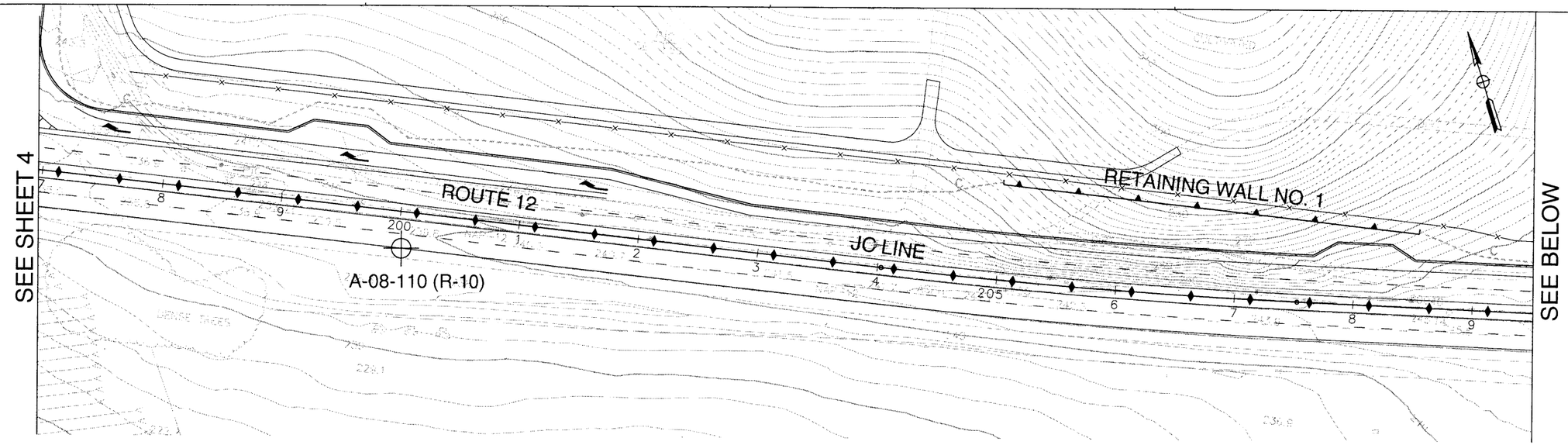

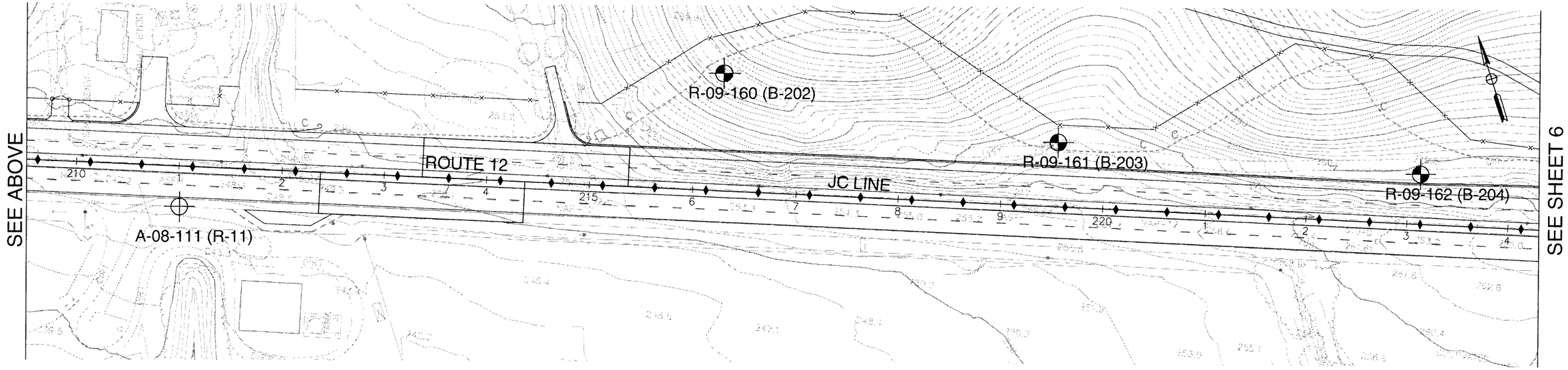

LEGEND

R-1 Approx. R-Value Boring Location

SCALE: 1 inch = 50 feet

Note: All units are in feet unless otherwise specified
Reference Map was provided by Mark Thomas & Company, Inc.

DESIGN OVERSIGHT	DRAWN BY L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER	BRIDGE NO. / POST MILES –
SIGN OFF DATE	CHECKED BY F. WANG	DATE: JULY 2009			

ROUTE 12/JAMESON CANYON ROAD PROJECT

ORINGS 5 OF 30

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/13/09 6/18/09 8/07/09 9/28/09 SHEET OF

Nov 05, 2009 - 12:01pm S:\ACAD\208117.FOK\Site Plan & Legend Sheets (GDAR).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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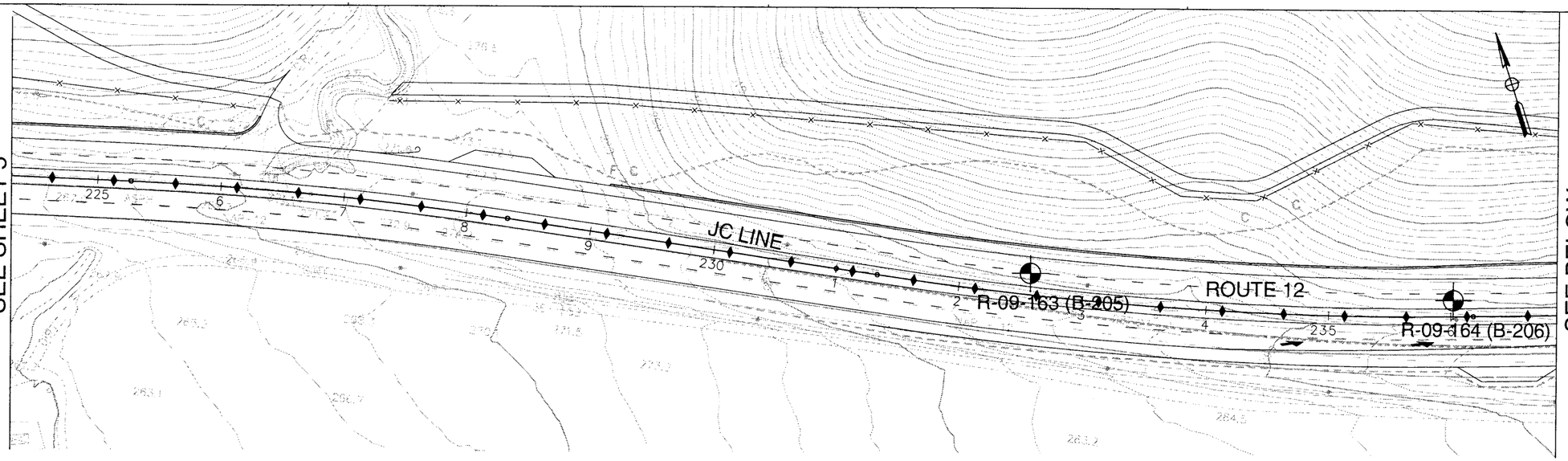

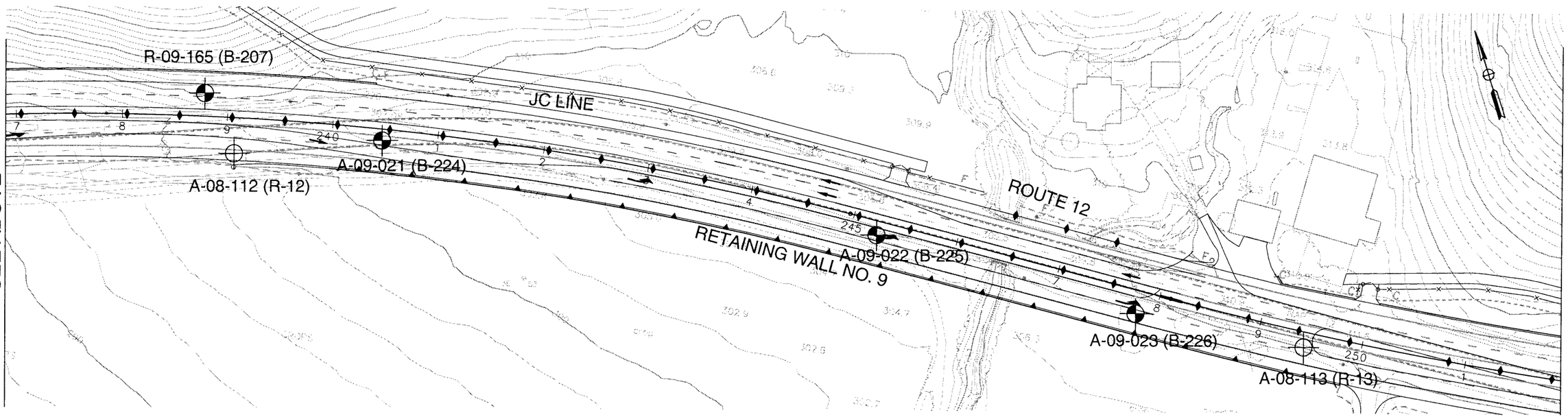

LEGEND

R-1 — Approx. R-Value Boring Location

RW-1 — Approx. Boring Location

SCALE: 1 inch = 50 feet

Note: All units are in feet unless otherwise specified
Reference Map was provided by Mark Thomas & Company, Inc.

DESIGN OVERSIGHT	DRAWN BY L. TRAN	V. SANTOS FIELD INVESTIGATION BY: DATE: JULY 2009	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER	BRIDGE NO. –
SIGN OFF DATE	CHECKED BY F. WANG				POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT

LOG OF TEST BORINGS 6 OF 30

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/11/09 5/18/09 8/31/09 9/28/09 11/05/09 SHEET OF

Nov 05, 2009 - 12:53pm S:\ACAD\208117.FDN\Site Plan & Legend Sheets (GDMR).dwg

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	---	---

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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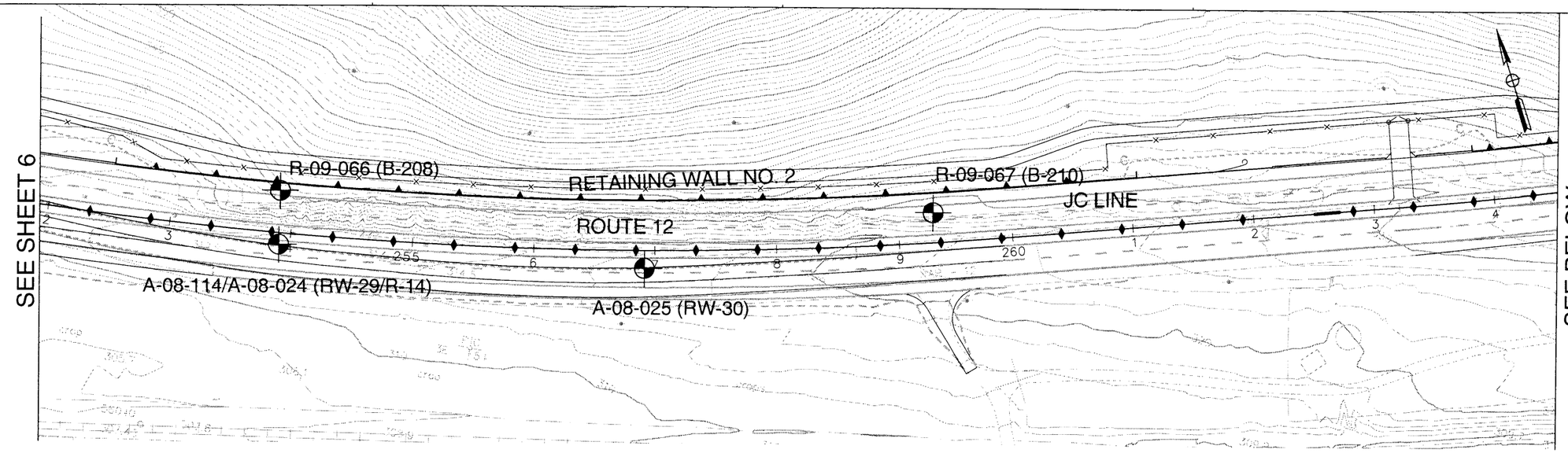

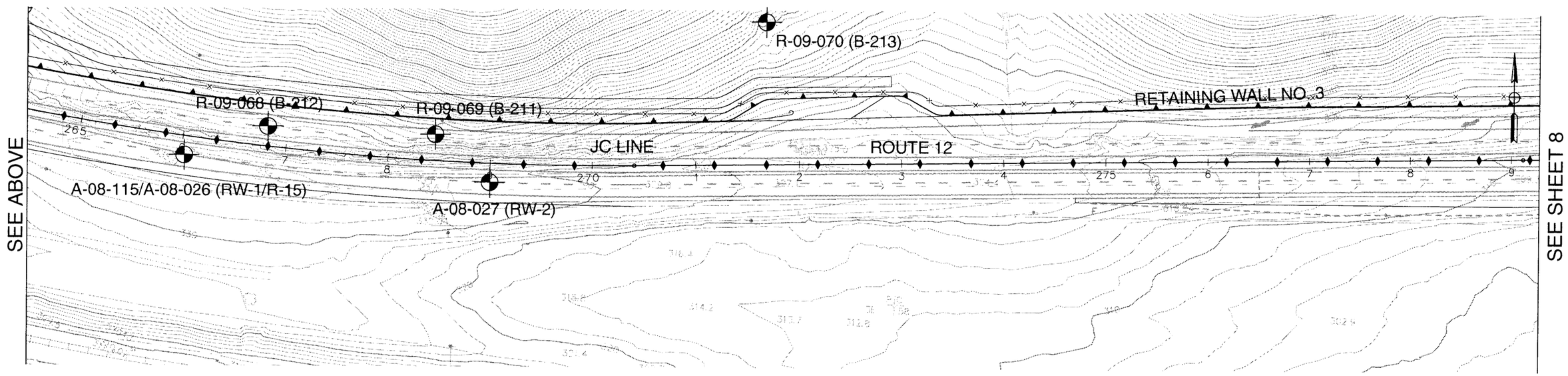

LEGEND

RW-1
Approx. Boring Location

SCALE: 1 inch = 50 feet

Note: All units are in feet unless otherwise specified
Reference Map was provided by Mark Thomas & Company, Inc.

DESIGN OVERSIGHT	DRAWN BY L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER	BRIDGE NO. –
SIGN OFF DATE	CHECKED BY F. WANG	DATE: JULY 2009			POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT

LOG OF TEST BORINGS 7 OF 30

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/24/09 5/28/09 8/27/09 9/28/09 11/05/09

SHEET OF

Nov 05, 2009 - 12:04pm S:\VCAD\208117.FDN\Site Plan & Legend Sheets (GOMR).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	---	---

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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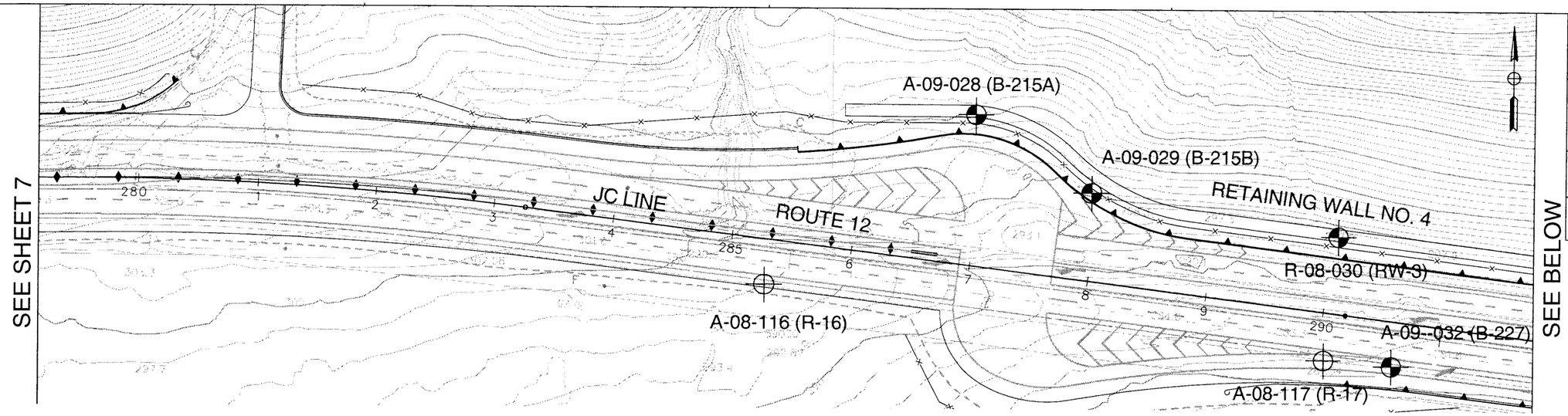

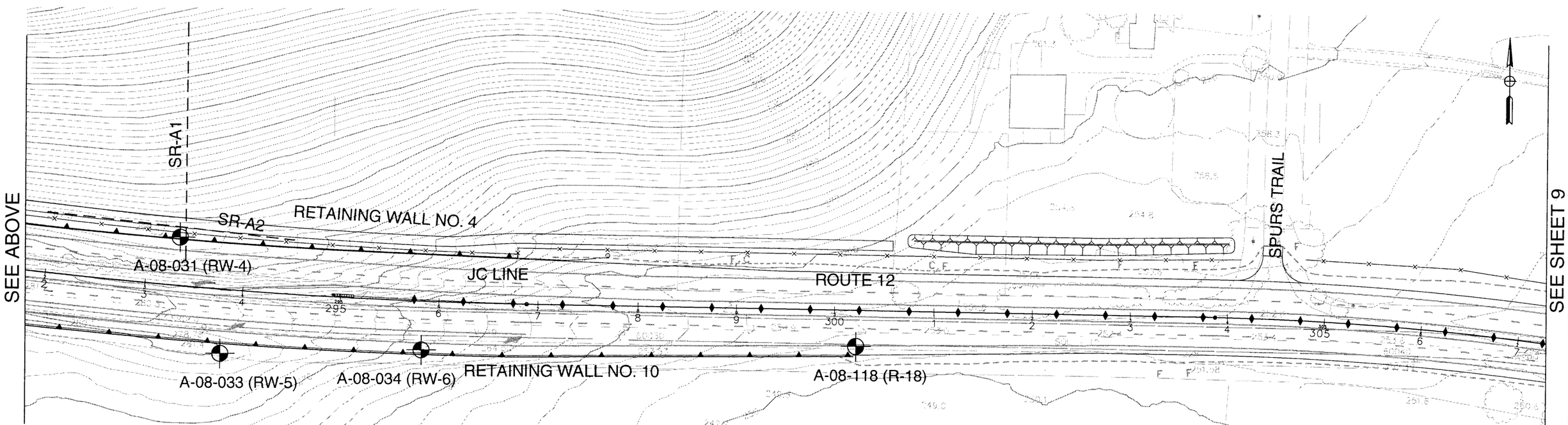

LEGEND

RW-1 — Approx. Boring Location

R-1 — Approx. R-Value Boring Location

— — — Approx. Seismic Refraction Survey Line Location

SCALE: 1 inch = 50 feet

Note: All units are in feet unless otherwise specified
Reference Map was provided by Mark Thomas & Company, Inc.

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: JULY 2009

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

F. WANG
PROJECT ENGINEER

BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT
LOG OF TEST BORINGS 8 OF 30

CU –
EA 04-264111

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/04/09 5/08/09 8/07/09 9/28/09 11/05/09

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6		

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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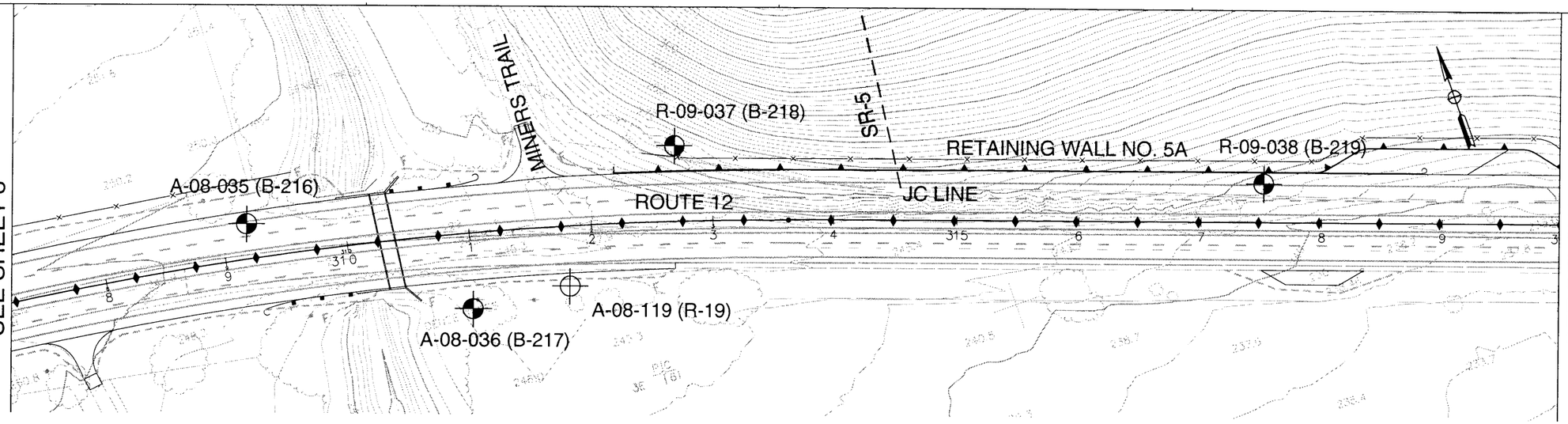

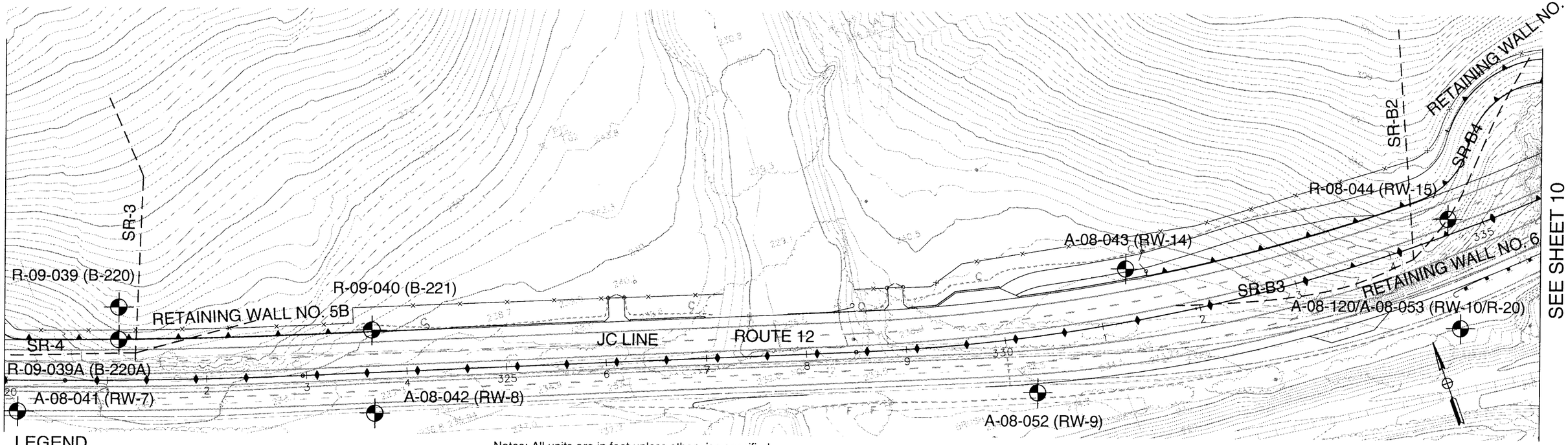

LEGEND

RW-1 — Approx. Boring Location

R-1 — Approx. R-Value Boring Location

— — — Approx. Seismic Refraction Survey Line Location

Notes: All units are in feet unless otherwise specified
Reference Map was provided by Mark Thomas & Company, Inc.

Boring R-09-039A (B-220A) was drilled only to verify the depth of the bedrock. The log is not presented.

SCALE: 1 inch = 50 feet

DESIGN OVERSIGHT	DRAWN BY L. TRAN	V. SANTOS FIELD INVESTIGATION BY: DATE: JULY 2009	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER	BRIDGE NO. –
SIGN OFF DATE	CHECKED BY F. WANG				POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT

LOG OF TEST BORINGS 9 OF 30

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/01/09 6/01/09 8/01/09 9/28/09 11/05/09

SHEET OF

Nov 05, 2009 - 12:09pm S:\ACAD\208117.DWG\Site Plan & Legend Sheets (GDMR).dwg

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	---	---

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

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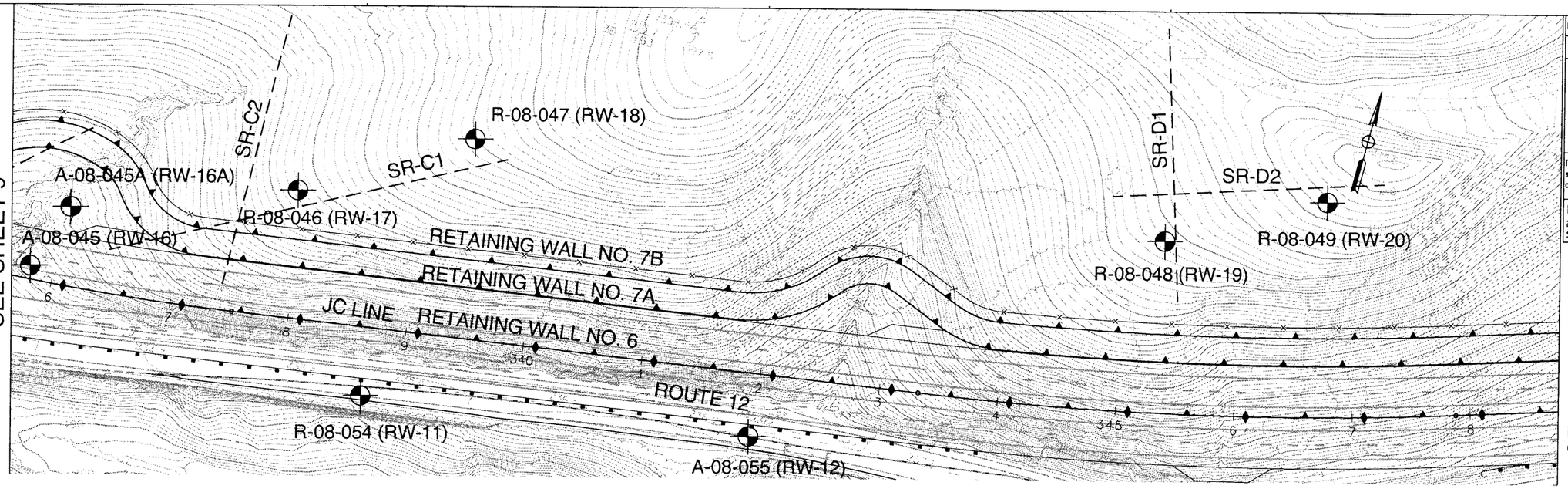
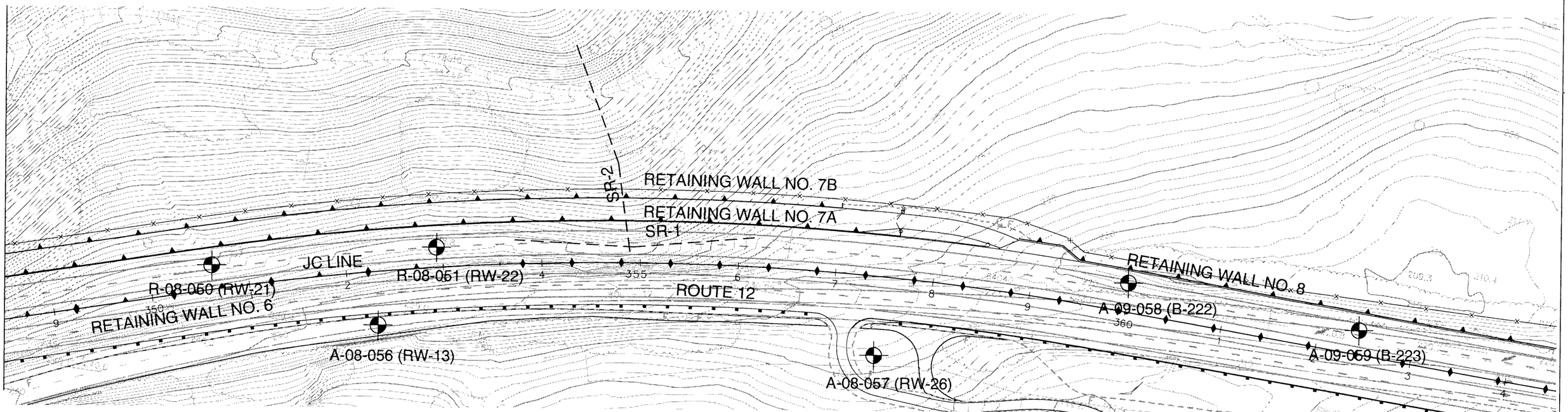
REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131





LEGEND

RW-1
Approx. Boring Location

Approx. Seismic Refraction Survey Line Location

SCALE 1 inch = 50 feet

Note: All units are in feet unless otherwise specified
Reference Map was provided by Mark Thomas & Company, Inc.

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: JULY 2009

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

F. WANG
PROJECT ENGINEER

BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT

LOG OF TEST BORINGS

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/31/09 5/28/09 8/03/09 9/28/09 11/05/09

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. G.E. 666
Exp. 12/31/09
GEOTECHNICAL
STATE OF CALIFORNIA

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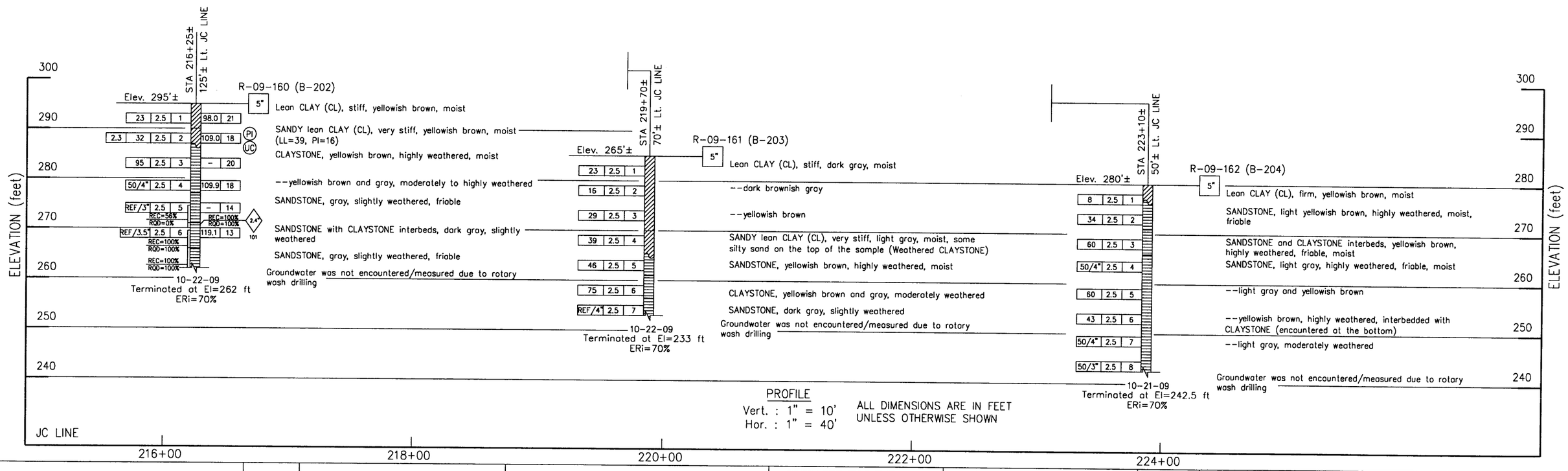
PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

(SEE SITE PLANS FOR BORING LOCATIONS)

Note:
Standard Penetration Test Sampler: I.D. = 1.4"; O.D. = 2"
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop
(Automatic Hammer)



DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: OCTOBER 2009		

BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT

LOG OF TEST BORINGS

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/24/09 6/26/09 8/03/09 9/28/09 11/05/09

SHEET OF

Nov 05, 2009 - 1:35pm S:\ACAD\208117.FDN\LOTB (COMR).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	---	-----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. G.E. 666
Exp. 12/31/09
GEOTECHNICAL
STATE OF CALIFORNIA

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2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

(SEE SITE PLANS FOR BORING LOCATIONS)

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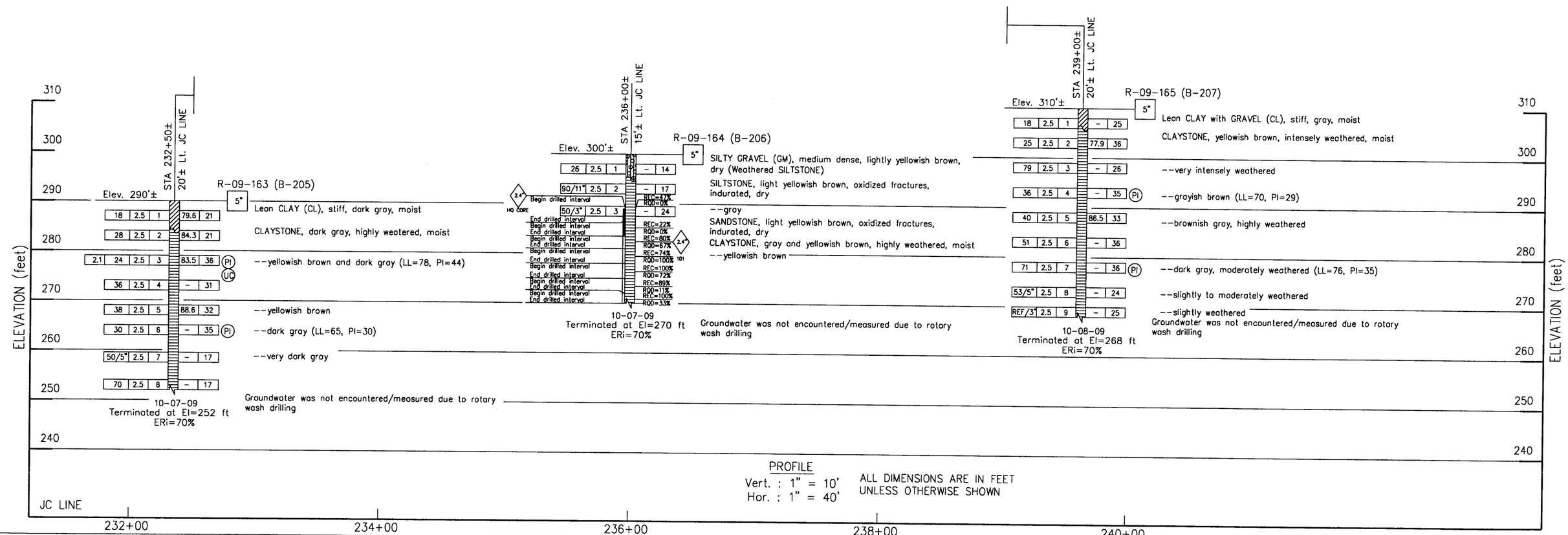

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 40'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: OCTOBER 2009		

BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT

LOG OF TEST BORINGS

CU –
EA 04-264111

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/24/09 5/28/09 8/07/09 9/28/09 11/05/09

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. G.E. 666
Exp. 12/31/09
GEOTECHNICAL
STATE OF CALIFORNIA

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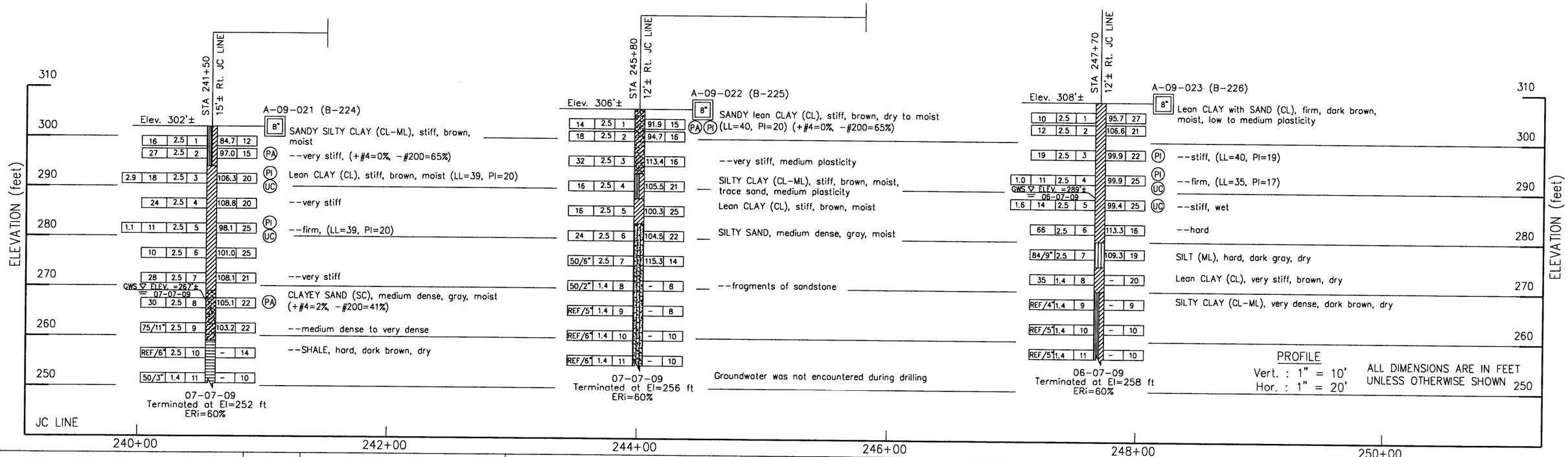
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

(SEE SITE PLANS FOR BORING LOCATIONS)



DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: JUNE 2009 & JULY 2009		

BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT

LOG OF TEST BORINGS 13 OF 30

CU –
EA 04-264111

DGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/24/09 6/26/09 8/07/09 9/28/09 11/05/09 SHEET OF

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. G.E. 666
Exp. 12/31/09
GEOTECHNICAL
STATE OF CALIFORNIA

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PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

(SEE SITE PLANS FOR BORING LOCATIONS)

Note:
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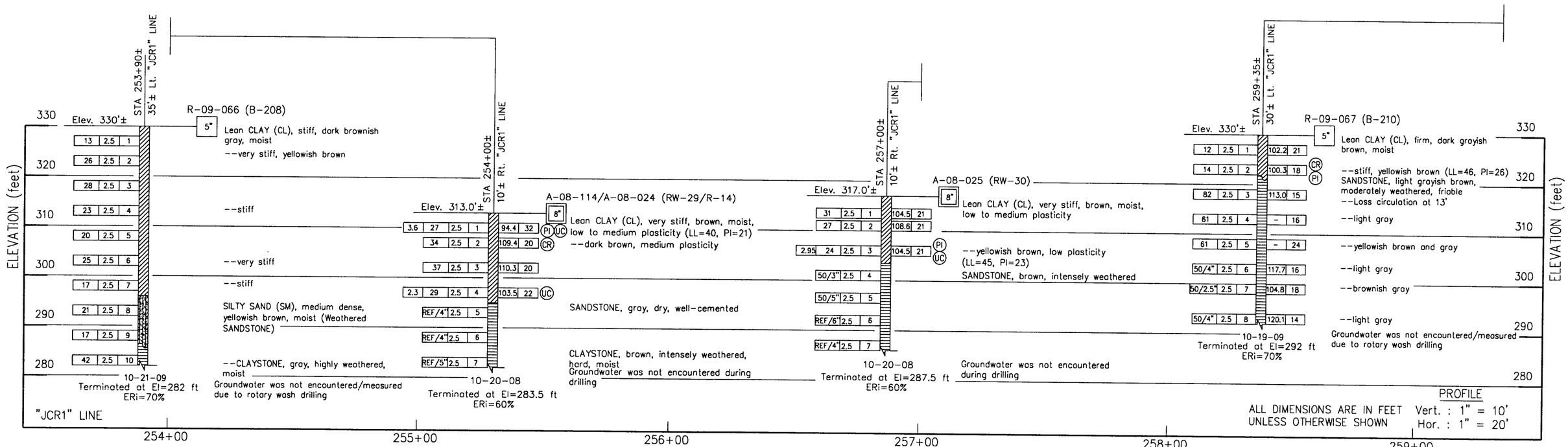
Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)



PROFILE
ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN
Vert. : 1" = 10'
Hor. : 1" = 20'

DESIGN OVERSIGHT	DRAWN BY L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER	BRIDGE NO. –
SIGN OFF DATE	CHECKED BY F. WANG	DATE: OCTOBER 2008			POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT
LOG OF TEST BORINGS 14 OF 30

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/31/09 5/28/09 8/27/09 9/28/09 11/05/09

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. G.E. 666
Exp. 12/31/09
GEOTECHNICAL
STATE OF CALIFORNIA

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PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

(SEE SITE PLANS FOR BORING LOCATIONS)

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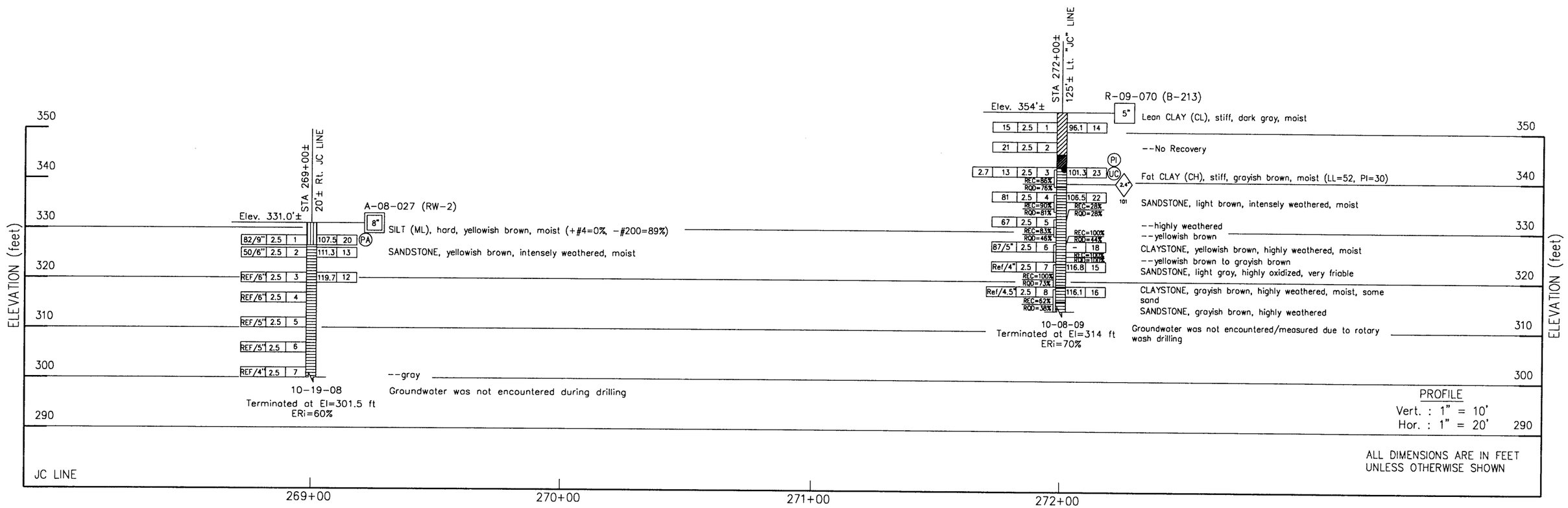

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: OCTOBER 2008		

BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT
LOG OF TEST BORINGS

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/24/09 5/28/09 8/07/09 9/28/09 11/05/09

SHEET OF

Nov 05, 2009 - 1:36pm S:\ACAD\208117.TDM\LOTB (GDWR).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. G.E. 666
Exp 12/31/09
GEOTECHNICAL
STATE OF CALIFORNIA

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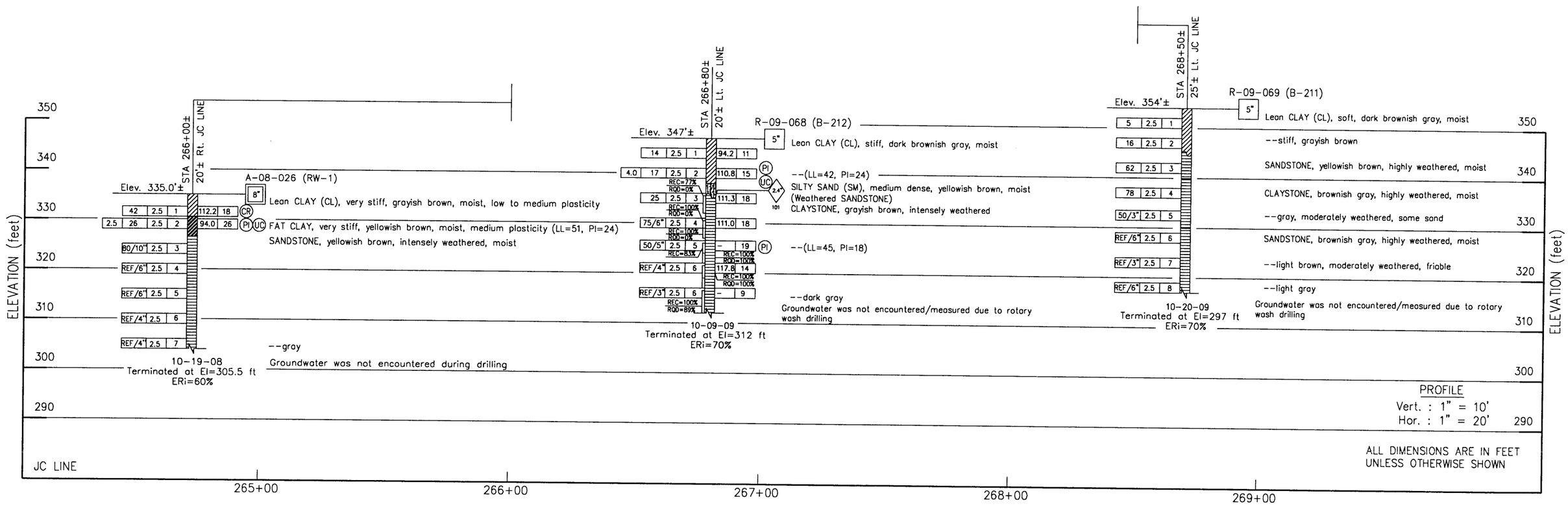
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

(SEE SITE PLANS FOR BORING LOCATIONS)



DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY: DATE: OCTOBER 2008	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG			

BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT
LOG OF TEST BORINGS

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/31/09 6/18/09 8/07/09 9/28/09 11/05/09

SHEET OF

Nov 05, 2009 - 1:35pm S:\ACAD\208117.FDN\LOTB (GDMR).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	---	---

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. G.E. 666
Exp. 12/31/09
GEOTECHNICAL
STATE OF CALIFORNIA

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SAN JOSE, CA 95131

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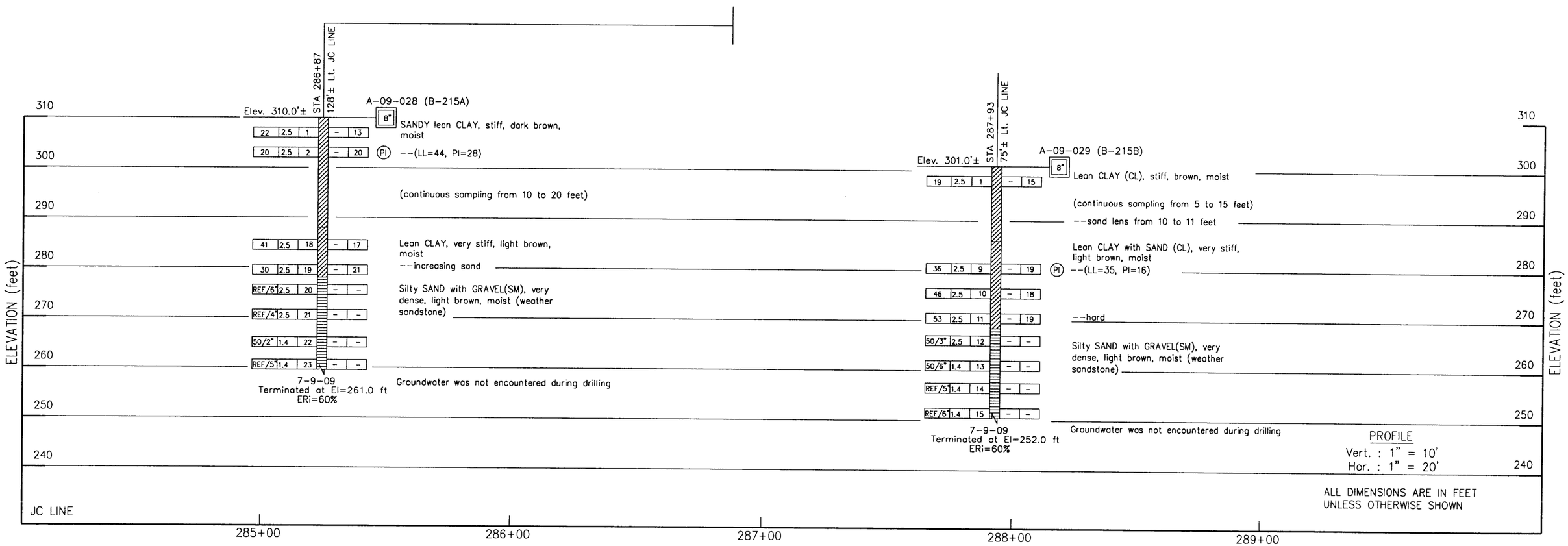

DESIGN OVERSIGHT	DRAWN BY L. TRAN	V. SANTOS FIELD INVESTIGATION BY: DATE: JULY 2009	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER	BRIDGE NO. -
SIGN OFF DATE	CHECKED BY F. WANG				POST MILES -

ROUTE 12/JAMESON CANYON ROAD PROJECT

LOG OF TEST BORINGS

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU -
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/13/09 5/18/09 8/07/09 9/28/09 11/05/09

SHEET OF

Nov 05, 2009 - 1:36pm S:\ACAD\208117.TDM\LOTB (GDWR).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	---	---

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. G.E. 666
Exp. 12/31/09
GEOTECHNICAL
STATE OF CALIFORNIA

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2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

(SEE SITE PLANS FOR BORING LOCATIONS)

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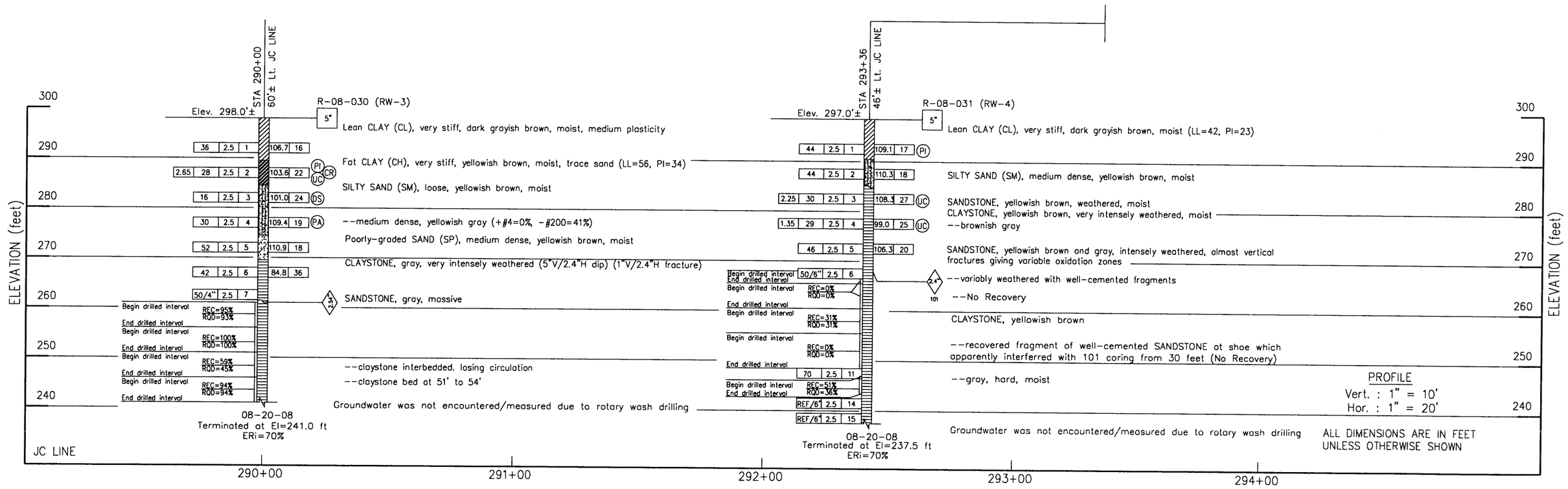

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: AUGUST 2008		

BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT
LOG OF TEST BORINGS

CU –
EA 04-264111

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/13/09 5/18/09 8/31/09 9/28/09 11/05/09

SHEET OF

Nov 05, 2009 - 1:36pm S:\ACAD\206117.FDN\LOTB (GDMR).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6		

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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SAN JOSE, CA 95131

(SEE SITE PLANS FOR BORING LOCATIONS)

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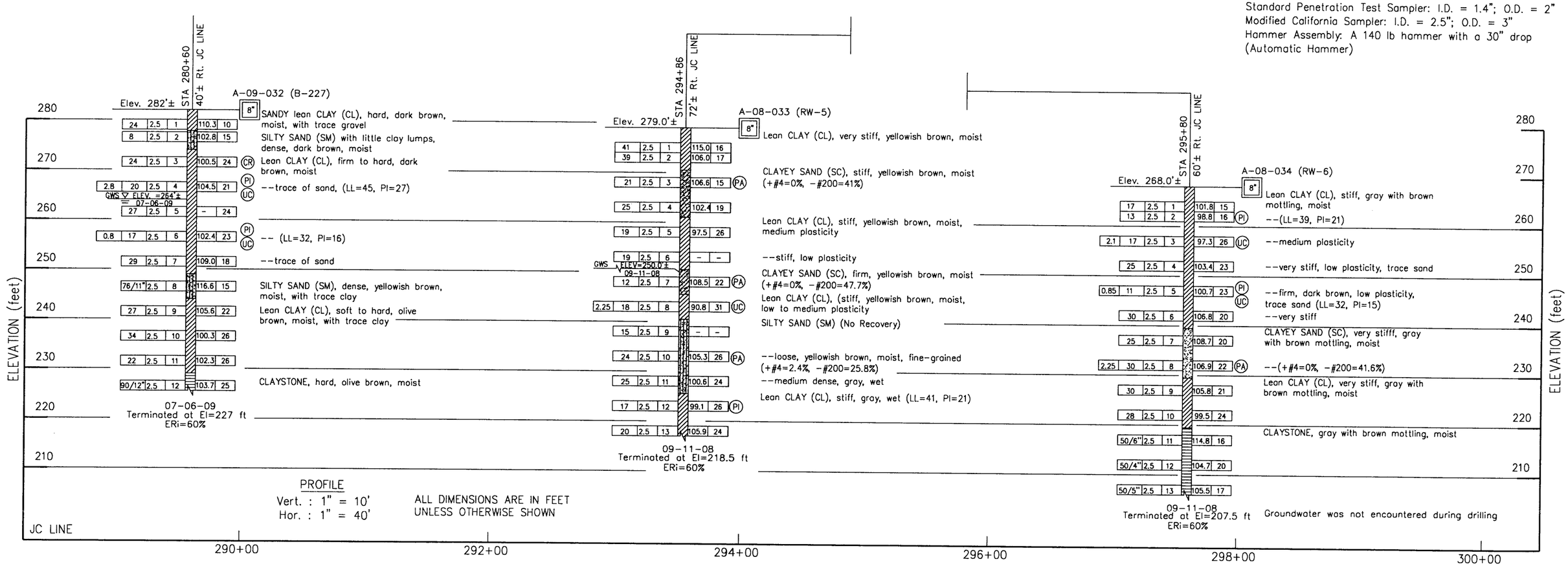

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 40'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY:	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG	DATE: SEPTEMBER 2008 & JULY 2009		

BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT
LOG OF TEST BORINGS

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/11/09 5/14/09 8/17/09 9/28/09 11/05/09 SHEET OF

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	---	---

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
GARY PARIKH
No. G.E. 666
Exp. 12/31/09
GEOTECHNICAL
STATE OF CALIFORNIA

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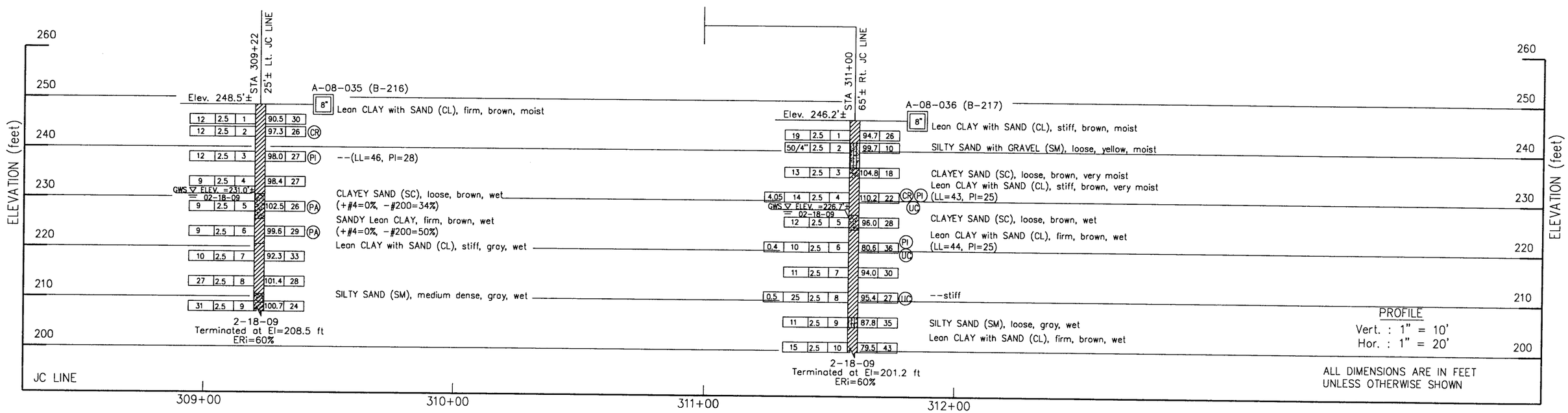

DESIGN OVERSIGHT	DRAWN BY	L. TRAN	V. SANTOS FIELD INVESTIGATION BY: DATE: FEBRUARY 2009	PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	F. WANG PROJECT ENGINEER
SIGN OFF DATE	CHECKED BY	F. WANG			

BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT
LOG OF TEST BORINGS

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU –
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/24/09 8/24/09 8/27/09 9/28/09 11/05/09

SHEET OF

Nov 05, 2009 - 1:36pm S:\ACAD\2081117.FDN\LOTB (CDWR).dwg

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER GARY PARIKH No. G.E. 666 Exp. 12/31/09 GEOTECHNICAL STATE OF CALIFORNIA

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PARIKH CONSULTANTS, INC.
2360 QUME DRIVE, SUITE A
SAN JOSE, CA 95131

(SEE SITE PLANS FOR BORING LOCATIONS)

Note:
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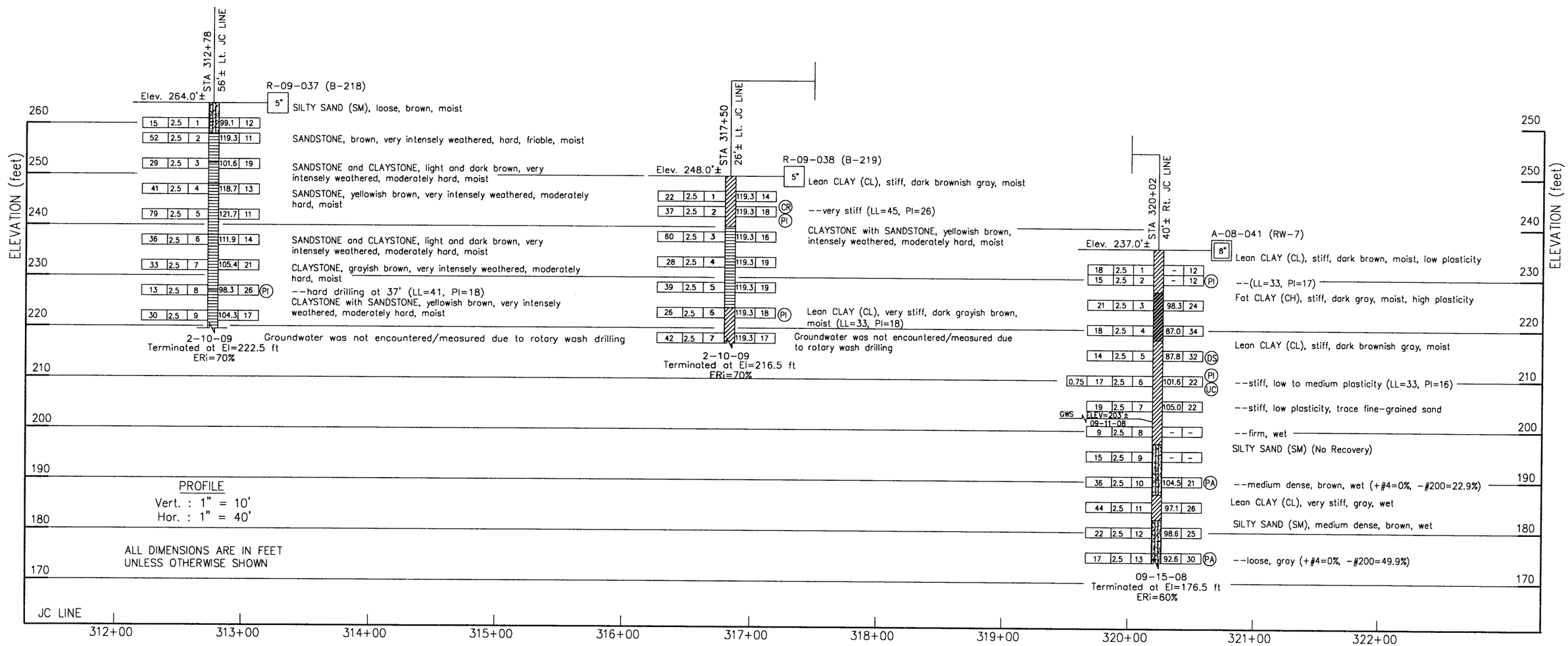

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BRIDGE NO. -
POST MILES -

ROUTE 12/JAMESON CANYON ROAD PROJECT
LOG OF TEST BORINGS

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU -
EA 04-264111

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES 3/31/09 6/30/09 8/31/09 9/30/09 11/05/09

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	---	---

GEOTECHNICAL PROFESSIONAL DATE

PLANS APPROVAL DATE

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SAN JOSE, CA 95131

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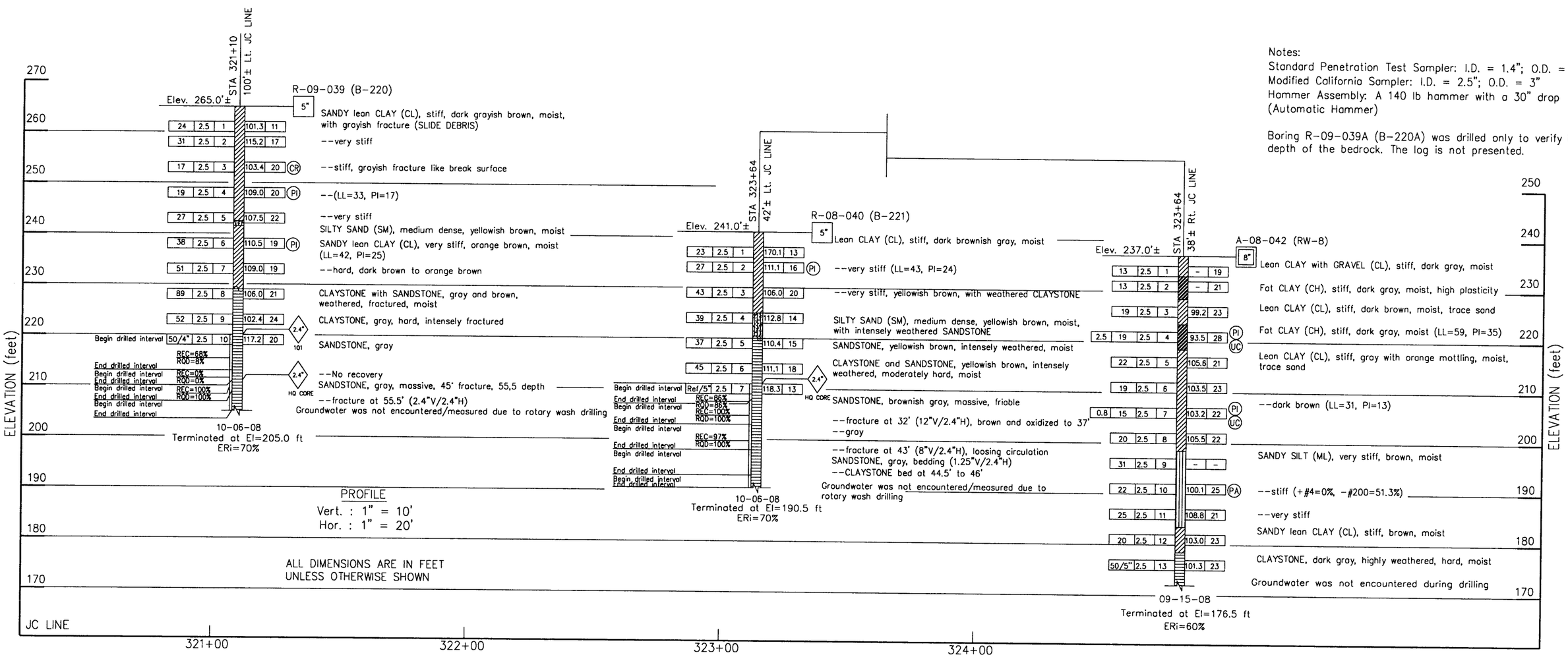

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Modified California Sampler: I.D. = 2.5"; O.D. = 3"
Hammer Assembly: A 140 lb hammer with a 30" drop (Automatic Hammer)

Boring R-09-039A (B-220A) was drilled only to verify the depth of the bedrock. The log is not presented.

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ROUTE 12/JAMESON CANYON ROAD PROJECT
LOG OF TEST BORINGS

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ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	---	---

GEOTECHNICAL PROFESSIONAL DATE

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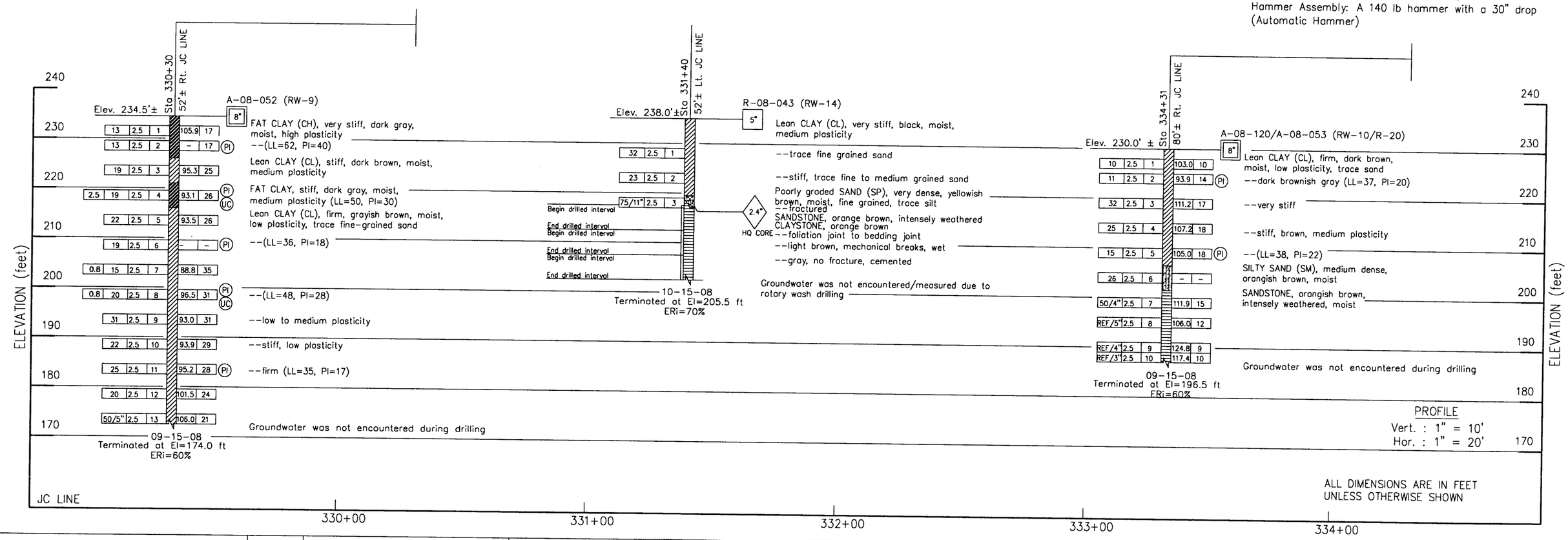

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BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT
LOG OF TEST BORINGS 23 OF 30

CU –
EA 04-264111

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES: 3/24/09 5/08/09 8/07/09 9/08/09 11/05/09

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	---	---

GEOTECHNICAL PROFESSIONAL DATE

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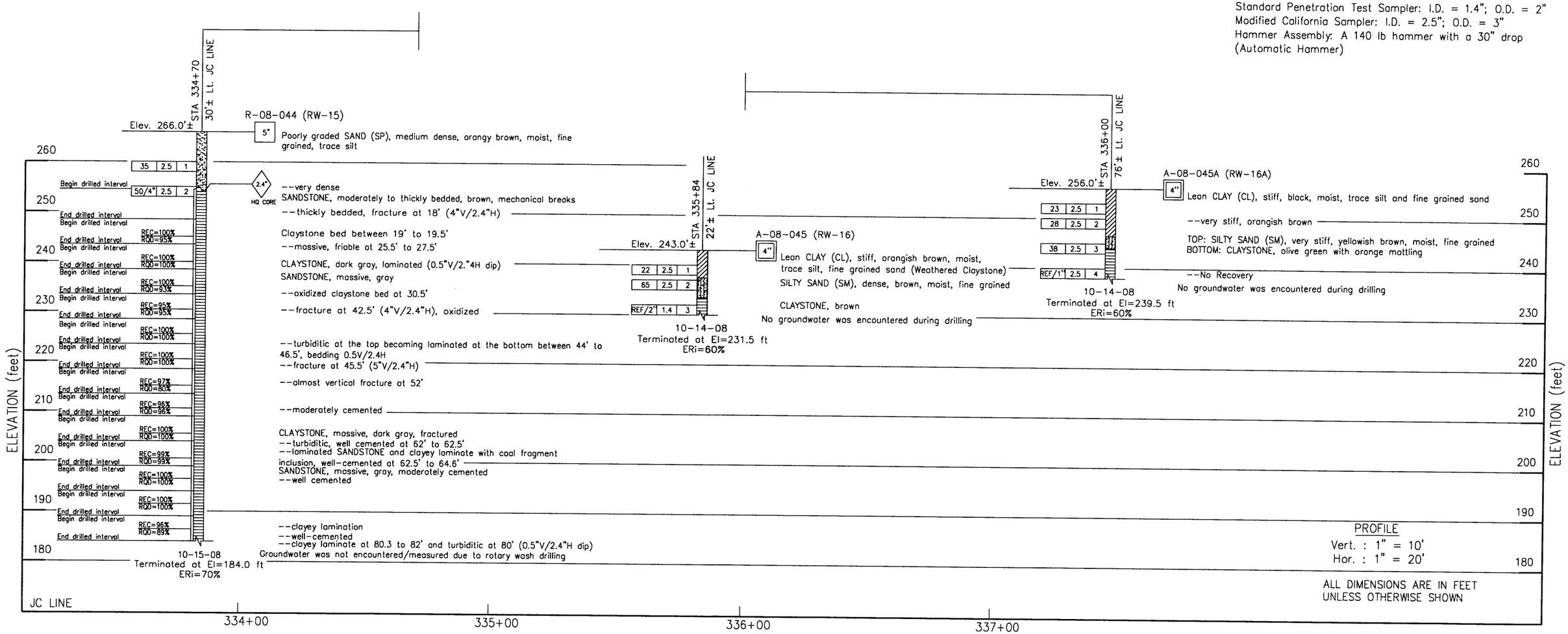

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BRIDGE NO. –
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ROUTE 12/JAMESON CANYON ROAD PROJECT
LOG OF TEST BORINGS

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(SEE SITE PLANS FOR BORING LOCATIONS)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
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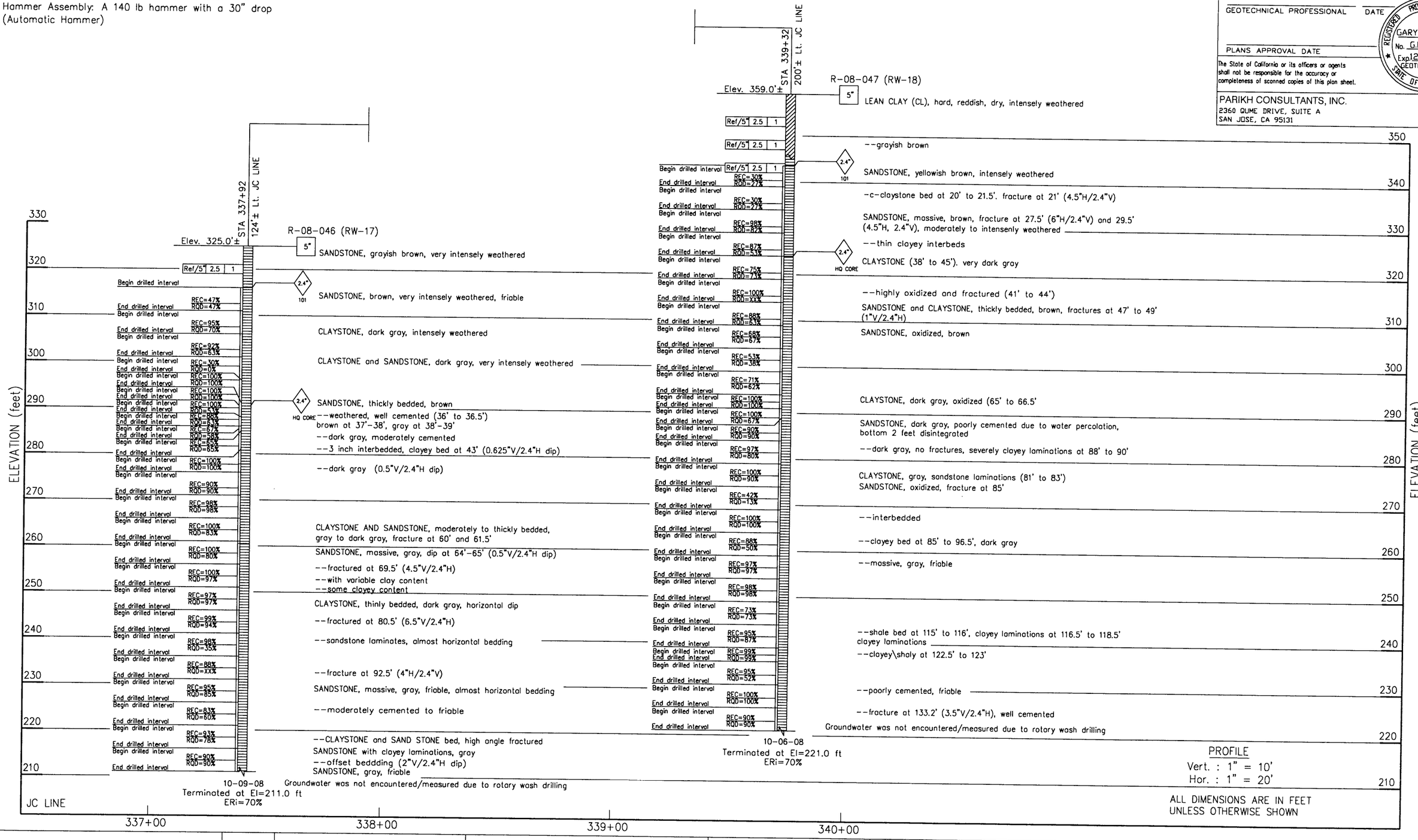

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BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT
LOG OF TEST BORINGS

CU –
EA 04-264111

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES → 3/24/09 5/28/09 8/27/09 9/28/09 11/05/09

REVISION DATES SHEET OF

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	----	----

GEOTECHNICAL PROFESSIONAL DATE

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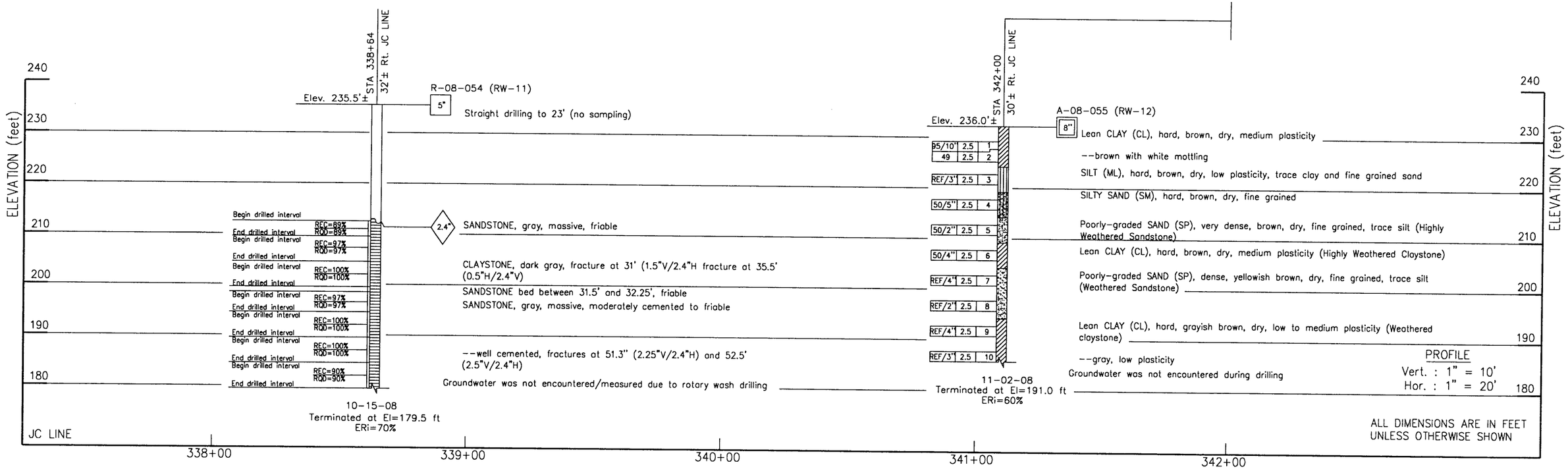

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REVISION DATES 3/24/09 6/08/09 8/07/09 9/28/09 11/05/09

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6		

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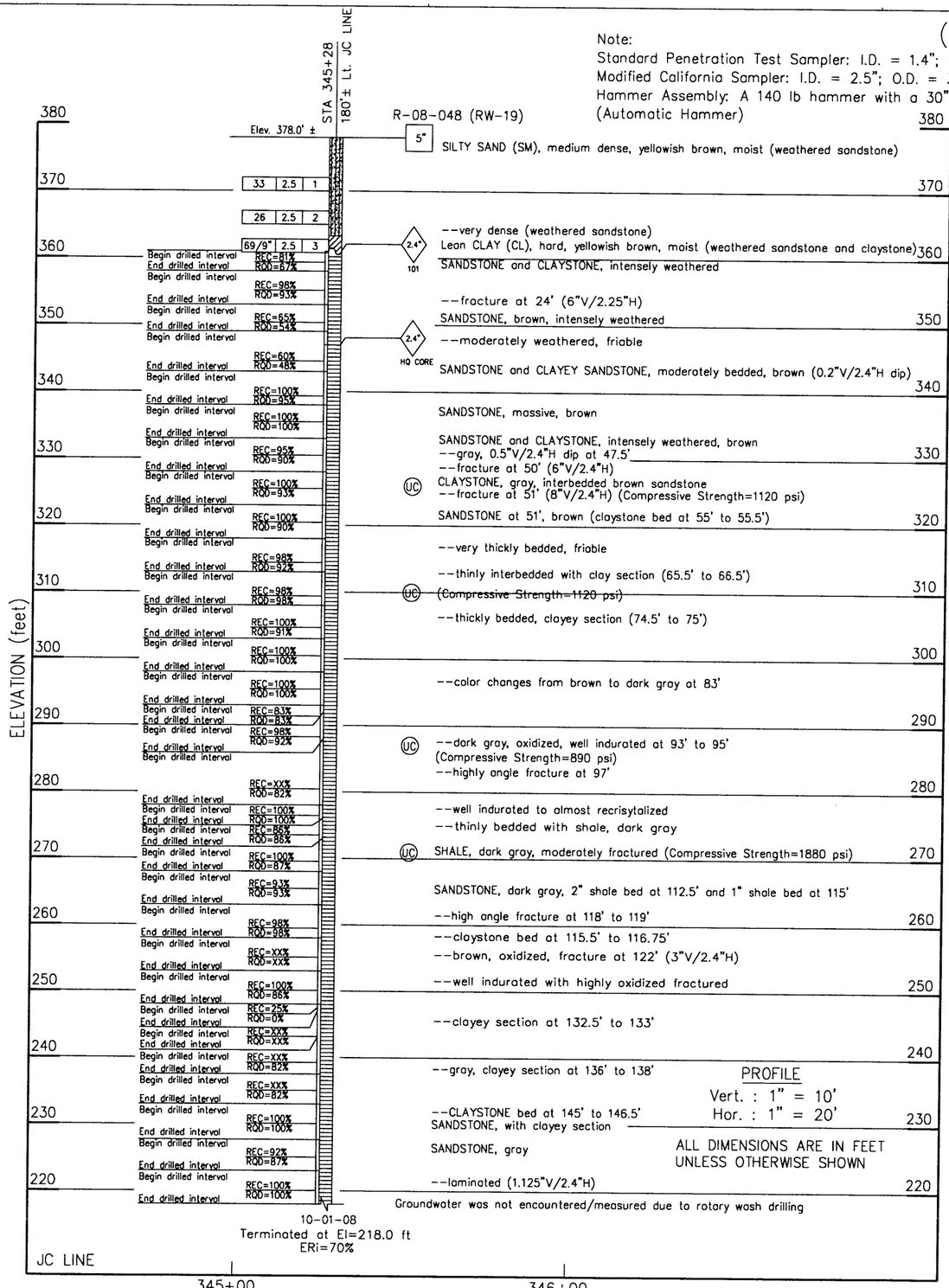

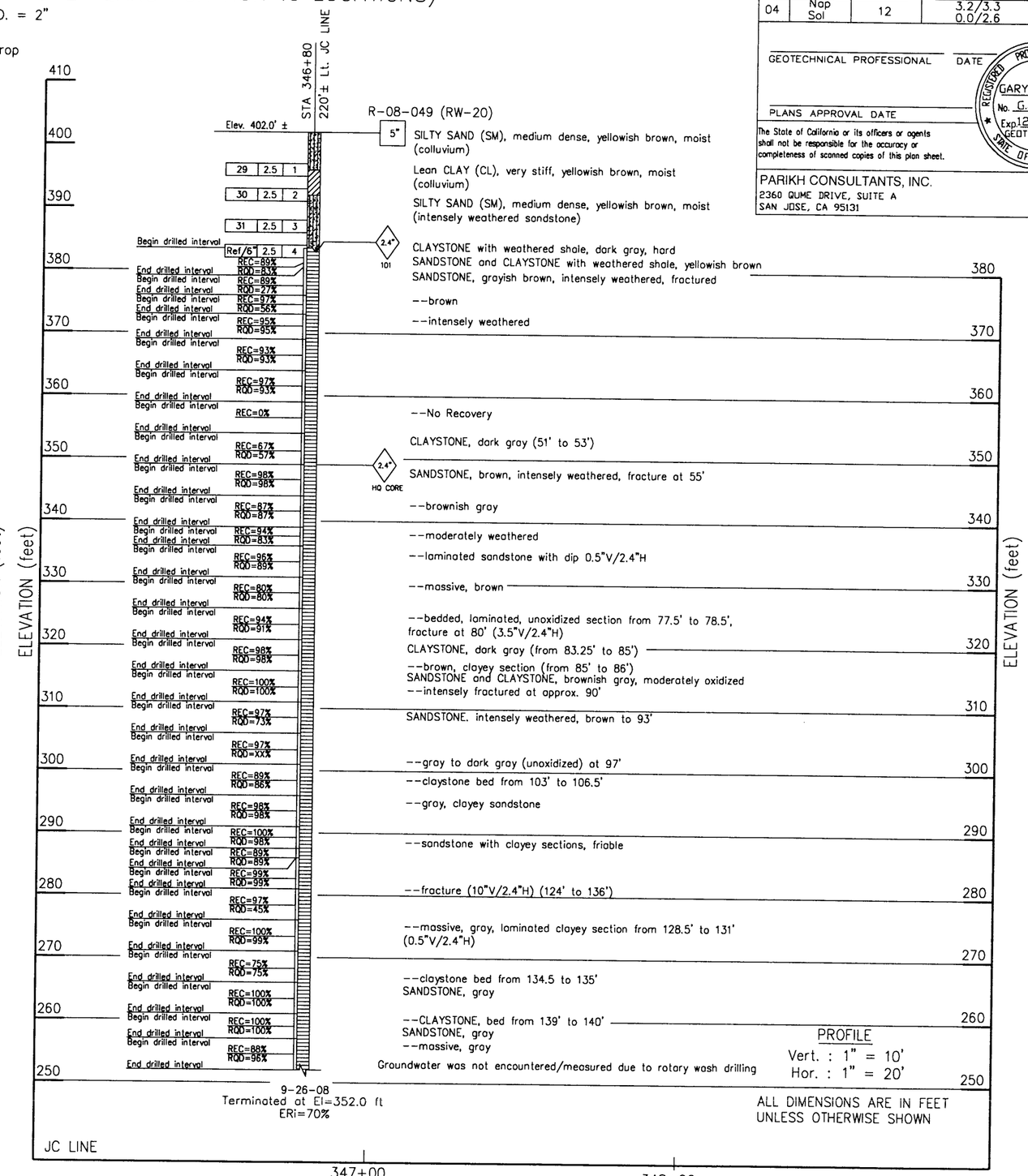

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LOG OF TEST BORINGS

CU –
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ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

DISREGARD PRINTS BEARING EARLIER REVISION DATES → REVISION DATES 3/23/09 6/26/09 8/07/09 9/28/09 11/05/09 SHEET OF

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	---	---

GEOTECHNICAL PROFESSIONAL DATE

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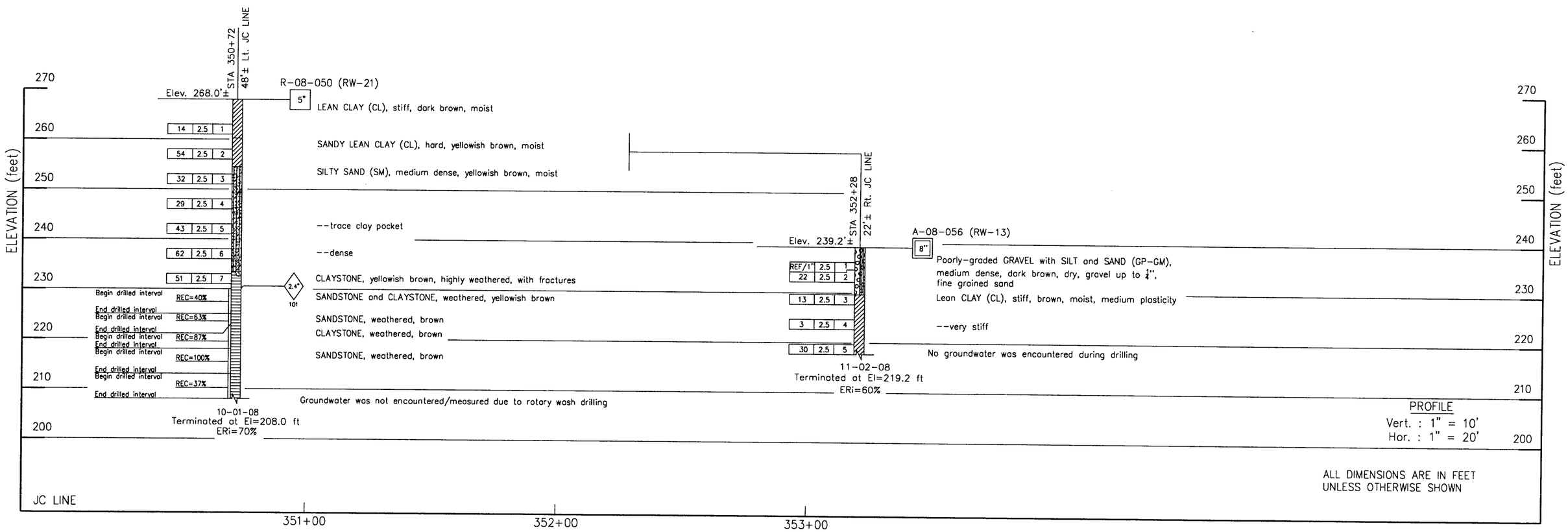

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DEPARTMENT OF TRANSPORTATION

F. WANG
PROJECT ENGINEER

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POST MILES –

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LOG OF TEST BORINGS

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	---	---

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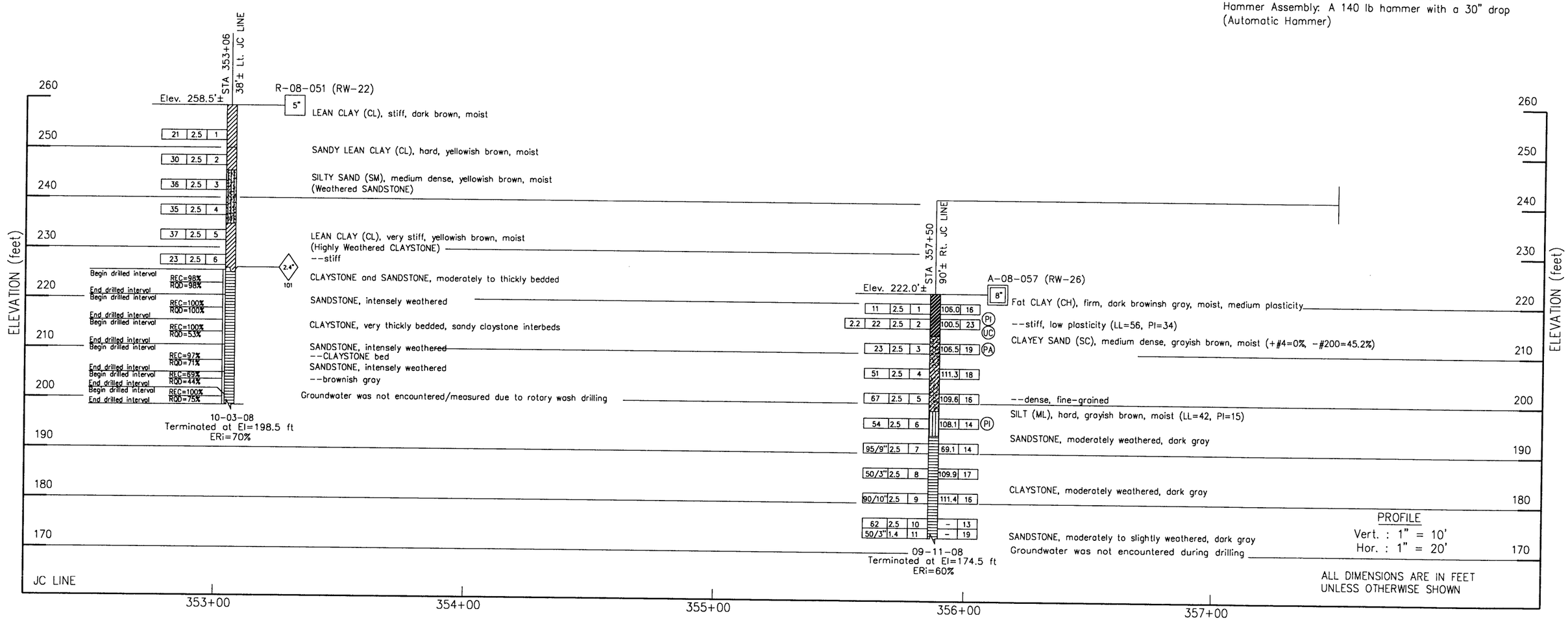

PROFILE
Vert. : 1" = 10'
Hor. : 1" = 20'

ALL DIMENSIONS ARE IN FEET UNLESS OTHERWISE SHOWN

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DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Nap Sol	12	3.2/3.3 0.0/2.6	---	---

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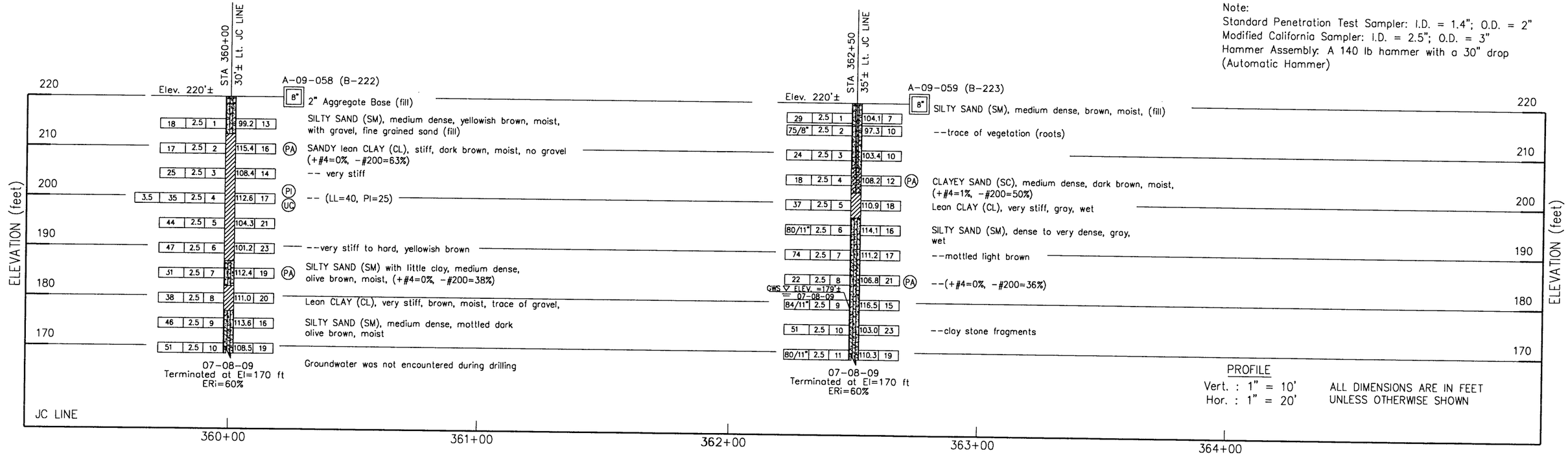

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BRIDGE NO. –
POST MILES –

ROUTE 12/JAMESON CANYON ROAD PROJECT
LOG OF TEST BORINGS 30 OF 30

OGS GEOTECHNICAL LOG OF TEST BORINGS SHEET (ENGLISH) (REV. 06-01-09)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

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APPENDIX B

APPENDIX B
LABORATORY TESTS

Classification Tests
The field classification of the samples was visually verified in the laboratory according to the Unified Soil Classification System (ASTM Test Method D 2488, Visual-Manual Procedure). The classification has been verified with laboratory data as necessary. The classification tests are presented on "Log of Test Borings", Appendix A.

Moisture-Density
The natural moisture contents and dry unit weights were determined for selected undisturbed samples of the soils in general accordance with ASTM Test Method D 2216-92. This information was used to classify and correlate the soils. The results are presented at the appropriate depths on the "Log of Test Borings", Appendix A.

Unconfined Compression Tests
Strength tests were performed on selected undisturbed sample using unconfined compression machine. Unconfined compression test was performed in general accordance with California Test Method T 221. The results are presented on "Log of Test Borings".

Atterberg Limits
The Atterberg Limits were determined for selected samples of the fine-grained materials. These results were used to classify the soils, as well as to obtain an indication of the effective strength characteristics and expansion potential with variations in moisture content. The Atterberg Limits were determined in general accordance with ASTM Test Method D 4318-93. The results of these tests are presented on Plates B-2A and B-2C, "Plasticity Chart".

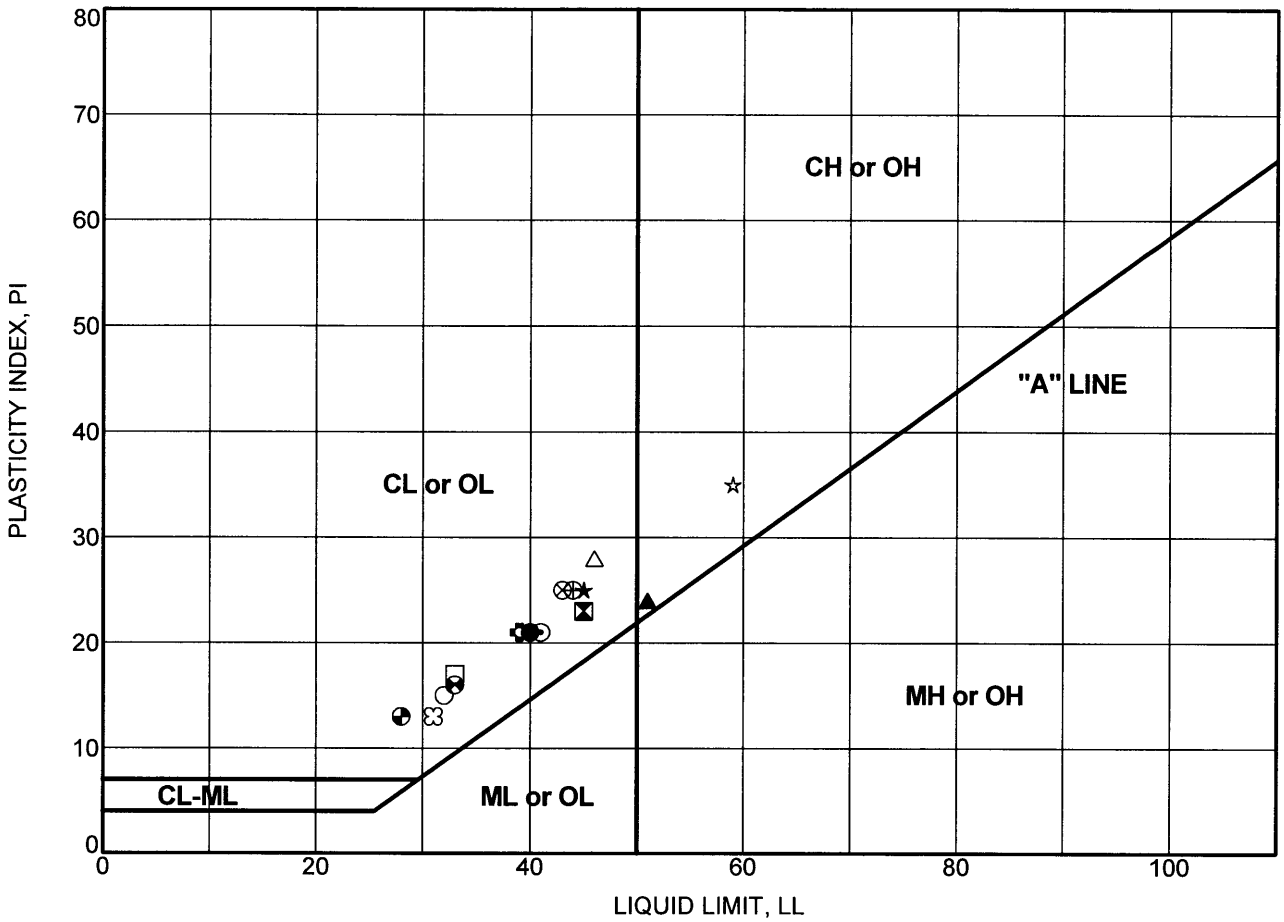
Grain Size Classification
Grain size classification tests (ASTM Test Method D 422-63) were performed on selected samples of granular soil to aid in the classification. The results are presented on Plates B-3A to B-3E, "Grain Size Distribution Curves".

Corrosion Tests
Corrosion tests were performed on selected samples to determine the corrosion potential of the soils. The pH and minimum resistively tests were performed according to California Test Method 643 by Parikh Consultants, Inc. The test results are presented on Plates B-4A to B-4N.

R-value Tests
R-value tests were performed on representative bulk samples for pavement design. The tests were performed by Parikh Consultants, Inc. Testing Laboratory. The results are presented on Plates B-5A thru B-5W.

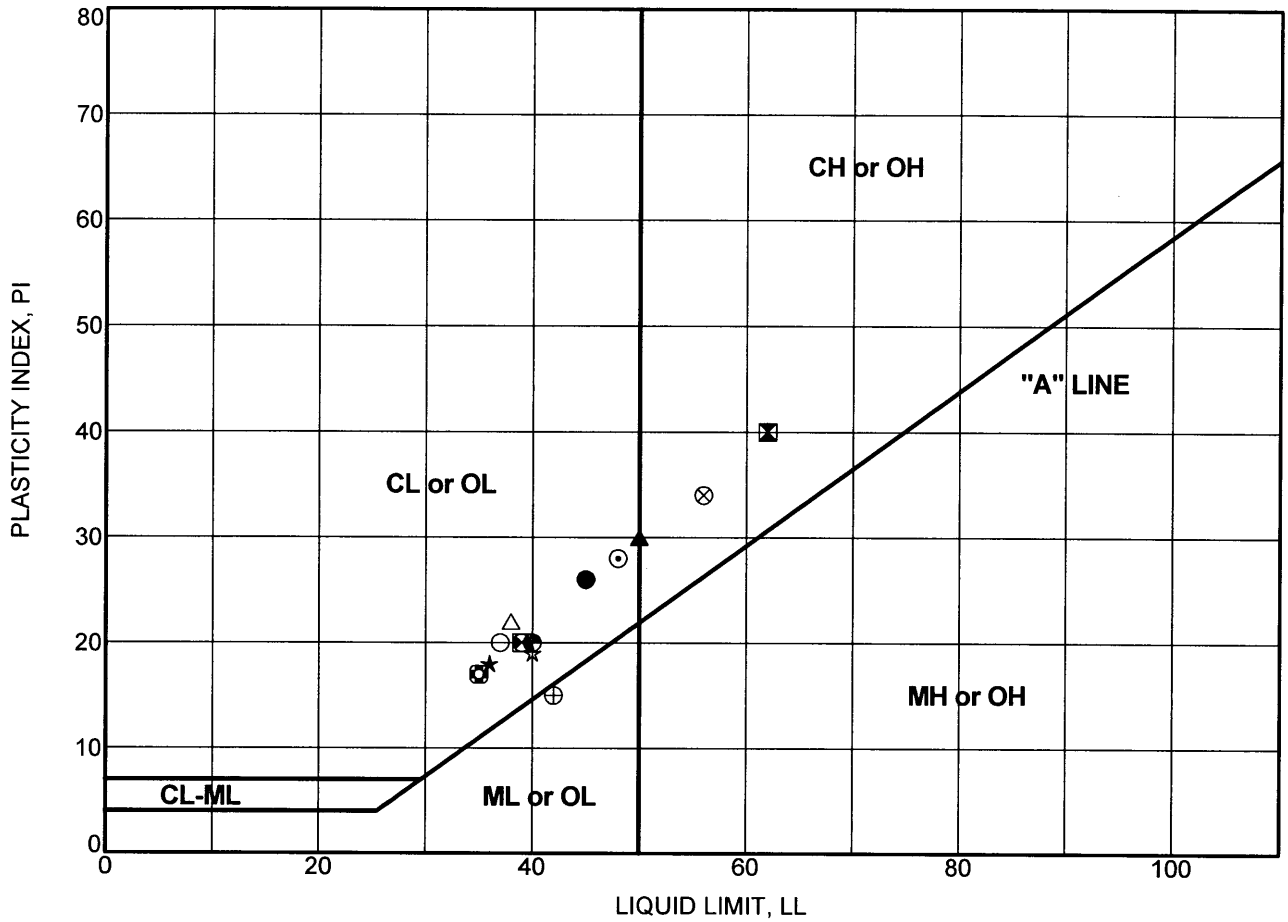
Rock Compressive Strength Tests
Compressive strength tests were performed on selected samples in accordance with ASTM Test Method D 2938 by Dynamic Consultants, Inc. The test results are presented on the Plate B-6.

Direct Shear Tests
Direct Shear tests were performed on selected samples in accordance with ASTM Test Method D 3080 by Cooper Testing. The test results are presented on the Plates B-7A and B-7E.



PLASTICITY CHART

Boring Number	Sample Number	Depth (feet)	Test Symbol	Moisture Content (%)	LL	PL	PI	Description
A-08-024	MC-1	2.0	●	32	40	19	21	LEAN CLAY (CL)
A-08-025	MC-3	10.0	⊠	20	45	22	23	LEAN CLAY (CL)
A-08-026	MC-2	5.0	▲	26	51	27	24	FAT CLAY (CH)
A-08-033	MC-6	25.0	★	22	45	20	25	LEAN CLAY (CL)
A-08-033	MC-12	55.0	⊙	26	41	20	21	LEAN CLAY (CL)
A-08-034	MC-2	5.0	✪	16	39	18	21	LEAN CLAY (CL)
A-08-034	MC-5	20.0	○	23	32	17	15	LEAN CLAY (CL)
A-08-035	MC-3	9.5	△	27	46	18	28	LEAN CLAY WITH SAND (CL)
A-08-036	MC-4	14.5	⊗	22	43	18	25	LEAN CLAY WITH SAND (CL)
A-08-036	MC-6	24.5	⊕	36	44	19	25	LEAN CLAY WITH SAND (CL)
A-08-041	MC-2	5.0	□	12	33	16	17	LEAN CLAY (CL)
A-08-041	MC-6	25.0	⊞	22	33	17	16	LEAN CLAY (CL)
A-08-041	MC-8	35.0	◕	23	28	15	13	LEAN CLAY (CL)
A-08-042	MC-4	15.0	☆	28	59	24	35	FAT CLAY (CH)
A-08-042	MC-7	30.0	⊠	22	31	18	13	LEAN CLAY (CL)



PLASTICITY CHART

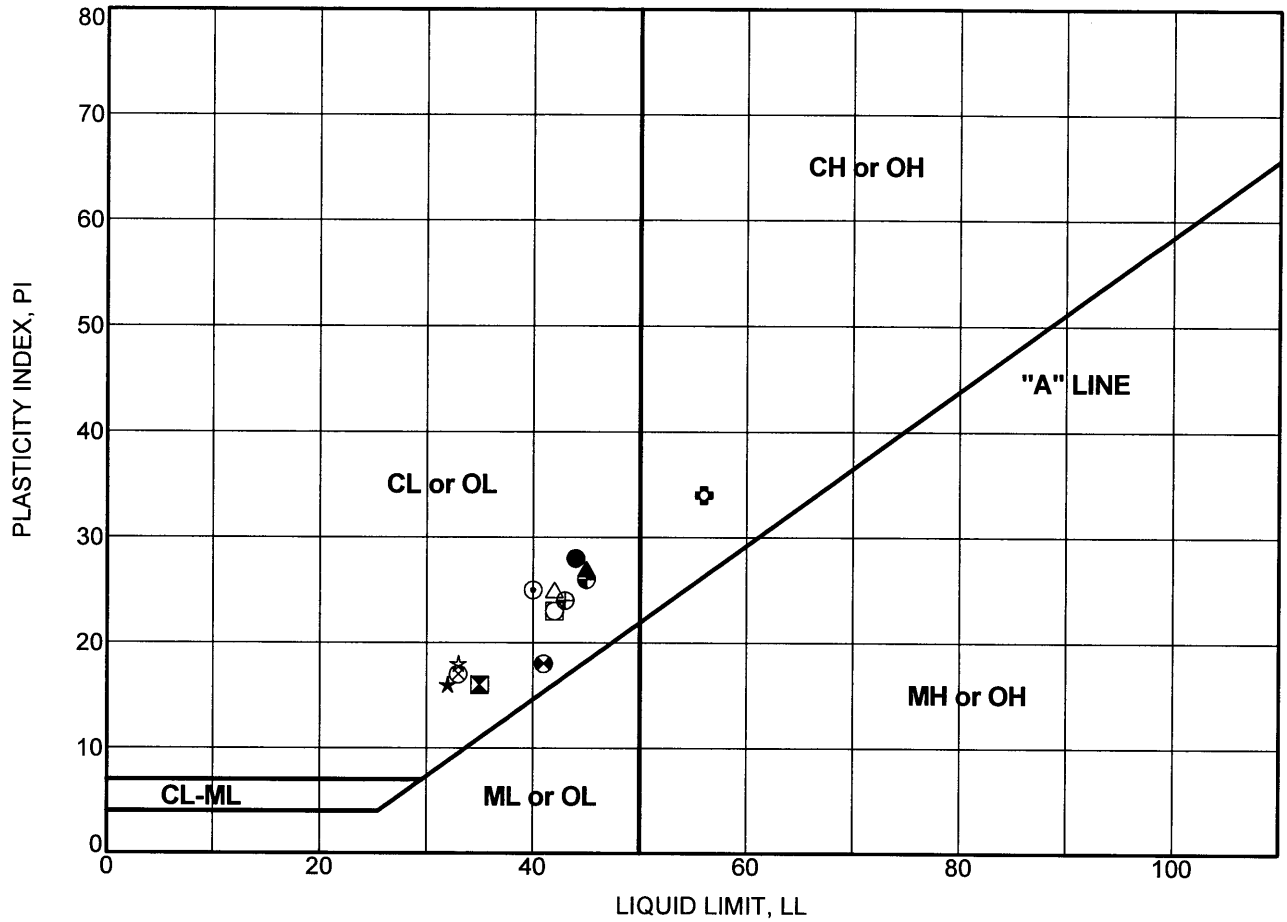
Boring Number	Sample Number	Depth (feet)	Test Symbol	Moisture Content (%)	LL	PL	PI	Description
A-08-045A	MC-1	3.0	●	14	45	19	26	LEAN CLAY (CL)
A-08-052	MC-2	5.0	⊠	17	62	22	40	FAT CLAY (CH)
A-08-052	MC-4	15.0	▲	26	50	20	30	FAT CLAY (CH)
A-08-052	MC-6	25.0	★	27	36	18	18	LEAN CLAY (CL)
A-08-052	MC-8	35.0	⊙	31	48	20	28	LEAN CLAY (CL)
A-08-052	MC-11	50.0	✪	28	35	18	17	LEAN CLAY (CL)
A-08-053	MC-2	5.0	○	14	37	17	20	LEAN CLAY (CL)
A-08-053	MC-5	20.0	△	18	38	16	22	LEAN CLAY (CL)
A-08-057	MC-2	5.0	⊗	23	56	22	34	FAT CLAY (CH)
A-08-057	MC-6	25.0	⊕	14	42	27	15	SILT (ML)
A-09-021	MC-3	9.5	□	20	39	19	20	LEAN CLAY (CL)
A-09-021	MC-5	19.5	⊗	25	39	19	20	LEAN CLAY (CL)
A-09-022	MC-1	2.0	◕	15	40	20	20	SANDY LEAN CLAY (CL)
A-09-023	MC-3	9.5	☆	22	40	21	19	LEAN CLAY (CL)
A-09-023	MC-4	14.5	☒	25	35	18	17	LEAN CLAY (CL)

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

ROUTE 12 WIDENING PROJECT
NAPA & SOLANO COUNTIES, CALIFORNIA

JOB NO: 208117.MAT

PLATE NO: B-2B



PLASTICITY CHART

Boring Number	Sample Number	Depth (feet)	Test Symbol	Moisture Content (%)	LL	PL	PI	Description
A-09-028	MC-2	6.0	●	20	44	16	28	LEAN CLAY (CL)
A-09-029	MC-9	19.5	⊠	19	35	19	16	LEAN CLAY (CL)
A-09-032	MC-4	14.5	▲	21	45	18	27	LEAN CLAY (CL)
A-09-032	MC-6	24.5	★	23	32	16	16	LEAN CLAY (CL)
A-09-058	MC-4	19.5	⊙	17	40	15	25	LEAN CLAY (CL)
R-08-030	MC-2	10.0	✿	22	56	22	34	FAT CLAY (CH)
R-08-031	MC-1	5.0	○	17	42	19	23	LEAN CLAY (CL)
R-08-039	MC-2	6.0	△	17	42	17	25	SANDY LEAN CLAY (CL)
R-08-039	MC-4	16.0	⊗	20	33	16	17	SANDY LEAN CLAY (CL)
R-08-040	MC-2	6.0	⊕	16	43	19	24	LEAN CLAY (CL)
R-08-043	MC-2	11.0	□	22	42	19	23	LEAN CLAY (CL)
R-09-037	MC-8	36.0	⊗	26	41	23	18	LEAN CLAY (CL)
R-09-038	MC-2	6.0	◕	18	45	19	26	LEAN CLAY (CL)
R-09-038	MC-6	26.0	☆	18	33	15	18	LEAN CLAY (CL)

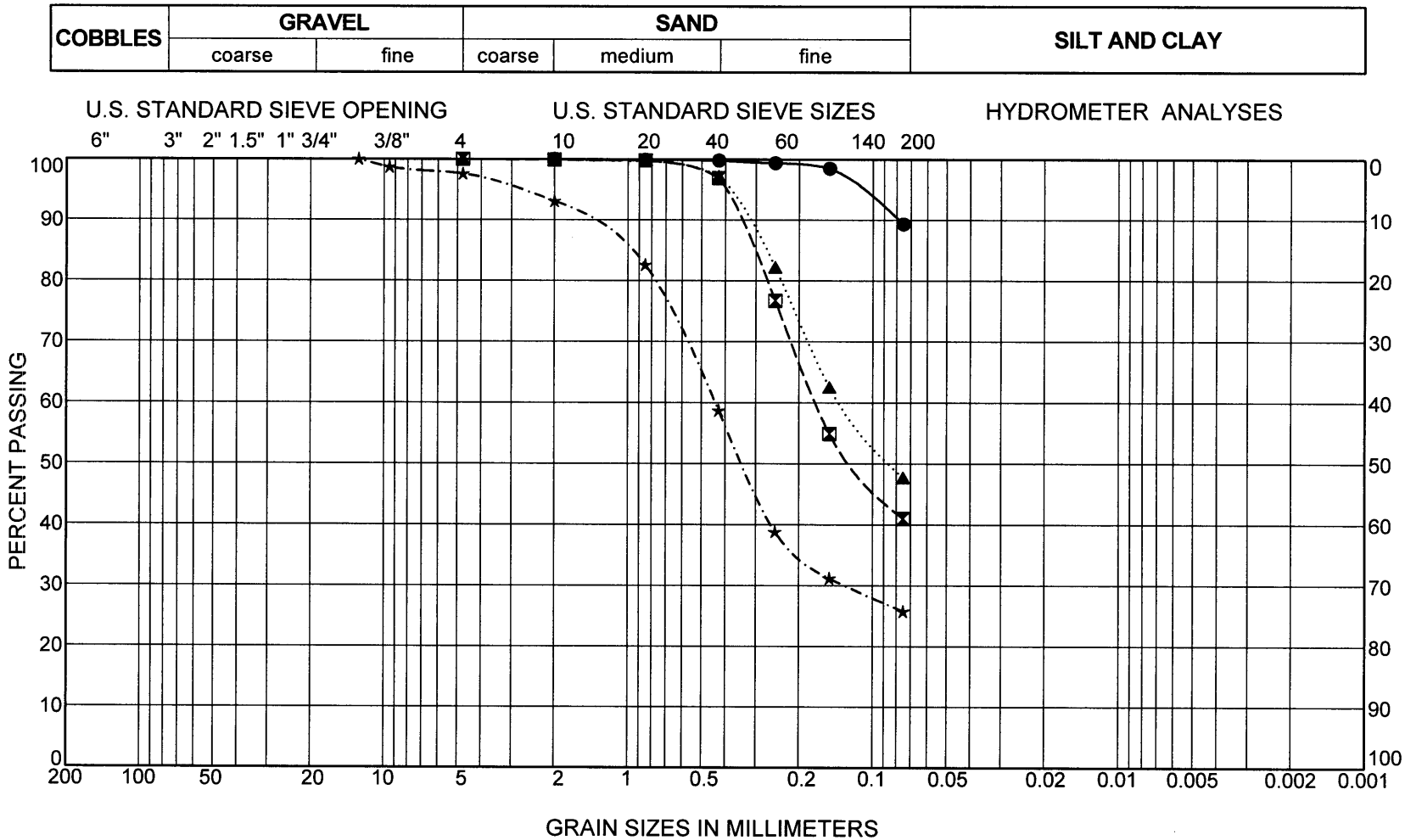
PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

ROUTE 12 WIDENING PROJECT
NAPA & SOLANO COUNTIES, CALIFORNIA

JOB NO: 208117.MAT

PLATE NO: B-2C

GRAIN SIZE DISTRIBUTION CURVES



Boring Number	Sample Number	Depth (feet)	Symbol	LL	PI	Description
A-08-027	MC-1	2.5	●			SILT (ML)
A-08-033	MC-3	10.0	⊠			CLAYEY SAND (SC)
A-08-033	MC-7	30.0	▲			CLAYEY SAND (SC)
A-08-033	MC-10	45.0	★			SILTY SAND (SM)

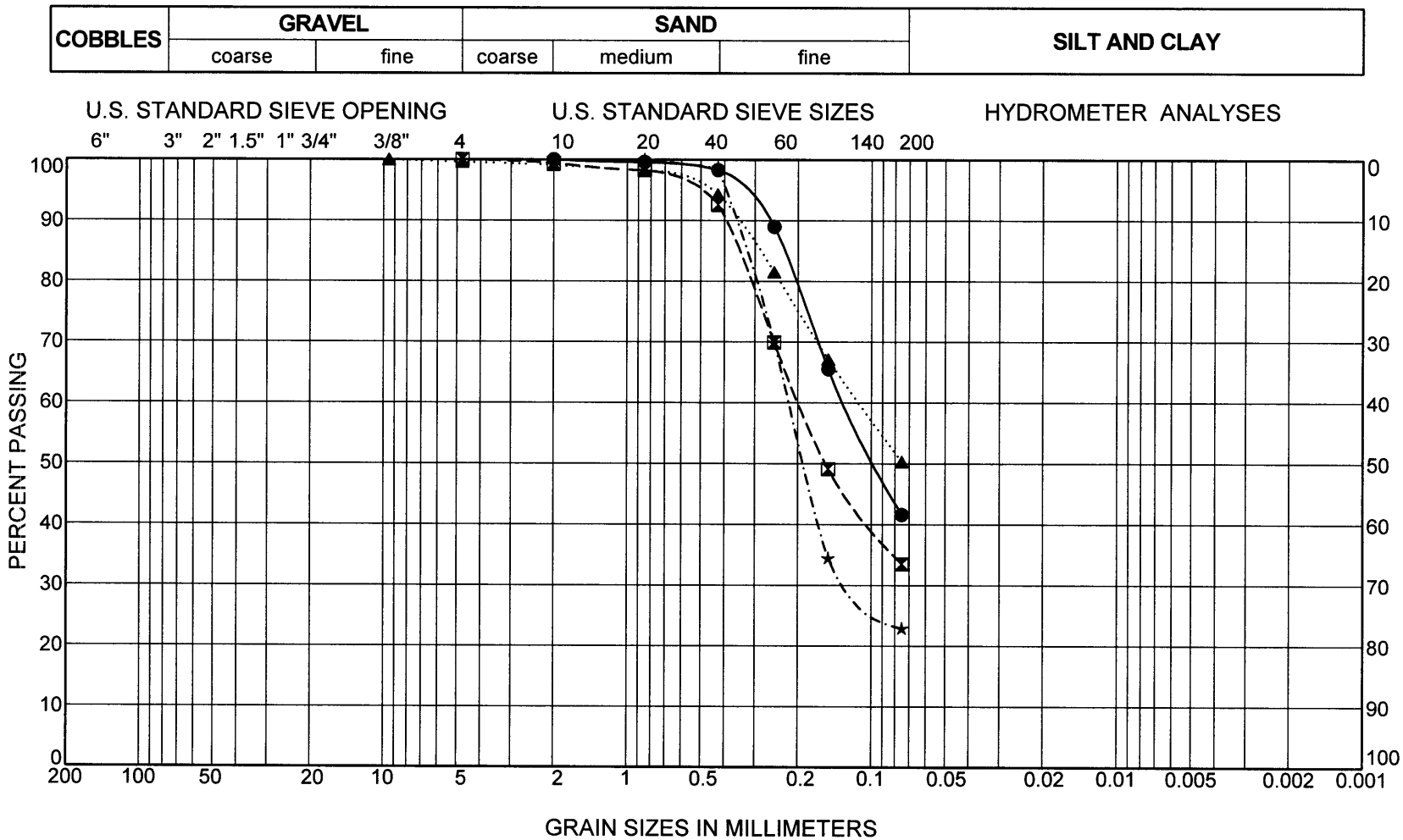
PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

ROUTE 12 WIDENING PROJECT
NAPA & SOLANO COUNTIES, CALIFORNIA

JOB NO: 208117.MAT

PLATE NO: B-3A

GRAIN SIZE DISTRIBUTION CURVES



Boring Number	Sample Number	Depth (feet)	Symbol	LL	PI	Description
A-08-034	MC-8	35.0	●			CLAYEY SAND (SC)
A-08-035	MC-5	19.5	⊠			CLAYEY SAND (SC)
A-08-035	MC-6	24.5	▲			SANDY LEAN CLAY (CL)
A-08-041	MC-10	45.0	★			SILTY SAND (SM)

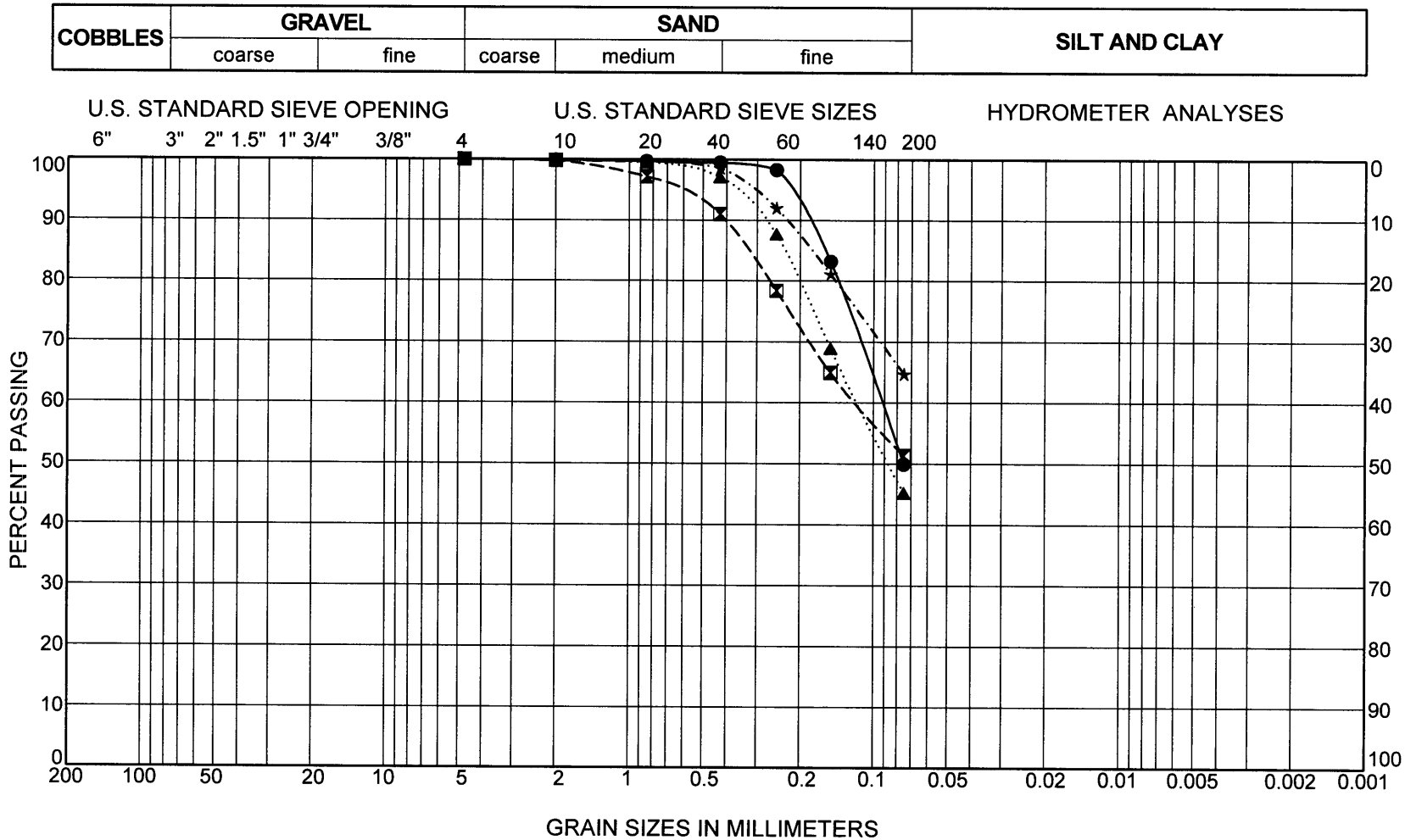
PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

ROUTE 12 WIDENING PROJECT
NAPA & SOLANO COUNTIES, CALIFORNIA

JOB NO: 208117.MAT

PLATE NO: B-3B

GRAIN SIZE DISTRIBUTION CURVES



Boring Number	Sample Number	Depth (feet)	Symbol	LL	PI	Description
A-08-041	MC-13	60.0	●			SILTY SAND (SM)
A-08-042	MC-10	45.0	⊠			SANDY SILT (ML)
A-08-057	MC-3	10.0	▲			CLAYEY SAND (SC)
A-09-021	MC-2	4.5	★			SANDY SILTY CLAY (CL-ML)

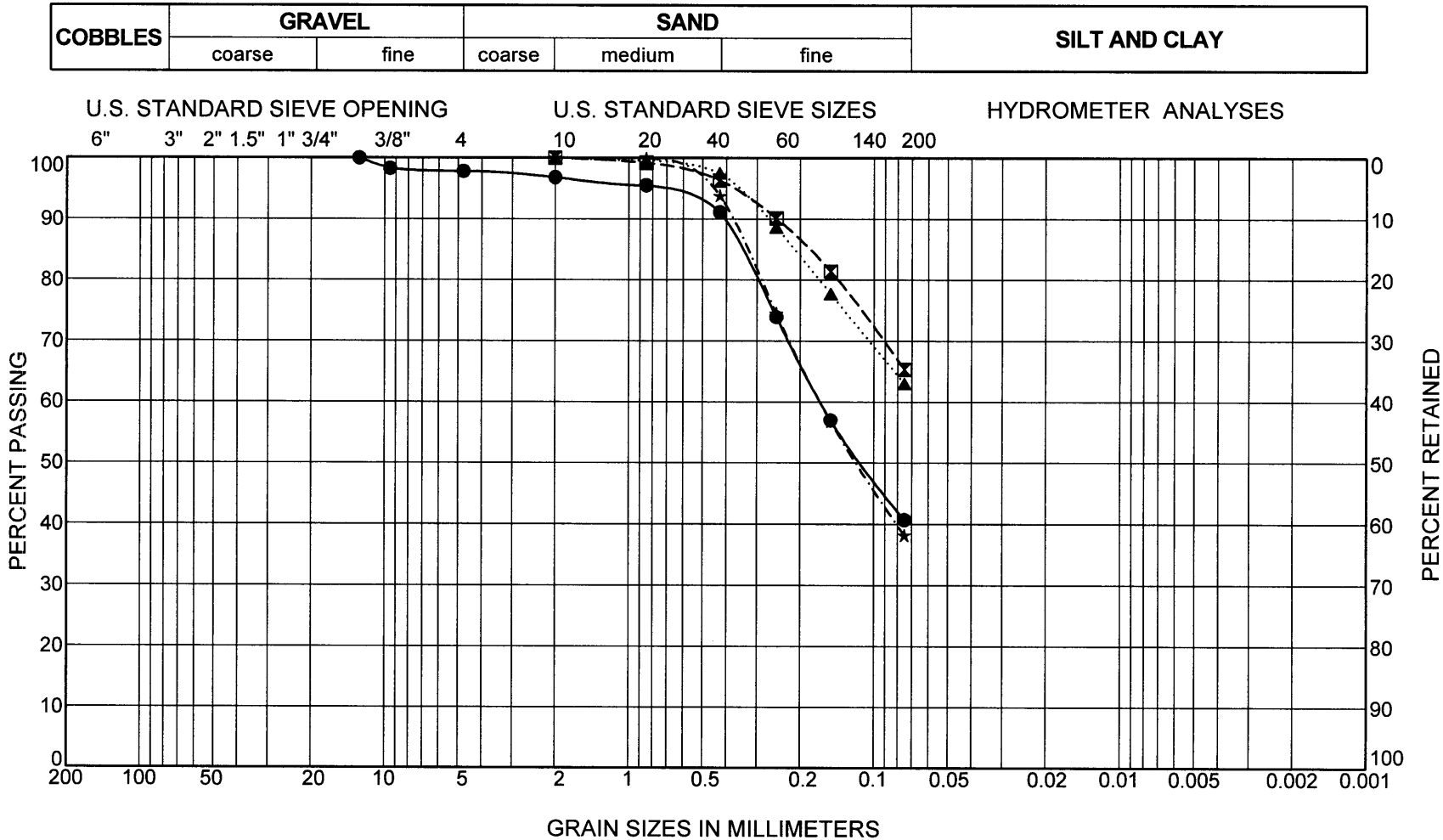
PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

ROUTE 12 WIDENING PROJECT
NAPA & SOLANO COUNTIES, CALIFORNIA

JOB NO: 208117.MAT

PLATE NO: B-3C

GRAIN SIZE DISTRIBUTION CURVES



Boring Number	Sample Number	Depth (feet)	Symbol	LL	PI	Description
A-09-021	MC-8	34.5	●			CLAYEY SAND (SC)
A-09-022	MC-1	2.0	⊠	40	20	SANDY LEAN CLAY (CL)
A-09-058	MC-2	2.0	▲			SANDY LEAN CLAY (CL)
A-09-058	MC-7	34.5	★			SILTY SAND (SM)

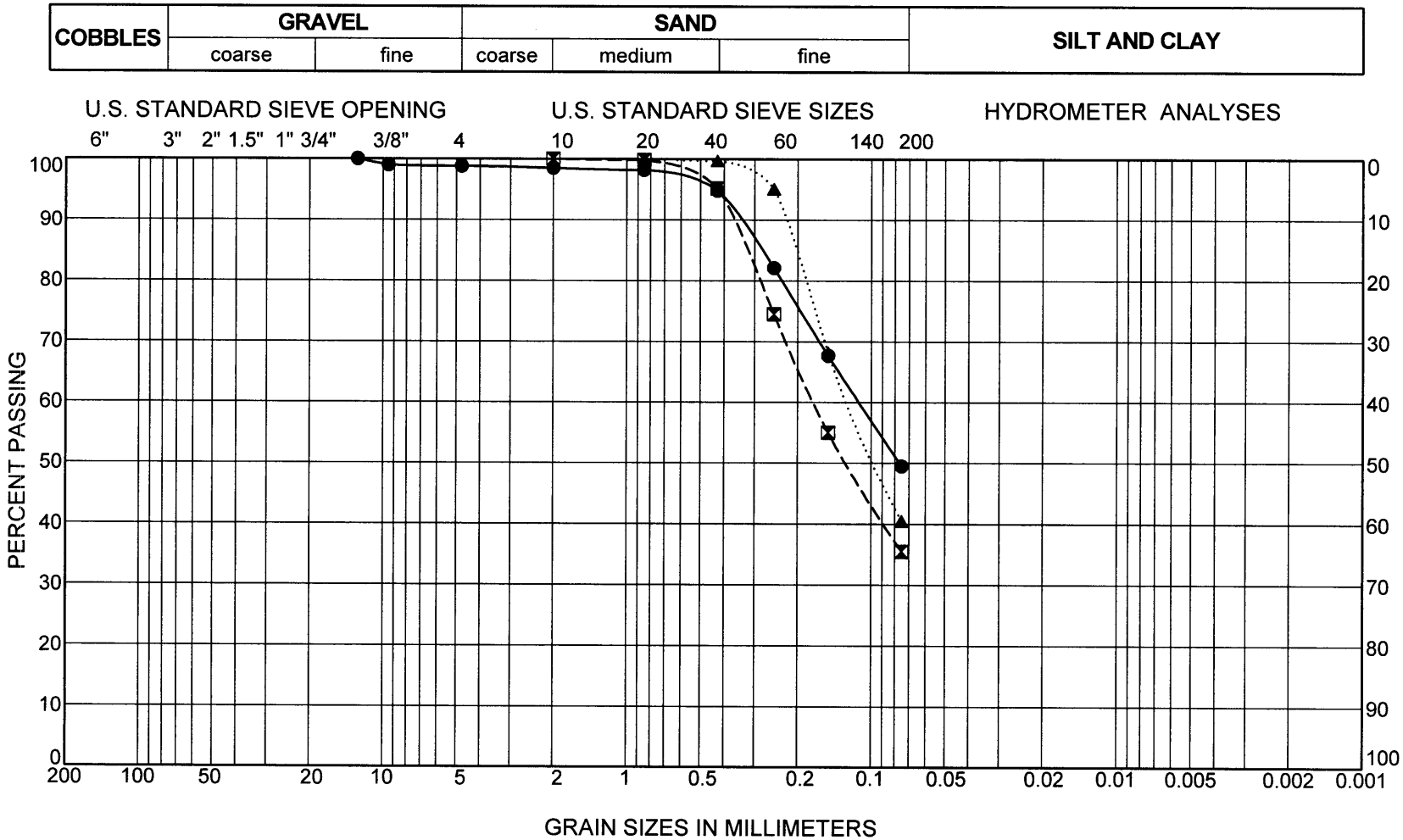
PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

ROUTE 12 WIDENING PROJECT
NAPA & SOLANO COUNTIES, CALIFORNIA

JOB NO: 208117.MAT

PLATE NO: B-3D

GRAIN SIZE DISTRIBUTION CURVES



Boring Number	Sample Number	Depth (feet)	Symbol	LL	PI	Description
A-09-059	MC-4	14.5	●			CLAYEY SAND (SC)
A-09-059	MC-8	34.5	⊠			SILTY SAND (SM)
R-08-030	MC-4	20.0	▲			SILTY SAND (SM)

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS ENGINEERING

ROUTE 12 WIDENING PROJECT
NAPA & SOLANO COUNTIES, CALIFORNIA

JOB NO: 208117.MAT

PLATE NO: B-3E

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 11/12/2008
Date Submitted 11/07/2008

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, CA 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN JAMESON Site ID : RW29 #2@5'.
Thank you for your business. (A-08-024)

* For future reference to this analysis please use SUN # 54752-109998.

EVALUATION FOR SOIL CORROSION

Soil pH	7.03		
Minimum Resistivity	1.15 ohm-cm (x1000)		
Chloride	13.9 ppm	00.00139	%
Sulfate	8.3 ppm	00.00083	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

OCT 14 2008

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 10/29/2008
Date Submitted 10/23/2008

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, CA 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN/JAMESON Site ID : RW3#2 @ 10'.
Thank you for your business. (R-08-030)

* For future reference to this analysis please use SUN # 54663-109813.

EVALUATION FOR SOIL CORROSION

Soil pH	7.95		
Minimum Resistivity	1.31 ohm-cm (x1000)		
Chloride	80.2 ppm	00.00802	%
Sulfate	95.7 ppm	00.00957	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

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OCT 29 2008

PLATE NO.: B-4B

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 10/10/2008
Date Submitted 10/07/2008

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, CA 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN-JAMESON Site ID : RW6#2@5'.
Thank you for your business. (A-08-034)

* For future reference to this analysis please use SUN # 54549-109523.

EVALUATION FOR SOIL CORROSION

Soil pH	6.56		
Minimum Resistivity	2.65 ohm-cm (x1000)		
Chloride	8.8 ppm	00.00088	%
Sulfate	3.0 ppm	00.00030	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 10/10/2008
Date Submitted 10/07/2008

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, CA 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN-JAMESON Site ID : RW7-2@5'.
Thank you for your business. (A-08-041)

* For future reference to this analysis please use SUN # 54549-109524.

EVALUATION FOR SOIL CORROSION

Soil pH	6.40		
Minimum Resistivity	2.39 ohm-cm (x1000)		
Chloride	11.7 ppm	00.00117	%
Sulfate	5.6 ppm	00.00056	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 10/10/2008
Date Submitted 10/07/2008

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, CA 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN-JAMESON Site ID : RW9#2@5' .
Thank you for your business. (A-08-052)

* For future reference to this analysis please use SUN # 54549-109525.

EVALUATION FOR SOIL CORROSION

Soil pH	7.32		
Minimum Resistivity	0.56 ohm-cm (x1000)		
Chloride	25.6 ppm	00.00256	%
Sulfate	3.4 ppm	00.00034	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 11/26/2008
Date Submitted 11/20/2008

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, CA 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN Site ID : RW-14 #1@6'.
Thank you for your business. (R-08-043)

* For future reference to this analysis please use SUN # 54831-110188.

EVALUATION FOR SOIL CORROSION

Soil pH	7.68		
Minimum Resistivity	0.86 ohm-cm (x1000)		
Chloride	204.7 ppm	00.02047	%
Sulfate	373.9 ppm	00.03739	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

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PLATE NO.: B-4F

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 10/10/2008
Date Submitted 10/07/2008

To: Prav Dayah
Parikh Consultants, Inc.
356 S. Milpitas Blvd.
Milpitas, CA 95035

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN-JAMESON Site ID : RW26#1@2'.
Thank you for your business. (A-08-057)

* For future reference to this analysis please use SUN # 54549-109526.

EVALUATION FOR SOIL CORROSION

Soil pH	7.31		
Minimum Resistivity	1.23 ohm-cm (x1000)		
Chloride	12.9 ppm	00.00129	%
Sulfate	27.6 ppm	00.00276	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 04/15/2009
Date Submitted 04/08/2009

To: Prav Dayah
Parikh Consultants, Inc.
2360 Qume Dr, Ste.A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN Site ID : B216 #2@4.5'.
Thank you for your business. (A-08-035)

* For future reference to this analysis please use SUN # 55448-111569.

EVALUATION FOR SOIL CORROSION

Soil pH	7.77		
Minimum Resistivity	1.02 ohm-cm (x1000)		
Chloride	34.7 ppm	00.00347	%
Sulfate	77.8 ppm	00.00778	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 04/15/2009
Date Submitted 04/08/2009

To: Prav Dayah
Parikh Consultants, Inc.
2360 Qume Dr, Ste.A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN Site ID : B217 #4@14.5'.
Thank you for your business. (A-08-036)

* For future reference to this analysis please use SUN # 55448-111567.

EVALUATION FOR SOIL CORROSION

Soil pH	6.93		
Minimum Resistivity	1.07 ohm-cm (x1000)		
Chloride	30.9 ppm	00.00309	%
Sulfate	83.2 ppm	00.00832	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

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Date Reported 04/15/2009
Date Submitted 04/08/2009

To: Prav Dayah
Parikh Consultants, Inc.
2360 Qume Dr, Ste.A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN JAMESON Site ID : B219 #2@6'.
Thank you for your business. (R-09-038)

* For future reference to this analysis please use SUN # 55448-111566.

EVALUATION FOR SOIL CORROSION

Soil pH	7.30	
Minimum Resistivity	0.38 ohm-cm (x1000)	
Chloride	484.5 ppm	00.04845 %
Sulfate	364.6 ppm	00.03646 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical

11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 04/15/2009
Date Submitted 04/08/2009

To: Prav Dayah
Parikh Consultants, Inc.
2360 Qume Dr, Ste.A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN Site ID : B220 #3@11'.
Thank you for your business. (R-08-039)

* For future reference to this analysis please use SUN # 55448-111568.

EVALUATION FOR SOIL CORROSION

Soil pH	6.18	
Minimum Resistivity	1.61 ohm-cm (x1000)	
Chloride	26.5 ppm	00.00265 %
Sulfate	12.6 ppm	00.00126 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 08/05/2009
Date Submitted 07/29/2009

To: Prav Dayah
Parikh Consultants, Inc.
2360 Qume Dr, Ste.A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN JAMESON C Site ID : B225 #3@9.5'.
Thank you for your business. (A-09-022)

* For future reference to this analysis please use SUN # 56359-113791.

EVALUATION FOR SOIL CORROSION

Soil pH	6.31		
Minimum Resistivity	1.61 ohm-cm (x1000)		
Chloride	23.0 ppm	00.00230	%
Sulfate	6.2 ppm	00.00062	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 08/05/2009
Date Submitted 07/29/2009

To: Prav Dayah
Parikh Consultants, Inc.
2360 Qume Dr, Ste.A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN JAMESON C Site ID : B227 #3@9.5'.
Thank you for your business. (A-09-032)

* For future reference to this analysis please use SUN # 56359-113792.

EVALUATION FOR SOIL CORROSION

Soil pH	7.75	
Minimum Resistivity	0.94 ohm-cm (x1000)	
Chloride	61.3 ppm	00.00613 %
Sulfate	124.0 ppm	00.01240 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

Sunland Analytical
11353 Pyrites Way, Suite 4
Rancho Cordova, CA 95670
(916) 852-8557

Date Reported 11/13/2009
Date Submitted 11/10/2009

To: Prav Dayah
Parikh Consultants, Inc.
2360 Qume Dr, Ste.A
San Jose, CA 95131

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 208117.FDN-JAMESON Site ID : B210#2 @ 6'.
Thank you for your business. (R-09-067)

* For future reference to this analysis please use SUN # 57014-115373.

EVALUATION FOR SOIL CORROSION

Soil pH	7.62		
Minimum Resistivity	0.67 ohm-cm (x1000)		
Chloride	122.4 ppm	00.01224	%
Sulfate	64.2 ppm	00.00642	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422

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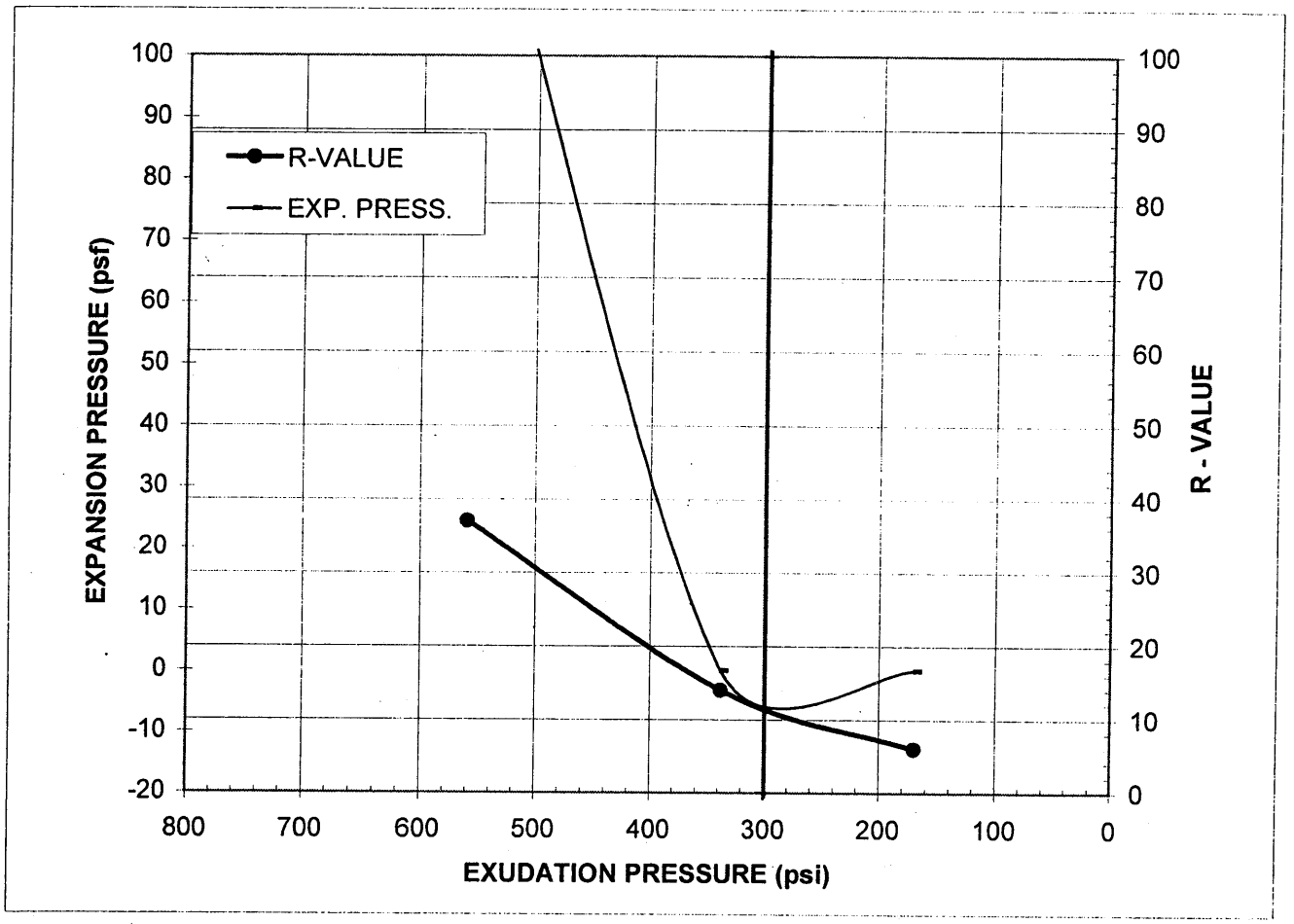
BY

PLATE NO.: B-4N

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	11/17/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R-1 (A-08-101) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Clay with gravel and roots, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	170	338	559
Expansion Pressure, psf	0	0	139
R-Value	6	14	37
Moisture Content at Test, %	17.5	15.6	13.8
Dry Density at Test, pcf	107.0	112.5	117.4

R-Value @ 300 psi Exudation Pressure = 11

Expansion Pressure @300 psi Exudation, psf = **0**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

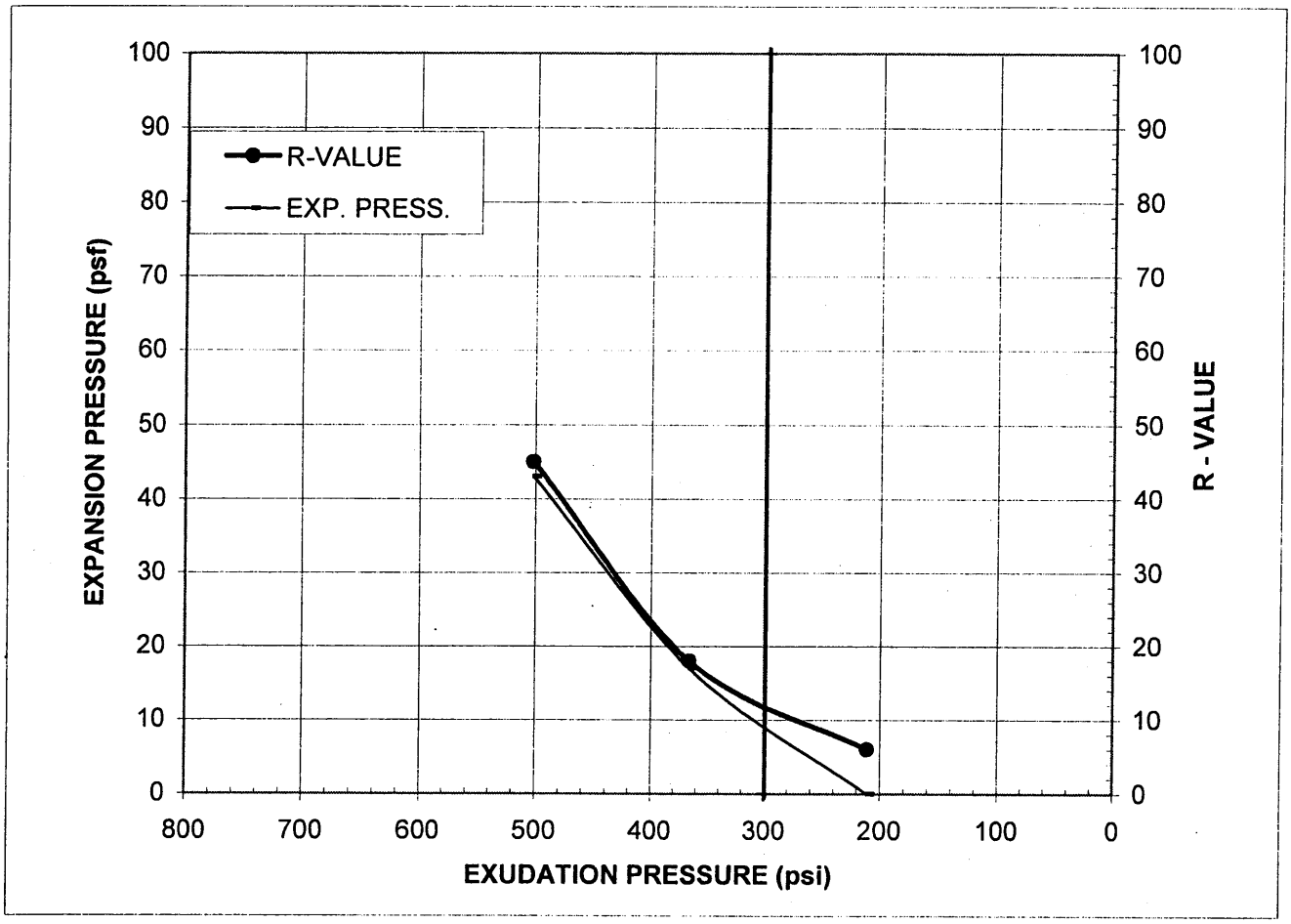
RVALUE with calcs pdp

PLATE NO.: B-5A

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	11/17/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R-2(A-08-102) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Sandy lean clay, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	211	366	502
Expansion Pressure, psf	0	17	43
R-Value	6	18	45
Moisture Content at Test, %	17.4	15.5	13.7
Dry Density at Test, pcf	107.0	111.6	116.4

R-Value @ 300 psi Exudation Pressure = **12**

Expansion Pressure @300 psi Exudation, psf = **9**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

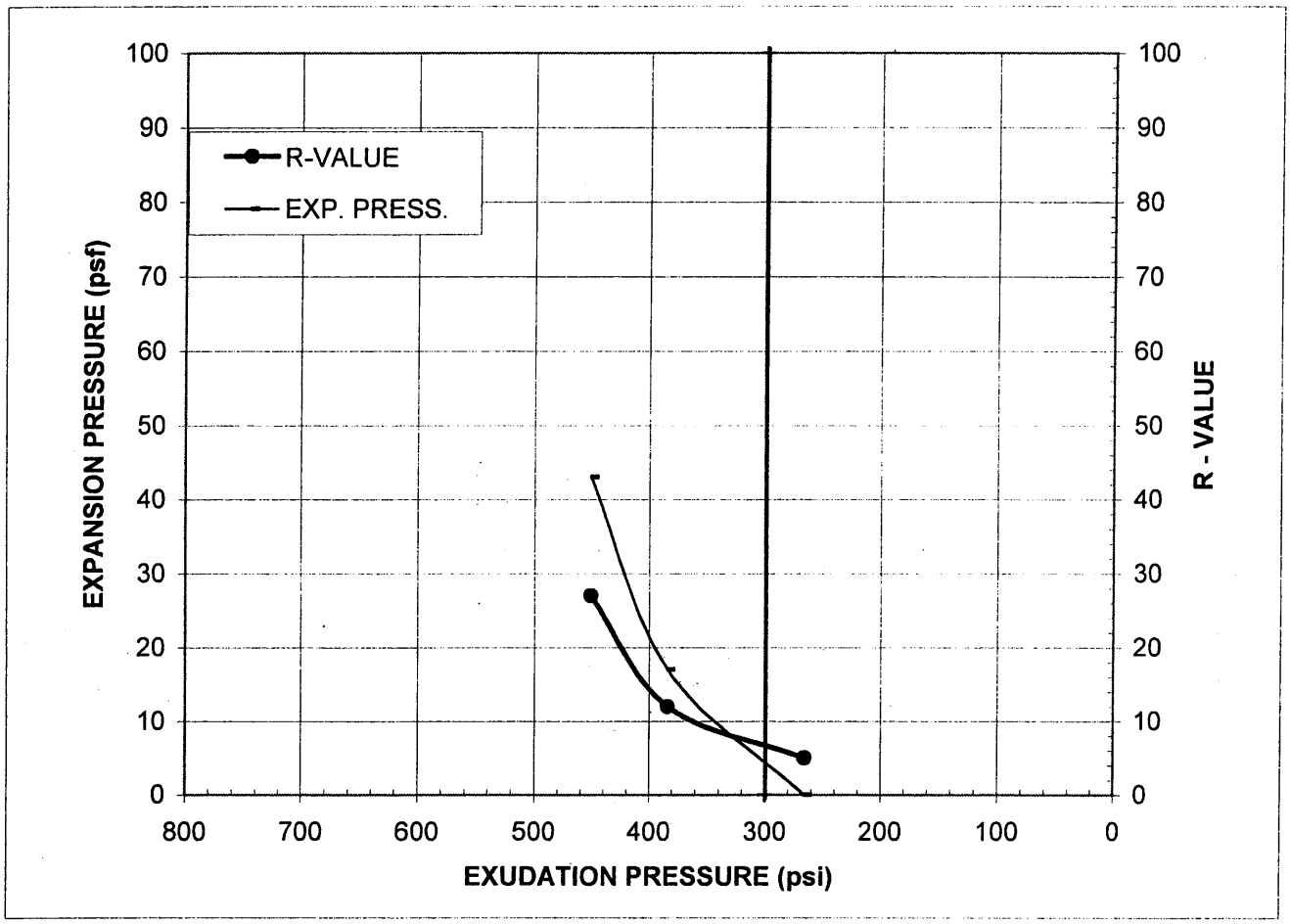
RVALUE with calcs pdp

PLATE NO.: B-5B

R-VALUE REPORT

Parikh Consultants, Inc. ASTM D2844 or CTM 301 (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	11/17/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R-3 (A-08-03) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Lean clay, Brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	266	384	451
Expansion Pressure, psf	0	17	43
R-Value	5	12	27
Moisture Content at Test, %	19.8	17.9	16.5
Dry Density at Test, pcf	102.6	107.5	111.1

R-Value @ 300 psi Exudation Pressure = **6**

Expansion Pressure @300 psi Exudation, psf = **4**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

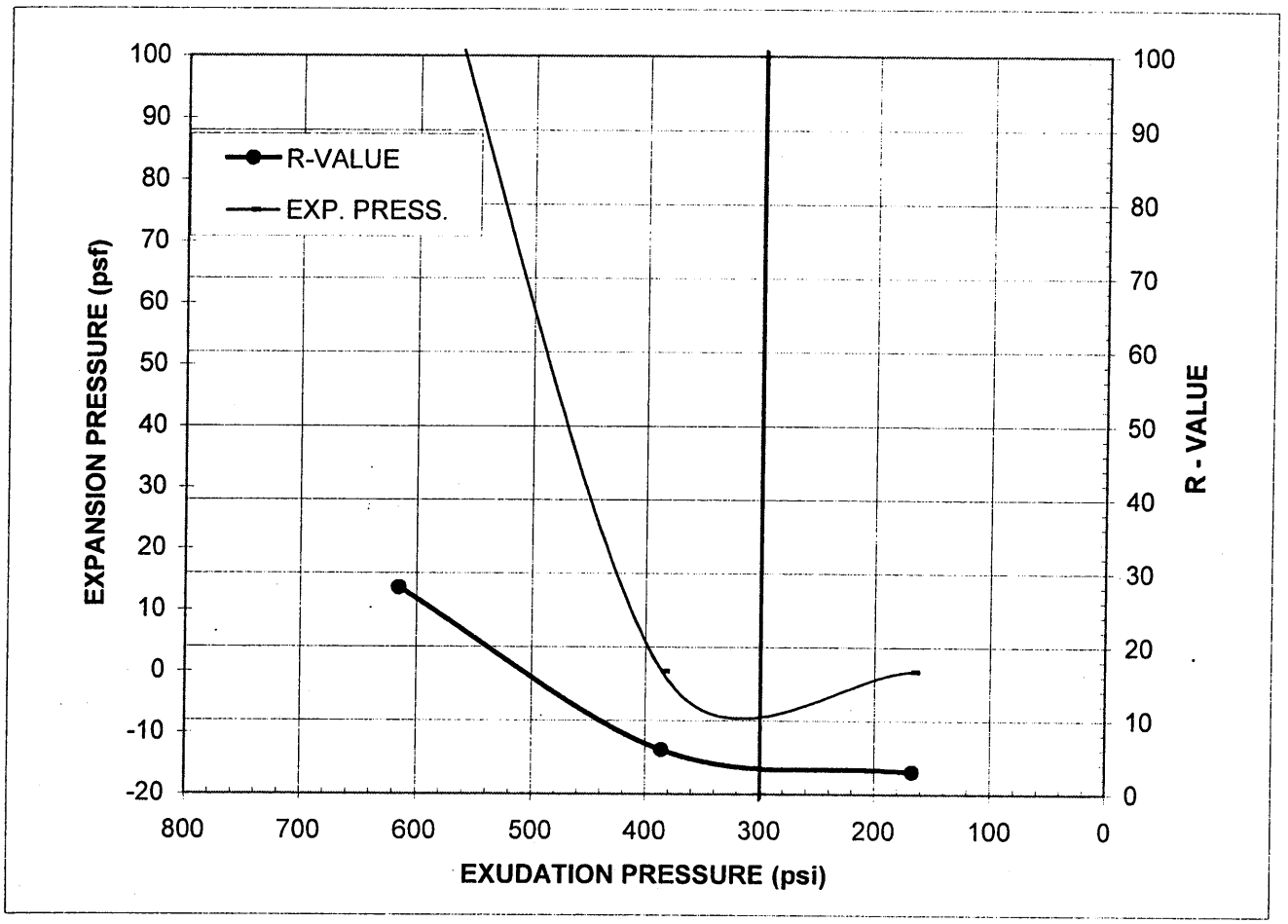
RVALUE with calcs pdp

PLATE NO.: B-5C

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	11/17/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R-4 (A-08-104) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Clay with gravel, dark brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	167	386	615
Expansion Pressure, psf	0	0	134
R-Value	3	6	28
Moisture Content at Test, %	23.8	20.9	17.2
Dry Density at Test, pcf	95.4	100.2	110.5

R-Value @ 300 psi Exudation Pressure = **4**

Expansion Pressure @300 psi Exudation, psf = **0**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

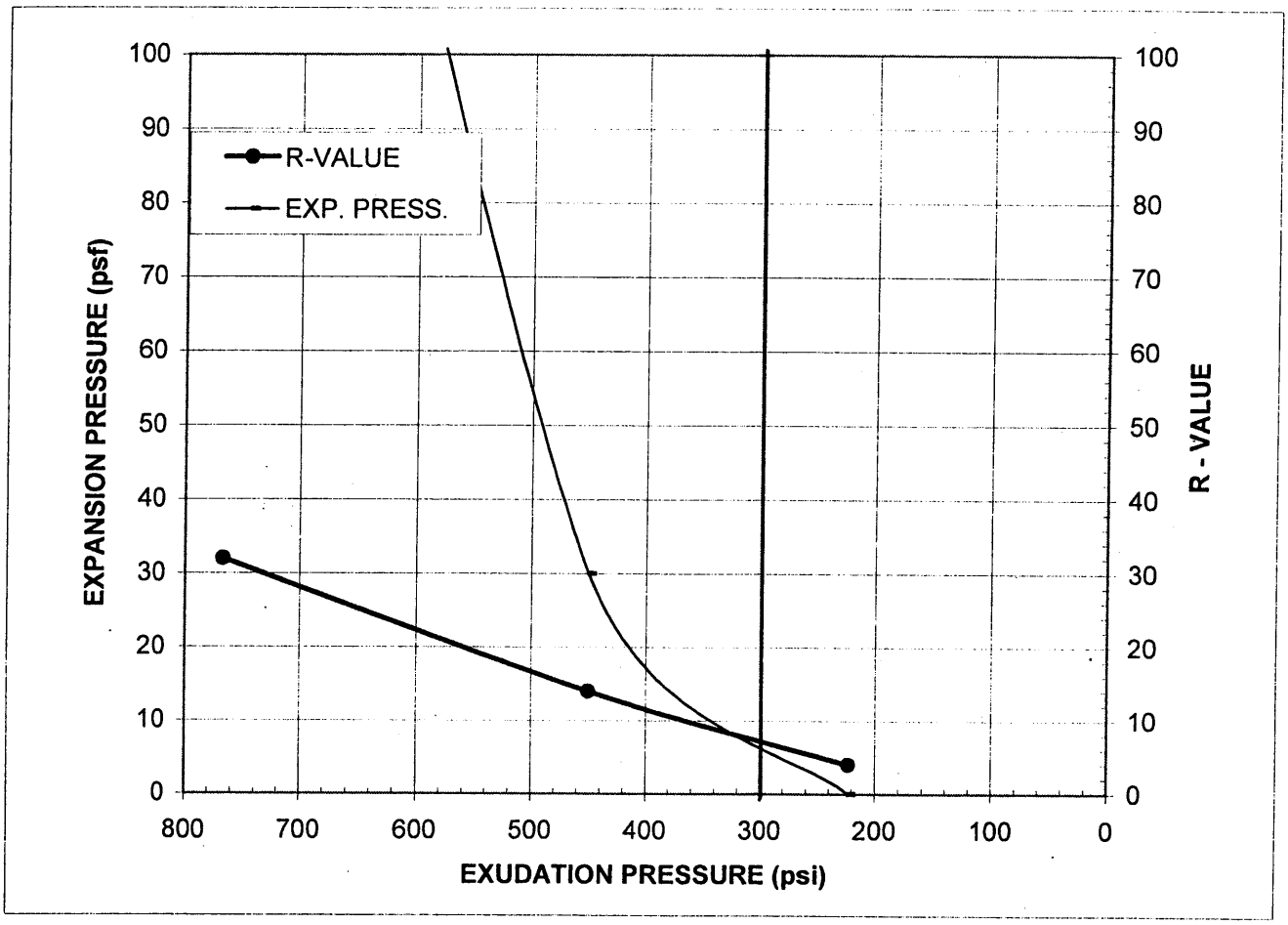
RVALUE with calcs pdp

PLATE NO.: B-5D

R-VALUE REPORT

Parikh Consultants, Inc. ASTM D2844 or CTM 301 (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	11/17/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R-5 (A-08-105) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Clay with gravel, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	223	450	767
Expansion Pressure, psf	0	30	225
R-Value	4	14	32
Moisture Content at Test, %	23.8	18.6	16.3
Dry Density at Test, pcf	98.7	108.6	114.5

R-Value @ 300 psi Exudation Pressure = 7

Expansion Pressure @300 psi Exudation, psf = **5**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

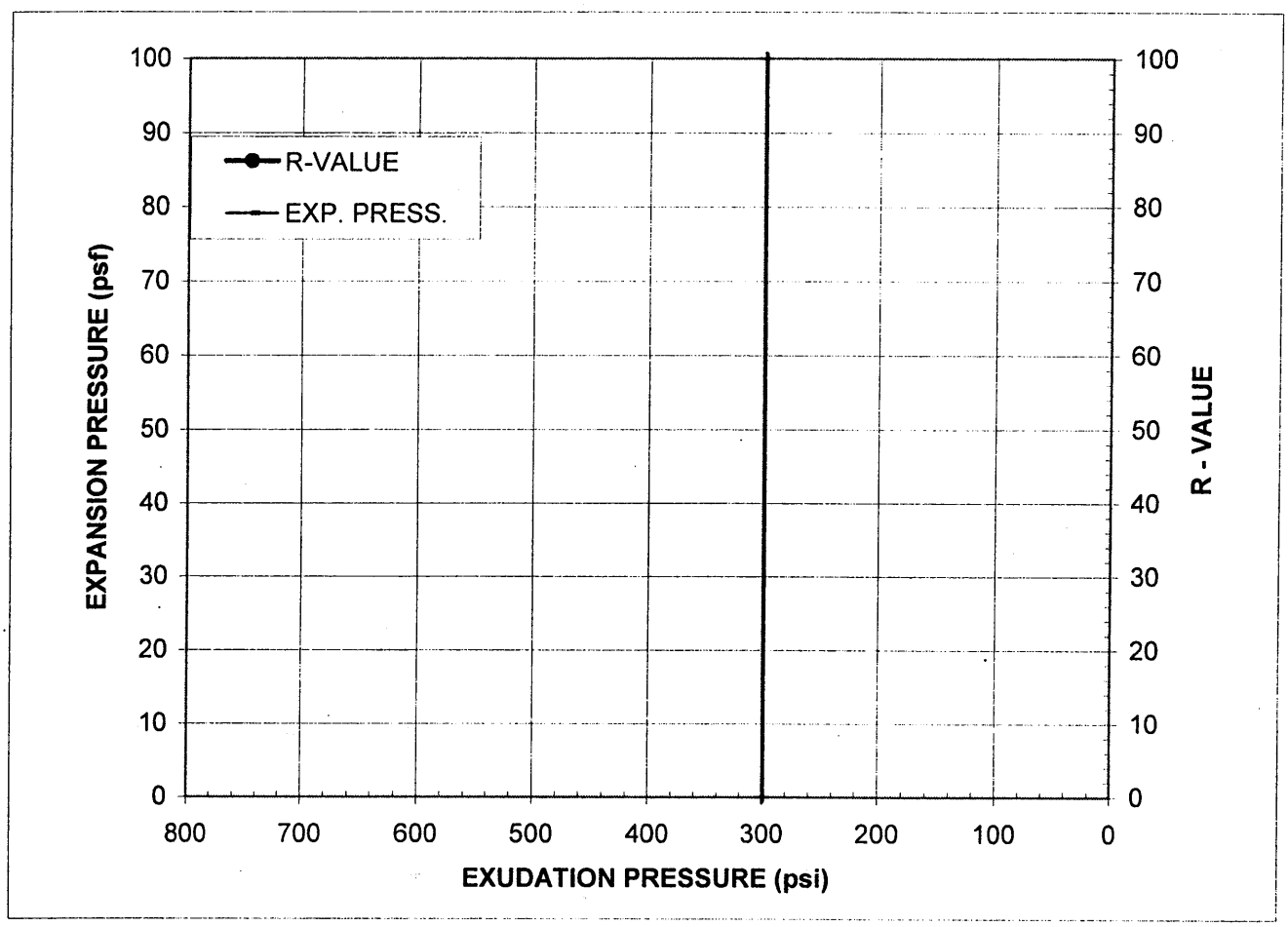
RVALUE with calcs pdp

PLATE NO.: B-5E

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	11/17/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R-6 (A-08-106) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Lean clay, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi			
Expansion Pressure, psf			
R-Value			
Moisture Content at Test, %			
Dry Density at Test, pcf			

R-Value @ 300 psi Exudation Pressure = <5	Expansion Pressure @300 psi Exudation, psf =
Minimum R-Value Requirement:	

Comments:

Test sample extruded from under the mold and around the follower ram during Exudation Test.
Test terminated - R-Valve = < 5

Report By: Prav Dayah

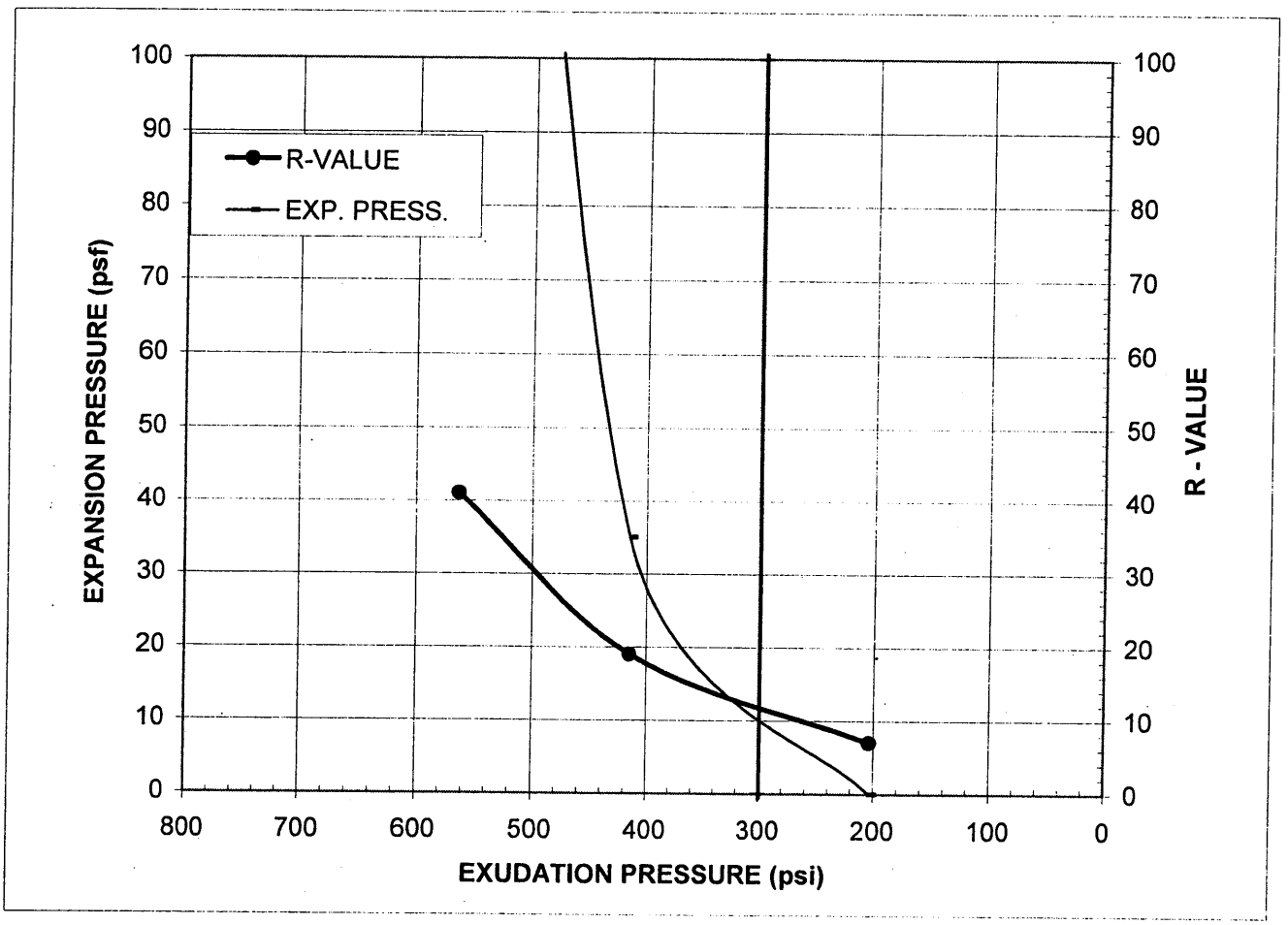
RVALUE with calcs pdp

PLATE NO.: B-5F

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	11/17/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R-7(A-08-(07) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Clay with gravel, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	204	415	563
Expansion Pressure, psf	0	35	234
R-Value	7	19	41
Moisture Content at Test, %	16.3	14.5	13.3
Dry Density at Test, pcf	110.7	115.5	119.6

R-Value @ 300 psi Exudation Pressure = 12

Expansion Pressure @300 psi Exudation, psf = **10**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

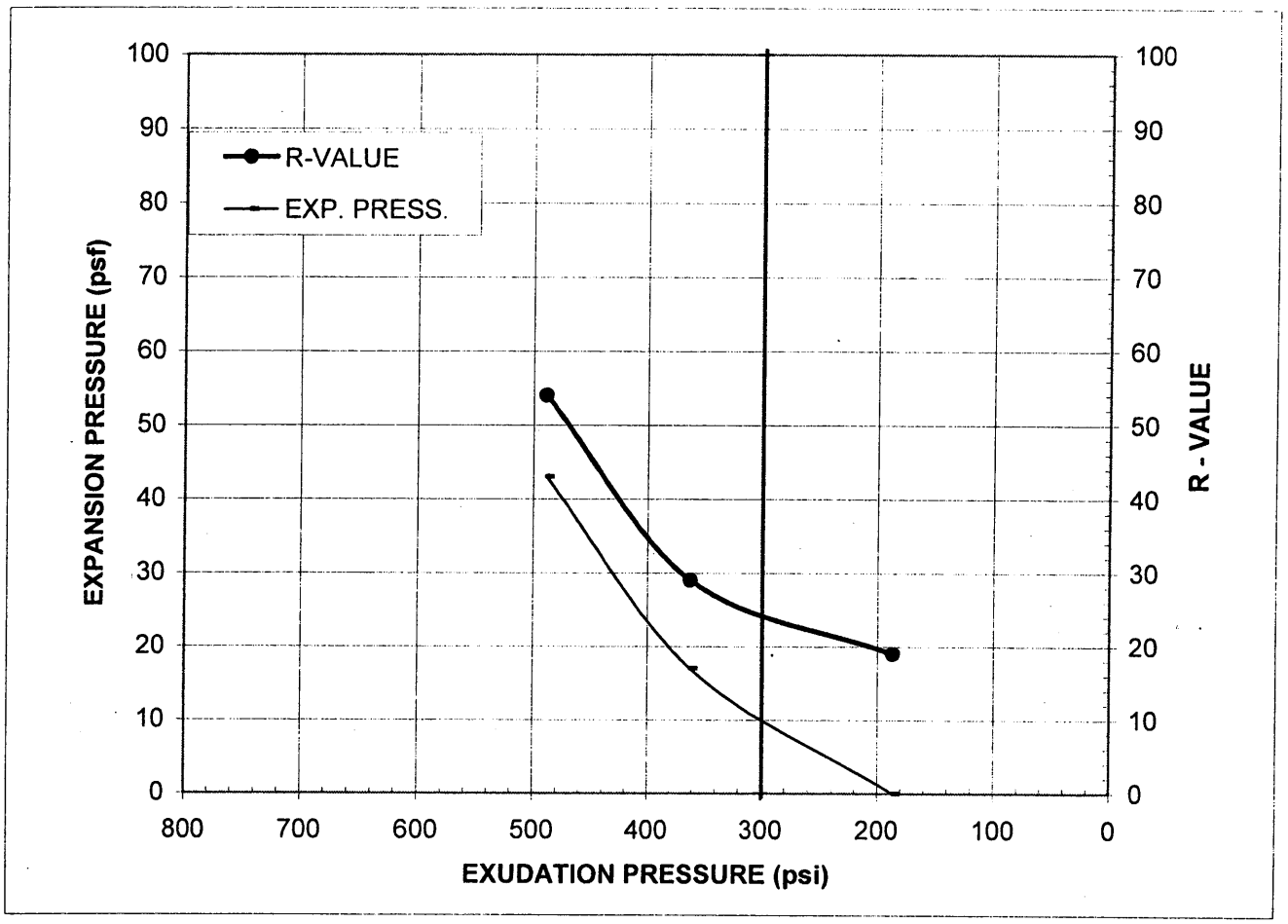
RVALUE with calcs pdp

PLATE NO.: B-5G

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	11/17/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R-8 (A-08-108) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Sandy lean clay with gravel, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	187	362	489
Expansion Pressure, psf	0	17	43
R-Value	19	29	54
Moisture Content at Test, %	13.3	12.3	11.4
Dry Density at Test, pcf	117.3	120.6	121.8

R-Value @ 300 psi Exudation Pressure = **24**

Expansion Pressure @300 psi Exudation, psf = **10**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

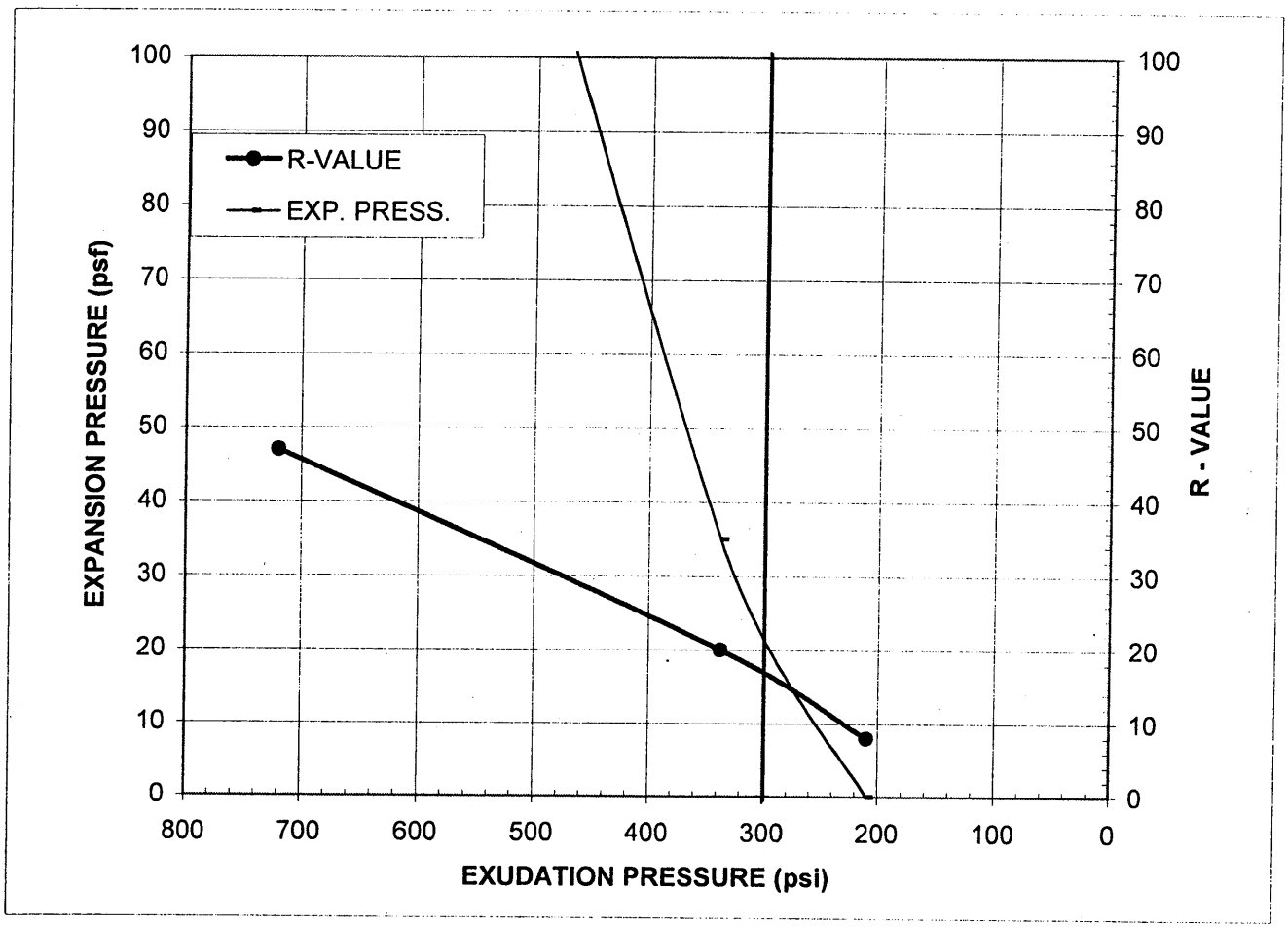
RVALUE with calcs pdp

PLATE NO.: B-5H

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	11/17/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R-9 (A-08-109) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Sandy clay with gravel and roots, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	210	337	720
Expansion Pressure, psf	0	35	234
R-Value	8	20	47
Moisture Content at Test, %	14.7	12.9	11.7
Dry Density at Test, pcf	112.9	117.9	123.0

R-Value @ 300 psi Exudation Pressure = 18

Expansion Pressure @300 psi Exudation, psf = **20**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

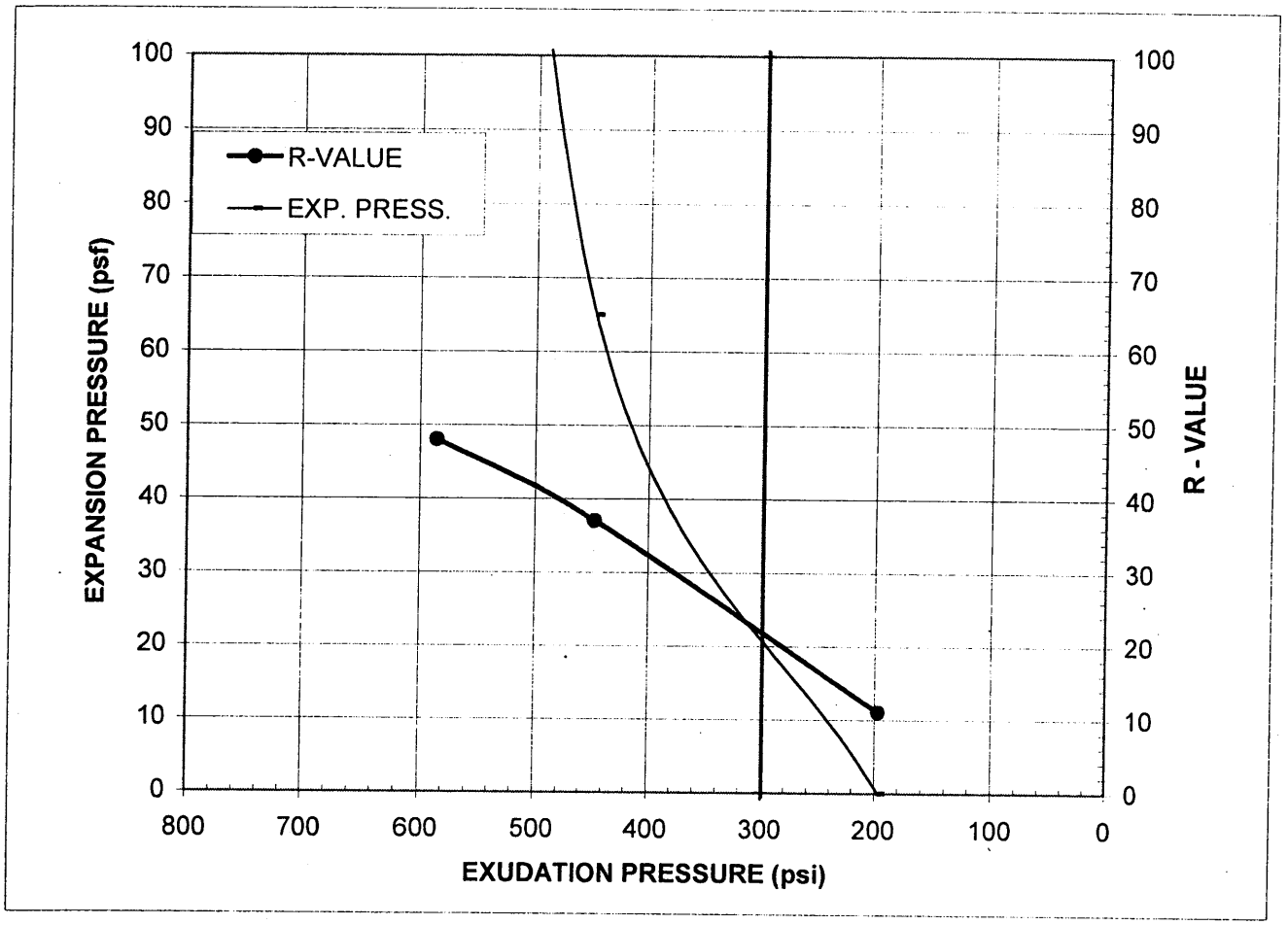
RVALUE with calcs pdp

PLATE NO.: B-5I

R-VALUE REPORT

Parikh Consultants, Inc. ASTM D2844 or CTM 301 (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	11/25/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R-10 (A-08-110) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Sandy clay with gravels and roots, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	197	447	585
Expansion Pressure, psf	0	65	238
R-Value	11	37	48
Moisture Content at Test, %	16.0	14.2	13.2
Dry Density at Test, pcf	111.8	116.9	119.0

R-Value @ 300 psi Exudation Pressure = **22**

Expansion Pressure @300 psi Exudation, psf = **20**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

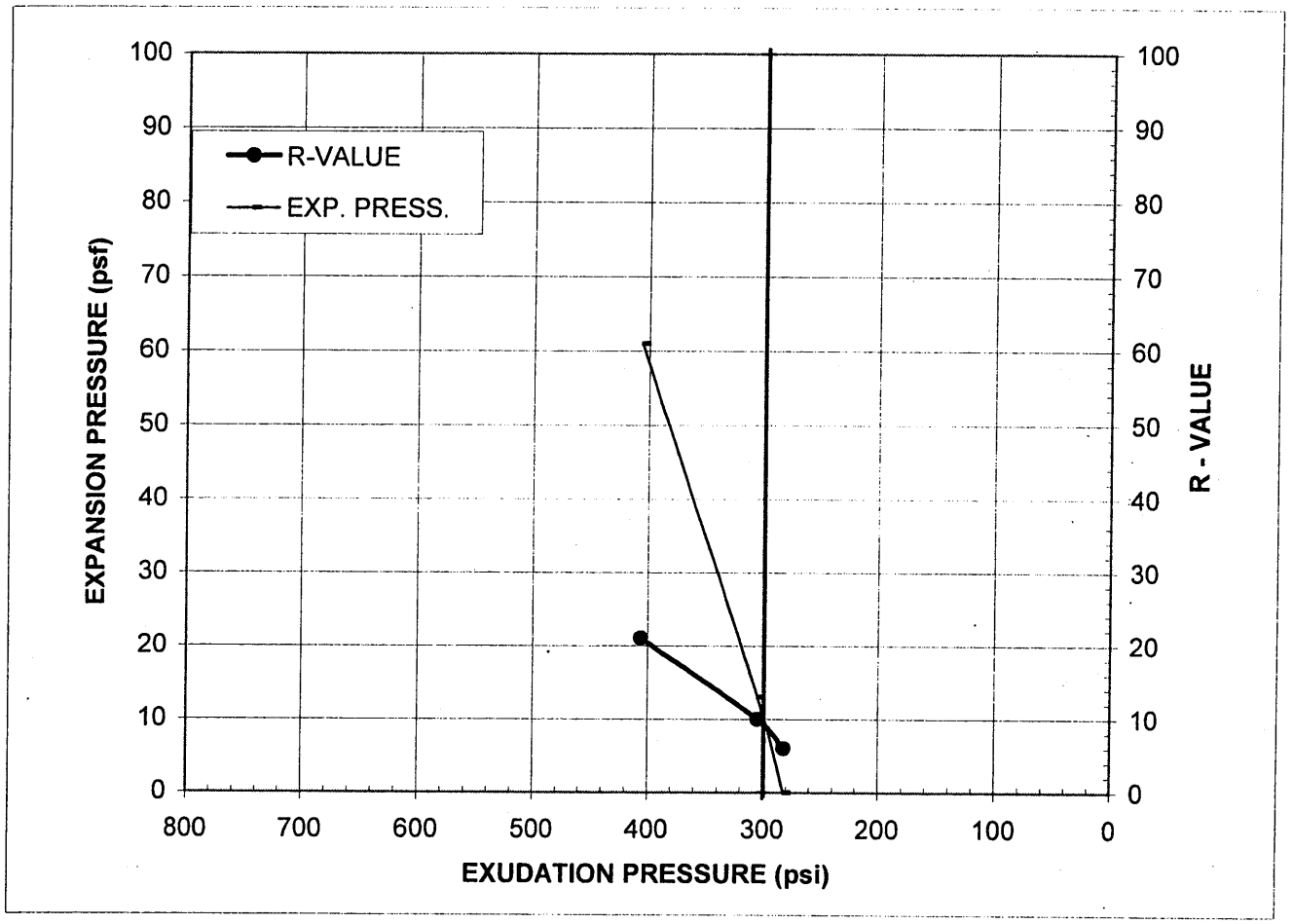
RVALUE with calcs pdp

PLATE NO.: B-5J

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	12/30/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R-14A (A-08-114) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Clay with gravel, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	282	305	406
Expansion Pressure, psf	0	13	61
R-Value	6	10	21
Moisture Content at Test, %	19.6	18.2	16.3
Dry Density at Test, pcf	101.9	106.1	111.0

R-Value @ 300 psi Exudation Pressure = 9

Expansion Pressure @300 psi Exudation, psf = 9

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

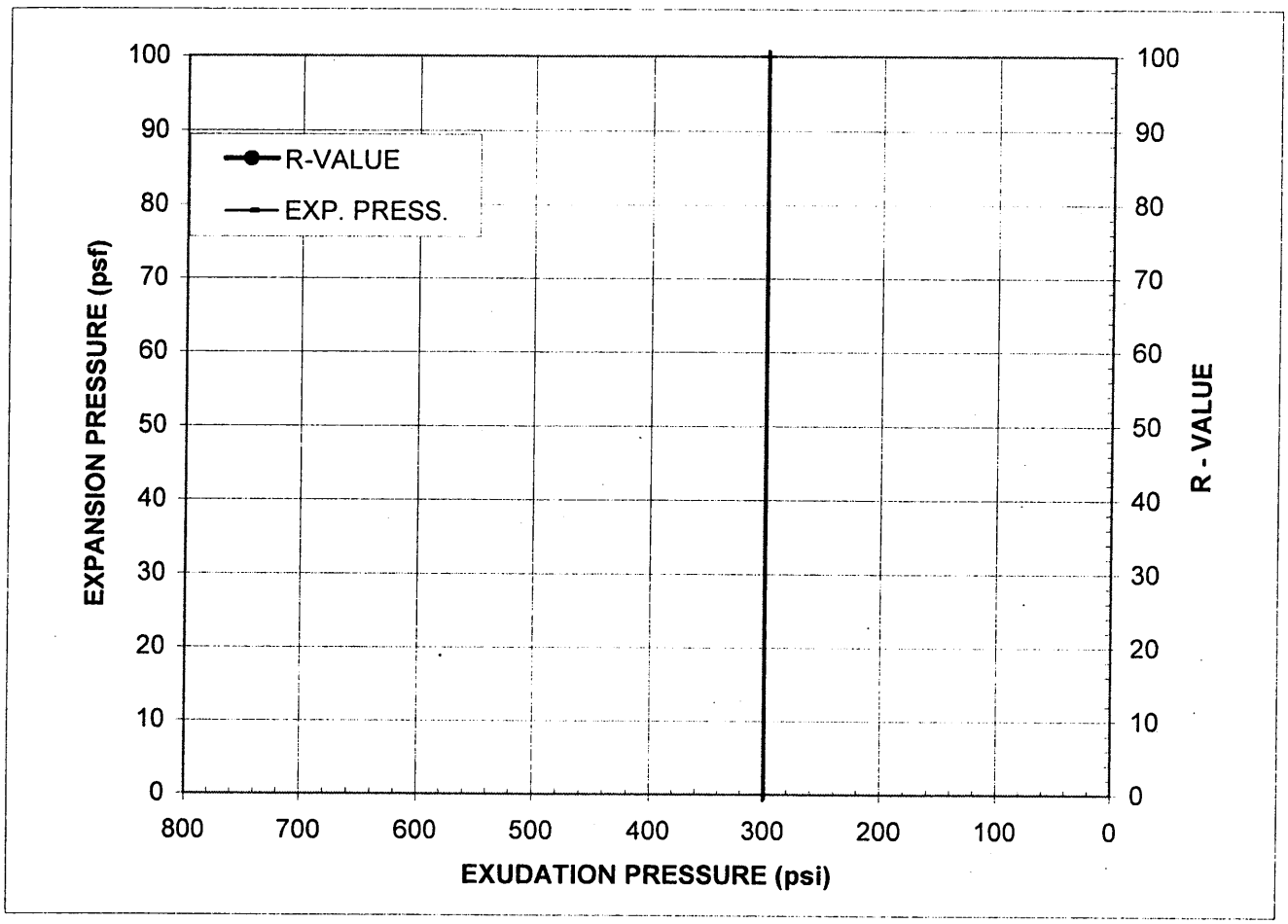
RVALUE with calcs pdp

PLATE NO.: B-5K

R-VALUE REPORT

Parikh Consultants, Inc. ASTM D2844 or CTM 301 (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	12/30/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R-15(A-08-115) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Clay, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi			
Expansion Pressure, psf			
R-Value			
Moisture Content at Test, %			
Dry Density at Test, pcf			

R-Value @ 300 psi Exudation Pressure = < 5

Expansion Pressure @300 psi Exudation, psf =

Minimum R-Value Requirement:

Comments:

Test sample extruded from under the mold and around the follower ram during Exudation Test.
Test terminated - R-Valve = < 5

Report By: Prav Dayah

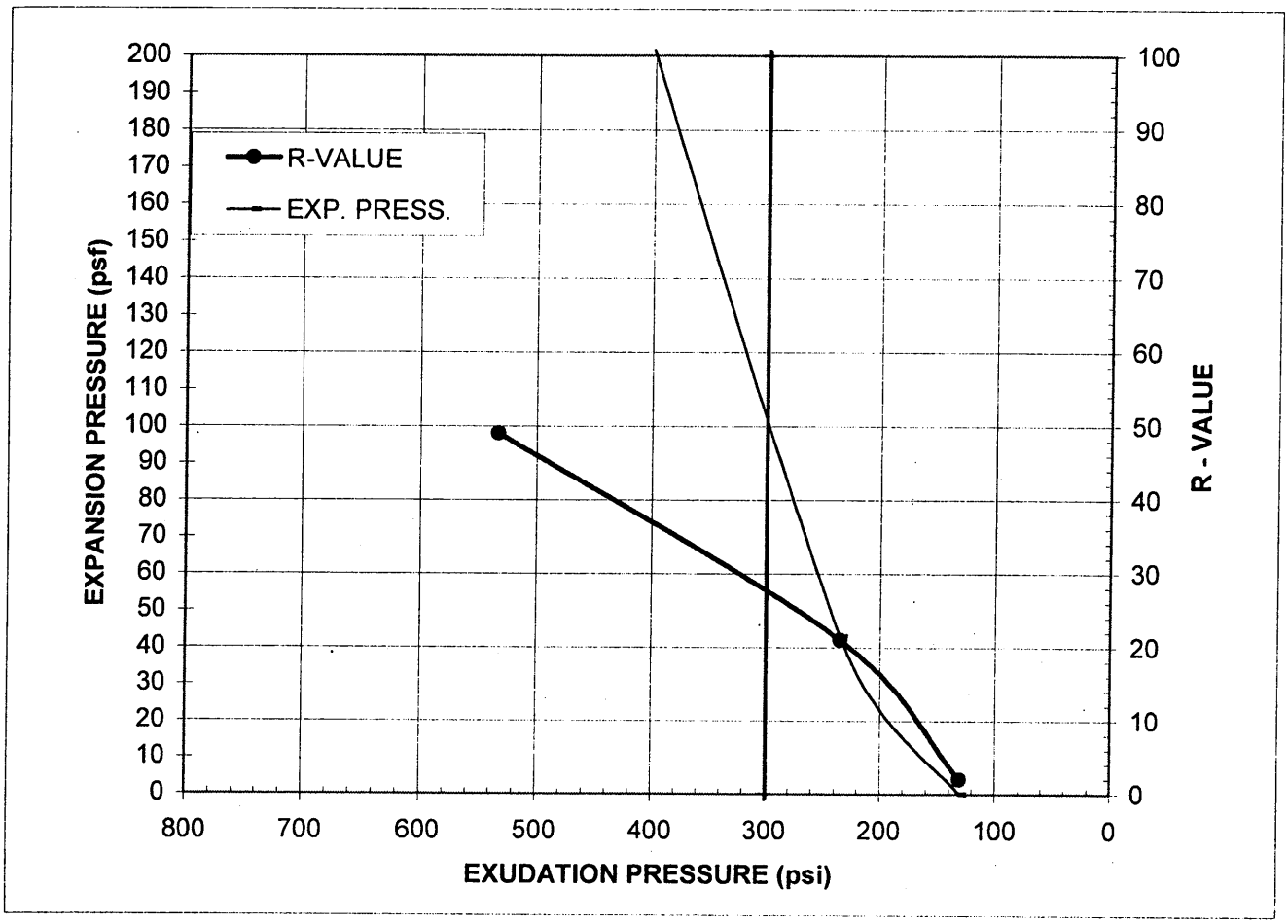
RVALUE with calcs pdp

PLATE NO.: B-5L

R-VALUE REPORT

Parikh Consultants, Inc. ASTM D2844 or CTM 301 (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	12/30/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R16(A-08-116) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Clayey silt, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	131	235	533
Expansion Pressure, psf	0	43	333
R-Value	2	21	49
Moisture Content at Test, %	19.5	15.7	13.4
Dry Density at Test, pcf	103.2	111.6	116.5

R-Value @ 300 psi Exudation Pressure = 28

Expansion Pressure @300 psi Exudation, psf = **100**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

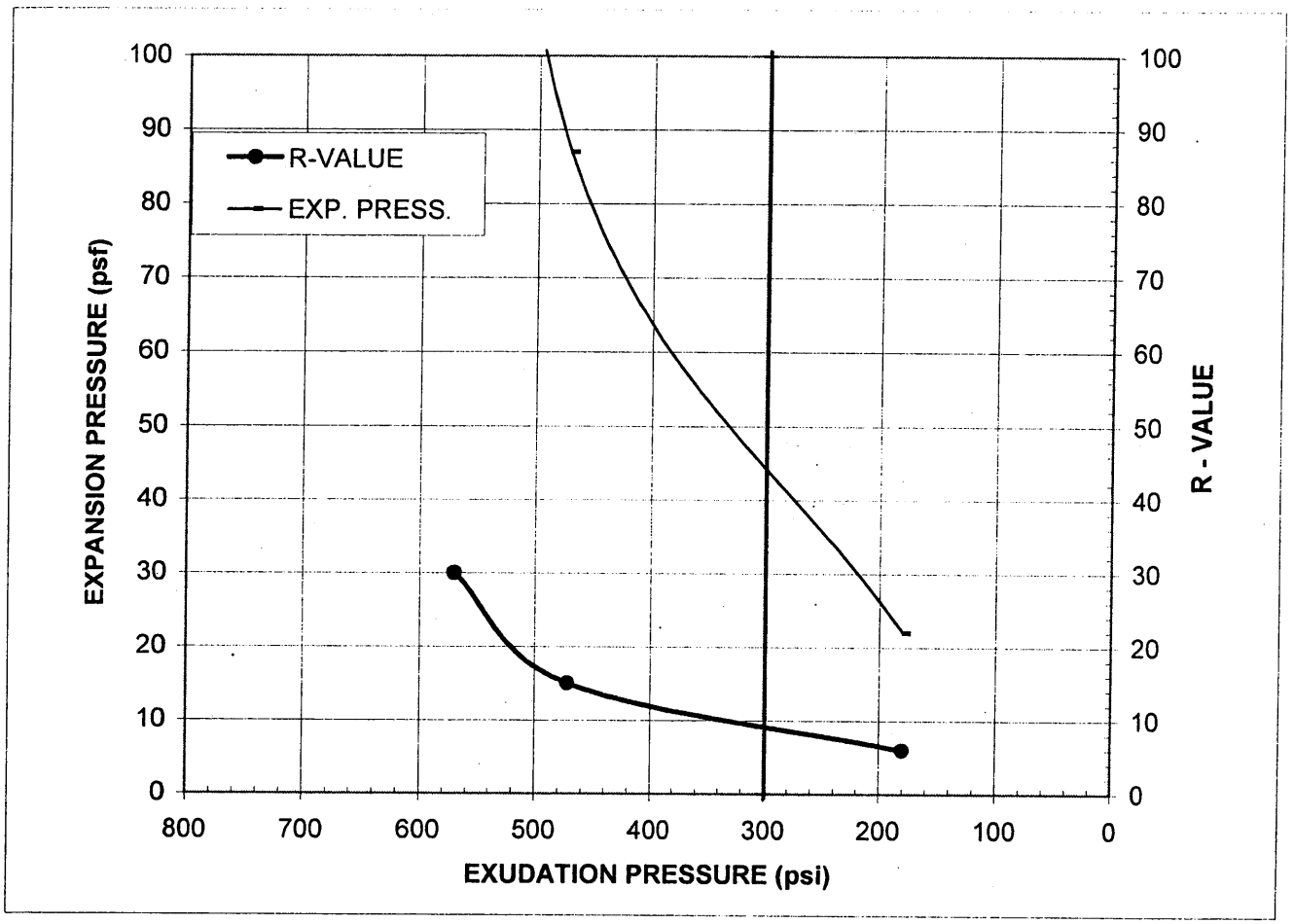
RVALUE with calcs pdp

PLATE NO.: B-5M

R-VALUE REPORT

Parikh Consultants, Inc. **ASTM D2844 or CTM 301** (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	12/30/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R17(A-08-117) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Clay with gravel and roots, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	180	472	570
Expansion Pressure, psf	22	87	208
R-Value	6	15	30
Moisture Content at Test, %	24.7	19.9	18.0
Dry Density at Test, pcf	96.0	105.0	108.7

R-Value @ 300 psi Exudation Pressure = 9

Expansion Pressure @300 psi Exudation, psf = **44**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

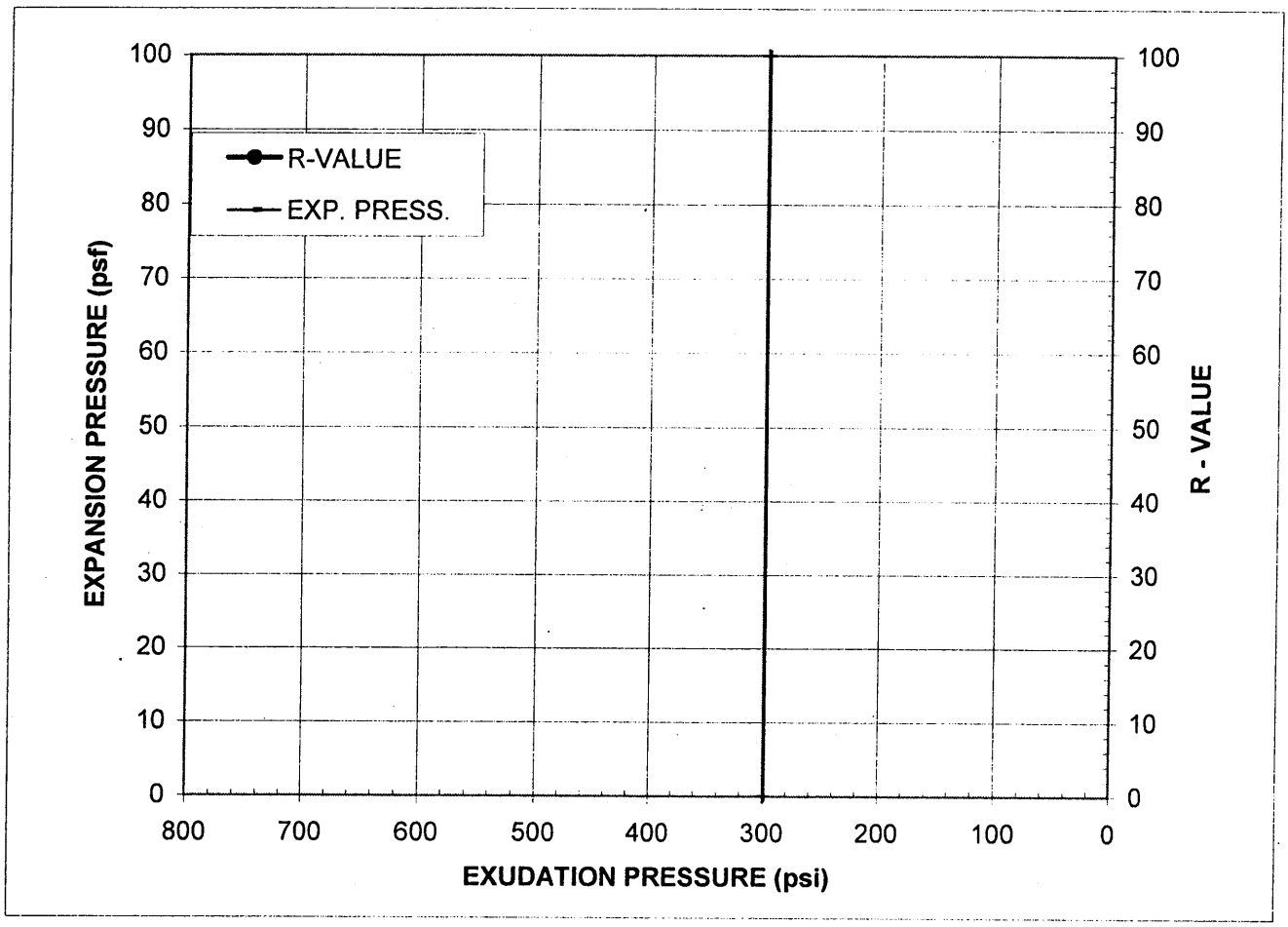
RVALUE with calcs pdp

PLATE NO.: B-5N

R-VALUE REPORT

Parikh Consultants, Inc. ASTM D2844 or CTM 301 (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	12/30/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R-18 (A-08-118) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Clay with some gravel and roots, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi			
Expansion Pressure, psf			
R-Value			
Moisture Content at Test, %			
Dry Density at Test, pcf			

R-Value @ 300 psi Exudation Pressure = < 5	Expansion Pressure @300 psi Exudation, psf =
Minimum R-Value Requirement:	

Comments:

Test sample extruded from under the mold and around the follower ram during Exudation Test.
Test terminated - R-Valve = < 5

Report By: Prav Dayah

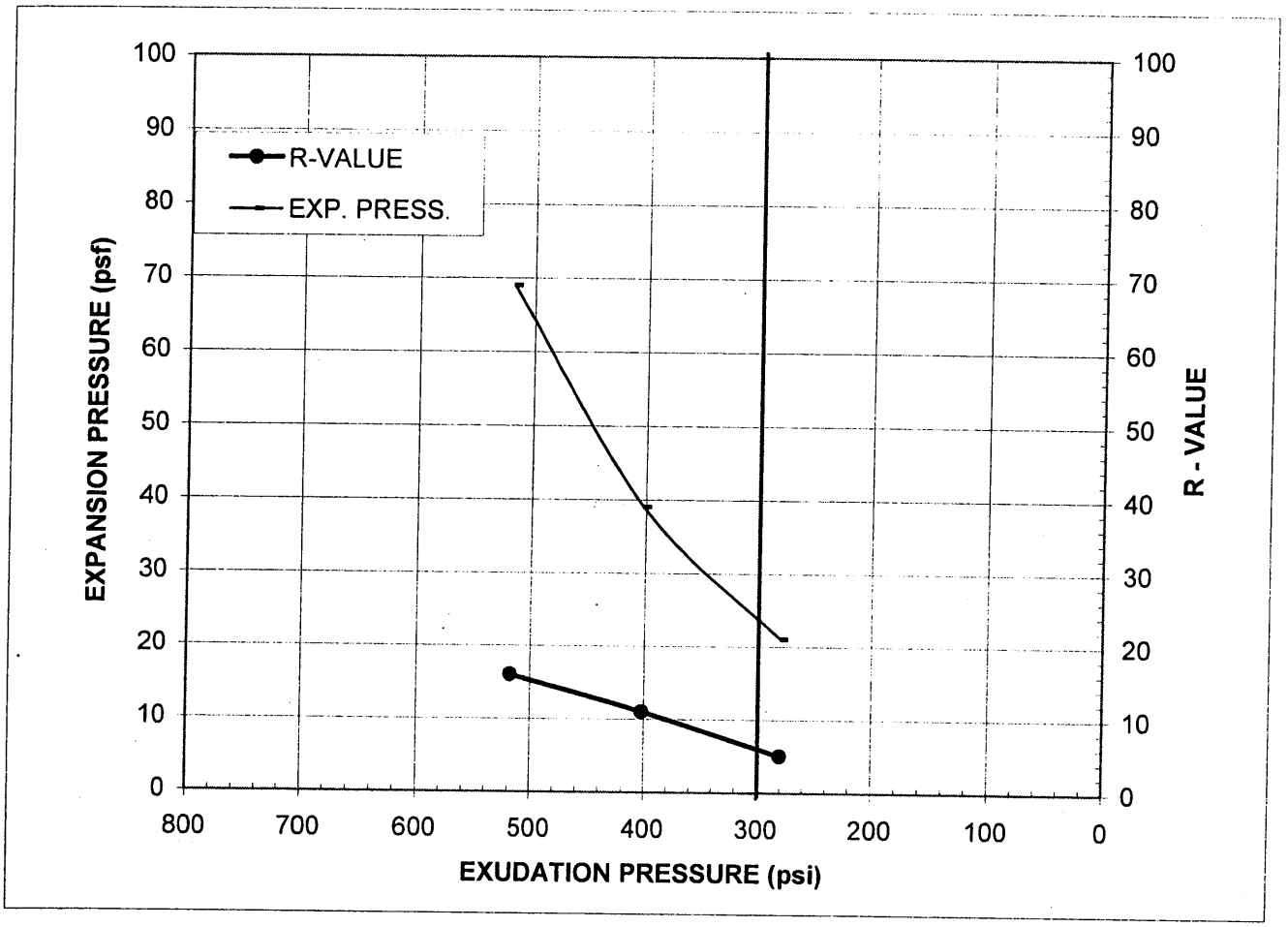
RVALUE with calcs pdp

PLATE NO.: B-5O

R-VALUE REPORT

Parikh Consultants, Inc. ASTM D2844 or CTM 301 (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	12/30/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R19 (A-08-119) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Heavy clay with roots, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	280	402	518
Expansion Pressure, psf	21	39	69
R-Value	5	11	16
Moisture Content at Test, %	26.3	22.4	20.5
Dry Density at Test, pcf	93.3	99.2	104.0

R-Value @ 300 psi Exudation Pressure = 6

Expansion Pressure @300 psi Exudation, psf = **23**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

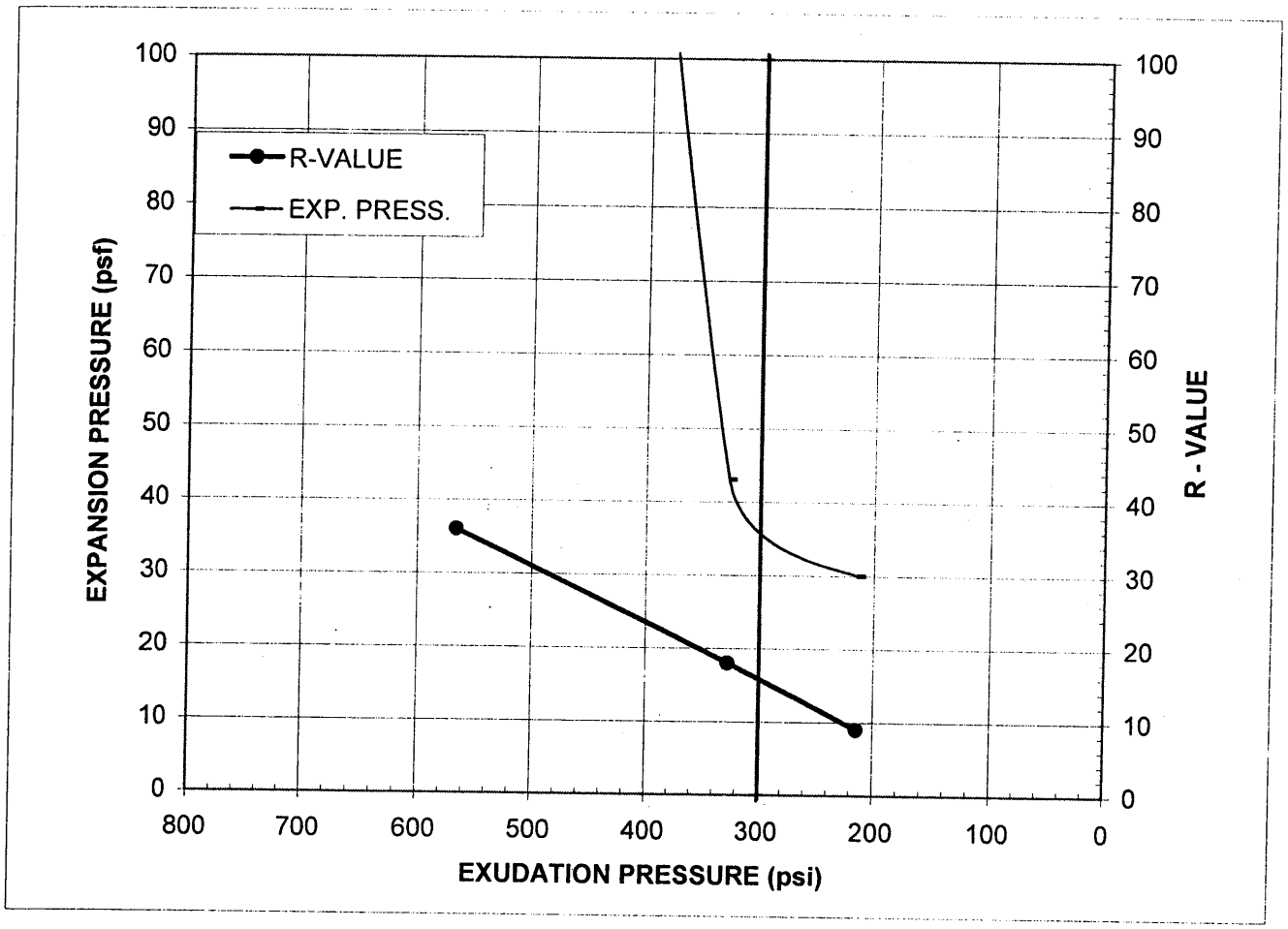
RVALUE with calcs pdp

PLATE NO.: B-5P

R-VALUE REPORT

Parikh Consultants, Inc. ASTM D2844 or CTM 301 (408) 945-1011

Project Name:	Jameson Canyon Road Project	Date:	12/30/08
Client:	MT / Caltrans	Project #:	208117.MAT
Sample #:	R20 (A-08-120) Depth: 1' - 5'	Lab #:	M735
Location / Source:	onsite / Native	Sample Date:	
Material :	Clay with gravels and roots, brown	Sampled By:	



Specimen No.	A	B	C
Exudation Pressure, psi	214	327	566
Expansion Pressure, psf	30	43	359
R-Value	9	18	36
Moisture Content at Test, %	19.2	17.3	15.4
Dry Density at Test, pcf	104.6	109.1	113.6

R-Value @ 300 psi Exudation Pressure = 16

Expansion Pressure @300 psi Exudation, psf = **35**

Minimum R-Value Requirement:

Comments:

Report By: Prav Dayah

RVALUE with calcs pdp

PLATE NO.: B-5Q

4262 - IP

BILLED

MAR 20 2008
CALC. BY _____ APPROVED BY _____
APR 10 2008
DATE REPORTED

☐ DISTRICT ☐ ☐ TRANS. L
☐ DIS. MAT L. ☐ ☐ PAV'T. SE
☐ RESIDENT ENGINEER ☐ ACCOUNTI
☐ CONSTRUCTION ☐

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATIO
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/07)
CARD NUMBER C634560

☒ PRELIMINARY TESTS
☐ PROCESS TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS
☐ DIST. LAB
☐ TRANS. LAB
☐ SPECIAL TESTS

SAMPLE SENT TO: ☒ HDQTRS. LAB

FIELD NO. 10

4262-IP

SAMPLE OF Subgrade Soil
FOR USE IN Pavement and Culvert Design
SAMPLE FROM Napa-12 PM 1.3 (S1)
DEPTH 2-3'
LOCATION OF SOURCE EB 12 side of road ~ 15' S. of Edge of pavt.

MAR 20 2008

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) 2 | AND IS ON & OF A GROUP OF 1 | SAMPLES REPRESENTING (TONS, GALS, BGLS, STA. ETC.) 2 bags
OWNER OR MANUFACTURER
TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☐ NORMAL ☒ PRIORITY | DATE NEEDED 4/10/08
REMARKS
R-Value and Corrosion Testing

COVER ADDITIONAL INFORMATION WITH LETTER
DATE SAMPLEED 3/20/08
BY Barber-Wang-DeLong TITLE TE/CT, M&R2 EA
DIST. CO. RTE. PM 04-NAP-12-PM 1.3
LIMITS
CONT. NO. EA 264101
FED. NO. 1-145
RES. ENGR. OR SUPT. Brian Barber
ADDRESS 111 Grand Av, 8th Fl, Eng. Ser. 1 Mat. B
CONTRACTOR
(510) 622-5490

MAIL TO SAME DESTINATION AS SAMPLE

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:
% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

RESISTIVITY = 2450
Specs: 1000Ω-cm (min)

REMARKS
pH = 5.8
Specs: 5.5 (min)

SURFACE
BASE
SUBBASE
GRAVEL EQUIVALENT FACTOR
TRAFFIC INDEX
R VALUE: EXUDATION PRESSURE RV = 17
EXPANSION PRESSURE
AT EQUILIBRIUM SPEC.
INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED		4-9-08		
COMPACTOR FOOT PRESSURE P.S.I.	170	120	50	
INITIAL MOISTURE %	1.8	1.8	1.8	
SOAK WATER ML	130	130	130	
WATER ADDED-ML (TOTAL)	155	170	200	
WATER ADDED %				
MOISTURE AT COMPACTION %	16.1	17.5	20.3	
WET WT. OF BRIQUETTE-GMS	1025	1045	995	
HEIGHT OF BRIQUETTE-INCHES	2.40	2.51	2.45	
DRY DENSITY OF BRIQ. - # CU. FT.	111	107	102	
STABILOMETER P_H AT 2000 LBS.	92	124	137	
DISPLACEMENT	3.32	3.49	4.64	
R-VALUE BY STABILOMETER	35	17	8	
EXUDATION PRES. P.S.I.	459	305	215	
THICK. BY STAB. FEET				
EXPANSION DIAL READING	23	6	6	
THICK. BY EXP. PRESS. FEET	0.77	0.20	0.20	
R-VALUE BY EXPANSION				

TEST RESULTS

			SPEC.
LL.	P.L.	P.I.	
CV			
S.E.	AS REC'D.		
	CRUSHED		
	COMBINED		
LART	GRADE	100 REV.	
		500 REV.	
DUR	D_i		
	D_f		
% CRUSHED PARTICLES			

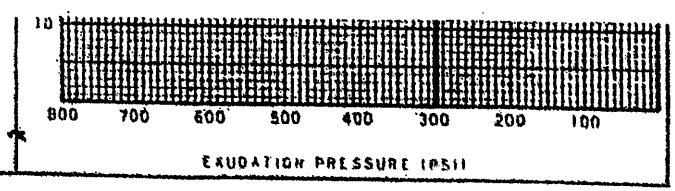
S.P. G.R. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

	FINE	C
AS REC'D.		
CRUSHED		

REL. COMPACTION D

	IN PLACE	DPI
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B



-TL-361 (Rev.10/78)

PLATE NO.: R-5R

4262 - 2P

BILLED

DATE RECEIVED MAR 20 2008

CALC. BY _____ APPROVED BY _____

DATE REPORTED APR 08 2008

☐ DISTRICT D ... ☐ TRANS. LAB
☐ DIS. MAT LB ... ☐ PAV'T. SECT
☐ RESIDENT ENGINEER ☐ ACCOUNTING
☐ CONSTRUCTION ☐

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C 634561

☐ PRELIMINARY TESTS
☐ PROCESS TESTS
☐ ACCEPTANCE TESTS

SAMPLE SENT TO: ☐ HDQTRS. LAB ☐ BRANCH LAB

INDEPENDENT ASSURANCE TESTS ☐ DIST. LAB ☐ TRANS. LAB

☐ SPECIAL TESTS

FIELD NO D0

DIST. LAB NO.

LOT NO.

4262-2P

SAMPLE OF Subgrade

FOR USE IN Pavement & Culvert Design

SAMPLE FROM Nap-12 PM 2.5 (S2)

DEPTH 2-3'

LOCATION OF SOURCE EB-12 South of road ~18'

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) 2 | AND IS ONE OF A GROUP OF 1 | SAMPLES REPRESENTING (TONS, GALS, BBLS, STA ETC.) 2 Bags

OWNER OR MANUFACTURER

TOTAL QUANTITY AVAILABLE | TEST RESULTS DESIRED ☐ NORMAL ☒ PRIORITY | DATE NEEDED 4/10/08

REMARKS

R-Value & Corrosion & P.I.

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLEED 3/10/08

BY Barber-Wang-DeLeon TITLE E/CT & MR & EA

DIST. CO. RTE. PM 04-Nap-12-PM 2.5

LIMITS

CONT. NO. EA 264101

FED. NO. 1-185

RES. ENGR. OR SUPT. B. Barber

ADDRESS 111 Grand Av. - 8th Fl., Eng. Ser. I - Mat. B

CONTRACTOR

(510) 622-5490

MAIL TO SAME DESTINATION AS SAMPLE

MAR 20 2008

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. | % BY VOL. | TEST NO. | DESCRIPTION

R RESISTIVITY = 1250
Specs: 1000 Ω-cm (min)

REMARKS

pH = 5.8
Specs: 5.0 (min)

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE (7) | EXPANSION PRESSURE | AT EQUILIBRUM | SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED	04-07-08			
COMPACTOR FOOT PRESSURE P.S.I.	70	40	30	
INITIAL MOISTURE %	3.6	3.6	3.6	
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %	26.9	29.5	33.9	
WET WT. OF BRIQUETTE-GMS	1033	981	937	
HEIGHT OF BRIQUETTE-INCHES	2.67	2.59	2.54	
DRY DENSITY OF BRIQ. - # CU. FT.	92	89	83	
STABILOMETER P_H AT 2000 LBS.	133	140	148	
DISPLACEMENT	4.02	3.95	4.41	
R-VALUE BY STABILOMETER	12	9	4	
EXUDATION PRES. P.S.I.	551	348	220	
THICK. BY STAB. FEET				
EXPANSION DIAL READING	25	17	10	
THICK. BY EXP. PRESS. FEET	0.83	0.57	0.33	
R-VALUE BY EXPANSION				

TEST RESULTS		SPEC.
LL 55 P.L. 23 P.I. 32		
CV		
S.E.	AS REC'D	
	CRUSHED	
	COMBINED	
LART	GRADE 100 REV.	
	500 REV.	
DUR.	D_f	
	D_c	
% CRUSHED PARTICLES		

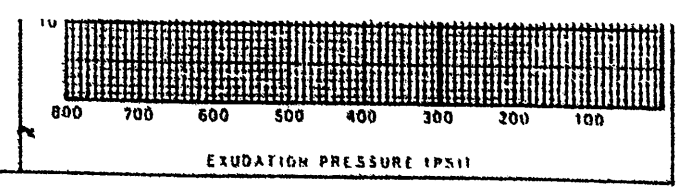
S.P. G.R. ☐ BULK (OVEN D ☐ BULK (SSD) ☐ APPARENT

	FINE	COAR
AS REC'D.		
CRUSHED		

REL. COMPACTION DA

	IN PLACE	OPTIM
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B



-TL-361 (Rev. 10/78)

PLATE NO.: B-5S

TEST NO. 4262 - 3P

BILLED

DATE RECEIVED MAR 20 2008

CALC. BY _____ APPROVED BY _____

DATE REPORTED APR 11 2008

☐ DISTRICT D OR ☐ TRANS. LAB
☐ DIS. MAT LS R ☐ PAV'T. SECT
☐ RESIDENT ENGINEER ☐ ACCOUNTING
☐ CONSTRUCTION ☐

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C 634562

☐ PRELIMINARY TESTS
☐ PROCESS TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS
☐ DIST. LAB
☐ TRANS. LAB
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☐ DIST. LAB
☐ SHIPMENT

FIELD NO. DO
DIST. LAB NO.
LOT NO.
B.B. CODE
AUTHORIZATION NO.

4262-3P

SAMPLE OF Subgrade Soil
FOR USE IN Pavement & Culvert Design
SAMPLE FROM Sol-12 PM 0.1
DEPTH 2-3'
LOCATION OF SOURCE EB-12 South of Road ~ 18'

THIS SAMPLE IS SHIPPED IN 2 (NO CONTAINERS)
AND IS ONE OF A GROUP OF 1
SAMPLES REPRESENTING (TONS, GALS, SQ.FT. STA. ETC.) 2 Bags
OWNER OR MANUFACTURER
TOTAL QUANTITY AVAILABLE
TEST RESULTS DESIRED ☐ NORMAL ☒ PRIORITY
DATE NEEDED 4/10/08

REMARKS
R-Value & Corrosion

COVER ADDITIONAL INFORMATION WITH LETTER
DATE SAMPLEED 3/28/08
BY Barker-Wong-Delcon TITLE TE/CT MRR & EA
DIST. CO. RTE. PM 04-Sol-12-PM 0.1
LIMITS
CONT. NO. EA 264101
FED. NO. I-195
RES. ENGR. OR SUPT. B. Barker
ADDRESS 111 Grand Av. 4th Fl. Eng. Sev. & Matls. B.
CONTRACTOR
(510) 622-5470

MAIL TO SAME DESTINATION AS SAMPLE

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

Resistivity - 3250
Spec: 1000 Ω-cm (min)

REMARKS
pH = 6.4
Spec: 5.5 (min)

SURFACE
BASE
SUBBASE
GRAVEL EQUIVALENT FACTOR
TRAFFIC INDEX
R VALUE: EXUDATION PRESSURE RV = 31
EXPANSION PRESSURE
AT EQUILIBRIUM SPEC.
INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED	04/10/08			
COMPACTOR FOOT PRESSURE P.S.I.	160	90	60	
INITIAL MOISTURE %	1.6	1.6	1.6	
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %	12.7	13.6	14.5	
WET WT. OF BRIQUETTE-GMS	1101	1137	1096	
HEIGHT OF BRIQUETTE-INCHES	2.46	2.58	2.52	
DRY DENSITY OF BRIQ. - # CU. FT.	120	118	115	
STABILOMETER P_H AT 2000 LBS.	80	96	106	
DISPLACEMENT	4.20	4.32	4.89	
R-VALUE BY STABILOMETER	37	28	21	
EXUDATION PRES. P.S.I.	410	256	201	
THICK. BY STAB FEET				
EXPANSION DIAL READING	15	13	13	
THICK. BY EXP. PRESS. FEET	0.50	0.43	0.43	
R-VALUE BY EXPANSION				

MAR 20 2008

TEST RESULTS

		SPEC.
LL. P.L. P.I.		
CV		
S.E. AS REC'D		
S.E. CRUSHED		
S.E. COMBINED		
LART GRADE 100 REV.		
LART GRADE 500 REV.		
DUR D_f		
DUR D_i		
% CRUSHED PARTICLES		

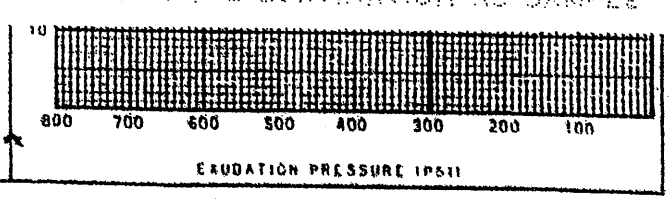
SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

	FINE	COA
AS REC'D.		
CRUSHED		

REL. COMPACTION DA

	IN PLACE	OPTI
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B



-TL-361 (Rev. 10/78)

PLATE NO.: R-5T

TEST NO. 4262-4P

BILLED

DATE RECEIVED MAR 20 2008

CALC. BY ____ APPROVED BY ____

DATE REPORTED APR 10 2008

☐ DISTRICT D R ☐ TRANS. L
☐ DIS. MAT LS. R ☐ PAV'T. SE
☐ RESIDENT ENGINEER ☐ ACCOUNTI
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET. CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

Resistivity = 1250
Specs: 1000 Ω-cm (min)

REMARKS

pH = 6.3
Specs: 5.5 (min)

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE RV = 11

EXPANSION PRESSURE

AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

SOIL

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED		4-9-08		
COMPACTOR FOOT PRESSURE P.S.I.	80	40	20	
INITIAL MOISTURE %	41	41	41	
SOAK WATER ML	140	140	140	
WATER ADDED-ML (TOTAL)	270	295	350	
WATER ADDED %				
MOISTURE AT COMPACTION %	29.6	32.0	37.2	
WET WT. OF BRIQUETTE-GMS	991	986	917	
HEIGHT OF BRIQUETTE-INCHES	2.59	2.60	2.50	
DRY DENSITY OF BRIQ. - # CU. FT.	89	87	81	
STABILOMETER P_H AT 2000 LBS.	138	136	148	
DISPLACEMENT	3.72	4.18	4.85	
R-VALUE BY STABILOMETER	11	11	4	
EXUDATION PRES. P.S.I.	472	269	206	
THICK. BY STAB FEET				
EXPANSION DIAL READING	0	0	0	
THICK. BY EXP. PRESS. FEET	0	0	0	
R-VALUE BY EXPANSION				

TEST RESULTS		SPEC.
LL 50 P.L. 19 P.I. 31		
CV		
S.E.	AS REC'D	
	CRUSHED	
	COMBINED	
CLAY	GRADE 100 REV.	
	500 REV.	
DUR.	D_f	
	D_i	
% CRUSHED PARTICLES		

SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT	FINE	C
AS REC'D.		
CRUSHED		

REL. COMPACTION D	IN PLACE	OPT
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

TL-361 (Rev. 10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C 634563

☐ PRELIMINARY TESTS
☐ PROCESS TESTS
☐ ACCEPTANCE TESTS
☐ INDEPENDENT ASSURANCE TESTS
☐ DIST. LAB
☐ TRANS. LAB
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☐ DIST. LAB
☐ SHIPPING

FIELD NO. D0
DIST. LAB NO.
LOT NO.
P.O. OR R.O. NO.

4262-4P

MAR 20 2008

SAMPLE OF Subgrade Soil

FOR USE IN Pavement & Culvert Design

SAMPLE FROM Sol-12 PM 1.1

(S4)

DEPTH 2-3'

LOCATION OF SOURCE EB-12 ~12' South of Edge of Road

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) 2 AND IS ONE OF A GROUP OF 1 SAMPLES REPRESENTING (TONS, BALE, BAG, STA. ETC.) 2 Bags

OWNER OR MANUFACTURER

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☐ NORMAL ☒ PRIORITY

DATE NEEDED 4/10/08

REMARKS

R-Value & Corrosion & P.I.

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLEED 3/20/08

BY Barber-Wang-Nelson TITLE CT/TE M&R & EA

DIST, CO, RTE, PM 04-Sol-12-PM 1.1

LIMITS

CONT. NO. EA 264101

FED. NO. 1-185

RES. ENGR. OR SUPT. S. Barber

ADDRESS 111 Grand Av. 8th Fl. Eng. Serv. I-Matls. B

CONTRACTOR

(510) 622-5490

MAIL TO SAME DESTINATION AS SAMPLE

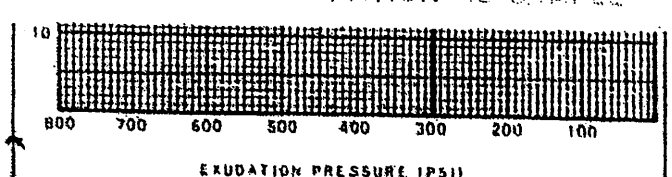


PLATE NO.: B-5U

TEST: 4262 - 5P

BILLED

DATE RECEIVED MAR 20 2008

CALC. BY _____ APPROVED BY _____

DATE REPORTED APR 11 2008

☐ DISTRICT D ☐ TRANS. LAB
☐ DIS. MAT L. ☐ PAV'T. SEC'
☐ RESIDENT ENGINEER ☐ ACCOUNTING
☐ CONSTRUCTION ☐

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C 634564

☐ PRELIMINARY TESTS
☐ PROCESS TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS
☐ DIST. LAB
☐ TRANS. LAB
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☐ LAB

FIELD NO. D0

DIST. LAB NO.

MAR 20 2008

4262-5P

SAMPLE OF Subgrade Soil

FOR USE IN Pavement & Culvert Design

SAMPLE FROM Sol-12 PM 2.1 (55)

DEPTH 2-3'

LOCATION OF SOURCE EB-12 ~22' South of Edge of Road

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) 2 AND IS ONE OF A GROUP OF 1 SAMPLES REPRESENTING (CONS. GAL. TONS STA. ETC.) 2 Bags

OWNER OR MANUFACTURER

TOTAL QUANTITY AVAILABLE

TEST RESULTS DESIRED ☐ NORMAL ☒ PRIORITY

DATE NEEDED 4/10/08

REMARKS R-Value & Corrosion

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLED 3/20/08

BY Barber - Wang - Dolan TITLE TE/CT M&R & EA

DIST. CO. RTE. PM 04-Sol-12 - PM 2.1

LIMITS

CONT. NO. EA 264101

FED. NO. 1-185

RES. ENGR. OR SUPT. B. Barber

ADDRESS 111 Grand Av. 9th Fl. Eng. Ser. 1-Mat'ls. B.

CONTRACTOR

(510) 622-5498

MAIL TO SAME DESTINATION AS SAMPLE

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT.	% BY VOL.	TEST NO.	DESCRIPTION

Resistivity.
specs. 1000 Ω-cm (min)

REMARKS 1600 Ω-cm
pH = 6.7
specs. 5.6 (min)

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE RV = 15

EXPANSION PRESSURE

AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

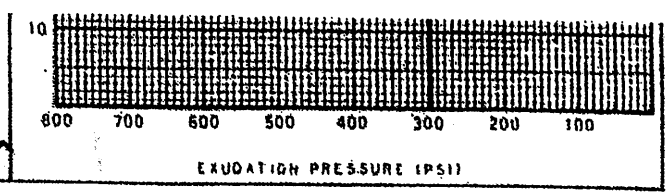
TEST SPECIMEN	A	B	C	D
DATE TESTED	04/10	04/10	04/08	
COMPACTOR FOOT PRESSURE P.S.I.	120	90	60	
INITIAL MOISTURE %	0.9	0.9	0.9	
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %	15.6	16.5	18.3	
WET WT. OF BRIQUETTE-GMS	1101	1091	1090	
HEIGHT OF BRIQUETTE-INCHES	2.57	2.55	2.61	
DRY DENSITY OF BRIQ. - # CU. FT.	112	111	107	
STABILOMETER P_H AT 2000 LBS.	114	114	136	
DISPLACEMENT	4.08	4.28	4.36	
R-VALUE BY STABILOMETER	20	19	11	
EXUDATION PRES. P.S.I.	504	341	259	
THICK. BY STAB. FEET				
EXPANSION DIAL READING	8	5	8	
THICK. BY EXP. PRESS. FEET	0.27	0.17	0.27	
R-VALUE BY EXPANSION				

TEST RESULTS		SPEC.
LL. P.L. P.I.		
CV		
S.E.	AS REC'D	
	CRUSHED	
	COMBINED	
LART	GRADE 100 REV.	
	500 REV.	
DUR	D_f	
	D_c	
% CRUSHED PARTICLES		

SP. GR. ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT	FINE	CO
AS REC'D.		
CRUSHED		

REL. COMPACTION D.	IN PLACE	OPT
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B



-TL-361 (Rev. 10/78)

PLATE NO.: R-5V

TEST NO. 4262-6P

BILLED

DATE RECEIVED MAR 20 2008

CALC. BY _____ APPROVED BY _____

DATE REPORTED APR 14 2008

☐ DISTRICT C ☐ TRANS. LAB
☐ DIS. MAT LS. ☐ PAV'T. SECT
☐ RESIDENT ENGINEER ☐ ACCOUNTING
☐ CONSTRUCTION ☐

GRADING ANALYSIS

SIEVE	AS RECEIVED	RET CR.	ADJ. OR COMB. GRADE	AS USED	SPECIF. LIMITS ☐ SOUGHT ☐
3					
2½					
2					
1½					
1					
¾					
½					
⅜					
4					
8					
16					
30					
50					
100					
200					
5μ					
1μ					

GRADING AS USED WAS OBTAINED AS FOLLOWS:

% BY WT. % BY VOL. TEST NO. DESCRIPTION

RESISTIVITY = 1600 Ω-CM
SPECIAL 1000 Ω-CM (min)

REMARKS: pH = 10.4
Sulfate: 5.6 (min)

SURFACE

BASE

SUBBASE

GRAVEL EQUIVALENT FACTOR

TRAFFIC INDEX

R VALUE: EXUDATION PRESSURE RV = 36

EXPANSION PRESSURE

AT EQUILIBRUM SPEC.

INDICATED MINIMUM THICKNESS OF COVER FOR ABOVE CONDITIONS (FEET)

REPORT OF TESTS ON

Soil

IF CONTRACT, USE CONTRACT ITEM

SOURCE	CHARGE	EXPENDITURE AUTHORIZATION

SPECIAL DESIGNATION (USE WHEN APPLICABLE)	ACTIVITY OR OBJECT	AMOUNT

TEST SPECIMEN	A	B	C	D
DATE TESTED	04	112	108	
COMPACTOR FOOT PRESSURE P.S.I.	300	130	50	
INITIAL MOISTURE %	1.8	1.8	1.8	
SOAK WATER ML				
WATER ADDED-ML (TOTAL)				
WATER ADDED %				
MOISTURE AT COMPACTION %	15.6	17.5	19.8	
WET WT. OF BRIQUETTE-GMS	1085	1095	1093	
HEIGHT OF BRIQUETTE-INCHES	2.55	2.64	2.70	
DRY DENSITY OF BRIQ. - # CU. FT.	112	107	102	
STABILOMETER P_H AT 2000 LBS.	56	78	112	
DISPLACEMENT	3.70	3.72	4.31	
R-VALUE BY STABILOMETER	56	45	24	
EXUDATION PRES. P.S.I.	714	385	196	
THICK. BY STAB. FEET				
EXPANSION DIAL READING	60	6	0	
THICK. BY EXP. PRESS. FEET	2.00	0.20	0	
R-VALUE BY EXPANSION				

TEST RESULTS			SPEC.
L.L.	P.L.	P.I.	
CV			
S.E.	AS REC'D		
	CRUSHED		
	COMBINED		
DUR. LART	GRADE	100 REV.	
		500 REV.	
DUR	D_f		
	D_i		
% CRUSHED PARTICLES			

S.P.G.: ☐ BULK (OVEN) ☐ BULK (SSD) ☐ APPARENT

	FINE	CO
AS REC'D.		
CRUSHED		

REL. COMPACTION D/

	IN PLACE	OPT
DENSITY		
MOISTURE		
% REL. COMP.		
SPEC.		

RICHARD CHAN
DISTRICT MATERIALS ENGINEER
BRANCH CHIEF, MATERIALS B

-TL-361 (Rev.10/78)

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTA

SAMPLE IDENTIFICATION CARD

TL-0101 (REV. 10/97)

CARD NUMBER C634565

☒ PRELIMINARY TESTS
☐ PROCESS TESTS
☐ ACCEPTANCE TESTS
INDEPENDENT ASSURANCE TESTS
☐ DIST. LAB
☐ TRANS. LAB
☐ SPECIAL TESTS

SAMPLE SENT TO:
☐ HDQTRS. LAB
☐ BRANCH LAB
☒ DIST. LAB

FIELD NO. D0
DIST. LAB NO.
LOT NO.

4262-6P

MAR 20 2008

SAMPLE OF Subgrade Soils
FOR USE IN Pavement Calcul Design

SAMPLE FROM FR-12 ~23' South of Edge of Road
Sol-12 PM 2.6

DEPTH 2-3'

LOCATION OF SOURCE

56

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) 2
AND IS ONE OF A GROUP OF 1
SAMPLES REPRESENTING (CONS, GALS, BKLS, STA, ETC.) 2 Bags

OWNER OR MANUFACTURER

TOTAL QUANTITY AVAILABLE
TEST RESULTS DESIRED ☐ NORMAL ☒ PRIORITY
DATE NEEDED 4/10/08

REMARKS R-Value, Corrosion

COVER ADDITIONAL INFORMATION WITH LETTER

DATE SAMPLEED 3/20/08
BY Barber-Nagy-Dolan TITLE CT/TE M&R & EA
DIST, CO, RTE, PM 04-SOL-12-PM 2.6

LIMITS

CONT. NO. EA 26410
FED. NO. 1-185
RES. ENGR. OR SUPT. D. Barber
ADDRESS 111 Grand Ave, 8th Fl., Eng. Ser. 1-Mat'ls B
CONTRACTOR
(510) 622-5490

MAIL TO SAME DESTINATION AS SAMPLE

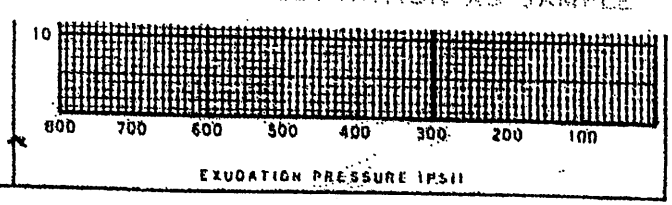


PLATE NO.: R-5W

Corporate Offices
Materials Laboratory
1300 Space Park Way
Mountain View, California 94043-1343
Telephone: (650) 967-6982
Facsimile: (650) 967-6955

DCI

DYNAMIC CONSULTANTS, INC.
Testing & Inspection Services

Branch Office
Watsonville, California

December 18, 2008/br

Parikh Consultants, Inc.
356 South Milpitas Blvd.
Milpitas, California 95035

DCI No.: 5103-M02
Lab No.: 8M-534668

Attention: Prav Dayah

PROJECT: ROUTE 12, JAMESTOWN CANYON ROAD WIDENING
No. 207117, FDN

SUBJECT: Rock/Soil Core Test Results

Four (4) samples of rock/soil cores were submitted to our laboratory by your representative on December 16, 2008, and were tested in accordance with California Test Method 382.

SUMMARY OF TEST RESULTS:

Compressive Strength – Rock Cores – ASTM D2938-02

Core ID	Moist. Cond.	Specimen Diameter, in.	Capped Height, in.	Temp., deg. F	Time to Ultimate Load	Area, sq. in.	Ultimate Load, lbf	Strength, psi
RW-19 52'-53-	Air-dry	2.37	4.60	72	2 min.	4.41	4,960	1,120
RW-19 68'-69-	Air-dry	2.37	4.62	72	2 min.	4.41	4,920	1,120
RW-19 91'-92-	Air-dry	2.37	4.61	72	2 min.	4.41	3,940	890
RW-19 105.5'-106'	Air-dry	2.37	4.60	72	2 min.	4.41	8,300	1,880

(RW-19 = R-08-048)

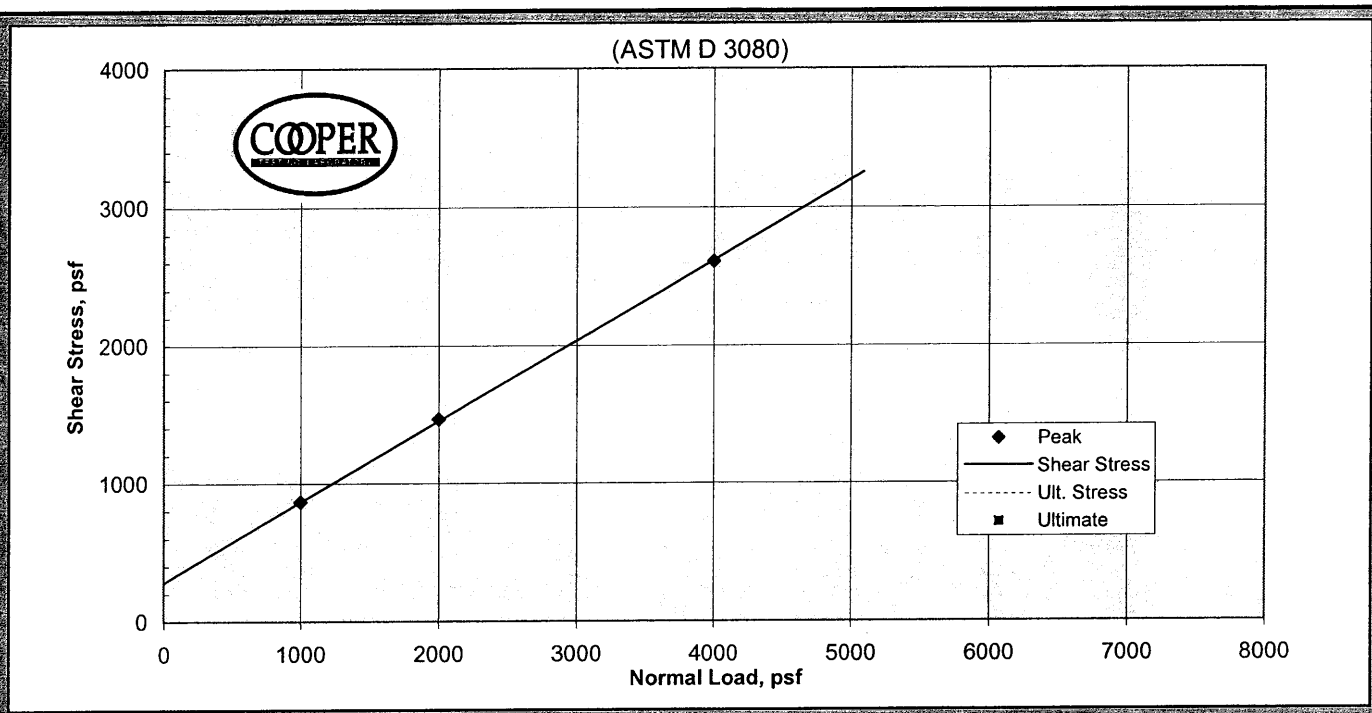
Respectfully submitted,
DYNAMIC CONSULTANTS, INC.

Bill Rodriguez

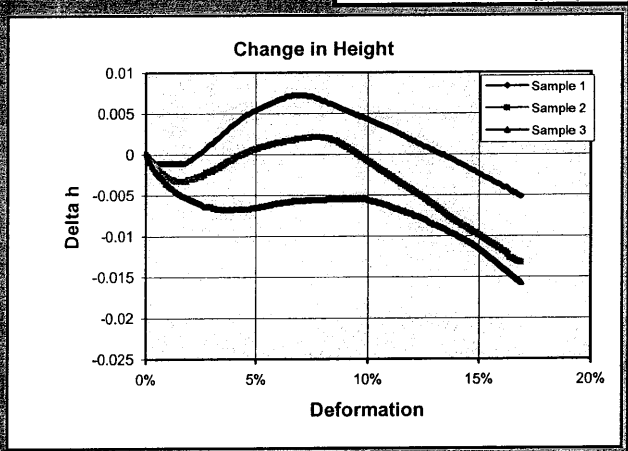
Bill Rodriguez
Laboratory Supervisor

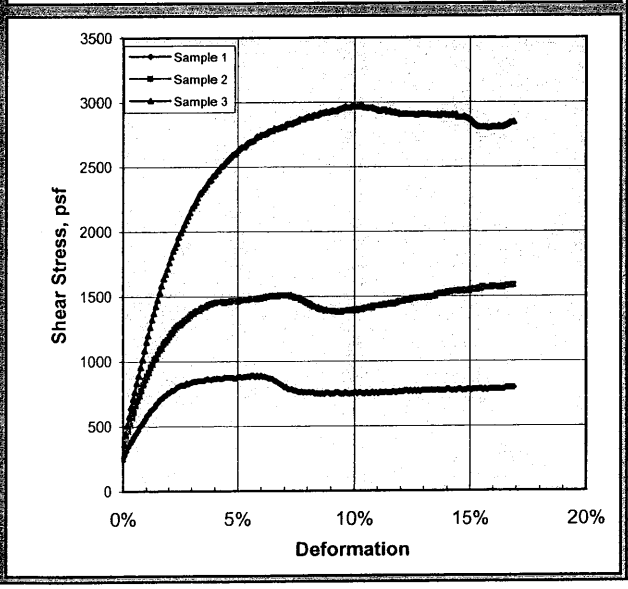
2 2 2008

Direct Shear



P. Phi (degrees)	30.3	Ult. phi (degrees)	
P. Cohesion (psf)	280	Ult.Cohesion (psf)	





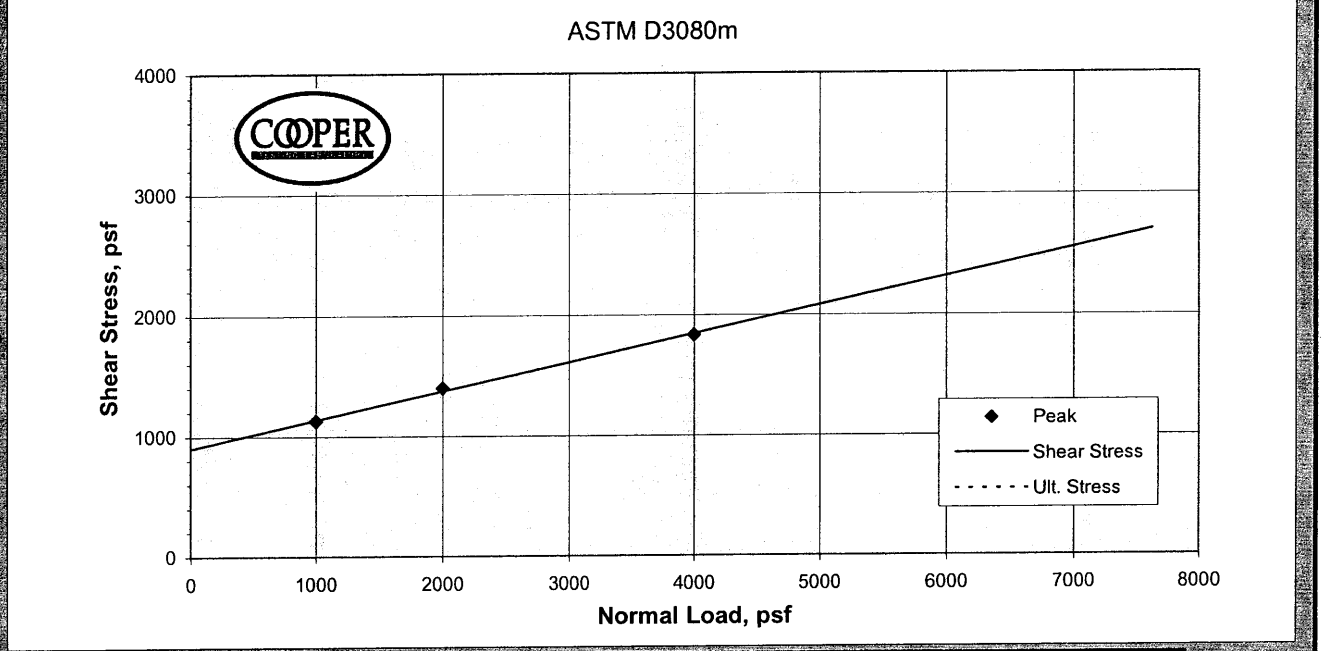
Sample Data: Initial				
Initial	1	2	3	4
Moisture	24.1%	23.8%	23.7%	
Dry Density, pcf	99.7	101.0	101.0	
Void Ratio	0.6899	0.6689	0.6695	
Saturation	94.4%	96.0%	95.8%	
Diameter, in.	2.43	2.43	2.43	
Height, in.	1.00	1.00	1.00	
Sample Data: At Test				
Moisture	24.4%	23.9%	23.8%	
Dry Density, pcf	101.8	102.9	103.1	
Void Ratio	0.6576	0.6335	0.6302	
Saturation	100.0%	100.0%	100.0%	
Diameter, in.	2.43	2.43	2.43	
Height, in.	0.98	0.98	0.98	
Normal Stress, psf	1000	2000	4000	
Shear Stress, psf	866	1462	2608	
Deformation	5%	5%	5%	
Ultimate Stress, psf	0	0	0	
Rate in/min.	0	0	0	

CTL #	157-264	Date:	11/11/2008	
Client:	Parikh Consultants			
Project Name:				
Project Number:	208117.FDN		Reduced by:	MD
Sample #	Boring	Sample	Depth, ft.	
1	RW-3	3	15	
2	RW-3	3	15	
3	RW-3	3	15	
4	(R-08-030)			
Visual Soil Classification				
1	Yellow-Brown Clayey SAND			
2	Yellow-Brown Clayey SAND			
3	Yellow-Brown Clayey SAND			
4				

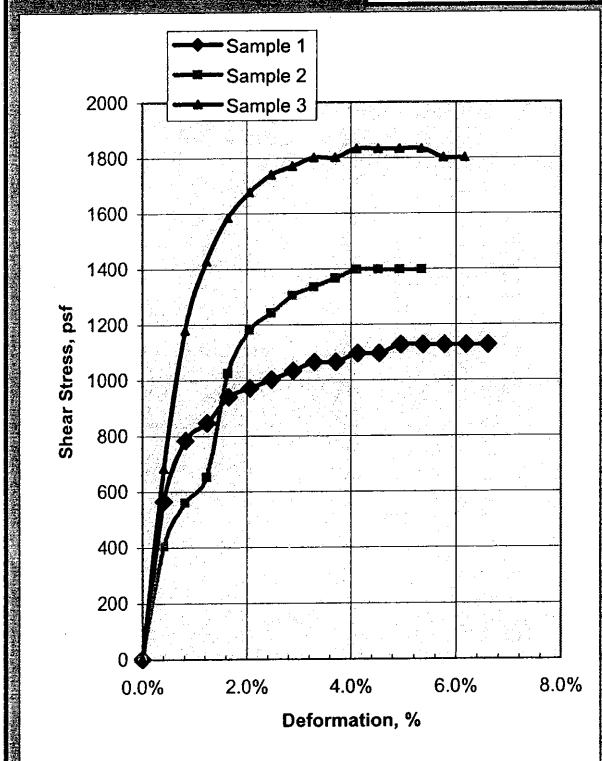
Remarks:

PLATE NO. B-7A

Direct Shear



P. Phi (degrees)	13.3	Ult. Phi (degrees)	
P. Cohesion(psf)	900	Ult. Cohesion (psf)	



	Sample Data: Initial			
	1	2	3	4
Moisture %	34.1	32.3	29.9	
Dry Dens., pcf	85.9	87.8	89.7	
Void Ratio	0.961	0.919	0.879	
Saturation %	95.7	94.9	91.8	
Diameter	2.42	2.43	2.43	
Height	1.01	1.01	1.02	
	Sample Data: At Test			
Moisture %	34.8	32.7	29.4	
Dry Dens., pcf	86.2	89.5	93.1	
Void Ratio	0.956	0.883	0.810	
Saturation %	98.3	99.9	97.8	
Diameter	2.42	2.43	2.43	
Height	1.01	0.99	0.98	
Normal Stress, psf	1000	2000	4000	
Shear Stress, psf	1127	1397	1832	
Strengths picked at	6.6%	5.3%	5.3%	
Ult. Stress, psf				
Strain Rate, in/min	0.020	0.020	0.020	

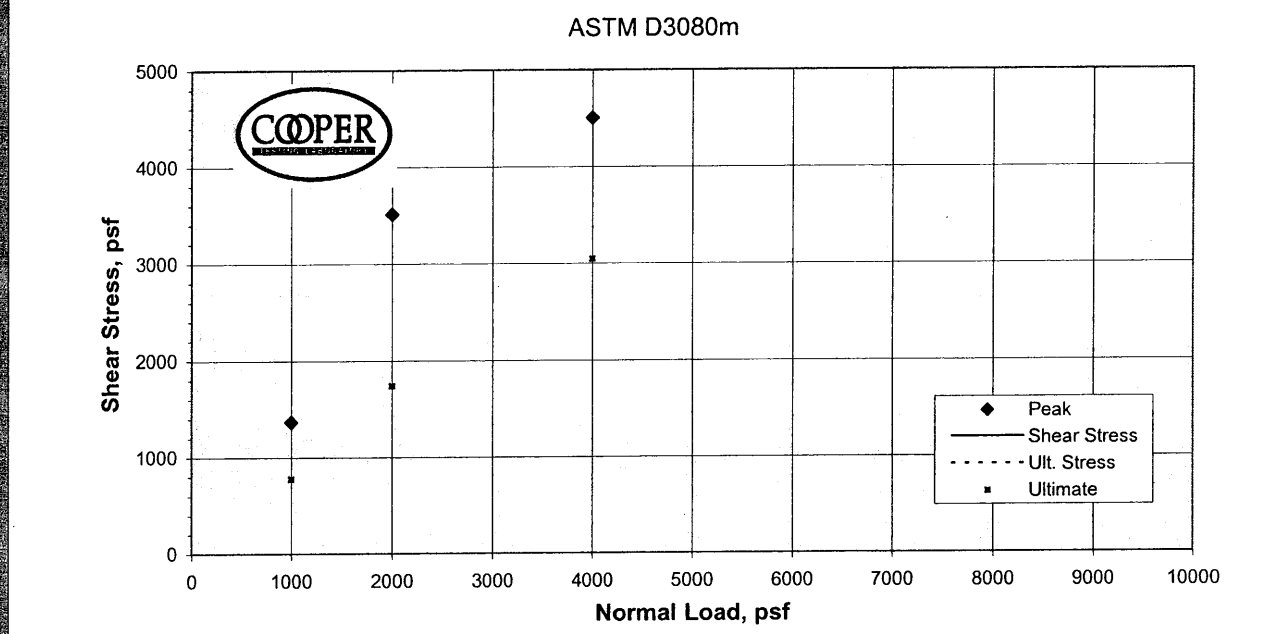
CTL #	157-263
Client:	Parikh Consultants, Inc.
Project	208117-FDW
Tested By:	MD
Reduced By:	RU
Date:	10/7/2008

Specimen #	Boring:	Sample:	Depth, ft:	Visual Soil Classification
1	RW-7	5	20	Dark Brown Sandy CLAY
2	RW-7	5	20	Dark Brown Sandy CLAY
3	RW-7	5	20	Dark Brown Sandy CLAY
4	(A-08-041)			

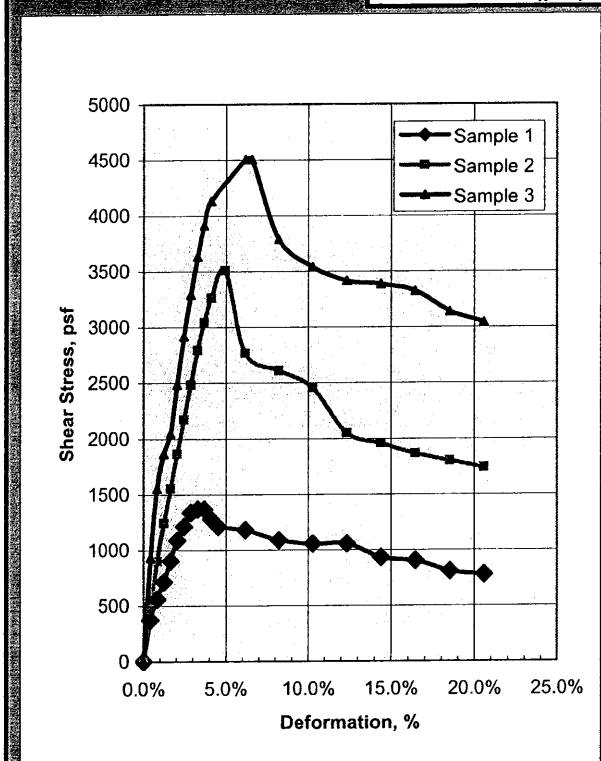
Remarks: *DS-CU* A fully undrained condition may not be attained in this test.

PLATE NO.: B-7B

Direct Shear



P. Phi (degrees)		Ult. Phi (degrees)	
P. Cohesion(psf)		Ult. Cohesion (psf)	



	Sample Data: Initial			
	1	2	3	4
Moisture %	19.6	19.1	18.7	
Dry Dens., pcf	107.5	108.2	107.8	
Void Ratio	0.568	0.557	0.564	
Saturation %	93.3	92.5	89.4	
Diameter	2.43	2.43	2.43	
Height	1.00	1.01	1.02	
	Sample Data: At Test			
Moisture %	19.9	19.1	18.5	
Dry Dens., pcf	108.7	110.7	111.3	
Void Ratio	0.551	0.522	0.515	
Saturation %	97.6	98.7	97.2	
Diameter	2.43	2.43	2.43	
Height	0.99	0.99	0.99	
Normal Stress, psf	1000	2000	4000	
Shear Stress, psf	1366	3509	4502	
Strengths picked at	3.7%	4.9%	6.6%	
Ult. Stress, psf	776	1739	3043	
Strain Rate, in/min	0.020	0.020	0.020	

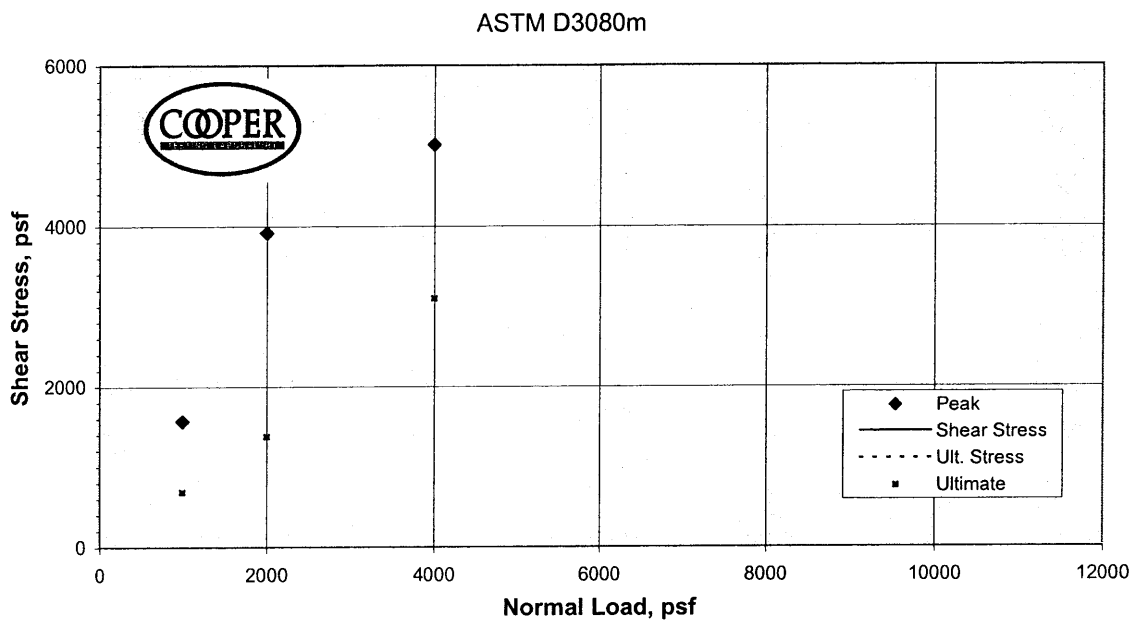
CTL #	157-263
Client:	Parikh Consultants, Inc.
Project	208117-FDW
Tested By:	MD
Reduced By:	RU
Date:	10/7/2008

Specimen #	Boring:	Sample:	Depth, ft:	Visual Soil Classification
1	RW-8	9	40	Yellowish Brown Clayey SAND (Silty)
2	RW-8	9	40	Yellowish Brown Clayey SAND (Silty)
3	RW-8	9	40	Yellowish Brown Clayey SAND (Silty)
4	(A-08-042)			

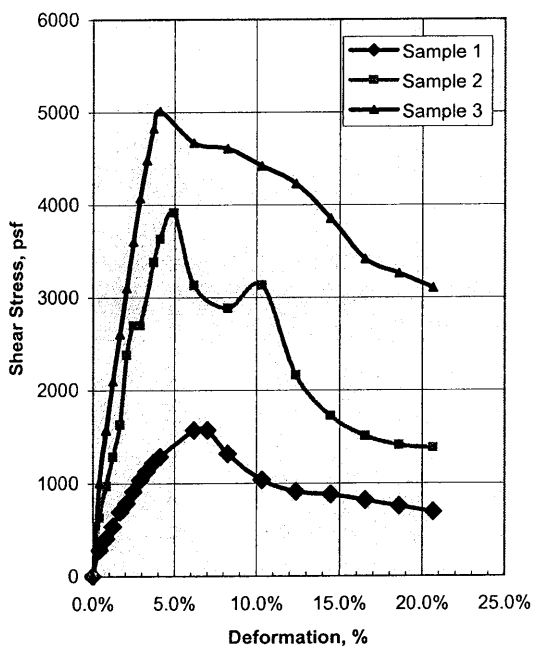
Remarks: *DS-CU* A fully undrained condition may not be attained in this test.

PLATE NO.: B-7C

Direct Shear



P. Phi (degrees)		Ult. Phi (degrees)	
P. Cohesion(psf)		Ult. Cohesion (psf)	



	Sample Data: Initial			
	1	2	3	4
Moisture %	14.5	14.1	14.1	
Dry Dens., pcf	105.7	108.9	110.7	
Void Ratio	0.595	0.548	0.522	
Saturation %	65.8	69.4	73.1	
Diameter	2.42	2.42	2.42	
Height	1.00	1.00	1.00	
	Sample Data: At Test			
Moisture %	19.7	18.2	17.6	
Dry Dens., pcf	106.5	110.7	113.6	
Void Ratio	0.583	0.522	0.483	
Saturation %	91.1	94.0	98.2	
Diameter	2.42	2.42	2.42	
Height	0.99	0.98	0.97	
Normal Stress, psf	1000	2000	4000	
Shear Stress, psf	1565	3913	5009	
Strengths picked at	7.0%	5.0%	4.1%	
Ult. Stress, psf	689	1378	3099	
Strain Rate, in/min	0.020	0.020	0.020	

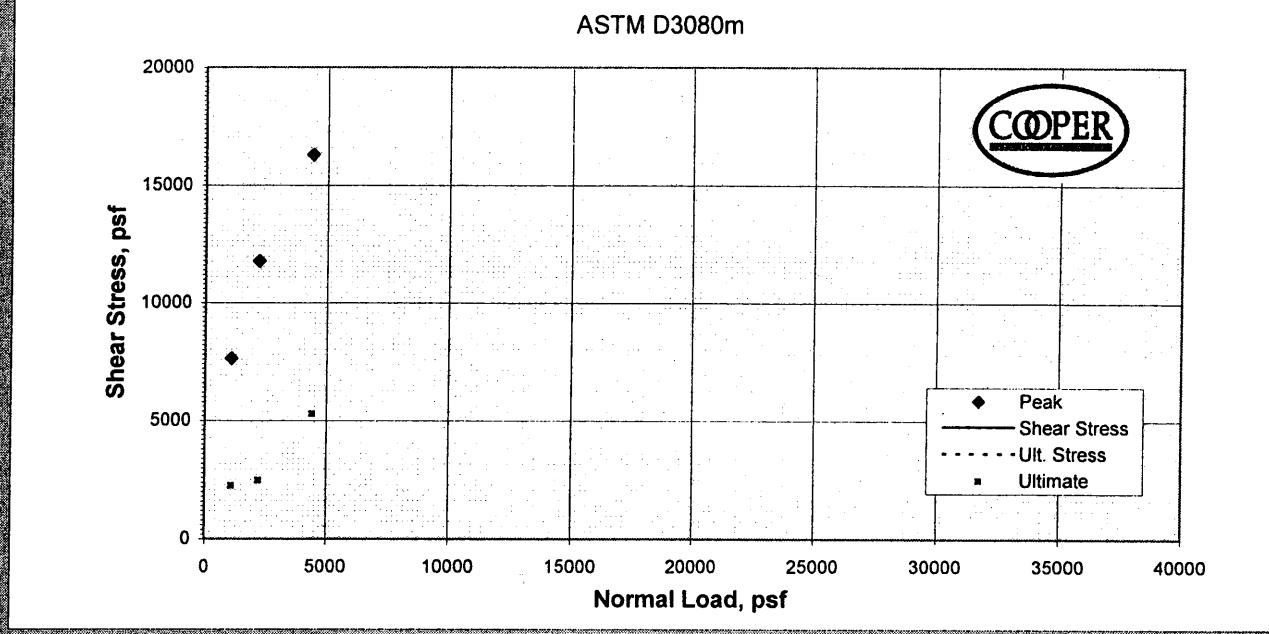
CTL #	157-263
Client:	Parikh Consultants, Inc.
Project	208117-FDW
Tested By:	MD
Reduced By:	RU
Date:	10/6/2008

Specimen #	Boring:	Sample:	Depth, ft:	Visual Soil Classification
1	RW-10	6	25	Yellowish Brown Clayey SAND (Silty)
2	RW-10	6	25	Yellowish Brown Clayey SAND (Silty)
3	RW-10	6	25	Yellowish Brown Clayey SAND (Silty)
4	(A-08-053)			

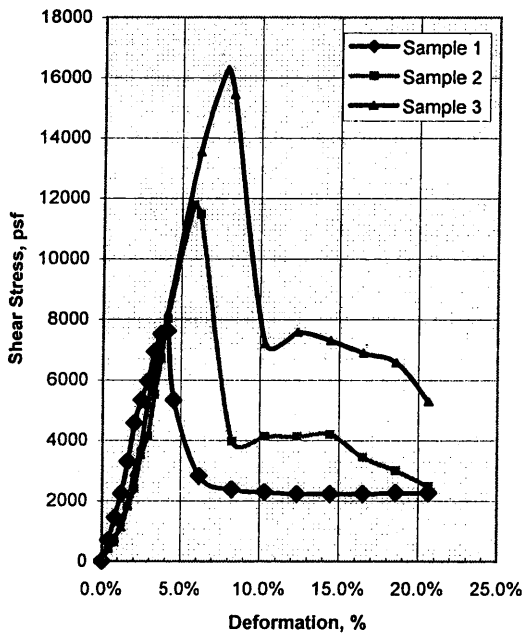
Remarks: *DS-CU* A fully undrained condition may not be attained in this test.

PLATE NO.: B-7D

Direct Shear



P. Phi (degrees)		Ult. Phi (degrees)	
P. Cohesion(psf)		Ult. Cohesion (psf)	



	Sample Data: Initial			
	1	2	3	4
Moisture %	12.8	12.3	12.7	
Dry Dens., pcf	117.4	120.4	118.4	
Void Ratio	0.436	0.400	0.424	
Saturation %	79.1	83.2	81.1	
Diameter	2.42	2.42	2.42	
Height	1.00	1.00	1.00	
	Sample Data: At Test			
Moisture %	15.1	13.9	14.3	
Dry Dens., pcf	118.4	121.5	120.2	
Void Ratio	0.424	0.387	0.402	
Saturation %	96.2	96.8	96.3	
Diameter	2.42	2.42	2.42	
Height	0.99	0.99	0.98	
Normal Stress, psf	1100	2200	4400	
Shear Stress, psf	7608	11771	16280	
Strengths picked at	4.1%	5.8%	7.9%	
Ult. Stress, psf	2254	2473	5291	
Strain Rate, in/min	0.020	0.020	0.020	

CTL #	157-271
Client:	Parikh Consultants
Project	208117.FDN
Tested By:	MD
Reduced By:	RU
Date:	4/6/2009

Specimen #	Boring:	Sample:	Depth, ft:	Visual Soil Classification
1	B218	4	16	Yellowish Brown Silty SAND (Cemented)
2	B218	4	16	Yellowish Brown Silty SAND (Cemented)
3	B218	4	16	Yellowish Brown Silty SAND (Cemented)
4	(R-09-037)			

Remarks: *DS-CU* A fully undrained condition may not be attained in this test. Angular, cemented, or gravelly material tend to give unrealistically high friction angles as determined by the direct shear test. In these cases, no phi or cohesion is reported.

PLATE NO.: B-7E

APPENDIX C

208117

MAINTENANCE-FREE SERVICE DESIGN ESTIMATES FOR DRAINAGE FACILITIES USING:
CALIFORNIA CULVERT CRITERIA AND CULVERT4.EXE, (RELEASE DATE 04-16-98)

PROJECT LOCATION...JAMENSON CANYON ROAD

PROJECT ACCOUNT NO.208117.FDN

SAMPLE LOCATION....RW-29 (A-08-024)

TEST SAMPLE NO.....2@5'

OPERATOR.....AMIT

TEST DATE.....11/12/2008

********** A DATA VALUE OF ZERO INDICATES NO DATA INPUT **********

CSP SITE pH = 7.0 , WATER pH = 0.0 , SOIL pH = 7.0

MINIMUM RESISTIVITY, OHM-CM: CSP SITE = 1150 , WATER = 0 , SOIL = 1150

****

ESTIMATED SERVICE LIFE OF CSP CULVERTS, YEARS
SEE CALTRANS HIGHWAY DESIGN MANUAL CHAPTER 850

CSP THICK Gage & in	GALV. 2 oz	GALV.+ BIT COAT. (WATER SIDE)	GALV.+ BIT COAT & PAVED INV. (ABRASION)	GALV.+ BIT COAT (SOIL SIDE)	GALV.+ POLYMER 90 DEG INVERT
18 0.052	18	26	33	43	68
16 0.064	24	32	39	49	74
14 0.079	29	37	44	54	79
12 0.109	41	49	56	66	91
10 0.138	52	60	67	77	102
08 0.168	63	71	78	88	113

FLOW VEL. <5 fps WITH NON-ABRASIVE CONDITIONS, (DEFAULT VALUES)
CAP, 18 GAGE (0.052 in) CSP AND CASP MAY BE USED WITH THESE FLOW VELOCITIES

STANDARD REINFORCED CONCRETE PIPE DESIGN SHOULD BE
SUITABLE FOR THIS USER DEFINED LEVEL OF CHLORIDES

CONCRETE AND RCP MITIGATION MEASURES FOR pH
TYPE IP (MS) MODIFIED CEMENT OR TYPE II MODIFIED CEMENT
MINIMUM REQUIRED BY CALTRANS STD. SPECS. 90-1.01

A CORRUGATED ALUMINUM PIPE, CAP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

A CORRUGATED ALUMINIZED STEEL PIPE, CASP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

PLASTIC PIPE IS APPROVED FOR 50 YEARS SERVICE LIFE FOR
CORROSIVE CONDITIONS. ABRASION MUST BE EVALUATED. ALSO,
CONSIDER CONCRETE HEADWALLS AND CONCRETE OR METAL END
TREATMENT WHERE HIGH FIRE POTENTIAL EXISTS.

208117

MAINTENANCE-FREE SERVICE DESIGN ESTIMATES FOR DRAINAGE FACILITIES USING:
CALIFORNIA CULVERT CRITERIA AND CULVERT4.EXE, (RELEASE DATE 04-16-98)

PROJECT LOCATION...JAMENSON CANYON ROAD

PROJECT ACCOUNT NO.208117.FDN

SAMPLE LOCATION....RW-3 (A-08-030)

TEST SAMPLE NO.....2@10'

OPERATOR.....AMIT

TEST DATE.....10/29/2008

********** A DATA VALUE OF ZERO INDICATES NO DATA INPUT **********

CSP SITE pH = 7.9 , WATER pH = 0.0 , SOIL pH = 7.9

MINIMUM RESISTIVITY, OHM-CM: CSP SITE = 1310 , WATER = 0 , SOIL = 1310

****

ESTIMATED SERVICE LIFE OF CSP CULVERTS, YEARS
SEE CALTRANS HIGHWAY DESIGN MANUAL CHAPTER 850

CSP THICK Gage	& in	GALV. 2 oz	GALV.+ BIT COAT. (WATER SIDE)	GALV.+ BIT COAT & PAVED INV. (ABRASION)	GALV.+ BIT COAT (SOIL SIDE)	GALV.+ POLYMER 90 DEG INVERT
18	0.052	27	35	42	52	77
16	0.064	36	44	51	61	86
14	0.079	44	52	59	69	94
12	0.109	61	69	76	86	111
10	0.138	78	86	93	103	128
08	0.168	94	102	109	119	144

FLOW VEL. <5 fps WITH NON-ABRASIVE CONDITIONS, (DEFAULT VALUES)
CAP, 18 GAGE (0.052 in) CSP AND CASP MAY BE USED WITH THESE FLOW VELOCITIES

STANDARD REINFORCED CONCRETE PIPE DESIGN SHOULD BE
SUITABLE FOR THIS USER DEFINED LEVEL OF CHLORIDES

CONCRETE AND RCP MITIGATION MEASURES FOR pH
TYPE IP (MS) MODIFIED CEMENT OR TYPE II MODIFIED CEMENT
MINIMUM REQUIRED BY CALTRANS STD. SPECS. 90-1.01

A CORRUGATED ALUMINUM PIPE, CAP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

A CORRUGATED ALUMINIZED STEEL PIPE, CASP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

PLASTIC PIPE IS APPROVED FOR 50 YEARS SERVICE LIFE FOR
CORROSIVE CONDITIONS. ABRASION MUST BE EVALUATED. ALSO,
CONSIDER CONCRETE HEADWALLS AND CONCRETE OR METAL END
TREATMENT WHERE HIGH FIRE POTENTIAL EXISTS.

208117

MAINTENANCE-FREE SERVICE DESIGN ESTIMATES FOR DRAINAGE FACILITIES USING:
CALIFORNIA CULVERT CRITERIA AND CULVERT4.EXE, (RELEASE DATE 04-16-98)

PROJECT LOCATION...JAMENSON CANYON ROAD

PROJECT ACCOUNT NO.208117.FDN

SAMPLE LOCATION....RW-6 (A08-034)

TEST SAMPLE NO.....2@5'

OPERATOR.....AMIT

TEST DATE.....10/10/2008

********** A DATA VALUE OF ZERO INDICATES NO DATA INPUT **********

CSP SITE pH = 6.6 , WATER pH = 0.0 , SOIL pH = 6.6

MINIMUM RESISTIVITY, OHM-CM: CSP SITE = 2650 , WATER = 0 , SOIL = 2650

****

ESTIMATED SERVICE LIFE OF CSP CULVERTS, YEARS
SEE CALTRANS HIGHWAY DESIGN MANUAL CHAPTER 850

CSP THICK Gage & in	GALV. 2 oz	GALV.+ BIT COAT. (WATER SIDE)	GALV.+ BIT COAT & PAVED INV. (ABRASION)	GALV.+ BIT COAT (SOIL SIDE)	GALV.+ POLYMER 90 DEG INVERT
18 0.052	18	26	33	43	68
16 0.064	23	31	38	48	73
14 0.079	29	37	44	54	79
12 0.109	40	48	55	65	90
10 0.138	51	59	66	76	101
08 0.168	62	70	77	87	112

FLOW VEL. <5 fps WITH NON-ABRASIVE CONDITIONS, (DEFAULT VALUES)
CAP, 18 GAGE (0.052 in) CSP AND CASP MAY BE USED WITH THESE FLOW VELOCITIES

STANDARD REINFORCED CONCRETE PIPE DESIGN SHOULD BE
SUITABLE FOR THIS USER DEFINED LEVEL OF CHLORIDES

CONCRETE AND RCP MITIGATION MEASURES FOR pH
TYPE IP (MS) MODIFIED CEMENT OR TYPE II MODIFIED CEMENT
MINIMUM REQUIRED BY CALTRANS STD. SPECS. 90-1.01
MAXIMUM W/C RATIO OF 0.45

A CORRUGATED ALUMINUM PIPE, CAP, MAY BE USED
IF ABRASIVE CONDITIONS DO NOT EXIST
SITE CONDITIONS MEET CORROSION REQUIREMENTS

A CORRUGATED ALUMINIZED STEEL PIPE, CASP, MAY BE USED
SITE CONDITIONS MEET CORROSION REQUIREMENTS

PLASTIC PIPE IS APPROVED FOR 50 YEARS SERVICE LIFE FOR
CORROSIVE CONDITIONS. ABRASION MUST BE EVALUATED. ALSO,
CONSIDER CONCRETE HEADWALLS AND CONCRETE OR METAL END
TREATMENT WHERE HIGH FIRE POTENTIAL EXISTS.

208117

MAINTENANCE-FREE SERVICE DESIGN ESTIMATES FOR DRAINAGE FACILITIES USING:
CALIFORNIA CULVERT CRITERIA AND CULVERT4.EXE, (RELEASE DATE 04-16-98)

PROJECT LOCATION...JAMENSON CANYON ROAD

PROJECT ACCOUNT NO.208117.FDN

SAMPLE LOCATION....RW-7 (A-08-041)

TEST SAMPLE NO.....2@5'

OPERATOR.....AMIT

TEST DATE.....10/10/2008

********** A DATA VALUE OF ZERO INDICATES NO DATA INPUT **********

CSP SITE pH = 6.4 , WATER pH = 0.0 , SOIL pH = 6.4

MINIMUM RESISTIVITY, OHM-CM: CSP SITE = 2390 , WATER = 0 , SOIL = 2390

****

ESTIMATED SERVICE LIFE OF CSP CULVERTS, YEARS
SEE CALTRANS HIGHWAY DESIGN MANUAL CHAPTER 850

CSP THICK Gage & in	GALV. 2 oz	GALV.+ BIT COAT. (WATER SIDE)	GALV.+ BIT COAT & PAVED INV. (ABRASION)	GALV.+ BIT COAT (SOIL SIDE)	GALV.+ POLYMER 90 DEG INVERT
18 0.052	16	24	31	41	66
16 0.064	21	29	36	46	71
14 0.079	26	34	41	51	76
12 0.109	36	44	51	61	86
10 0.138	46	54	61	71	96
08 0.168	56	64	71	81	106

FLOW VEL. <5 fps WITH NON-ABRASIVE CONDITIONS, (DEFAULT VALUES)
CAP, 18 GAGE (0.052 in) CSP AND CASP MAY BE USED WITH THESE FLOW VELOCITIES

STANDARD REINFORCED CONCRETE PIPE DESIGN SHOULD BE
SUITABLE FOR THIS USER DEFINED LEVEL OF CHLORIDES

CONCRETE AND RCP MITIGATION MEASURES FOR pH
TYPE IP (MS) MODIFIED CEMENT OR TYPE II MODIFIED CEMENT
MINIMUM REQUIRED BY CALTRANS STD. SPECS. 90-1.01
MAXIMUM W/C RATIO OF 0.45

A CORRUGATED ALUMINUM PIPE, CAP, MAY BE USED
IF ABRASIVE CONDITIONS DO NOT EXIST
SITE CONDITIONS MEET CORROSION REQUIREMENTS

A CORRUGATED ALUMINIZED STEEL PIPE, CASP, MAY BE USED
SITE CONDITIONS MEET CORROSION REQUIREMENTS

PLASTIC PIPE IS APPROVED FOR 50 YEARS SERVICE LIFE FOR
CORROSIVE CONDITIONS. ABRASION MUST BE EVALUATED. ALSO,
CONSIDER CONCRETE HEADWALLS AND CONCRETE OR METAL END
TREATMENT WHERE HIGH FIRE POTENTIAL EXISTS.

208117

MAINTENANCE-FREE SERVICE DESIGN ESTIMATES FOR DRAINAGE FACILITIES USING:
CALIFORNIA CULVERT CRITERIA AND CULVERT4.EXE, (RELEASE DATE 04-16-98)

PROJECT LOCATION...JAMENSON CANYON ROAD

PROJECT ACCOUNT NO.208117.FDN

SAMPLE LOCATION....RW-9 (A-08-052)

TEST SAMPLE NO.....2@5'

OPERATOR.....AMIT

TEST DATE.....10/10/2008

********** A DATA VALUE OF ZERO INDICATES NO DATA INPUT **********

CSP SITE pH = 7.3 , WATER pH = 0.0 , SOIL pH = 7.3

MINIMUM RESISTIVITY, OHM-CM: CSP SITE = 560 , WATER = 0 , SOIL = 560

CHLORIDES, PPM... 25.6 , SULFATES, PPM... 3.4

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ESTIMATED SERVICE LIFE OF CSP CULVERTS, YEARS
SEE CALTRANS HIGHWAY DESIGN MANUAL CHAPTER 850

CSP THICK Gage & in		GALV. 2 oz	GALV.+ BIT COAT. (WATER SIDE)	GALV.+ BIT COAT & PAVED INV. (ABRASION)	GALV.+ BIT COAT (SOIL SIDE)	GALV.+ POLYMER 90 DEG INVERT
18	0.052	19	27	34	44	69
16	0.064	25	33	40	50	75
14	0.079	31	39	46	56	81
12	0.109	43	51	58	68	93
10	0.138	55	63	70	80	105
08	0.168	66	74	81	91	116

FLOW VEL. <5 fps WITH NON-ABRASIVE CONDITIONS, (DEFAULT VALUES)
CAP, 18 GAGE (0.052 in) CSP AND CASP MAY BE USED WITH THESE FLOW VELOCITIES

STANDARD REINFORCED CONCRETE PIPE DESIGN SHOULD BE
SUITABLE FOR THIS USER DEFINED LEVEL OF CHLORIDES

FOR SULFATE RESISTANT CONCRETE AND RCP
TYPE IP (MS) MODIFIED CEMENT OR TYPE II MODIFIED CEMENT
MINIMUM REQUIRED BY CALTRANS STD. SPECS. 90-1.01

A CORRUGATED ALUMINUM PIPE, CAP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

A CORRUGATED ALUMINIZED STEEL PIPE, CASP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

PLASTIC PIPE IS APPROVED FOR 50 YEARS SERVICE LIFE FOR
CORROSIVE CONDITIONS. ABRASION MUST BE EVALUATED. ALSO,
CONSIDER CONCRETE HEADWALLS AND CONCRETE OR METAL END
TREATMENT WHERE HIGH FIRE POTENTIAL EXISTS.

208117

MAINTENANCE-FREE SERVICE DESIGN ESTIMATES FOR DRAINAGE FACILITIES USING:
CALIFORNIA CULVERT CRITERIA AND CULVERT4.EXE, (RELEASE DATE 04-16-98)

PROJECT LOCATION...JAMENSON CANYON ROAD

PROJECT ACCOUNT NO.208117.FDN

SAMPLE LOCATION....RW-14 (R-08-043)

TEST SAMPLE NO.....1@6'

OPERATOR.....AMIT

TEST DATE.....11/26/2008

********** A DATA VALUE OF ZERO INDICATES NO DATA INPUT **********

CSP SITE pH = 7.7 , WATER pH = 0.0 , SOIL pH = 7.7

MINIMUM RESISTIVITY, OHM-CM: CSP SITE = 860 , WATER = 0 , SOIL = 860

CHLORIDES, PPM... 204.7 , SULFATES, PPM... 373.9

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ESTIMATED SERVICE LIFE OF CSP CULVERTS, YEARS
SEE CALTRANS HIGHWAY DESIGN MANUAL CHAPTER 850

CSP THICK Gage & in	GALV. 2 oz	GALV.+ BIT COAT. (WATER SIDE)	GALV.+ BIT COAT & PAVED INV. (ABRASION)	GALV.+ BIT COAT (SOIL SIDE)	GALV.+ POLYMER 90 DEG INVERT
18 0.052	23	31	38	48	73
16 0.064	30	38	45	55	80
14 0.079	37	45	52	62	87
12 0.109	51	59	66	76	101
10 0.138	65	73	80	90	115
08 0.168	79	87	94	104	129

FLOW VEL. <5 fps WITH NON-ABRASIVE CONDITIONS, (DEFAULT VALUES)
CAP, 18 GAGE (0.052 in) CSP AND CASP MAY BE USED WITH THESE FLOW VELOCITIES

STANDARD REINFORCED CONCRETE PIPE DESIGN SHOULD BE
SUITABLE FOR THIS USER DEFINED LEVEL OF CHLORIDES

FOR SULFATE RESISTANT CONCRETE AND RCP
TYPE IP (MS) MODIFIED CEMENT OR TYPE II MODIFIED CEMENT
MINIMUM REQUIRED BY CALTRANS STD. SPECS. 90-1.01

A CORRUGATED ALUMINUM PIPE, CAP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

A CORRUGATED ALUMINIZED STEEL PIPE, CASP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

PLASTIC PIPE IS APPROVED FOR 50 YEARS SERVICE LIFE FOR
CORROSIVE CONDITIONS. ABRASION MUST BE EVALUATED. ALSO,
CONSIDER CONCRETE HEADWALLS AND CONCRETE OR METAL END
TREATMENT WHERE HIGH FIRE POTENTIAL EXISTS.

208117

MAINTENANCE-FREE SERVICE DESIGN ESTIMATES FOR DRAINAGE FACILITIES USING:
CALIFORNIA CULVERT CRITERIA AND CULVERT4.EXE, (RELEASE DATE 04-16-98)

PROJECT LOCATION...JAMENSON CANYON ROAD

PROJECT ACCOUNT NO.208117.FDN

SAMPLE LOCATION....RW-26 (A-08-057)

TEST SAMPLE NO.....1@2'

OPERATOR.....AMIT

TEST DATE.....10/10/2008

********** A DATA VALUE OF ZERO INDICATES NO DATA INPUT **********

CSP SITE pH = 7.3 , WATER pH = 0.0 , SOIL pH = 7.3

MINIMUM RESISTIVITY, OHM-CM: CSP SITE = 1230 , WATER = 0 , SOIL = 1230

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ESTIMATED SERVICE LIFE OF CSP CULVERTS, YEARS
SEE CALTRANS HIGHWAY DESIGN MANUAL CHAPTER 850

CSP THICK Gage & in	GALV. 2 oz	GALV.+ BIT COAT. (WATER SIDE)	GALV.+ BIT COAT & PAVED INV. (ABRASION)	GALV.+ BIT COAT (SOIL SIDE)	GALV.+ POLYMER 90 DEG INVERT
18 0.052	27	35	42	52	77
16 0.064	35	43	50	60	85
14 0.079	43	51	58	68	93
12 0.109	59	67	74	84	109
10 0.138	76	84	91	101	126
08 0.168	92	100	107	117	142

FLOW VEL. <5 fps WITH NON-ABRASIVE CONDITIONS, (DEFAULT VALUES)
CAP, 18 GAGE (0.052 in) CSP AND CASP MAY BE USED WITH THESE FLOW VELOCITIES

STANDARD REINFORCED CONCRETE PIPE DESIGN SHOULD BE
SUITABLE FOR THIS USER DEFINED LEVEL OF CHLORIDES

CONCRETE AND RCP MITIGATION MEASURES FOR pH
TYPE IP (MS) MODIFIED CEMENT OR TYPE II MODIFIED CEMENT
MINIMUM REQUIRED BY CALTRANS STD. SPECS. 90-1.01

A CORRUGATED ALUMINUM PIPE, CAP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

A CORRUGATED ALUMINIZED STEEL PIPE, CASP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

PLASTIC PIPE IS APPROVED FOR 50 YEARS SERVICE LIFE FOR
CORROSIVE CONDITIONS. ABRASION MUST BE EVALUATED. ALSO,
CONSIDER CONCRETE HEADWALLS AND CONCRETE OR METAL END
TREATMENT WHERE HIGH FIRE POTENTIAL EXISTS.

MAINTENANCE-FREE SERVICE DESIGN ESTIMATES FOR DRAINAGE FACILITIES USING:
CALIFORNIA CULVERT CRITERIA AND CULVERT4.EXE, (RELEASE DATE 04-16-98)

PROJECT LOCATION...JAMESON CANYON ROAD

PROJECT ACCOUNT NO.208117.FDN

SAMPLE LOCATION....B-216 (A-08-035)

TEST SAMPLE NO.....2@4.5'

OPERATOR.....LT

TEST DATE.....04-15-09

********** A DATA VALUE OF ZERO INDICATES NO DATA INPUT **********

CSP SITE pH = 7.8 , WATER pH = 0.0 , SOIL pH = 7.8

MINIMUM RESISTIVITY, OHM-CM: CSP SITE = 1020 , WATER = 0 , SOIL = 1020

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ESTIMATED SERVICE LIFE OF CSP CULVERTS, YEARS
SEE CALTRANS HIGHWAY DESIGN MANUAL CHAPTER 850

CSP THICK Gage	& mm	GALV. 57 g	GALV.+ BIT COAT. (WATER SIDE)	GALV.+ BIT COAT & PAVED INV. (ABRASION)	GALV.+ BIT COAT (SOIL SIDE)	GALV.+ POLYMER 90 DEG INVERT
18	1.3	25	33	40	50	75
16	1.6	32	40	47	57	82
14	2.0	40	48	55	65	90
12	2.8	55	63	70	80	105
10	3.5	70	78	85	95	120
8	4.3	85	93	100	110	135

FLOW VEL. <1.5 m/s WITH NON-ABRASIVE CONDITIONS, (DEFAULT VALUES)
CAP, 18 GAGE (1.3 mm) CSP AND CASP MAY BE USED WITH THESE FLOW VELOCITIES

STANDARD REINFORCED CONCRETE PIPE DESIGN SHOULD BE
SUITABLE FOR THIS USER DEFINED LEVEL OF CHLORIDES

CONCRETE AND RCP MITIGATION MEASURES FOR pH
TYPE IP (MS) MODIFIED CEMENT OR TYPE II MODIFIED CEMENT
MINIMUM REQUIRED BY CALTRANS STD. SPECS. 90-1.01

A CORRUGATED ALUMINUM PIPE, CAP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

A CORRUGATED ALUMINIZED STEEL PIPE, CASP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

PLASTIC PIPE IS APPROVED FOR 50 YEARS SERVICE LIFE FOR
CORROSIVE CONDITIONS. ABRASION MUST BE EVALUATED. ALSO,
CONSIDER CONCRETE HEADWALLS AND CONCRETE OR METAL END
TREATMENT WHERE HIGH FIRE POTENTIAL EXISTS.

MAINTENANCE-FREE SERVICE DESIGN ESTIMATES FOR DRAINAGE FACILITIES USING:
CALIFORNIA CULVERT CRITERIA AND CULVERT4.EXE, (RELEASE DATE 04-16-98)

PROJECT LOCATION...JAMESON CANYON ROAD

PROJECT ACCOUNT NO.208117.FDN

SAMPLE LOCATION....B-217 (A-08-036)

TEST SAMPLE NO.....4 # 14.5'

OPERATOR.....LT

TEST DATE.....04-15-09

********** A DATA VALUE OF ZERO INDICATES NO DATA INPUT **********

CSP SITE pH = 6.9 , WATER pH = 0.0 , SOIL pH = 6.9

MINIMUM RESISTIVITY, OHM-CM: CSP SITE = 1070 , WATER = 0 , SOIL = 1070

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ESTIMATED SERVICE LIFE OF CSP CULVERTS, YEARS
SEE CALTRANS HIGHWAY DESIGN MANUAL CHAPTER 850

CSP THICK Gage	& mm	GALV. 57 g	GALV.+ BIT COAT. (WATER SIDE)	GALV.+ BIT COAT & PAVED INV. (ABRASION)	GALV.+ BIT COAT (SOIL SIDE)	GALV.+ POLYMER 90 DEG INVERT
18	1.3	16	24	31	41	66
16	1.6	21	29	36	46	71
14	2.0	26	34	41	51	76
12	2.8	36	44	51	61	86
10	3.5	46	54	61	71	96
8	4.3	56	64	71	81	106

FLOW VEL. <1.5 m/s WITH NON-ABRASIVE CONDITIONS, (DEFAULT VALUES)
CAP, 18 GAGE (1.3 mm) CSP AND CASP MAY BE USED WITH THESE FLOW VELOCITIES

STANDARD REINFORCED CONCRETE PIPE DESIGN SHOULD BE
SUITABLE FOR THIS USER DEFINED LEVEL OF CHLORIDES

CONCRETE AND RCP MITIGATION MEASURES FOR pH
TYPE IP (MS) MODIFIED CEMENT OR TYPE II MODIFIED CEMENT
MINIMUM REQUIRED BY CALTRANS STD. SPEC. 90-1.01
MAXIMUM W/C RATIO OF 0.45

A CORRUGATED ALUMINUM PIPE, CAP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

A CORRUGATED ALUMINIZED STEEL PIPE, CASP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

PLASTIC PIPE IS APPROVED FOR 50 YEARS SERVICE LIFE FOR
CORROSIVE CONDITIONS. ABRASION MUST BE EVALUATED. ALSO,
CONSIDER CONCRETE HEADWALLS AND CONCRETE OR METAL END
TREATMENT WHERE HIGH FIRE POTENTIAL EXISTS.

MAINTENANCE-FREE SERVICE DESIGN ESTIMATES FOR DRAINAGE FACILITIES USING:
CALIFORNIA CULVERT CRITERIA AND CULVERT4.EXE, (RELEASE DATE 04-16-98)

PROJECT LOCATION...JAMESON CANYON ROAD

PROJECT ACCOUNT NO.208117.FDN

SAMPLE LOCATION....B-219 (R-09-038)

TEST SAMPLE NO.....2 @ 6'

OPERATOR.....LT

TEST DATE.....04-15-09

********** A DATA VALUE OF ZERO INDICATES NO DATA INPUT **********

CSP SITE pH = 7.3 , WATER pH = 0.0 , SOIL pH = 7.3

MINIMUM RESISTIVITY, OHM-CM: CSP SITE = 380 , WATER = 0 , SOIL = 380

CHLORIDES, PPM... 484.5 , SULFATES, PPM... 364.6

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ESTIMATED SERVICE LIFE OF CSP CULVERTS, YEARS
SEE CALTRANS HIGHWAY DESIGN MANUAL CHAPTER 850

CSP THICK Gage	& mm	GALV. 57 g	GALV.+ BIT COAT. (WATER SIDE)	GALV.+ BIT COAT & PAVED INV. (ABRASION)	GALV.+ BIT COAT (SOIL SIDE)	GALV.+ POLYMER 90 DEG INVERT
18	1.3	16	24	31	41	66
16	1.6	21	29	36	46	71
14	2.0	26	34	41	51	76
12	2.8	36	44	51	61	86
10	3.5	47	55	62	72	97
8	4.3	57	65	72	82	107

FLOW VEL. <1.5 m/s WITH NON-ABRASIVE CONDITIONS, (DEFAULT VALUES)
CAP, 18 GAGE (1.3 mm) CSP AND CASP MAY BE USED WITH THESE FLOW VELOCITIES

STANDARD REINFORCED CONCRETE PIPE DESIGN SHOULD BE
SUITABLE FOR THIS USER DEFINED LEVEL OF CHLORIDES

FOR SULFATE RESISTANT CONCRETE AND RCP
TYPE IP (MS) MODIFIED CEMENT OR TYPE II MODIFIED CEMENT
MINIMUM REQUIRED BY CALTRANS STD. SPECS. 90-1.01

A CORRUGATED ALUMINUM PIPE, CAP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

A CORRUGATED ALUMINIZED STEEL PIPE, CASP, SHOULD NOT BE USED
DUE TO CORROSIVE CONDITIONS

PLASTIC PIPE IS APPROVED FOR 50 YEARS SERVICE LIFE FOR
CORROSIVE CONDITIONS. ABRASION MUST BE EVALUATED. ALSO,
CONSIDER CONCRETE HEADWALLS AND CONCRETE OR METAL END
TREATMENT WHERE HIGH FIRE POTENTIAL EXISTS.

MAINTENANCE-FREE SERVICE DESIGN ESTIMATES FOR DRAINAGE FACILITIES USING:
CALIFORNIA CULVERT CRITERIA AND CULVERT4.EXE, (RELEASE DATE 04-16-98)

PROJECT LOCATION...JAMESON CANYON ROAD

PROJECT ACCOUNT NO.208117.FDN

SAMPLE LOCATION....B-220 (R-08-039)

TEST SAMPLE NO.....3 @ 11'

OPERATOR.....LT

TEST DATE.....04-15-09

********** A DATA VALUE OF ZERO INDICATES NO DATA INPUT **********

CSP SITE pH = 6.2 , WATER pH = 0.0 , SOIL pH = 6.2

MINIMUM RESISTIVITY, OHM-CM: CSP SITE = 1610 , WATER = 0 , SOIL = 1610

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ESTIMATED SERVICE LIFE OF CSP CULVERTS, YEARS
SEE CALTRANS HIGHWAY DESIGN MANUAL CHAPTER 850

CSP THICK Gage	& mm	GALV. 57 g	GALV.+ BIT COAT. (WATER SIDE)	GALV.+ BIT COAT & PAVED INV. (ABRASION)	GALV.+ BIT COAT (SOIL SIDE)	GALV.+ POLYMER 90 DEG INVERT
18	1.3	12	20	27	37	62
16	1.6	16	24	31	41	66
14	2.0	20	28	35	45	70
12	2.8	28	36	43	53	78
10	3.5	35	43	50	60	85
8	4.3	43	51	58	68	93

FLOW VEL. <1.5 m/s WITH NON-ABRASIVE CONDITIONS, (DEFAULT VALUES)
CAP, 18 GAGE (1.3 mm) CSP AND CASP MAY BE USED WITH THESE FLOW VELOCITIES

STANDARD REINFORCED CONCRETE PIPE DESIGN SHOULD BE
SUITABLE FOR THIS USER DEFINED LEVEL OF CHLORIDES

CONCRETE AND RCP MITIGATION MEASURES FOR pH
TYPE IP (MS) MODIFIED CEMENT OR TYPE II MODIFIED CEMENT
MINIMUM REQUIRED BY CALTRANS STD. SPEC. 90-1.01
MAXIMUM W/C RATIO OF 0.45

A CORRUGATED ALUMINUM PIPE, CAP, MAY BE USED
IF ABRASIVE CONDITIONS DO NOT EXIST
SITE CONDITIONS MEET CORROSION REQUIREMENTS

A CORRUGATED ALUMINIZED STEEL PIPE, CASP, MAY BE USED
SITE CONDITIONS MEET CORROSION REQUIREMENTS

PLASTIC PIPE IS APPROVED FOR 50 YEARS SERVICE LIFE FOR
CORROSIVE CONDITIONS. ABRASION MUST BE EVALUATED. ALSO,
CONSIDER CONCRETE HEADWALLS AND CONCRETE OR METAL END
TREATMENT WHERE HIGH FIRE POTENTIAL EXISTS.

MAINTENANCE-FREE SERVICE DESIGN ESTIMATES FOR DRAINAGE FACILITIES USING:
CALIFORNIA CULVERT CRITERIA AND CULVERT4.EXE, (RELEASE DATE 04-16-98)

PROJECT LOCATION...JAMESON CANYON ROAD

PROJECT ACCOUNT NO.208117.FDN

SAMPLE LOCATION....B-225 (A-09-022)

TEST SAMPLE NO.....3@9.5'

OPERATOR.....OG

TEST DATE.....08/05/2009

********** A DATA VALUE OF ZERO INDICATES NO DATA INPUT **********

CSP SITE pH = 6.3 , WATER pH = 0.0 , SOIL pH = 6.3

MINIMUM RESISTIVITY, OHM-CM: CSP SITE = 1610 , WATER = 0 , SOIL = 1610

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ESTIMATED SERVICE LIFE OF CSP CULVERTS, YEARS
SEE CALTRANS HIGHWAY DESIGN MANUAL CHAPTER 850

CSP THICK Gage	& mm	GALV. 57 g	GALV.+ BIT COAT. (WATER SIDE)	GALV.+ BIT COAT & PAVED INV. (ABRASION)	GALV.+ BIT COAT (SOIL SIDE)	GALV.+ POLYMER 90 DEG INVERT
18	1.3	13	21	28	38	63
16	1.6	17	25	32	42	67
14	2.0	21	29	36	46	71
12	2.8	29	37	44	54	79
10	3.5	37	45	52	62	87
8	4.3	46	54	61	71	96

FLOW VEL. <1.5 m/s WITH NON-ABRASIVE CONDITIONS, (DEFAULT VALUES)
CAP, 18 GAGE (1.3 mm) CSP AND CASP MAY BE USED WITH THESE FLOW VELOCITIES

STANDARD REINFORCED CONCRETE PIPE DESIGN SHOULD BE SUITABLE FOR THIS USER DEFINED LEVEL OF CHLORIDES

CONCRETE AND RCP MITIGATION MEASURES FOR pH TYPE IP (MS) MODIFIED CEMENT OR TYPE II MODIFIED CEMENT MINIMUM REQUIRED BY CALTRANS STD. SPEC. 90-1.01 MAXIMUM W/C RATIO OF 0.45

A CORRUGATED ALUMINUM PIPE, CAP, MAY BE USED IF ABRASIVE CONDITIONS DO NOT EXIST
SITE CONDITIONS MEET CORROSION REQUIREMENTS
A CORRUGATED ALUMINIZED STEEL PIPE, CASP, MAY BE USED
SITE CONDITIONS MEET CORROSION REQUIREMENTS

PLASTIC PIPE IS APPROVED FOR 50 YEARS SERVICE LIFE FOR CORROSIVE CONDITIONS. ABRASION MUST BE EVALUATED. ALSO, CONSIDER CONCRETE HEADWALLS AND CONCRETE OR METAL END TREATMENT WHERE HIGH FIRE POTENTIAL EXISTS.

MAINTENANCE-FREE SERVICE DESIGN ESTIMATES FOR DRAINAGE FACILITIES USING:
CALIFORNIA CULVERT CRITERIA AND CULVERT4.EXE, (RELEASE DATE 04-16-98)

PROJECT LOCATION...JAMESON CANYON ROAD

PROJECT ACCOUNT NO.208117.FDN

SAMPLE LOCATION....B-227 (A-09-032)

TEST SAMPLE NO.....3@9.5'

OPERATOR.....OG

TEST DATE.....08/05/2009

********** A DATA VALUE OF ZERO INDICATES NO DATA INPUT **********

CSP SITE pH = 7.8 , WATER pH = 0.0 , SOIL pH = 7.8
MINIMUM RESISTIVITY, OHM-CM: CSP SITE = 940 , WATER = 0 , SOIL = 940
CHLORIDES, PPM... 61.3 , SULFATES, PPM... 124

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ESTIMATED SERVICE LIFE OF CSP CULVERTS, YEARS
SEE CALTRANS HIGHWAY DESIGN MANUAL CHAPTER 850

CSP THICK Gage	& mm	GALV. 57 g	GALV.+ BIT COAT. (WATER SIDE)	GALV.+ BIT COAT & PAVED INV. (ABRASION)	GALV.+ BIT COAT (SOIL SIDE)	GALV.+ POLYMER 90 DEG INVERT
18	1.3	24	32	39	49	74
16	1.6	31	39	46	56	81
14	2.0	38	46	53	63	88
12	2.8	53	61	68	78	103
10	3.5	68	76	83	93	118
8	4.3	82	90	97	107	132

FLOW VEL. <1.5 m/s WITH NON-ABRASIVE CONDITIONS, (DEFAULT VALUES)
CAP, 18 GAGE (1.3 mm) CSP AND CASP MAY BE USED WITH THESE FLOW VELOCITIES

STANDARD REINFORCED CONCRETE PIPE DESIGN SHOULD BE SUITABLE FOR THIS USER DEFINED LEVEL OF CHLORIDES

FOR SULFATE RESISTANT CONCRETE AND RCPTYPE IP (MS) MODIFIED CEMENT OR TYPE II MODIFIED CEMENT MINIMUM REQUIRED BY CALTRANS STD. SPECS. 90-1.01

A CORRUGATED ALUMINUM PIPE, CAP, SHOULD NOT BE USED DUE TO CORROSIVE CONDITIONS

A CORRUGATED ALUMINIZED STEEL PIPE, CASP, SHOULD NOT BE USED DUE TO CORROSIVE CONDITIONS

PLASTIC PIPE IS APPROVED FOR 50 YEARS SERVICE LIFE FOR CORROSIVE CONDITIONS. ABRASION MUST BE EVALUATED. ALSO, CONSIDER CONCRETE HEADWALLS AND CONCRETE OR METAL END TREATMENT WHERE HIGH FIRE POTENTIAL EXISTS.

MAINTENANCE-FREE SERVICE DESIGN ESTIMATES FOR DRAINAGE FACILITIES USING:
CALIFORNIA CULVERT CRITERIA AND CULVERT4.EXE, (RELEASE DATE 04-16-98)

PROJECT LOCATION...JAMESON CANYON ROAD

PROJECT ACCOUNT NO.208117.FDN

SAMPLE LOCATION....B-210 (R-09-067)

TEST SAMPLE NO.....2@6'

OPERATOR.....OG

TEST DATE.....11/13/09
********** A DATA VALUE OF ZERO INDICATES NO DATA INPUT
****
CSP SITE pH = 7.6 , WATER pH = 0.0 , SOIL pH = 7.6
MINIMUM RESISTIVITY, OHM-CM: CSP SITE = 670 , WATER = 0 , SOIL = 670
CHLORIDES, PPM... 122.4 , SULFATES, PPM... 64.2
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ESTIMATED SERVICE LIFE OF CSP CULVERTS, YEARS
SEE CALTRANS HIGHWAY DESIGN MANUAL CHAPTER 850

CSP THICK Gage & in	GALV. 2 oz	GALV.+ BIT COAT. (WATER SIDE)	GALV.+ BIT COAT & PAVED INV. (ABRASION)	GALV.+ BIT COAT (SOIL SIDE)	GALV.+ POLYMER 90 DEG INVERT
18 0.052	21	29	36	46	71
16 0.064	27	35	42	52	77
14 0.079	33	41	48	58	83
12 0.109	46	54	61	71	96
10 0.138	59	67	74	84	109
08 0.168	72	80	87	97	122

FLOW VEL. <5 fps WITH NON-ABRASIVE CONDITIONS, (DEFAULT VALUES)
CAP, 18 GAGE (0.052 in) CSP AND CASP MAY BE USED WITH THESE FLOW VELOCITIES

STANDARD REINFORCED CONCRETE PIPE DESIGN SHOULD BE SUITABLE FOR THIS USER DEFINED LEVEL OF CHLORIDES

FOR SULFATE RESISTANT CONCRETE AND RCP TYPE IP (MS) MODIFIED CEMENT OR TYPE II MODIFIED CEMENT MINIMUM REQUIRED BY CALTRANS STD. SPECS. 90-1.01

A CORRUGATED ALUMINUM PIPE, CAP, SHOULD NOT BE USED DUE TO CORROSIVE CONDITIONS

A CORRUGATED ALUMINIZED STEEL PIPE, CASP, SHOULD NOT BE USED DUE TO CORROSIVE CONDITIONS

PLASTIC PIPE IS APPROVED FOR 50 YEARS SERVICE LIFE FOR CORROSIVE CONDITIONS. ABRASION MUST BE EVALUATED. ALSO, CONSIDER CONCRETE HEADWALLS AND CONCRETE OR METAL END TREATMENT WHERE HIGH FIRE POTENTIAL EXISTS.

PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

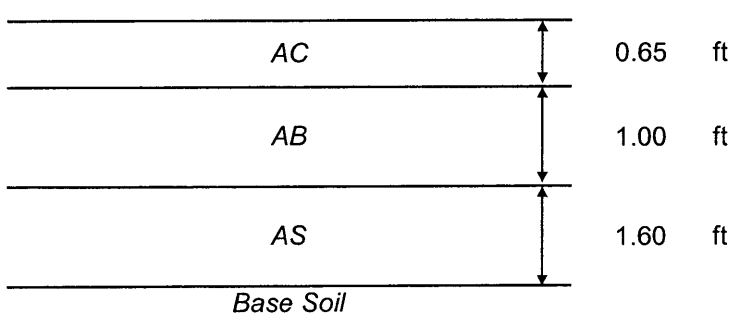
PROJECT NAME: *JAMESON CANYON ROAD PROJECT (ROUTE 12)*
PROJECT NO.: *208117.10*

Design Case: AC over AB over AS

Design TI=	***12.5***
R_{BS}=	***5***
R_{AB}=	78
R_{AS}=	50

$GE_{TOTAL} = 0..0032*TI*(100-R_{BS}) =$		3.80	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.88	
=>	GE'_{AC} =	1.08	(add 0.2 ft safety factor)
	AC thickness =	0.63	ft
=>	AC Thickness=	**0.65**	ft (round up to the nearest 0.05 ft)
	$G_{f,AC}$=	1.72	
	GE_{AC}=	1.11	
$GE_{AB+AC} = 0.0032*TI*(100-R_{AS}) =$		2.00	
=>	GE_{AC+AB}=	2.20	(add 0.2 ft safety factor)
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		1.09	
=>	AB thickness=	0.99	
=>	AB Thickness=	**1.00**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	1.10	$G_{f,AB}$=1.1
$GE_{AS} = GE_{TOTAL} - GE_{AB} - GE_{AC} =$		1.59	
=>	AS Thickness=	**1.60**	ft (round up to the nearest 0.05 ft)

Design Section:



0.65 ft

1.00 ft

1.60 ft

PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

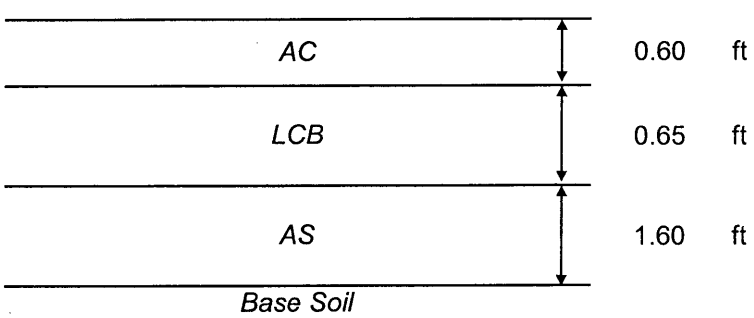
PROJECT NAME: *JAMESON CANYON ROAD PROJECT (ROUTE 12)*
PROJECT NO.: *208117.10*

Design Case: AC over LCB over AS

Design TI=	***12.5***
R_{BS}=	***5***
R_{AB}=	78
R_{AS}=	50

$GE_{TOTAL} = 0.0032*TI*(100-R_{BS}) =$		3.80	
$GE_{AC+LCB} = 0.0032*TI*(100-R_{AS}) =$		2.00	
$GE_{AC} = 0.4*GE_{AC+LCB} =$		0.80	
=>	$GE'_{AC} =$	1.00	(add 0.2 ft safety factor)
	AC thickness =	0.60	ft
=>	AC Thickness=	**0.60**	ft (round up to the nearest 0.05 ft)
	$G_{f,AC}$=	1.67	
	GE_{AC}=	1.00	
$GE_{LCB} = (GE_{AC+LCB})-GE_{AC} =$		1.00	
=>	GE_{AC+AB}=	1.20	(add 0.2 ft safety factor)
	$G_{f,LCB}$=	1.90	
	LCB thickness=	0.63	
=>	LCB Thickness=	**0.65**	ft (round up to the nearest 0.05 ft)
	GE_{LCB}=	1.24	
$GE_{AS} = GE_{TOTAL}-GE_{LCB}-GE_{AC} =$		1.56	
=>	AS Thickness=	**1.60**	ft (round up to the nearest 0.05 ft)

Design Section:



0.60 ft

0.65 ft

1.60 ft

PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

PROJECT NAME: *JAMESON CANYON ROAD PROJECT (ROUTE 12)*
PROJECT NO.: *208117.10*

Design Case: AC over AB over AS

Design TI=	***12.5***
R_{BS}=	***15***
R_{AB}=	78
R_{AS}=	50

$GE_{TOTAL} = 0..0032*TI*(100-R_{BS}) =$		3.40	
$GE_{AC} = 0.0032*TI*(100-R_{AB}) =$		0.88	
=>	GE'_{AC} =	1.08	(add 0.2 ft safety factor)
	AC thickness =	0.63	ft
=>	AC Thickness=	**0.65**	ft (round up to the nearest 0.05 ft)
	$G_{f,AC}$=	1.72	
	GE_{AC}=	1.11	
$GE_{AB+AC} = 0.0032*TI*(100-R_{AS}) =$		2.00	
=>	GE_{AC+AB}=	2.20	(add 0.2 ft safety factor)
$GE_{AB} = GE_{AC+AB} - GE_{AC} =$		1.09	
=>	AB thickness=	0.99	
=>	AB Thickness=	**1.00**	ft (round up to the nearest 0.05 ft)
	GE_{AB}=	1.10	$G_{f,AB}$=1.1
$GE_{AS} = GE_{TOTAL} - GE_{AB} - GE_{AC} =$		1.19	
=>	AS Thickness=	**1.20**	ft (round up to the nearest 0.05 ft)

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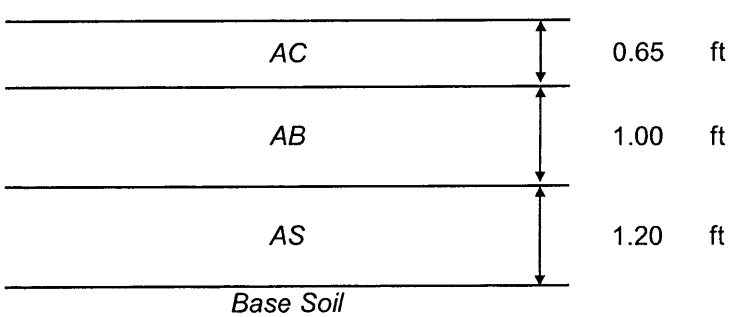


0.65	ft
1.00	ft
1.20	ft

PAVEMENT DESIGN

PER HIGHWAY DESIGN MANUAL, CHAP. 600

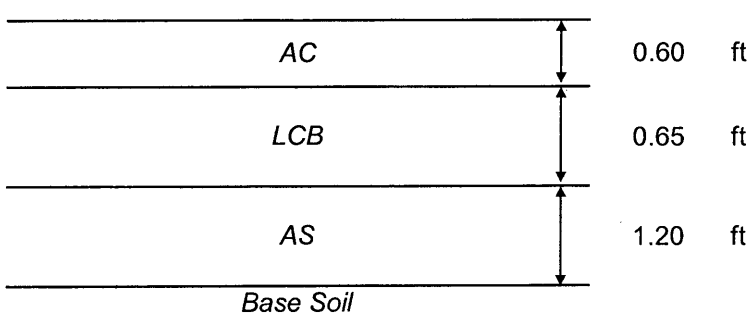
PROJECT NAME: *JAMESON CANYON ROAD PROJECT (ROUTE 12)*
PROJECT NO.: *208117.10*

Design Case: AC over LCB over AS

Design TI=	***12.5***
R_{BS}=	***15***
R_{AB}=	78
R_{AS}=	50

$GE_{TOTAL} = 0.0032*TI*(100-R_{BS}) =$		3.40	
$GE_{AC+LCB} = 0.0032*TI*(100-R_{AS}) =$		2.00	
$GE_{AC} = 0.4*GE_{AC+LCB} =$		0.80	
=>	GE'_{AC} =	1.00	(add 0.2 ft safety factor)
	AC thickness =	0.60	ft
=>	AC Thickness=	**0.60**	ft (round up to the nearest 0.05 ft)
	$G_{f,AC}$=	1.67	
	GE_{AC}=	1.00	
$GE_{LCB} = (GE_{AC+LCB})-GE_{AC} =$		1.00	
=>	GE_{AC+AB}=	1.20	(add 0.2 ft safety factor)
	$G_{f,LCB}$=	1.90	
	LCB thickness=	0.63	
=>	LCB Thickness=	**0.65**	ft (round up to the nearest 0.05 ft)
	GE_{LCB}=	1.24	
$GE_{AS} = GE_{TOTAL}-GE_{LCB}-GE_{AC} =$		1.16	
=>	AS Thickness=	**1.20**	ft (round up to the nearest 0.05 ft)

Design Section:



0.60 ft

0.65 ft

1.20 ft

Post-Liquefaction Settlement

Boring A-08-035 (B-216), Sample No. 5 at 19.5' deep.
(GW at approx. 15' deep, hammer energy = 60%)

(i) MC-N = 9 (field) ⇒ SPT-N_{60} ≈ 9 × 0.65 = 6

- $N_{1,60} = N_{60} \times C_N$

$$C_N = (P_a/\sigma_v)^{0.5} = \left(2000/(125\times15+65\times4.5)\right)^{0.5} = 0.96$$

$N_{1,60} = 5.8$

- $N_{1,60,cs} = \alpha + \beta (N_{1,60})$ – fines content correction

F.C. = 34% (-#200)

$$\left.\begin{aligned} \alpha &= \exp[1.76 - 190/FC^2] \\ \beta &= 0.99 + FC^{1.5}/1000 \end{aligned}\right\} \text{for } 5\% < FC < 35\%$$

⇒ $\alpha = 4.93$, $\beta = 1.19$

⇒ $N_{1,60,cs} = 4.93 + 1.19 \times N_{1,60} \approx 12$

(ii) Per Tokimatsu & Seed (1987) $\varepsilon_v \approx 2\%$ for $N_{1,60,cs} = 12$

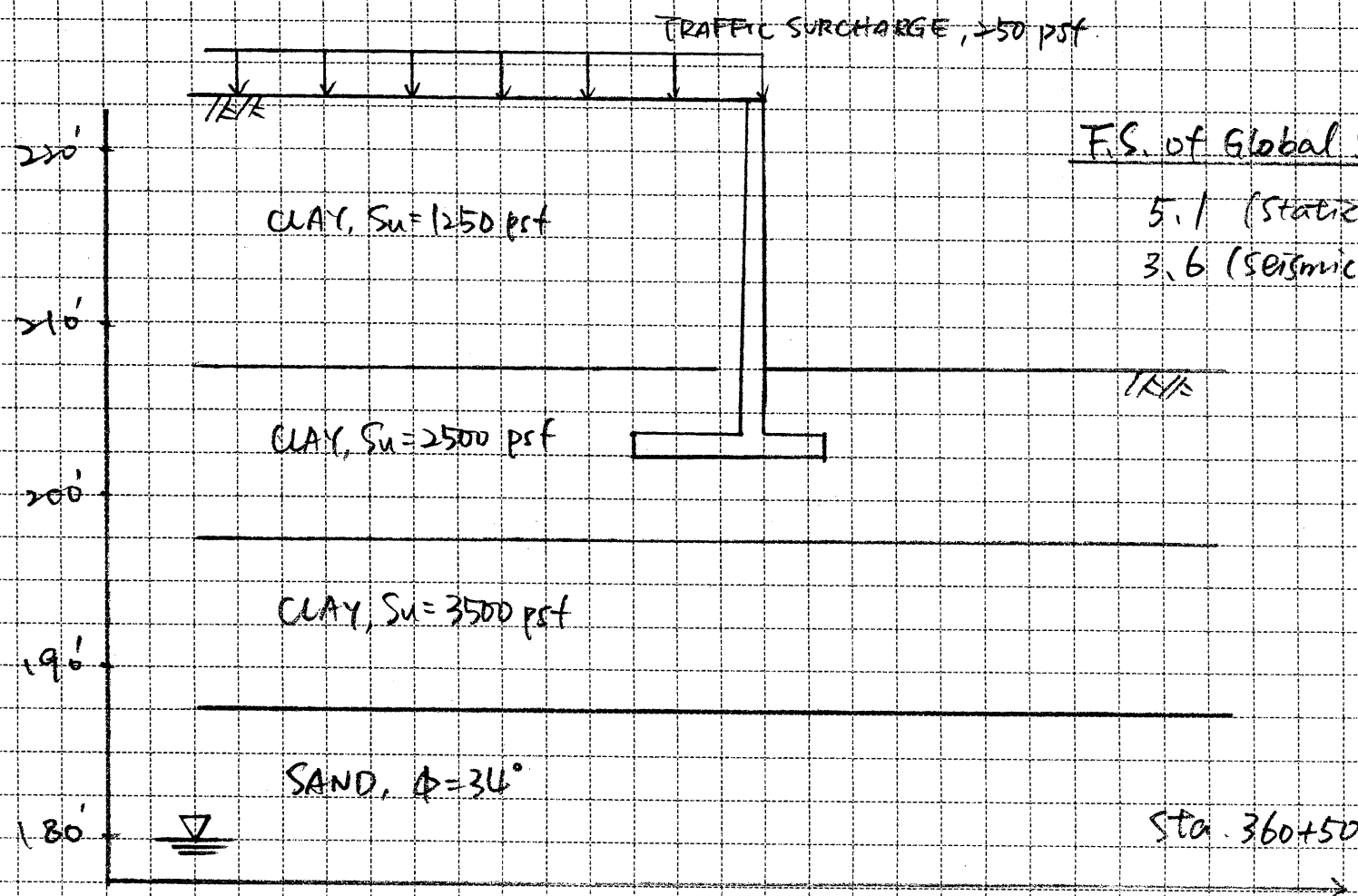
δ_{liq} = Thickness × ε_v

$= (5' \times 12'') \times 0.02 = 1.2''$

Due to the high F.C. the anticipated post-liq settlement should be on the order of 1" *

JOB
SHEET NO OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

RETAINING WALL #8



F.S. of Global Stability

5.1 (Static)
3.6 (Seismic, 0.2g)

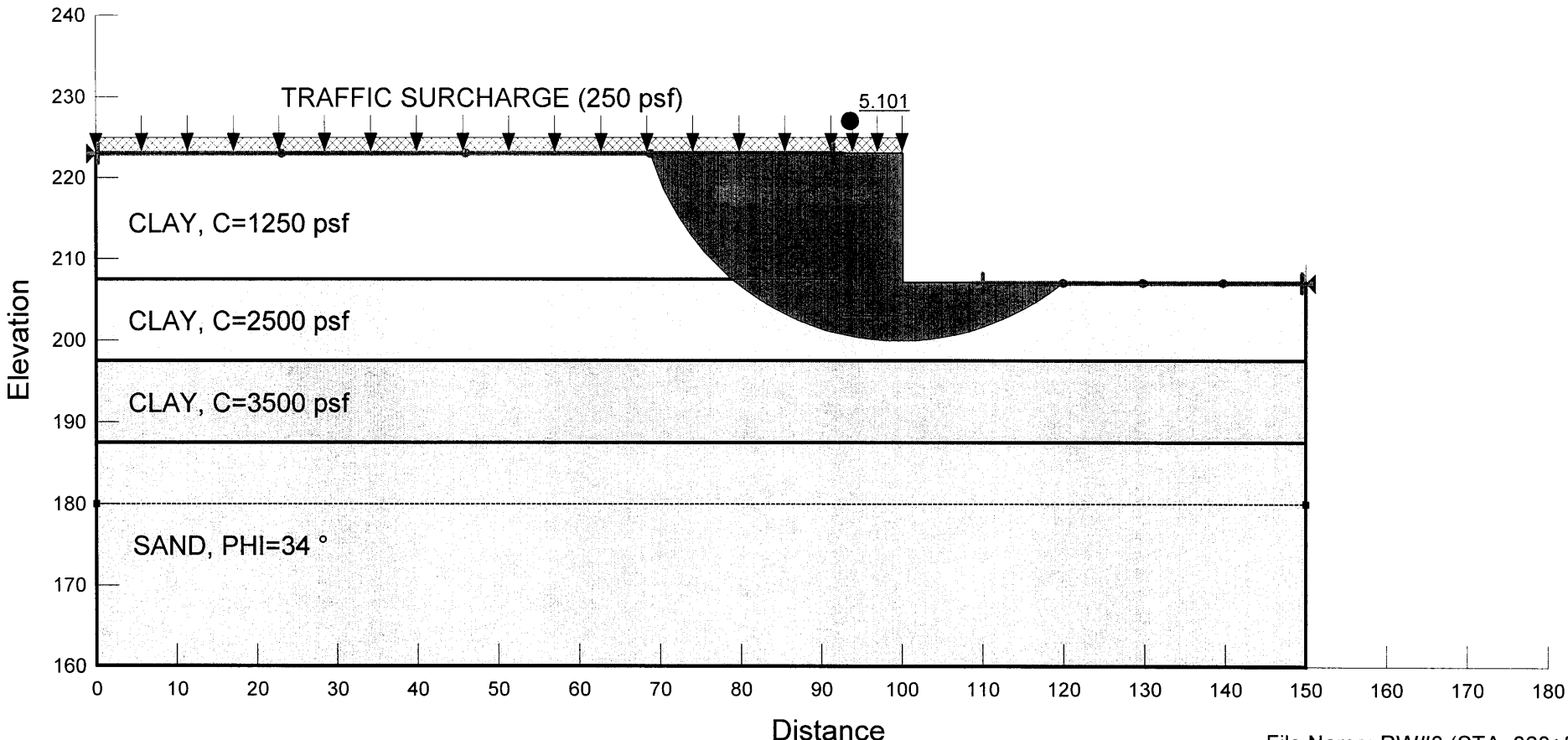
BEARING CAPACITY

$Q_{all} = C \times N_c / F.S. = 2500 \times 5.53 / 3 = 4.6$ ksf

⇒ recommended $q_{all} = 4.5$ ksf

RETAINING WALL NO. 8 - TYPE 1 (MOD.)

STA. 360+50, STATIC CONDITION



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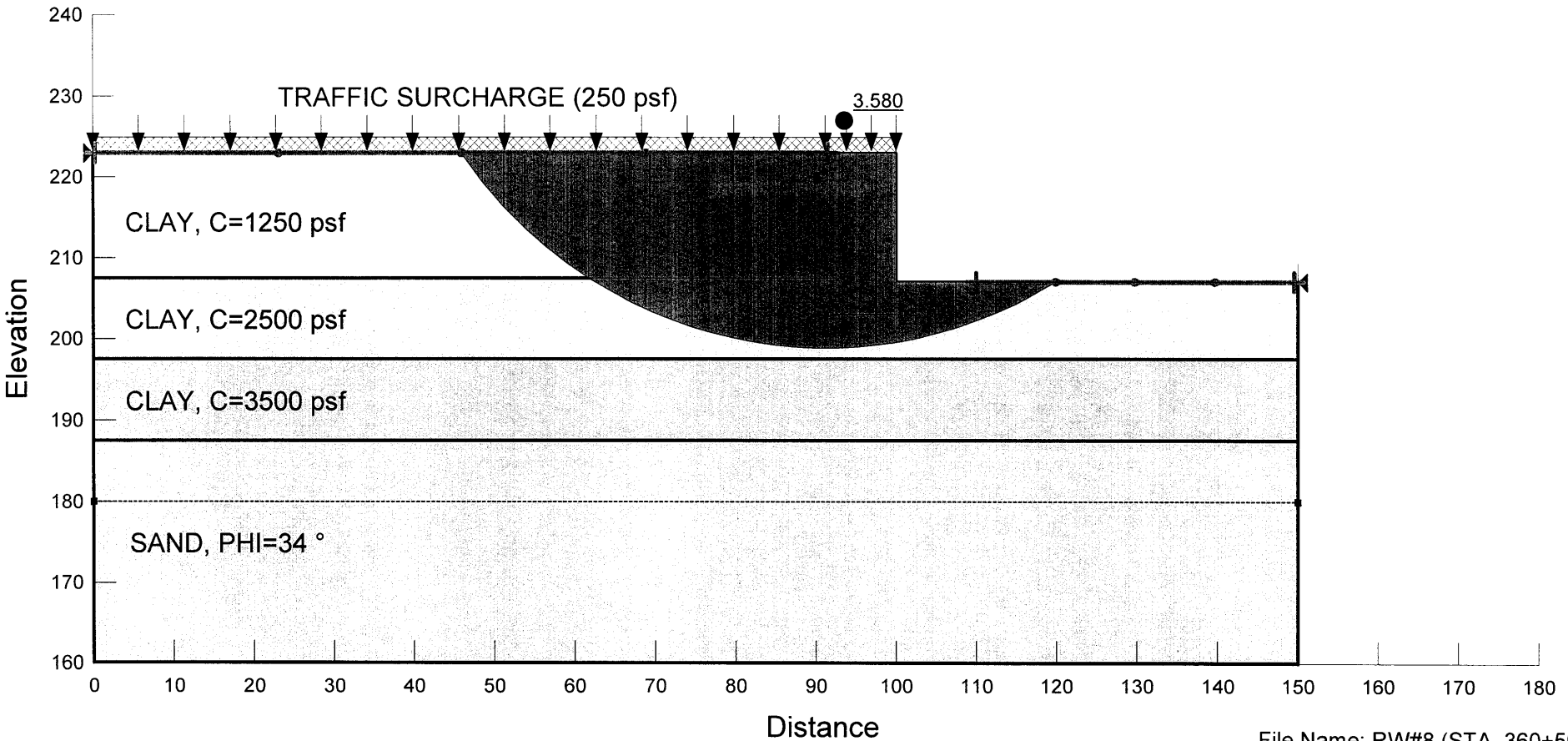
RETAINING WALL NO. 8 - TYPE 1 (MOD.)

STA. 360+50, SEISMIC CONDITION (k=0.2g)



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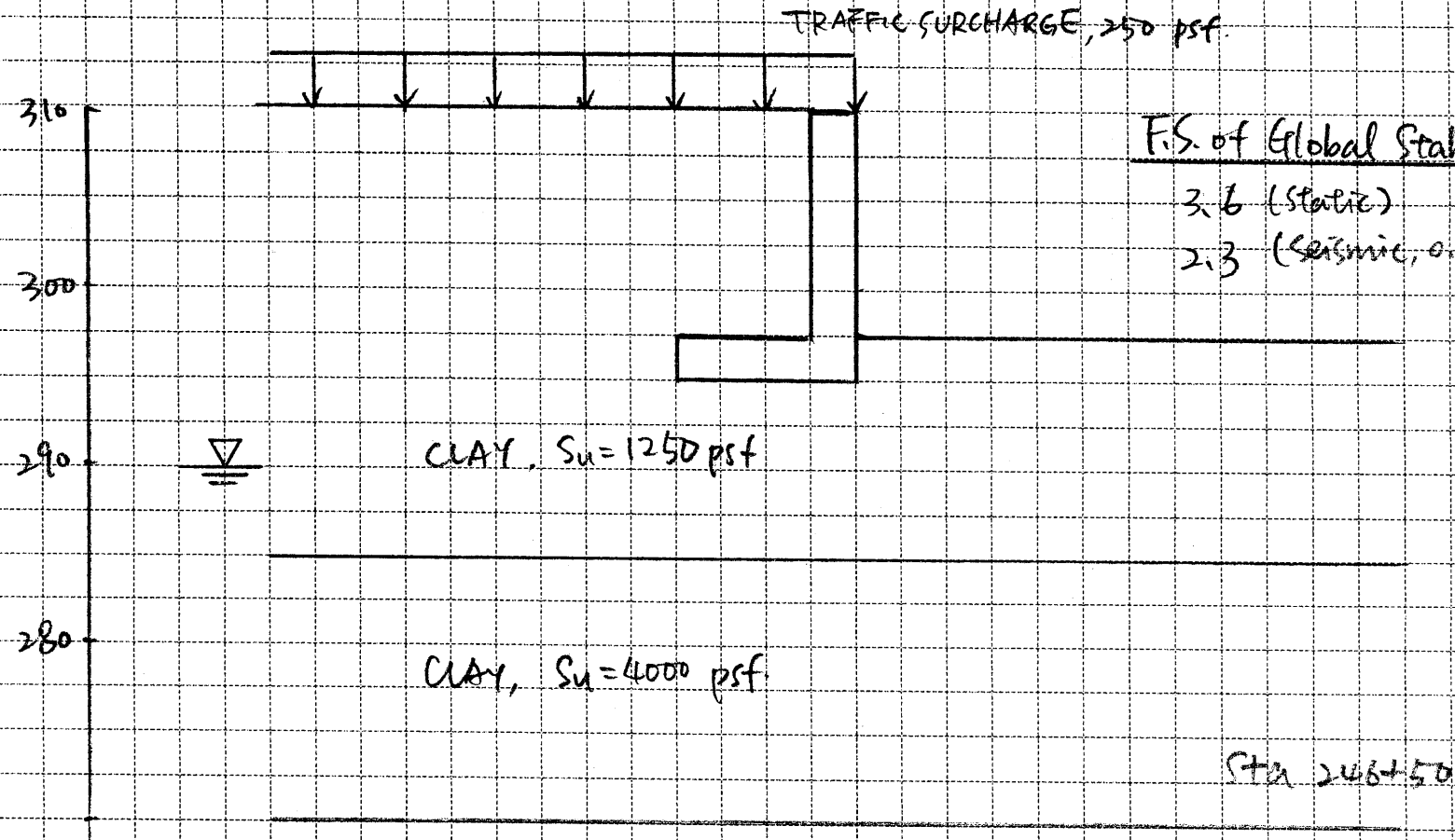
RETAINING WALL #9



F.S. of Global Stability

3.6 (static)

2.3 (seismic, 0.2g)

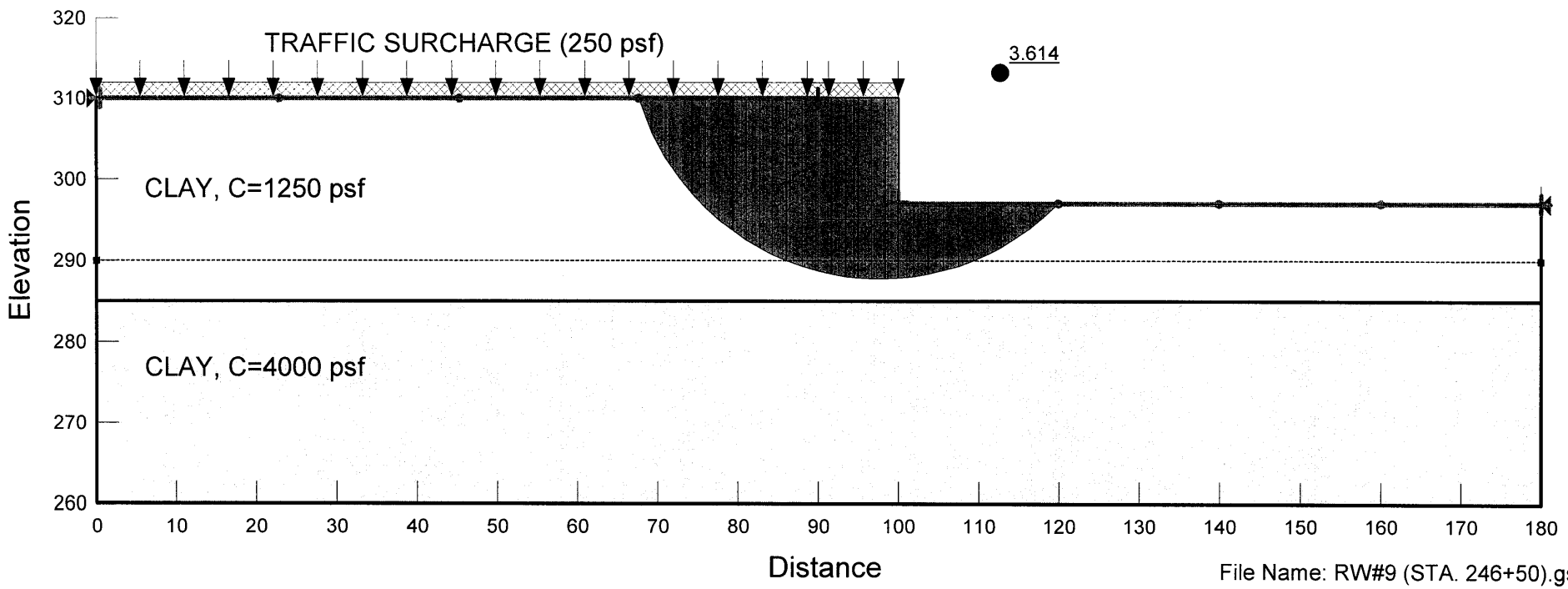
BEARING CAPACITY

Based on the boring data, the Su of the subgrade is approx. 1250 psf. The allowable bearing capacity is roughly the same as unconfined compressive strength

$\Rightarrow q_u = 2 \times S_u = 2.5$ ksf

RETAINING WALL NO. 9 - TYPE 5 (MOD.)

STA. 360+50, STATIC CONDITION



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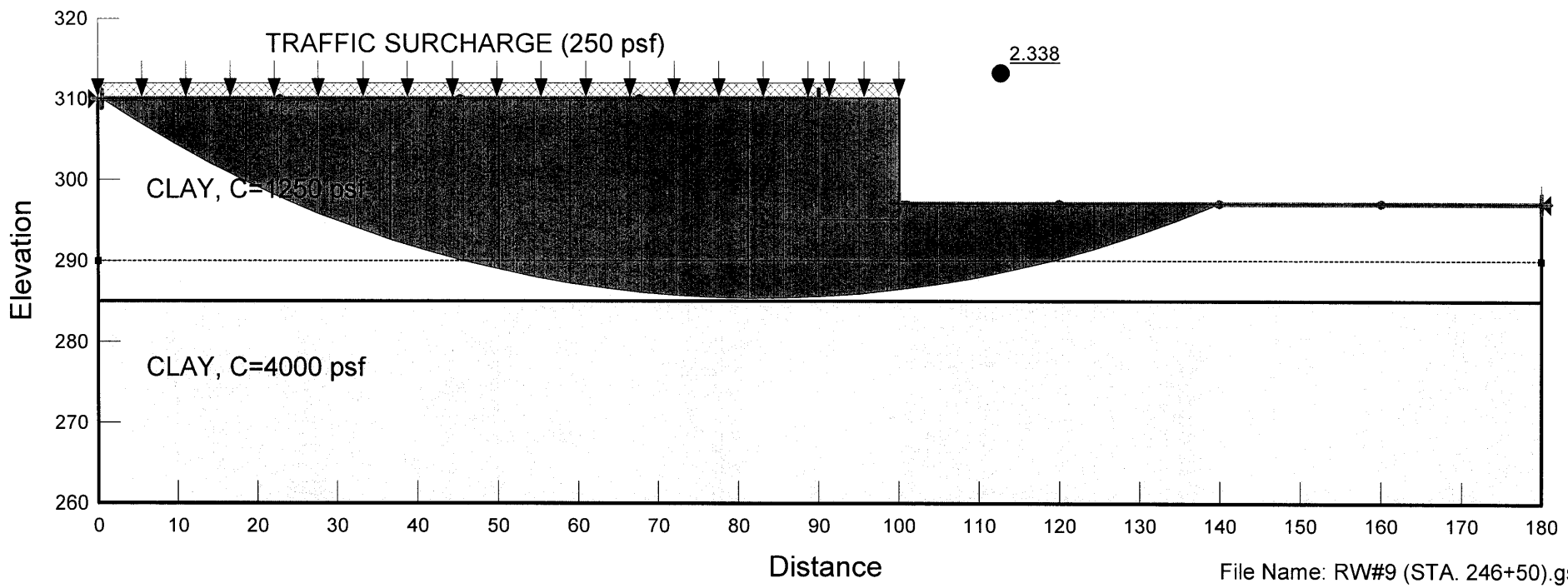
10/4/2009 3:56:16 PM

RETAINING WALL NO. 9 - TYPE 5 (MOD.)

STA. 360+50, SEISMIC CONDITION (k=0.2g)



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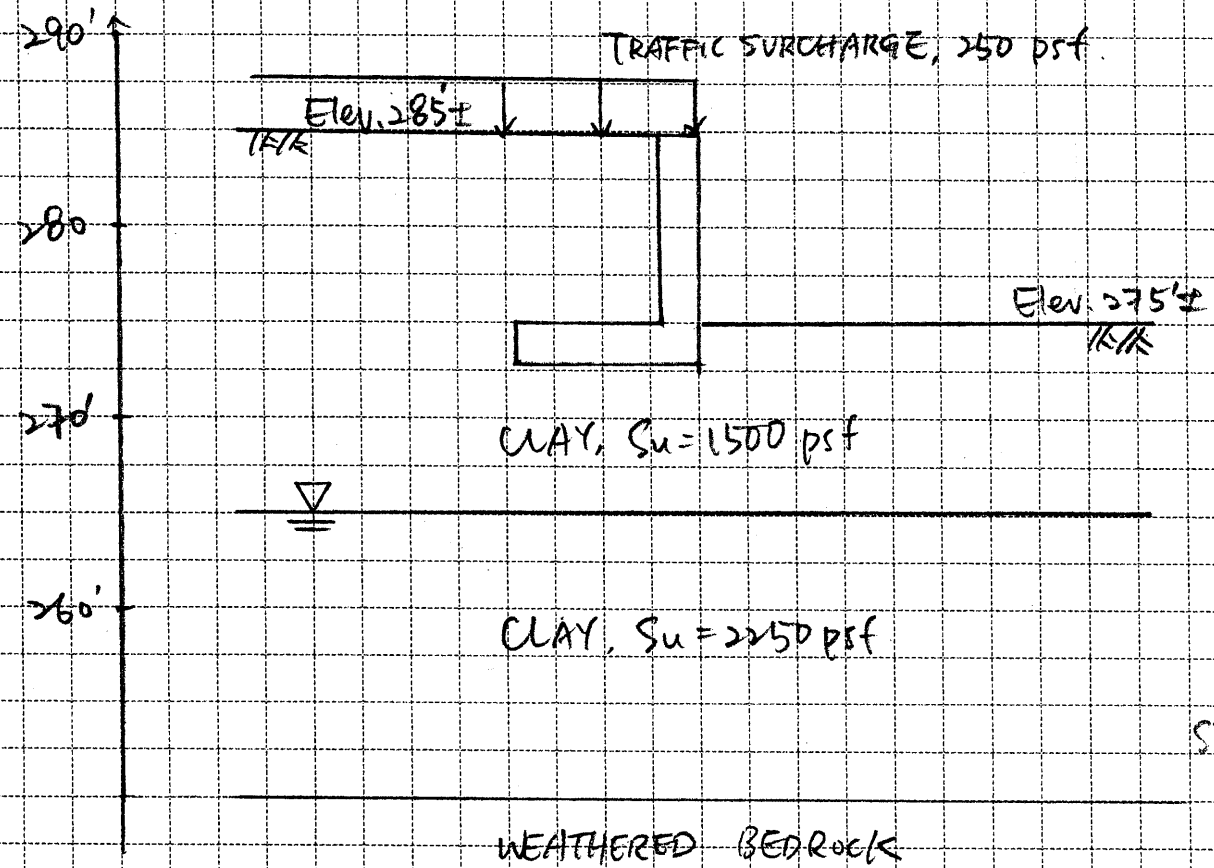
JOB
SHEET NO OF
CALCULATED BY DATE
CHECKED BY DATE
SCALE

RETAINING WALL #10



F.S. of Global Stability

5.8 (Static)
2.6 (Seismic, 0.2g)

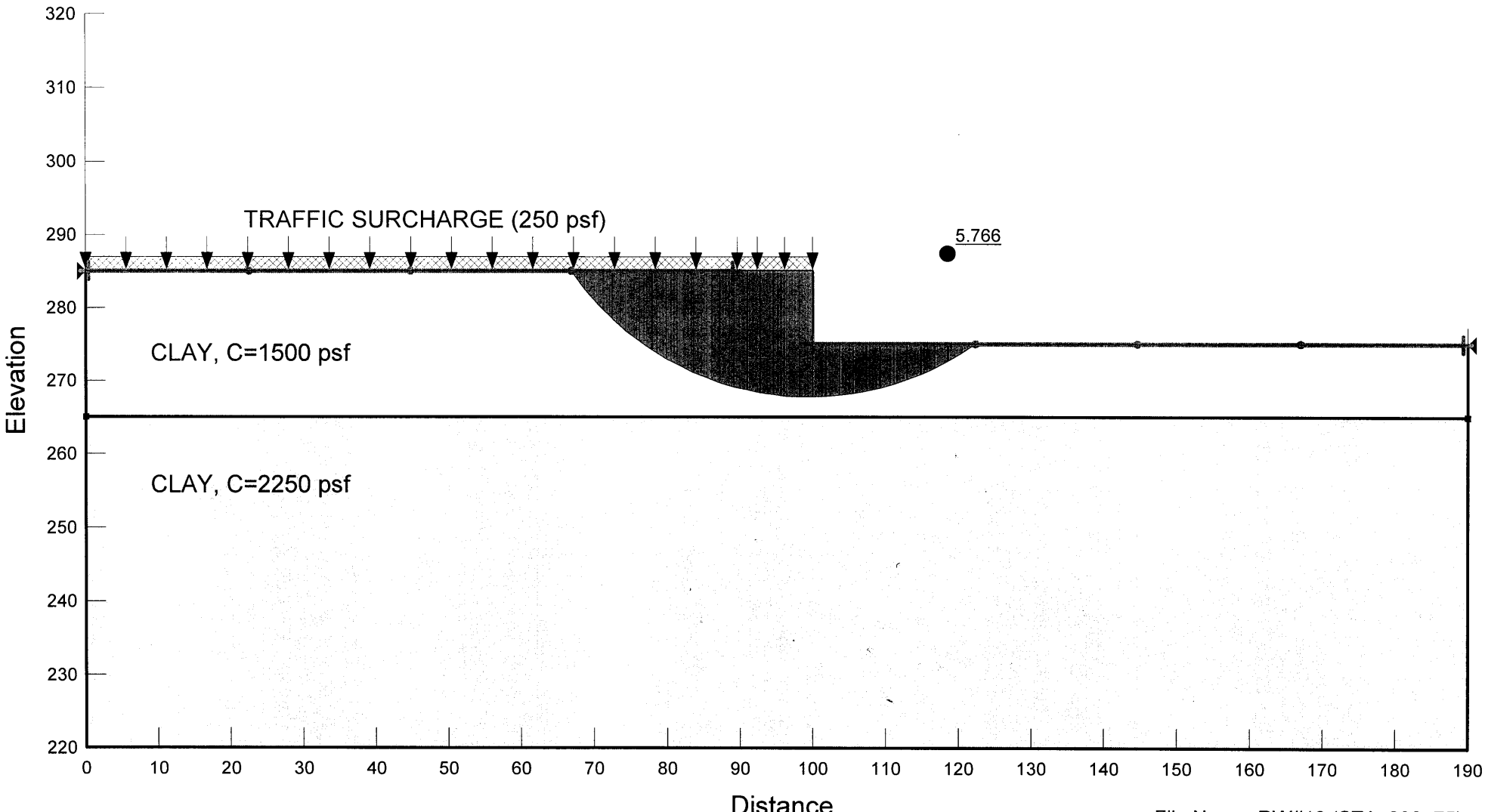
BEARING CAPACITY

The Su of the subgrade material is 1500 psf. Based on general geotechnical practice, the allowable bearing capacity is roughly the same as unconfined compressive strength.

$\Rightarrow q_{all} = 2 \times S_u = 3000$ psf

RETAINING WALL NO. 10 - TYPE 5 (MOD.)

STA. 360+50, STATIC CONDITION



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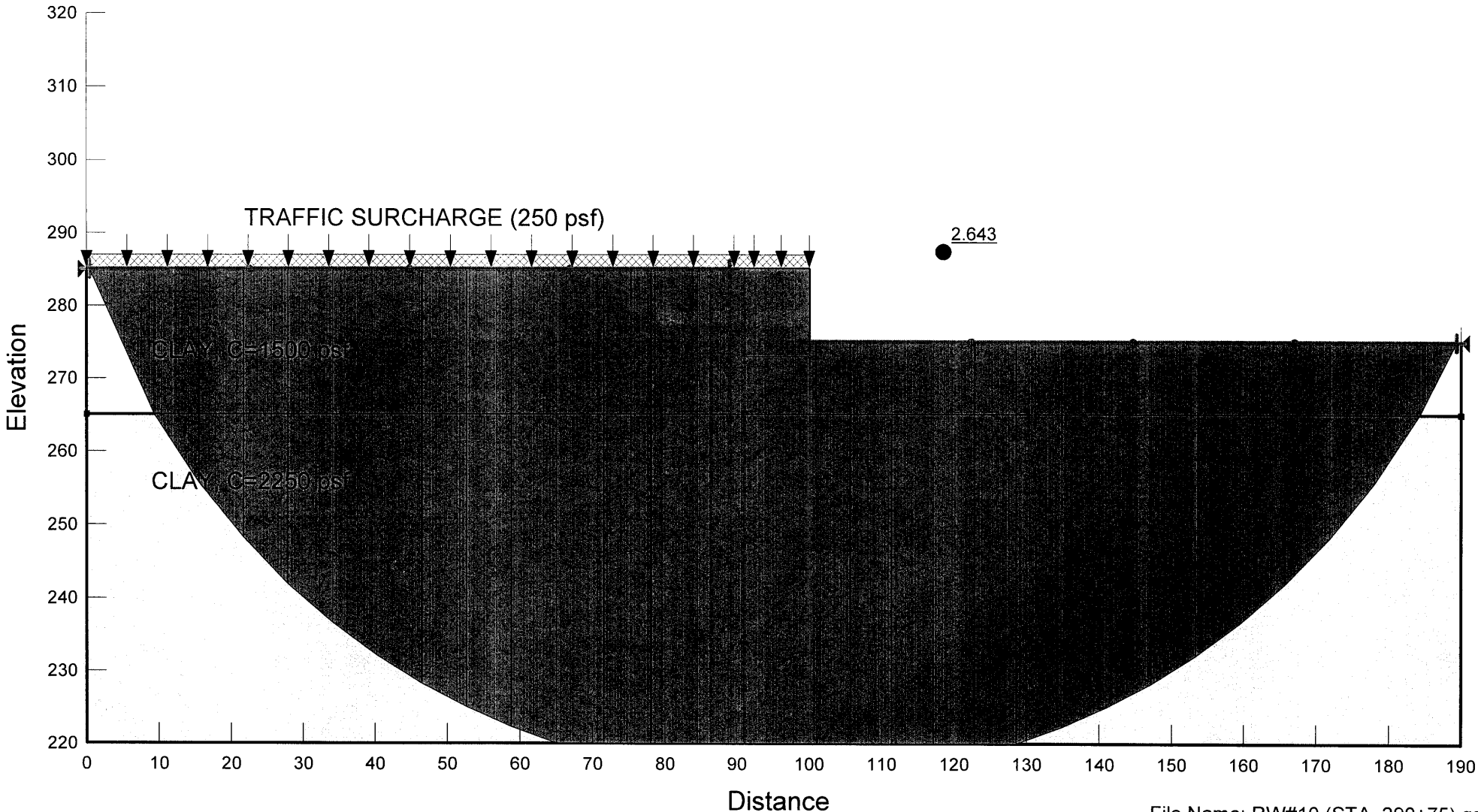
RETAINING WALL NO. 10 - TYPE 5 (MOD.)

STA. 360+50, SEISMIC CONDITION (k=0.2g)



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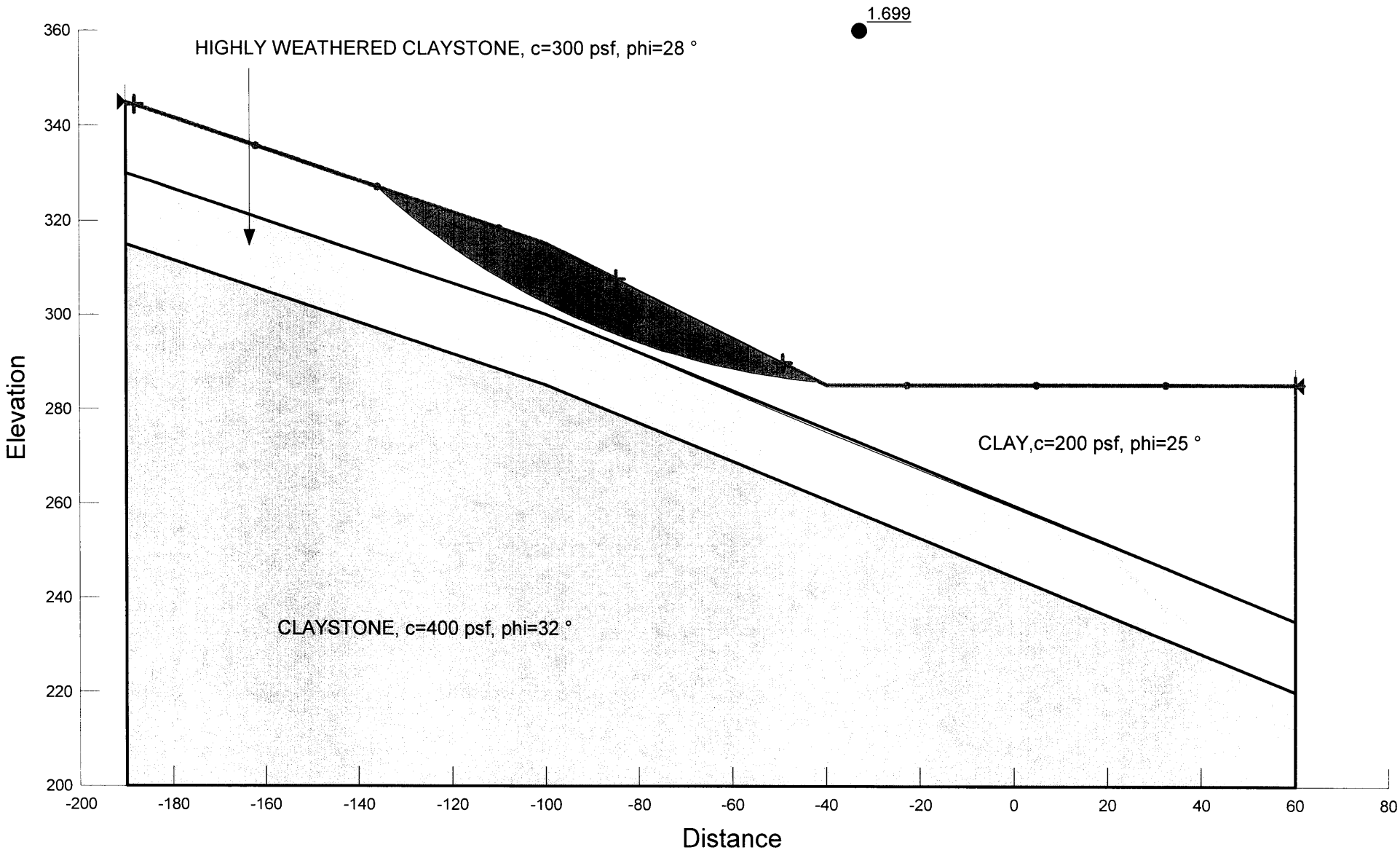
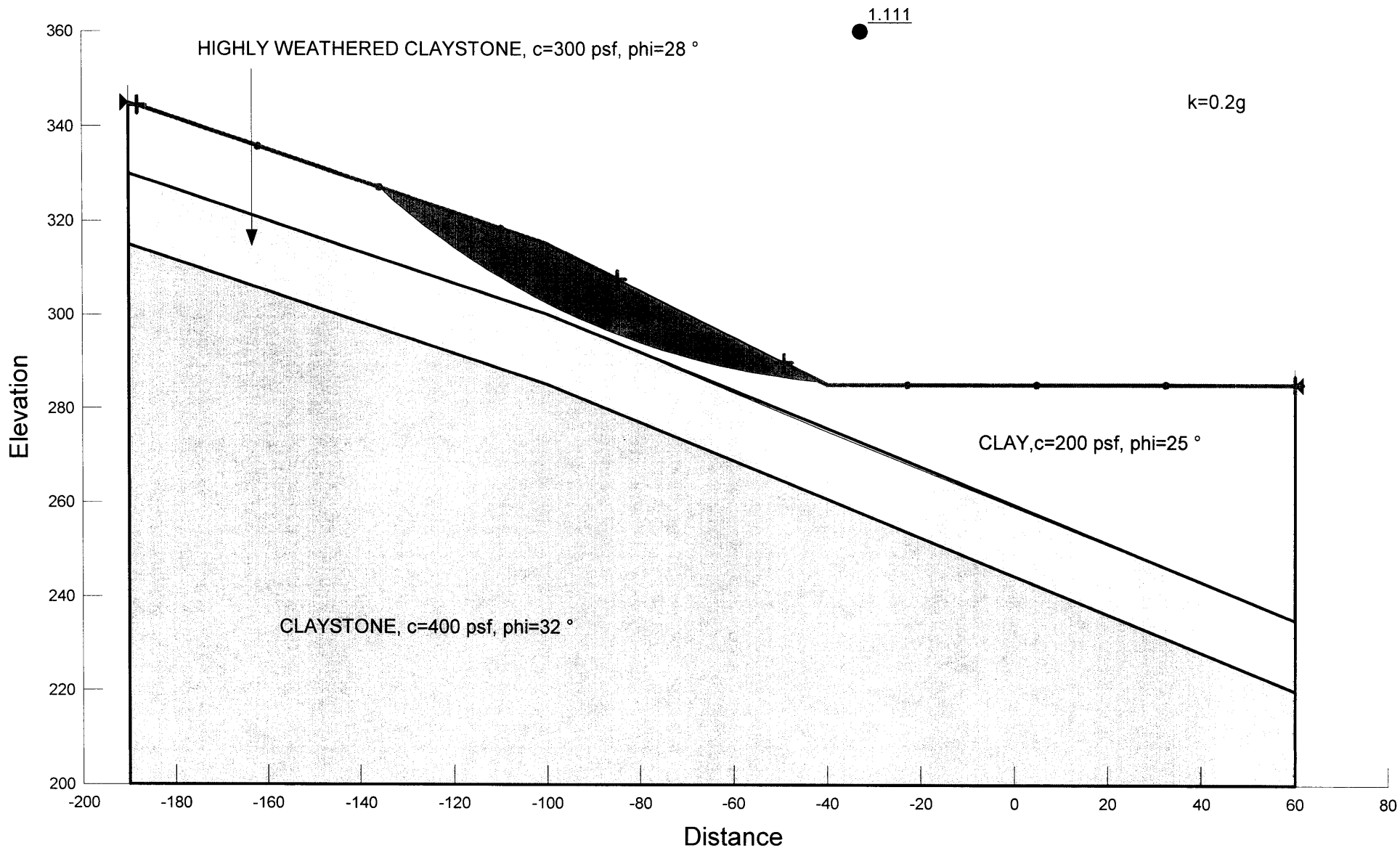
ROUTE 12/JAMESON CANYON ROAD PROJECT

CUT SLOPE (STA. 229+00 - 234+00)



ROUTE 12/JAMESON CANYON ROAD PROJECT

CUT SLOPE (STA. 229+00 - 234+00)



NORCAL GEOPHYSICAL CONSULTANTS, INC.

November 3, 2008

Mr. Gary Parikh
Parikh Consultants, Inc.
356 South Milpitas Boulevard
Milpitas, California 95035

Subject: Seismic Refraction Survey
Jameson Canyon – Highway 12
Solano County, California

NORCAL Project No. 08-426.11

Dear Mr. Parikh:

This report presents the findings of a seismic refraction survey performed by NORCAL Geophysical Consultants, Inc. along the Jameson Canyon corridor of Highway 12, in Solano County, California. The geophysical survey was conducted during the period September 29th through October 3rd, 2008 by the following NORCAL personnel:

- David T. Hagin PGp 1033
- Senior Geophysical Technician Travis W. Black
- Geophysical Technician Ken McGuire

Site orientation, background information and logistical support were provided by Mr. Frank Wang of Parikh.

SITE DESCRIPTION and PURPOSE

The site lies on the northern side of the Jameson Canyon corridor, Highway 12, Solano County, California. This narrow section of road is planned for improvement, and deep cuts will be required to widen the roadway. The purpose of this seismic refraction survey was to measure seismic p-wave velocities to aid in characterizing the underlying rock, and to quantify seismic compressional wave velocities as they pertain to rippability.

The general conditions along Jameson Canyon can be characterized as moderate to steep slopes with occasional relatively local slope failures. The bedrock is predominantly sandstone.

321A BLODGETT STREET • COTATI, CA 94931 • TELEPHONE (707) 796-7170 • FAX (707) 796-7175
www.norcalgeophysical.com

METHODOLOGY and RIPPABILITY

The seismic refraction method provides a measure of the velocity of compressional (p)-waves as they propagate through soil and rock. Quantification of these values within rock provides an estimation of the rock hardness and degree of weathering and/or fracturing. Generally, low seismic velocities are indicative of fill, soil or recently deposited materials. Moderate velocity material can include both older alluvium and highly weathered and fractured bedrock. The highest velocities are typically measured in less weathered and less fractured rock. An assessment of rippability can be made by comparing the measured velocities to published rippability tables.

A more detailed discussion of the seismic refraction method and its inherent limitations, geophysical instrumentation, data analysis, interpretation and rippability is presented in Appendix A.

FIELD SURVEY and EQUIPMENT

The seismic survey consisted of nine seismic lines located in planned cut areas designated as Area "A" through Area "D", progressing from west to east, as shown on Plate 1; line locations and orientations were specified by Parikh personnel. All lines were comprised of one geophone array (spread) containing 24 geophones distributed in a collinear array. An exception was Line C1, which had two 24-channel arrays overlapped by 12 geophones for a total of 36 stations. All lines employed 10-foot geophone station intervals yielding total line lengths of 240 feet, except Line C1 with a line length of 360 feet.

A Geometrics Geode, 24-bit digital instrument with 8 Hertz digital-grade geophones was used for data acquisition. Multiple impacts with an AWD200 (200-pound, Accelerated Weight Drop) provided the energy source for generation of seismic waves. Energy source points (shots) were placed equidistant between geophone stations at regular intervals, and off both ends of each spread for a total of 7 shots per spread. A hand level was used to determine relative elevations of the geophone stations. Locations of line endpoints were also recorded with a Trimble GPS system.

DATA PROCESSING

The seismic refraction data were processed in-house with software developed by Optim. This software uses a modeling technique which derives detailed velocity models that are capable of defining strong lateral velocity gradients, even with extreme variations in topography or complex geologic structure.

A color-coded seismic velocity cross-section of the subsurface has been generated for each seismic line (profile), where cool colors (blues) indicate lower seismic velocities and warm colors (reds) indicate higher velocities. Color scaling for all profiles has been normalized based on the overall range of measured seismic velocity values. Additionally, the axes have been scaled 1:1, vertical to horizontal.

RESULTS AND INTERPRETATION

The measured seismic velocities range in value from less than 1,000 to over 10,000 feet per second (ft/s). Based on our experience working in a similar geologic environment, velocities less than about 4,000 ft/s (low velocities) are typical of fill and/or soil materials; however, highly weathered to decomposed rock can have similar velocities. The moderate velocities of about 4,000 to 8,000 ft/s probably represent highly to moderately weathered and fractured bedrock; however, the lower end of this velocity range can also include alluvium. Velocities in excess of 8,000 ft/s (high velocities) represent less weathered and less fractured rock.

For the purposes of discussion regarding the results at the four survey areas, materials less than 4,000 ft/s will be referred to as overburden, velocities from 4,000 to 8,000 ft/s referred to as weathered rock and velocities greater than 8,000 ft/s as hard rock.

Area A

The maximum seismic velocities measured in Area A are greater than 10,000 ft/s. Overburden ranges in thickness from 15 to 50 feet. Line A2 extends directly uphill, and shows a thin weathered zone above the hard rock. Line A1 shows a thicker weathered rock zone as measured along contour. The depth to the hard rock surface varies considerably along both profiles.

Area B

Overburden appears irregular in thickness, and ranges from about 5 to 25 feet. Below the overburden layer, seismic velocities increase gradually with increasing depth to weathered rock velocities. The maximum seismic velocities are about 6,500 ft/s, as measured along all 3 lines.

Area C

Seismic profiles in Area C indicate a range in the thickness of overburden from 10 to over 30 feet. As in Area A, the weathered zone appears as a thin layer above hard rock, except for the upper portion of Line C1, where the hard rock zone is not present. Maximum seismic velocities are greater than 10,000 ft/s in Area C. The profiles illustrate a discontinuous hard rock zone with an irregular and undulating surface.

Area D

Seismic profiles in Area D show a thick section of overburden ranging from 25 to over 50 feet in thickness. In some locations, the overburden extends to the full depth of investigation. Where higher velocities are present, seismic velocities increase gradually with increasing depth to weathered rock velocities. Maximum seismic velocities in Area D are slightly over 6,000 ft/s.

EXCAVATION CHARACTERISTICS (Rippability)

Seismic velocity charts relating seismic velocity to excavation characteristics have been developed from field tests by others. These charts list the seismic velocity of various types of rock and soils and their relative ease of excavation using different types of rippers. Caterpillar Tractor Company publishes a performance manual that lists ripper performance charts for the D8R, D9R, D10T and D11T tractors. The following information in Table A was obtained from a performance chart for a D9R ripper in sandstone, the primary rock found on site (Caterpillar Performance Handbook, Edition 36, April 2006).

Table A: CAT D9R Ripper Performance in Sandstone Rock

PERFORMANCE	VELOCITY RANGE (FT/S)
Rippable	Less than 7,400
Marginally Rippable	7,400 to 9,600
Non-Rippable	Greater than 9,600

This information should only be used as a general guide, however, as many other factors should also be considered. These factors include rock jointing and fracture patterns, the experience of the equipment operator, and the equipment and excavation methods selected. Also, the computed velocities measured along each line are an average; therefore, there may be localized zones where the velocities may be higher or lower than indicated. Since the accuracy of our findings is subject to these limitations, it should be noted that subsurface conditions may vary from those depicted in the final results. A more detailed discussion of the limitations with regard to the seismic refraction method is presented in Appendix A.

SUMMARY

The maximum seismic velocities measured varied considerably from site to site. In Areas A and C, maximum seismic velocities were greater than 10,000 ft/s, whereas in Areas B and D maximum velocities were in the range of 6,000 ft/s. Overburden is found in thick accumulations in some locations, and as a thin layer in others. Where hard rock is present, the weathered layer appears thin; however, where hard rock is absent the

weathered layer appears thicker, with a gradual increase in seismic velocities. The underlying hard rock in Areas A and C can be characterized as undulating and discontinuous.

Our investigation revealed seismic velocities suggesting the presence of non-rippable (by a CAT D9R) rock at depths of 12 to 60 feet in locations A and C. Depths to higher velocities are highly variable laterally on the seismic profiles. In areas B and D, seismic velocities all fall within the rippable category, as defined by Caterpillar.

STANDARD CARE AND WARRANTY

The scope of NORCAL's services for this project consisted of using geophysical methods to characterize the shallow subsurface. The accuracy of our findings is subject to specific site conditions and limitations inherent to the techniques used. We performed our services in a manner consistent with the level of skill ordinarily exercised by members of the profession currently employing similar methods. No warranty, with respect to the performance of services or products delivered under this agreement, expressed or implied, is made by NORCAL.

We appreciate having the opportunity to provide our services to Parikh Consultants.

Sincerely,

NORCAL Geophysical Consultants, Inc.

David T. Hagin

David T. Hagin
Geophysicist GP-1033

DTH/KGB/tt

Enclosures: Plates 1- 10
Appendix A - Geophysical Methodology, Instrumentation, Data Analysis, and Limitations

Appendix A

GEOPHYSICAL METHODOLOGY

Appendix A

SEISMIC REFRACTION

Methodology

The seismic refraction (SR) method provides information regarding the seismic velocity structure of the subsurface. An impulsive (mechanical or explosive) source is used to produce compressional (p) wave seismic energy. The p-waves propagate into the earth and are refracted along interfaces representing an increase in velocity. A portion of the p-wave energy is refracted back to the surface where it is detected by sensors (geophones) that are coupled to the ground surface in a collinear array (spread). The detected signals are recorded on a multi-channel seismograph and are analyzed to determine the shot point-to-geophone travel times. These data can be used along with the corresponding shot point-to-geophone distances to determine the depth, thickness, and velocity of subsurface seismic layers.

The seismic refraction technique is based on several assumptions. Paramount among these are that seismic velocity increases with depth. In cases where this assumption is invalid, the accuracy of the technique decreases. For example, if a low velocity layer occurs between two layers of higher velocity, the low velocity layer will not be detected and the depth to the underlying high velocity layer will be erroneously large.

Instrumentation

Data acquisition is initiated along each SR line by producing seismic energy using either an explosive or mechanical source. Explosive sources are typically buried from 2 to 4 feet beneath the ground surface and are detonated by electric blasting caps. The detonation is initiated by a blaster that is connected to a seismograph. Mechanical sources produce energy by impacting a metal strike plate on the ground surface with either a 12-16 pound sledge hammer or an elastic-band or hydraulically driven weight drop.

The resulting seismic wave forms are recorded using a Geometrics 24-channel digital, engineering seismograph and Mark Products geophones with a natural frequency of 8 or 10 Hz. The data may be recorded on hard copy records (seismograms) as well as on magnetic or optical media for future processing. The seismograms can be analyzed to determine the amount of time it takes for a p-wave to travel from a given shot point to each geophone in a spread.

Data Analysis

The seismic data are downloaded to a computer and processed using software by Optim. Picker is used to define the shot point to geophone travel times, and geophone geometry, including elevations as picked from topography maps, hand-level techniques and/or a global positioning system (GPS). Models are created from this information through

inversion processing using a non-linear forward modeling optimization technique called adaptive simulated annealing.

The final output consists of a color coded seismic velocity cross-section showing the surface topography, the elevation and configuration of the seismic layers, the corresponding velocity of each colored layer, and the locations of the shot points.

Rippability

Rippability (excavatibility) is dependent on the physical condition of the rock masses to be excavated. In addition to the rock type and degree of weathering, structural features in the rock, such as bedding planes, cleavage planes, joints, fractures and shear zones also influence rippability. Rock masses tend to be more easily ripped if they have well defined, closely-spaced fractures, joints, or other planes of weakness. Massive rock bodies which lack discontinuities may exhibit marginal rippability, even where partially weathered, and may require blasting for efficient removal. The association between the rippability of various earth materials and their seismic velocity is most recently detailed in the Caterpillar Performance Handbook, Edition 36, October 2006.

The charts of ripper performance should be considered as being only one indicator of rippability. Ripper tooth penetration is usually the key to successful ripping, regardless of seismic velocity. This is particularly true in finer-grained, homogeneous materials and in tightly cemented formations. Ripping success may ultimately be determined by the operator finding the proper combination of factors, such as: number of shanks used, length and depth of shank, tooth angle and direction, and use of throttle. Although low seismic velocities in any rock type indicate probable rippability, if the fractures, bedding and/or joints do not allow tooth penetration, the material may not be ripped efficiently. In some cases, pre-blasting may be required to induce sufficient fracturing to allow tooth penetration for excavation.

Limitations

There are limitations unique to the SR method. The basic physics involved in refraction of acoustic waves dictates certain physical parameters for any survey. For example, if a layer has a lower velocity than that of the overlying layer, the low velocity layer will be invisible or improperly resolved. Furthermore, the computed depth of the next layer down will be erroneously large. Also, a velocity layer may simply be too thin to be detected. Due to these and other limitations inherent to the SR method, the results of the SR survey should be considered only as approximations of the subsurface conditions. The actual conditions may vary locally.

Additionally, there is inherent ambiguity involved with inversion processing. Models created through the inversion process are non-unique, and therefore must be evaluated carefully based upon site geology and data values.

LEGEND	
	SEISMIC REFRACTION PROFILE

SCALE

0 400 800 1600

(1 inch = 800 feet)

NORCAL

SITE LOCATION MAP
JAMESON CANYON – HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

NORCAL GEOPHYSICAL CONSULTANTS INC.

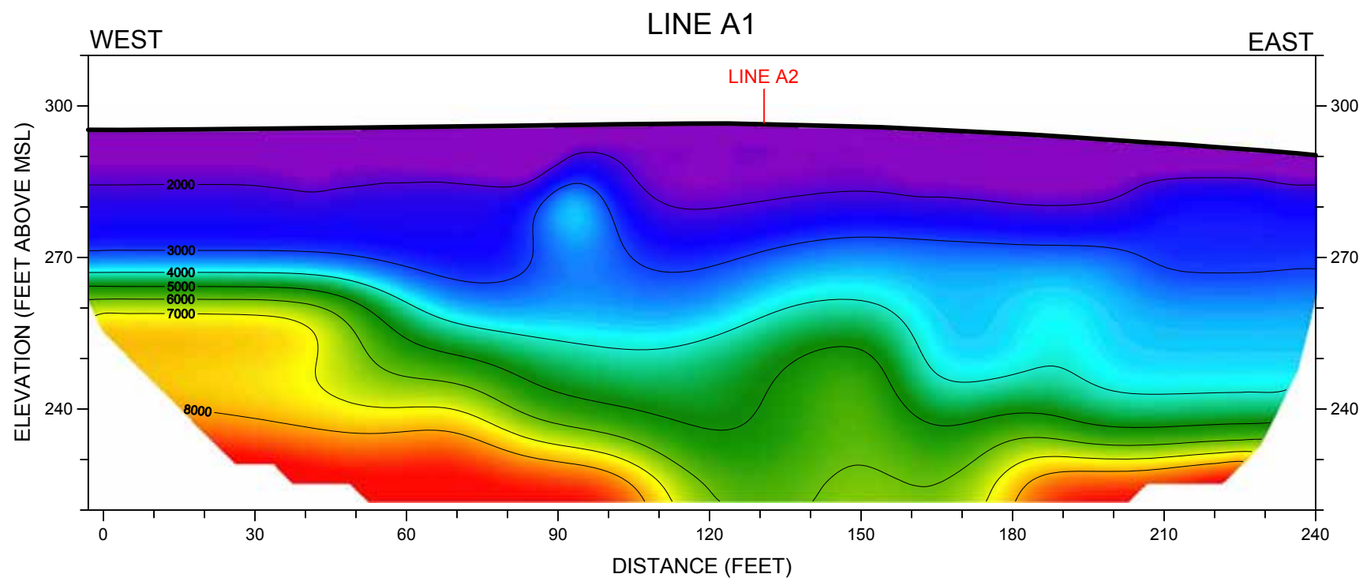
JOB #: 08–428.11

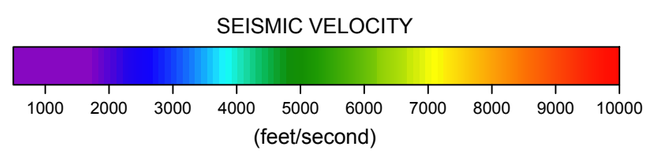
DATE: OCT. 2008

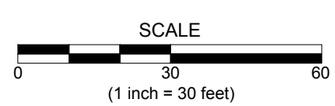
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE 1







NORCAL

SEISMIC REFRACTION PROFILE
LINE A1
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

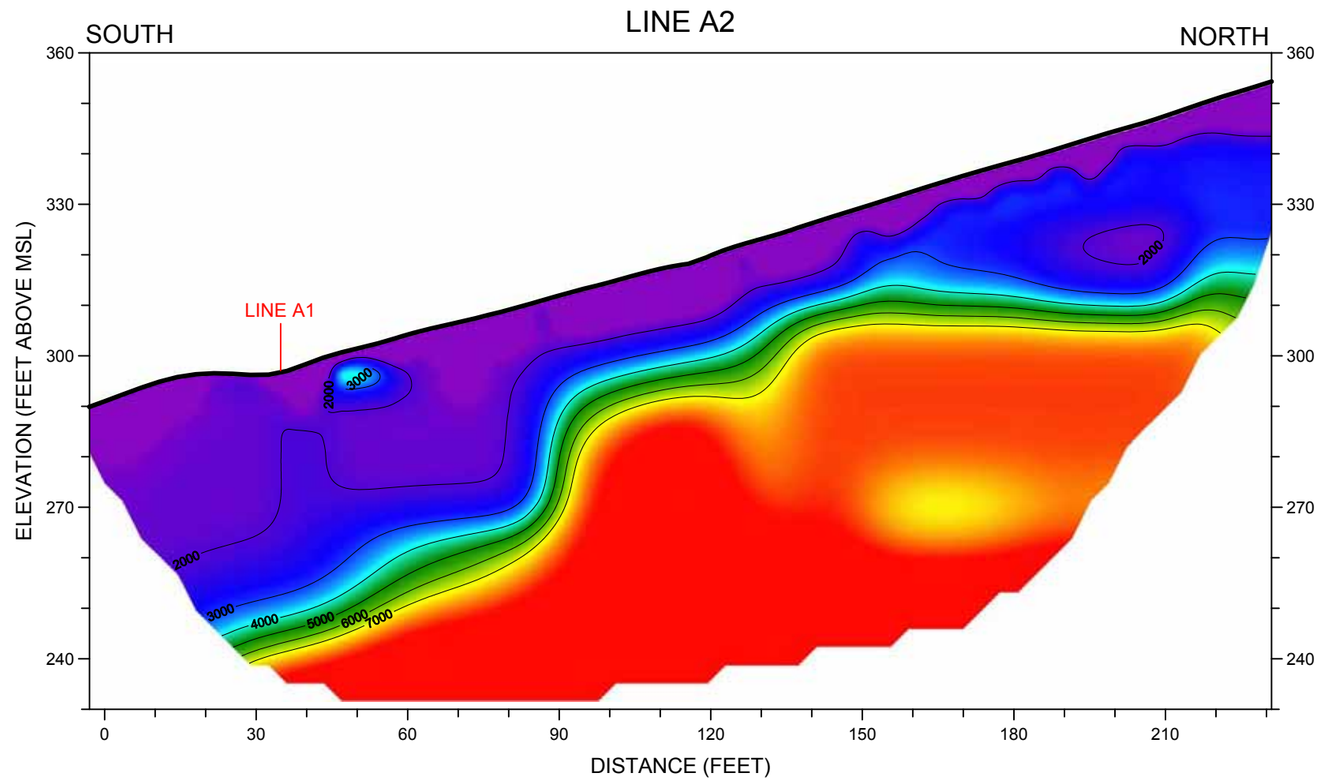
NORCAL GEOPHYSICAL CONSULTANTS INC.

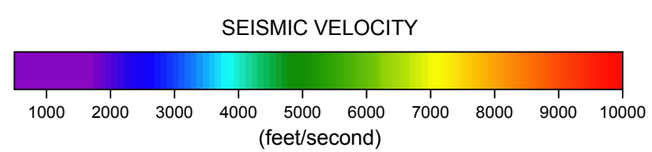
DATE: OCT. 2008

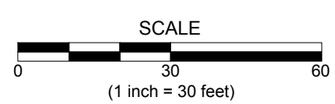
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE
2







NORCAL

SEISMIC REFRACTION PROFILE
LINE A2
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

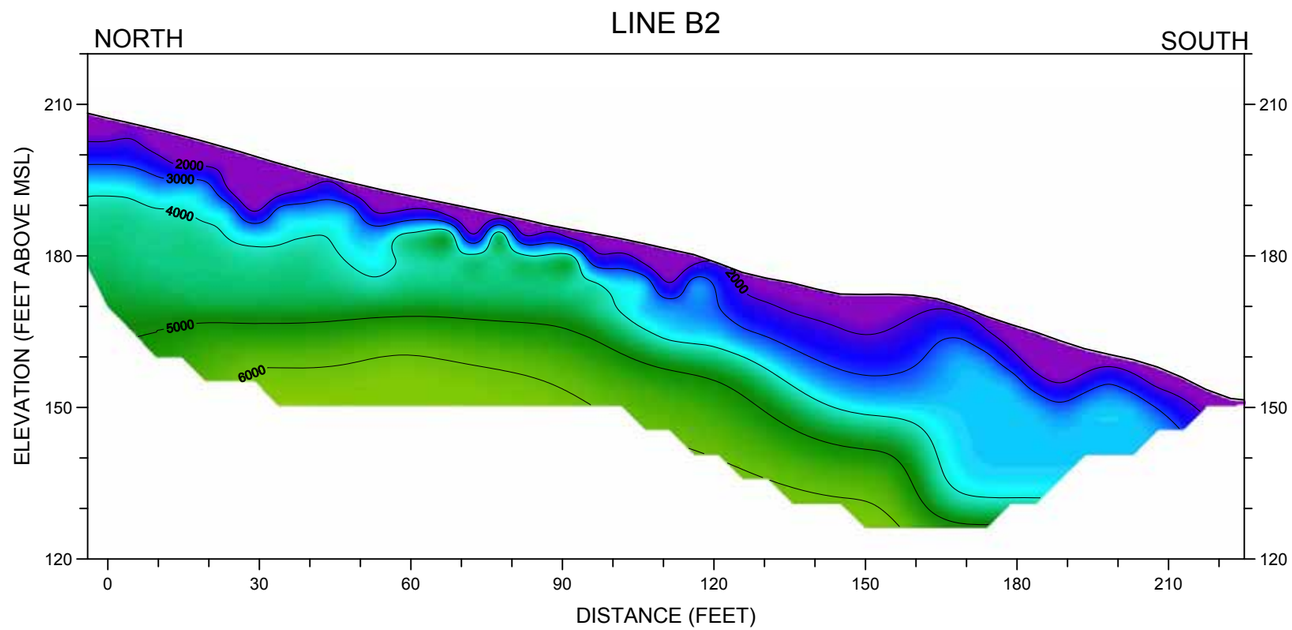
NORCAL GEOPHYSICAL CONSULTANTS INC.

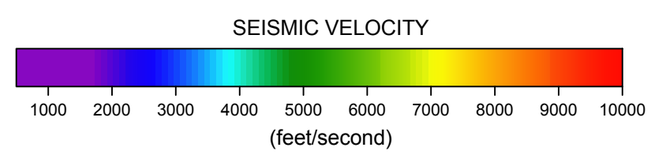
DATE: OCT. 2008

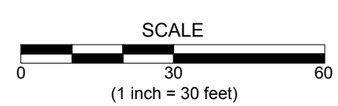
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE 3







NORCAL

SEISMIC REFRACTION PROFILE
LINE B2
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

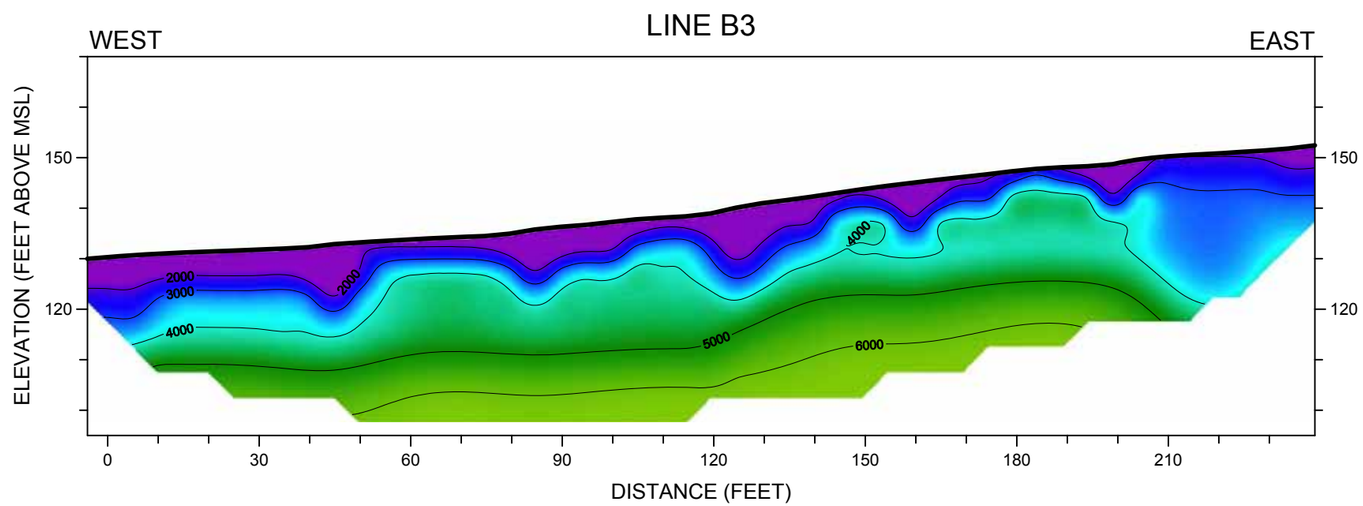
NORCAL GEOPHYSICAL CONSULTANTS INC.

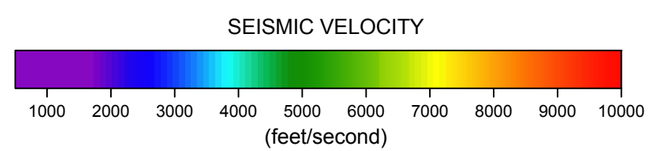
DATE: OCT. 2008

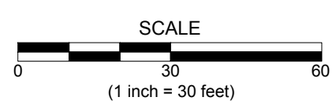
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE
4







NORCAL

SEISMIC REFRACTION PROFILE
LINE B3
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

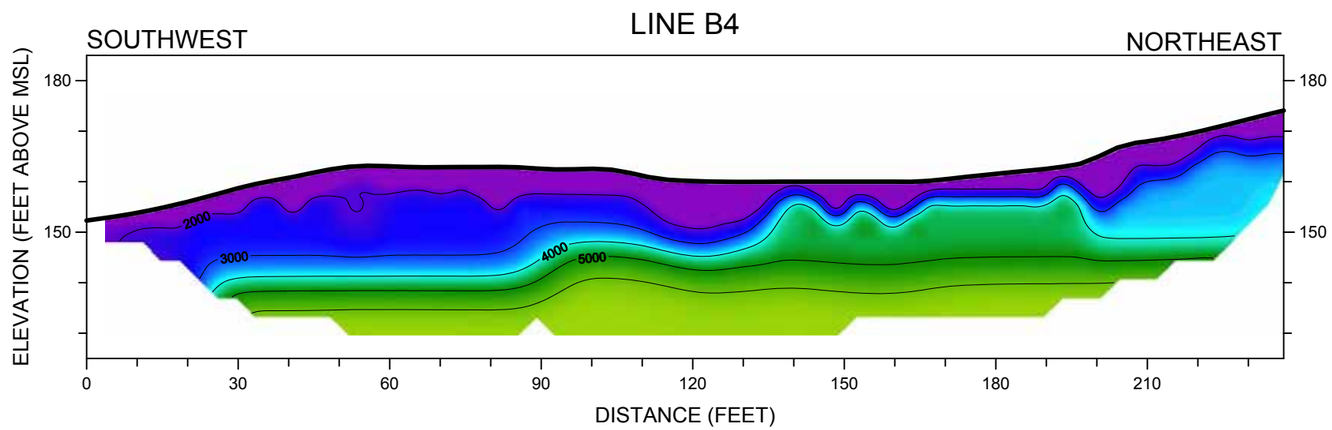
NORCAL GEOPHYSICAL CONSULTANTS INC.

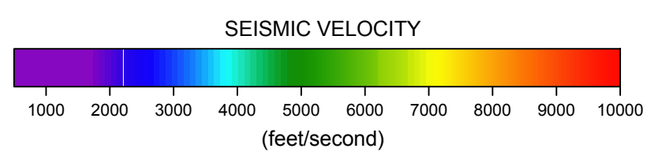
DATE: OCT. 2008

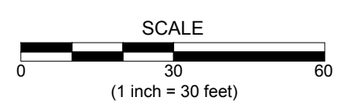
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE
5







NORCAL

SEISMIC REFRACTION PROFILE
LINE B4
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

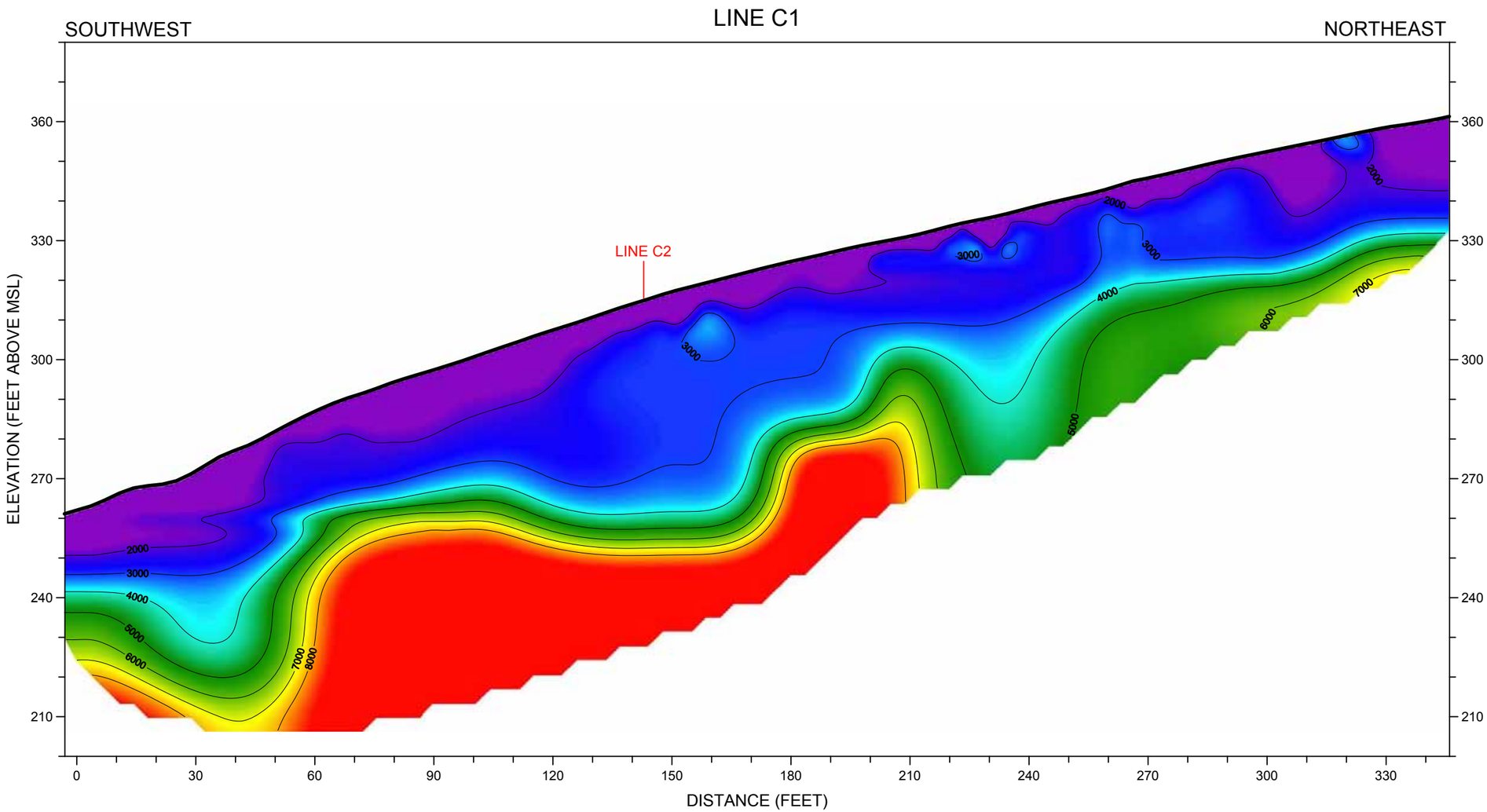
NORCAL GEOPHYSICAL CONSULTANTS INC.

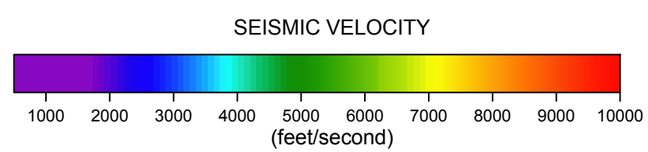
DATE: OCT. 2008

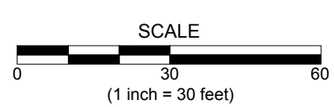
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE 6







NORCAL

SEISMIC REFRACTION PROFILE
LINE C1
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

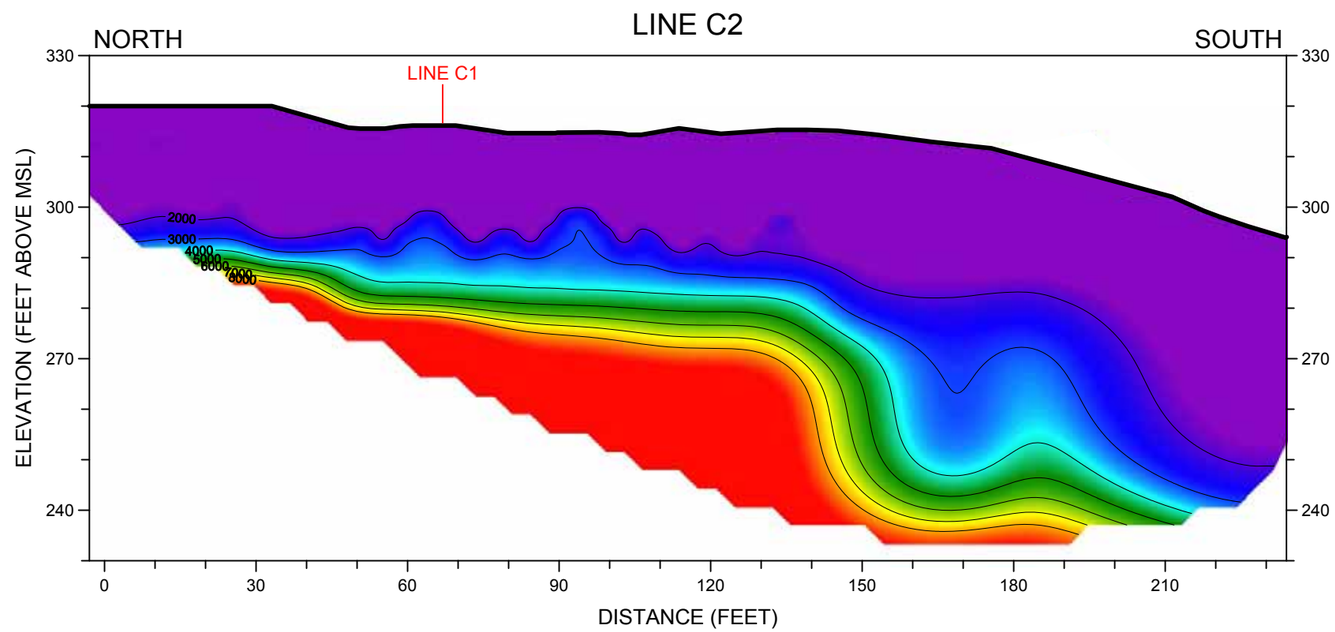
NORCAL GEOPHYSICAL CONSULTANTS INC.

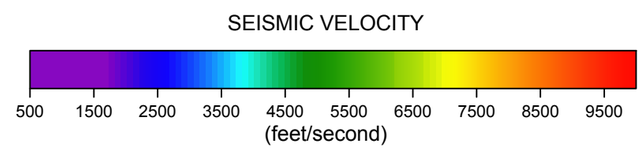
DATE: OCT. 2008

DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE 7





NORCAL

SEISMIC REFRACTION PROFILE
LINE C2
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

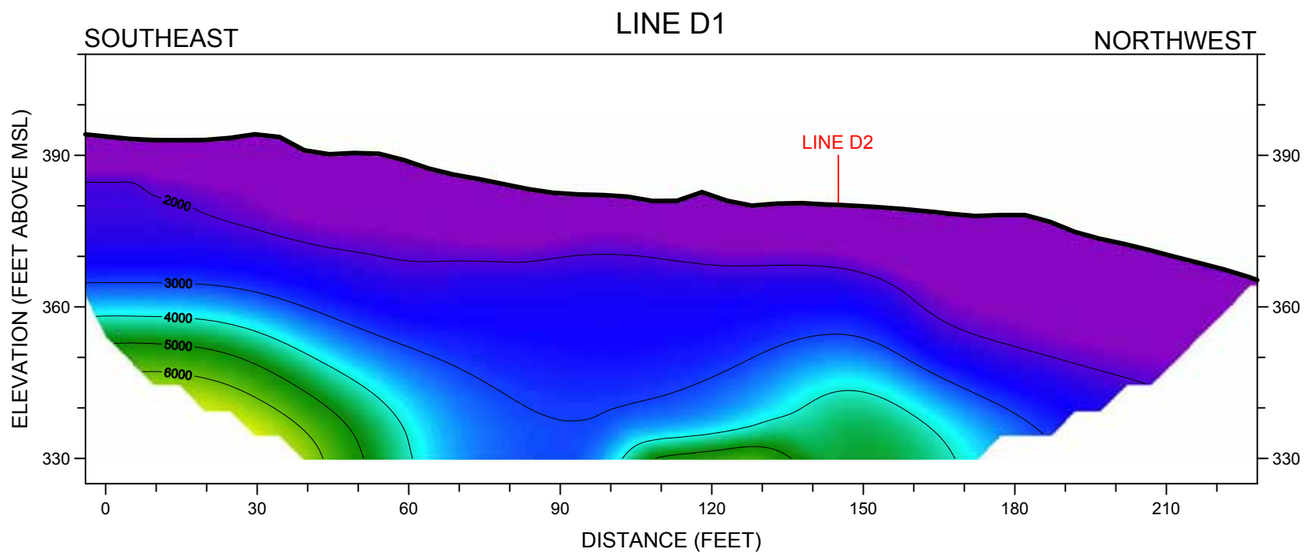
NORCAL GEOPHYSICAL CONSULTANTS INC.

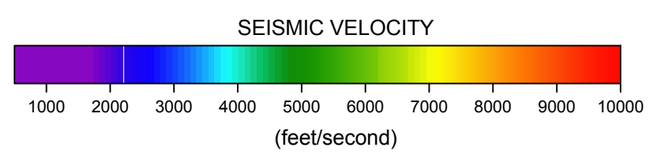
DATE: OCT. 2008

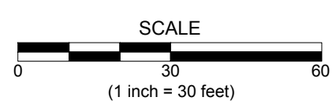
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE
8







NORCAL

SEISMIC REFRACTION PROFILE
LINE D1
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

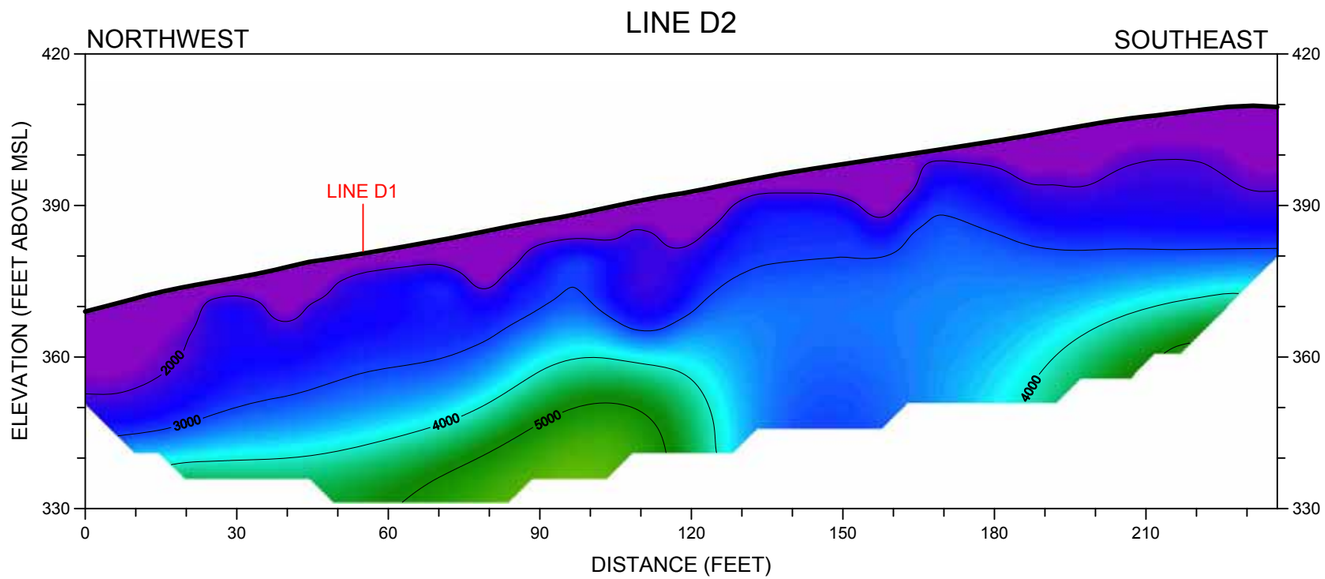
NORCAL GEOPHYSICAL CONSULTANTS INC.

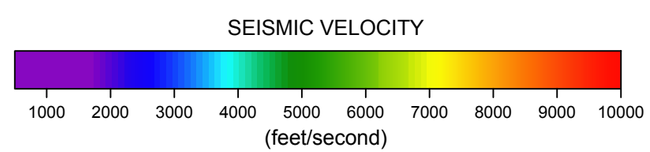
DATE: OCT. 2008

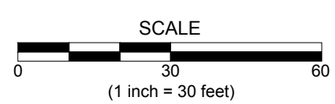
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE 9







NORCAL

SEISMIC REFRACTION PROFILE
LINE D2
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 08-428.11

NORCAL GEOPHYSICAL CONSULTANTS INC.

DATE: OCT. 2008

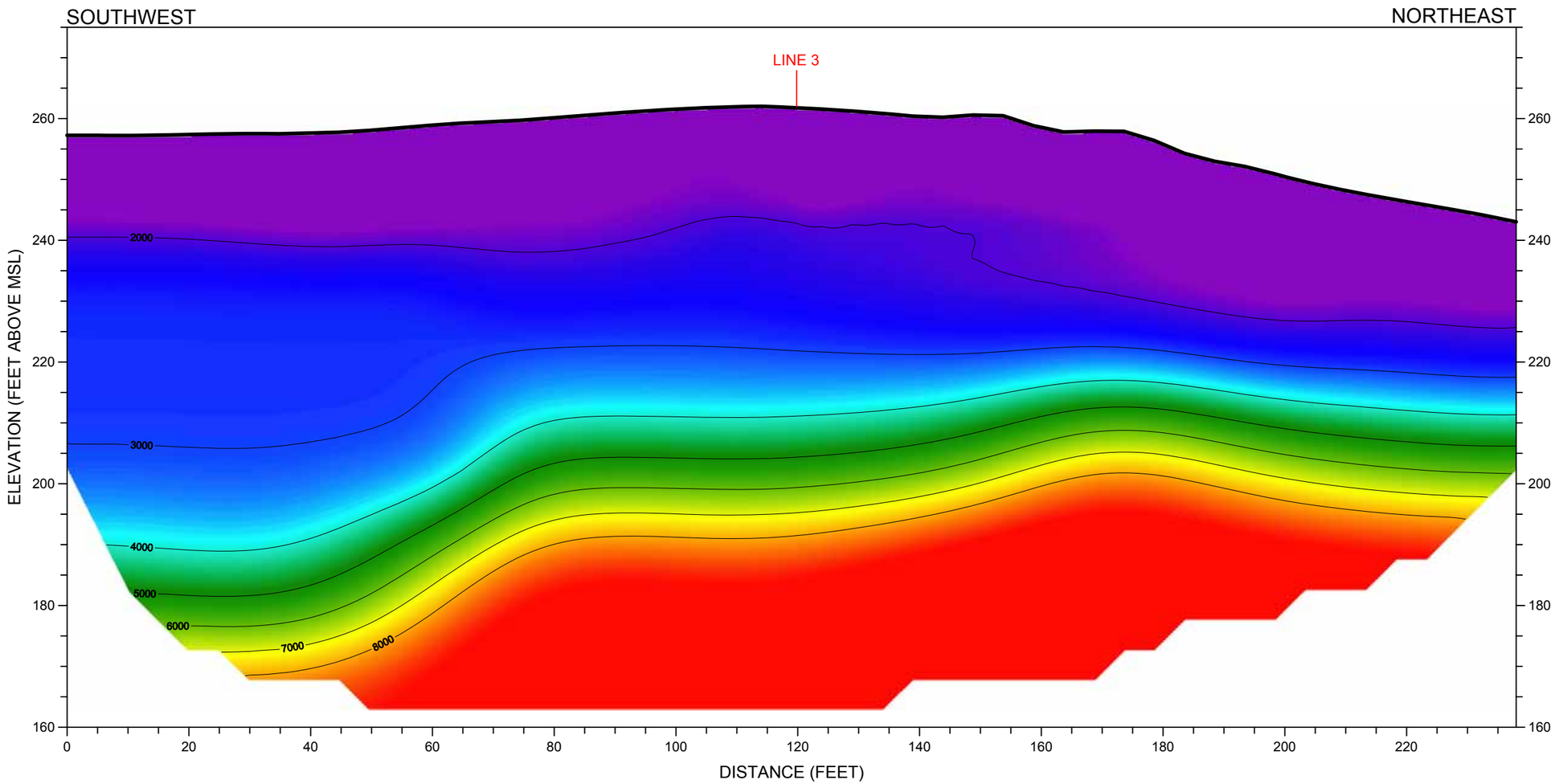
DRAWN BY: G.RANDALL

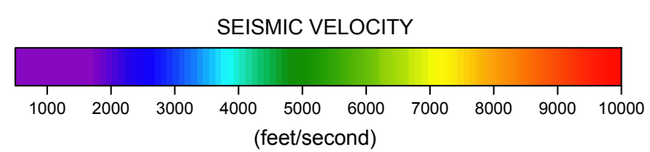
APPROVED BY: DTH

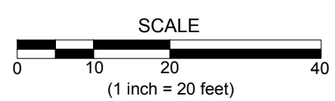
PLATE 10

RECENTLY PERFORMED PROFILES

(LINES 1 TO 5, NORCAL GEOPHYSICAL)







DRAFT

NORCAL

SEISMIC REFRACTION PROFILE
LINE 1 - SR:355+00
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 09-428.12

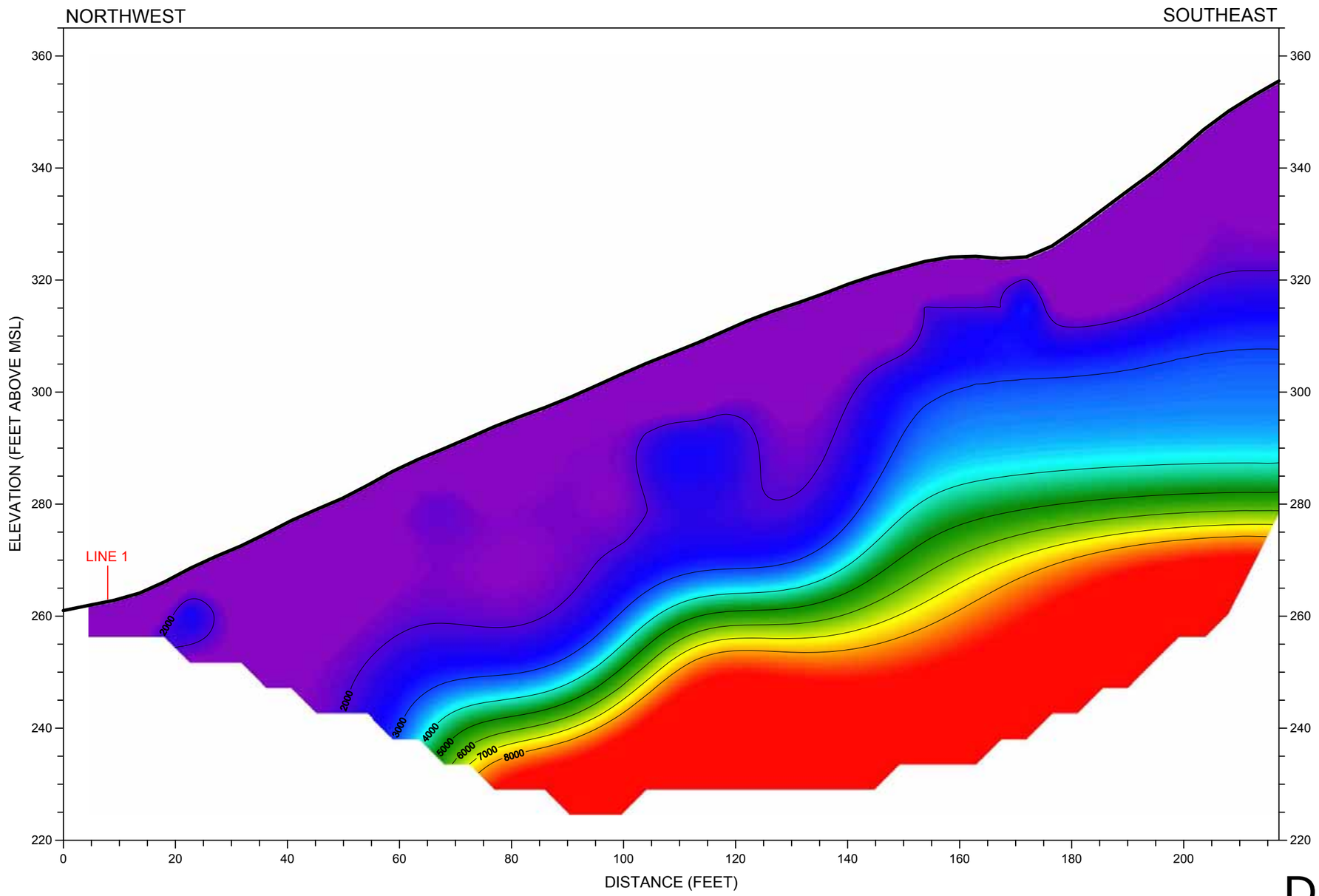
NORCAL GEOPHYSICAL CONSULTANTS INC.

DATE: MAR. 2009

DRAWN BY: G.RANDALL

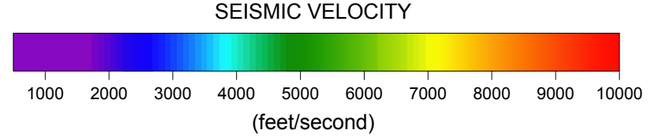
APPROVED BY: DTH

PLATE 2

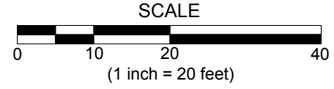


DRAFT

SEISMIC VELOCITY



SCALE



NORCAL

SEISMIC REFRACTION PROFILE
LINE 2 - SR:355+00
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 09-428.12

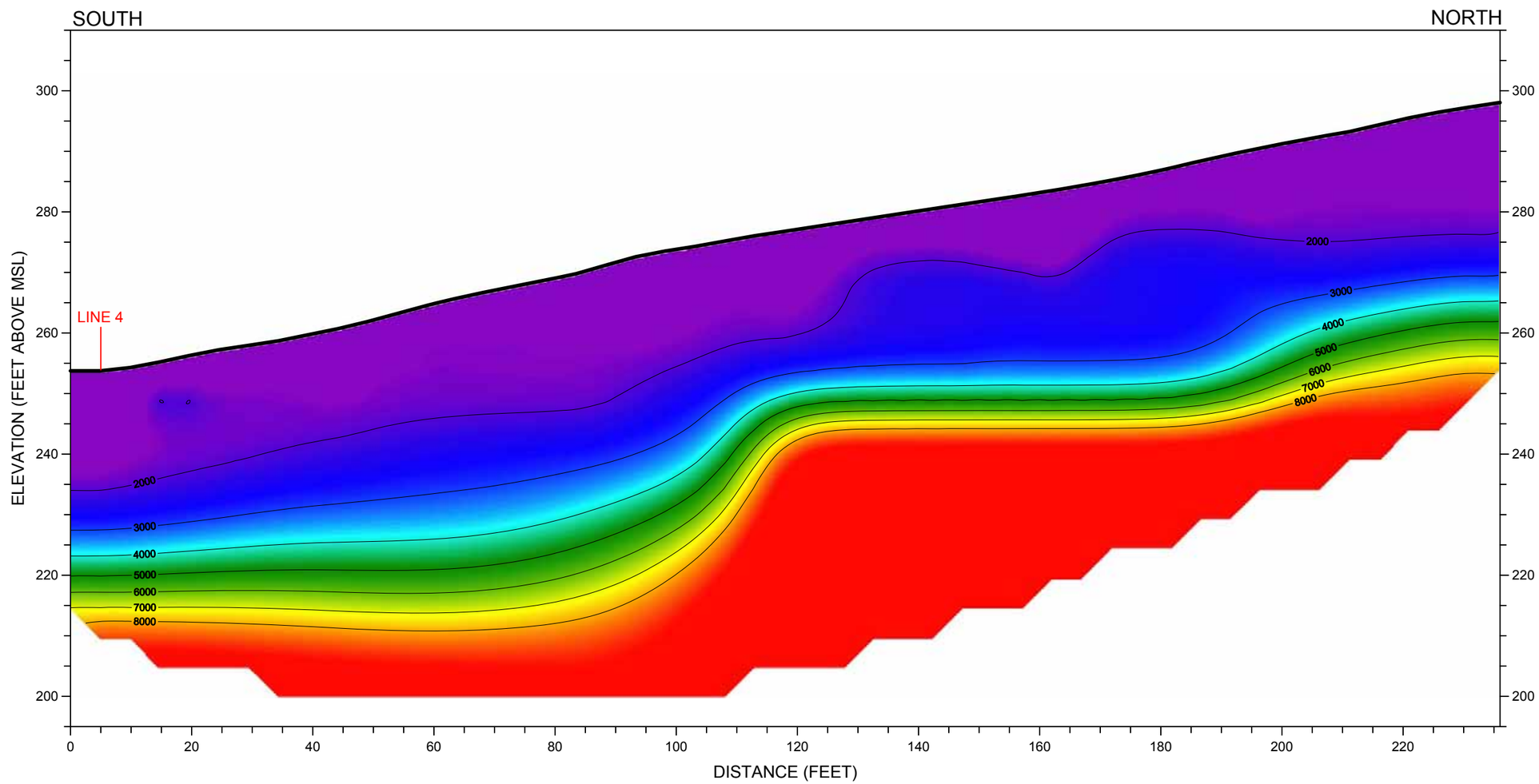
NORCAL GEOPHYSICAL CONSULTANTS INC.

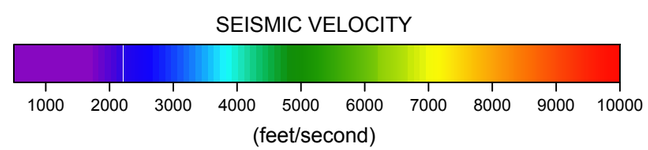
DATE: MAR. 2009

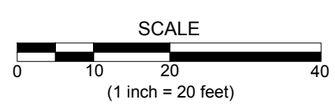
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE 3







DRAFT

NORCAL

SEISMIC REFRACTION PROFILE
LINE 3 - SR:321+25
JAMESON CANYON - HIGHWAY 12

LOCATION: NAPA COUNTY, CALIFORNIA

CLIENT: PARIKH CONSULTANTS

JOB #: 09-428.12

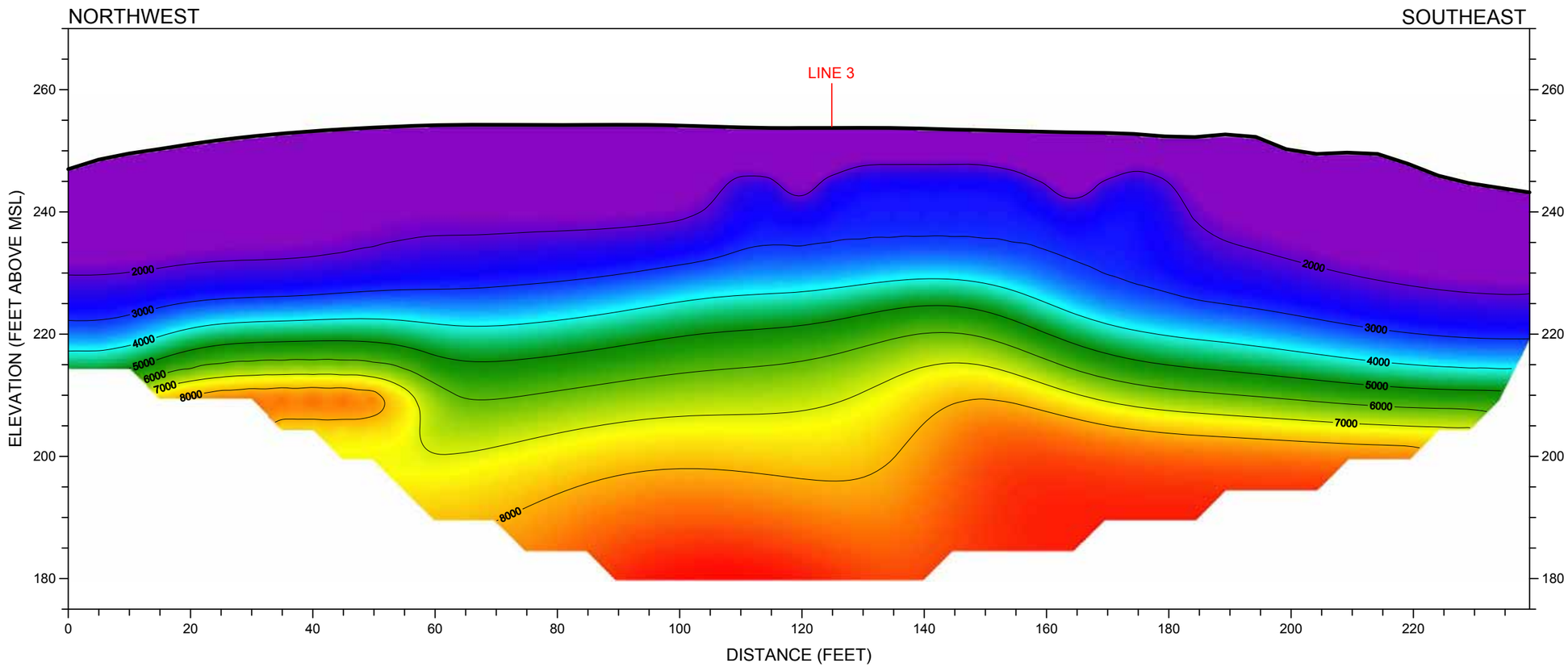
NORCAL GEOPHYSICAL CONSULTANTS INC.

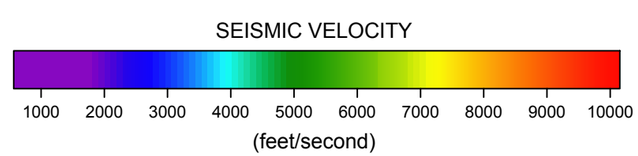
DATE: MAR. 2009

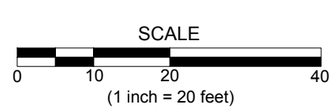
DRAWN BY: G.RANDALL

APPROVED BY: DTH

PLATE 4

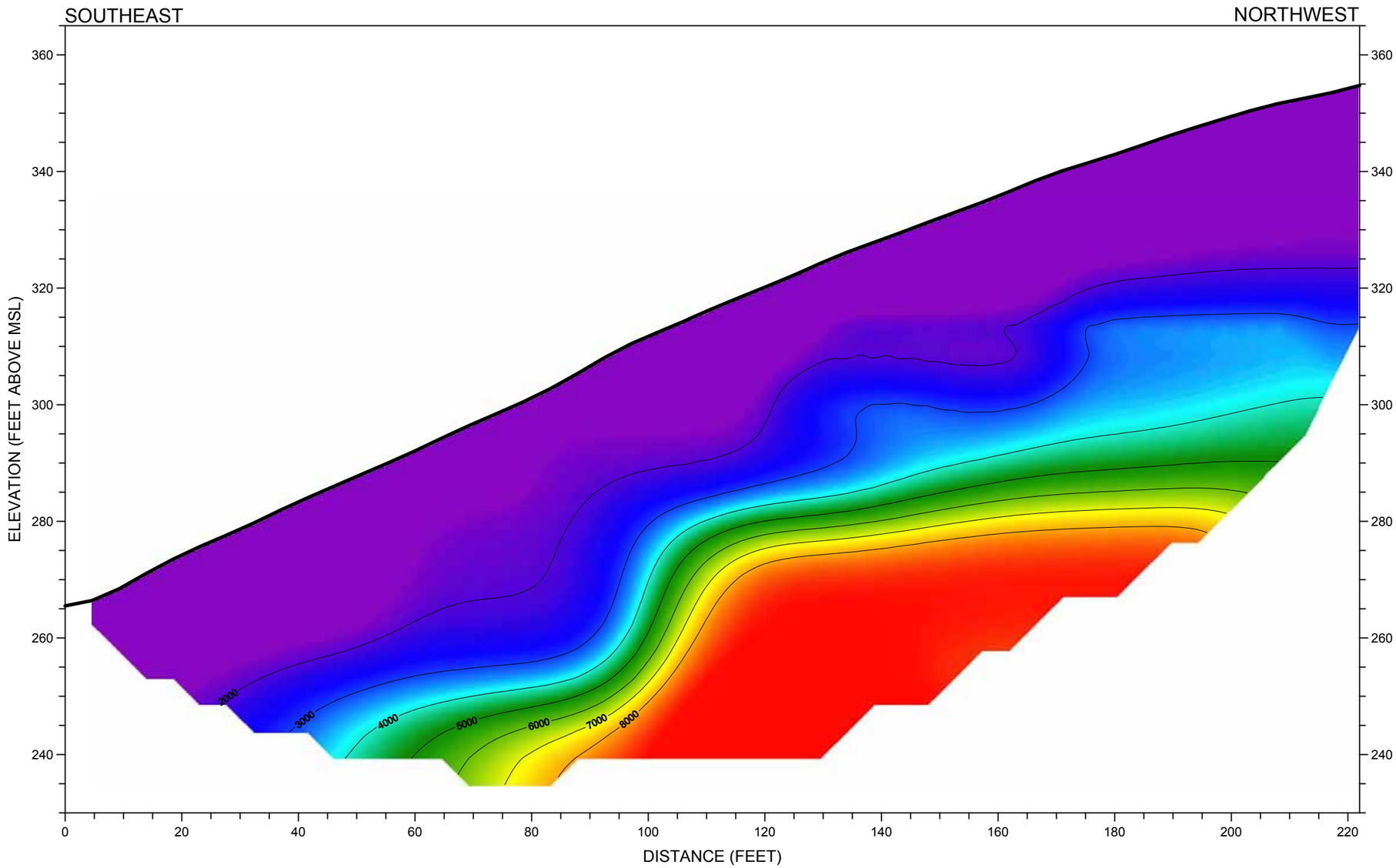






DRAFT

NORCAL	SEISMIC REFRACTION PROFILE LINE 4 - SR:321+25 JAMESON CANYON - HIGHWAY 12		
	LOCATION: NAPA COUNTY, CALIFORNIA		
	CLIENT: PARIKH CONSULTANTS		PLATE
JOB #: 09-428.12	NORCAL GEOPHYSICAL CONSULTANTS INC.		5
DATE: MAR. 2009	DRAWN BY: G.RANDALL	APPROVED BY: DTH	



SEISMIC VELOCITY

1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

(feet/second)

SCALE

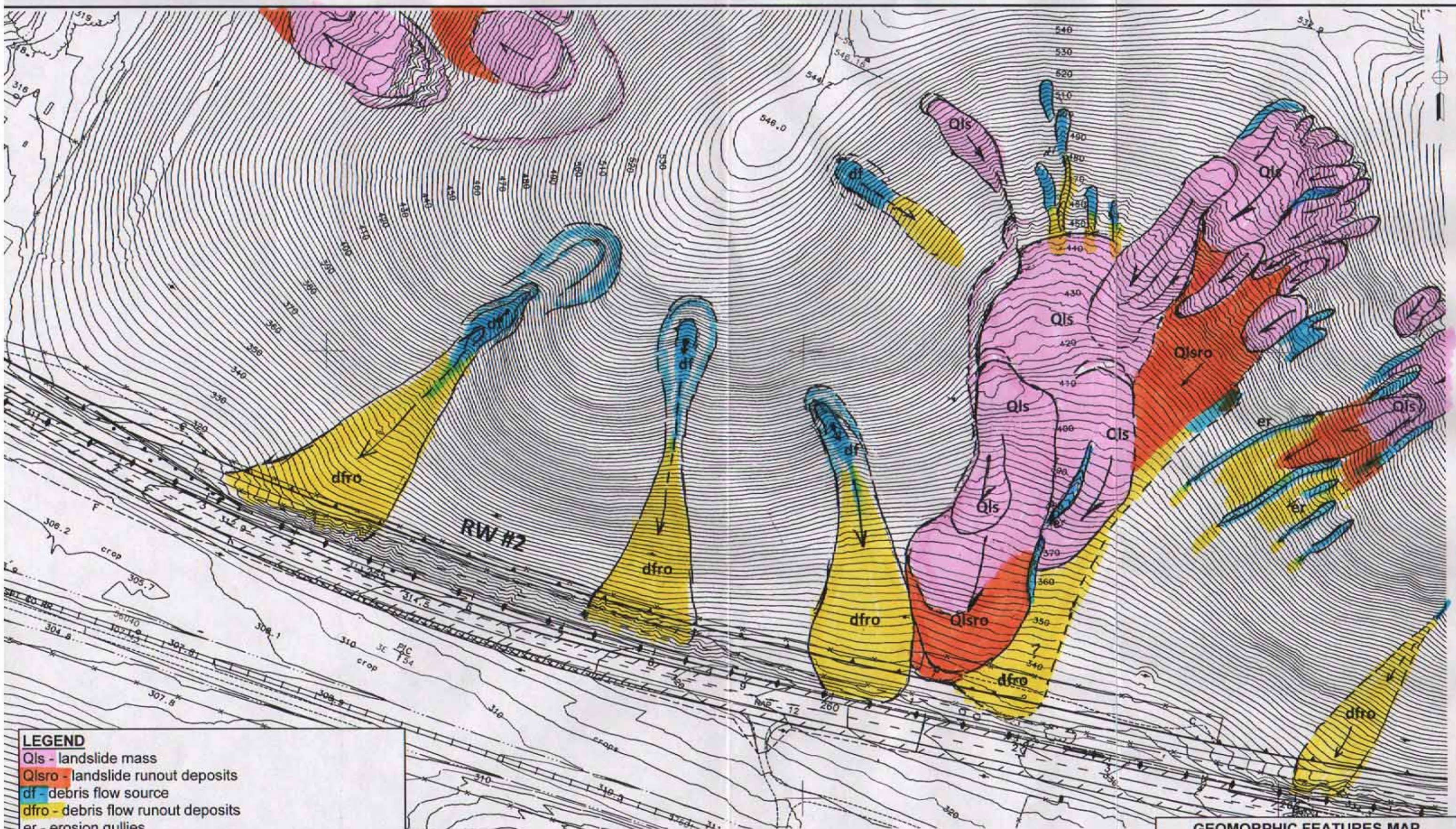
0 10 20 40

(1 inch = 20 feet)

DRAFT

NORCAL	SEISMIC REFRACTION PROFILE LINE 5 - SR:314+50 JAMESON CANYON - HIGHWAY 12		
	LOCATION: NAPA COUNTY, CALIFORNIA		
	CLIENT: PARIKH CONSULTANTS		PLATE
JOB #: 09-428.12	NORCAL GEOPHYSICAL CONSULTANTS INC.		6
DATE: MAR. 2009	DRAWN BY: G.RANDALL	APPROVED BY: DTH	

APPENDIX E



LEGEND

Qls - landslide mass
Qlsro - landslide runout deposits
df - debris flow source
dfro - debris flow runout deposits
er - erosion gullies

SOURCE

Topography data provided by Mark Thomas & Co.

0 100 200 300 400 500 Feet

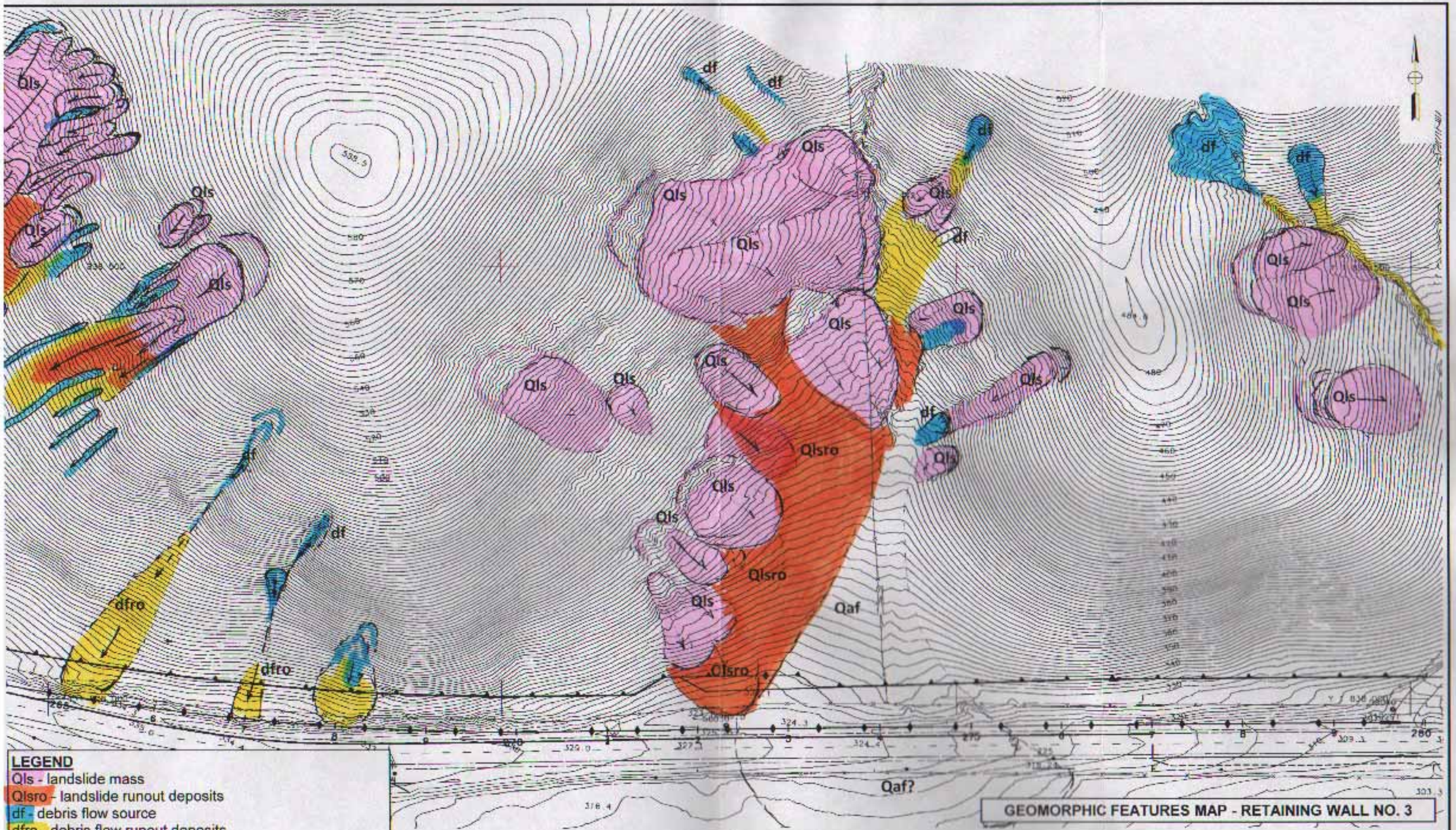
GEOMORPHIC FEATURES MAP

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA COUNTY, CALIFORNIA

208117.MAT

PLATE NO.: E-1



LEGEND

Qls - landslide mass
Qlsro - landslide runout deposits
df - debris flow source
dfro - debris flow runout deposits
er - erosion gullies
Qaf - alluvial fan deposits

SOURCE

Topography data provided by Mark Thomas & Co.

SCALE: 1" = 100'

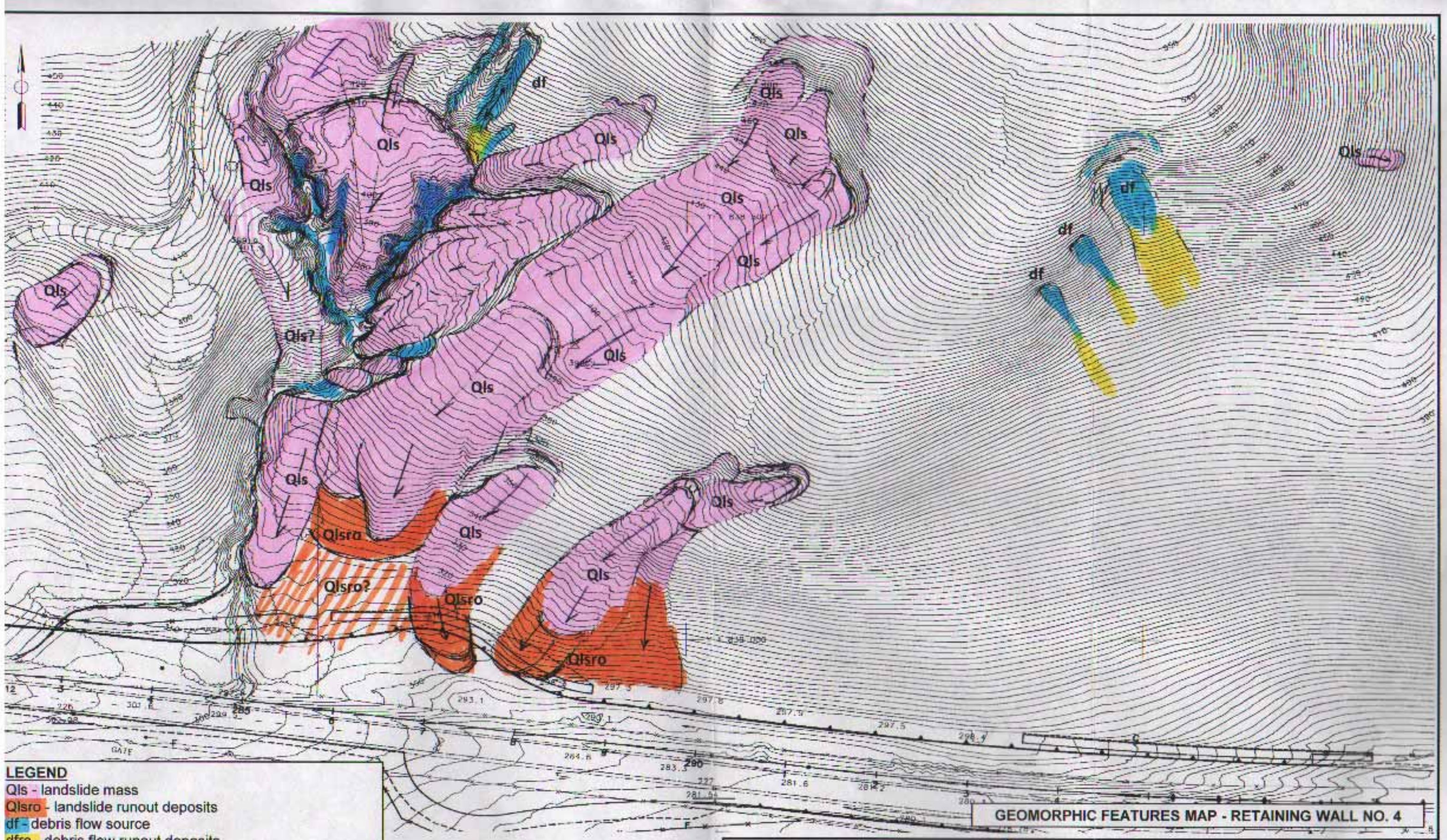
GEOMORPHIC FEATURES MAP - RETAINING WALL NO. 3

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: E-2



LEGEND

Qls - landslide mass
Qlsro - landslide runout deposits
df - debris flow source
dfro - debris flow runout deposits
er - erosion gullies

SOURCE

Topography data provided by Mark Thomas & Co.

SCALE: 1" = 100'

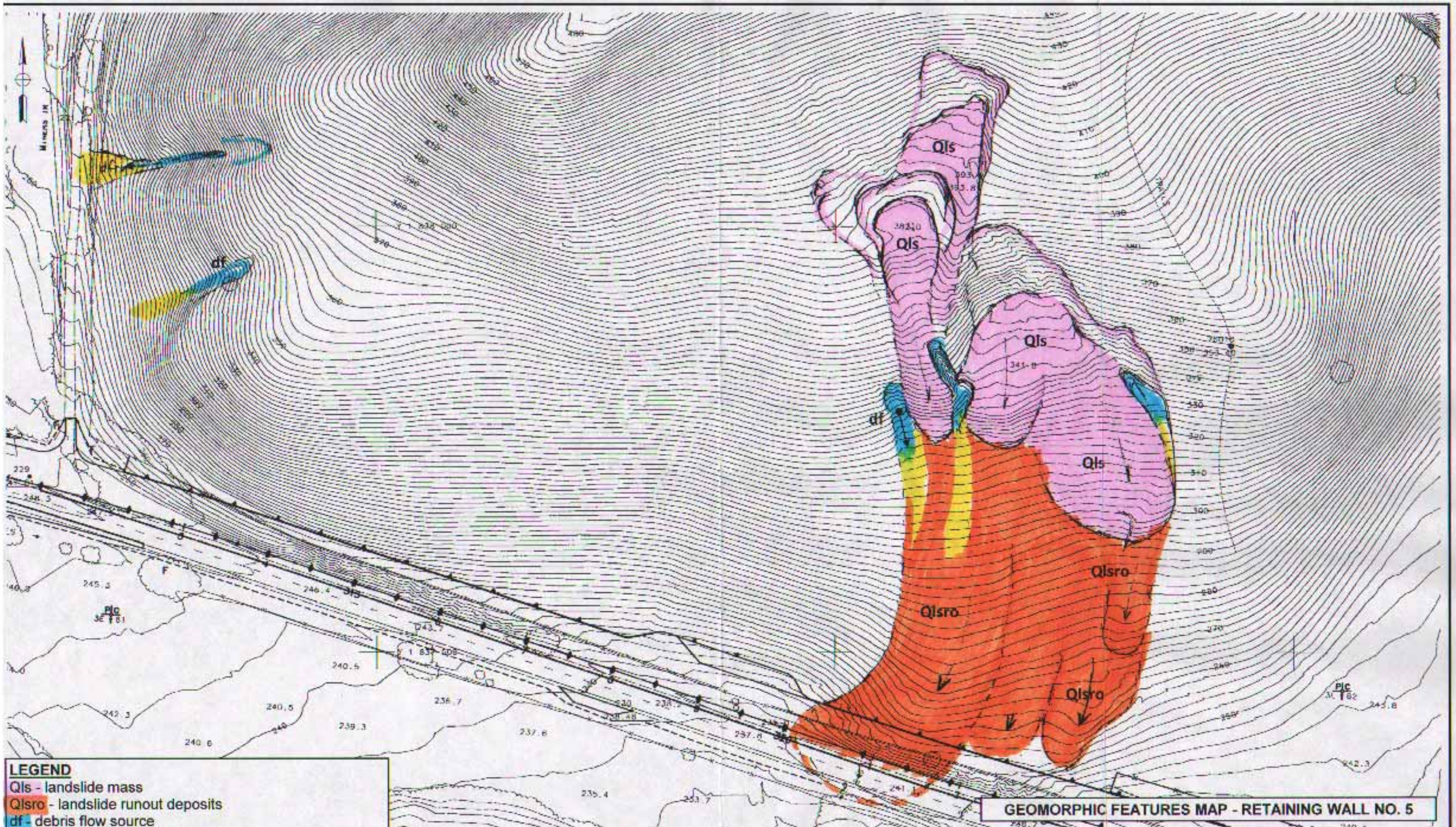
GEOMORPHIC FEATURES MAP - RETAINING WALL NO. 4

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: E-3



LEGEND

Qls - landslide mass
Qlsro - landslide runout deposits
df - debris flow source
dfro - debris flow runout deposits
er - erosion gullies

SOURCE

Topography data provided by Mark Thomas & Co.

SCALE: 1" = 100'

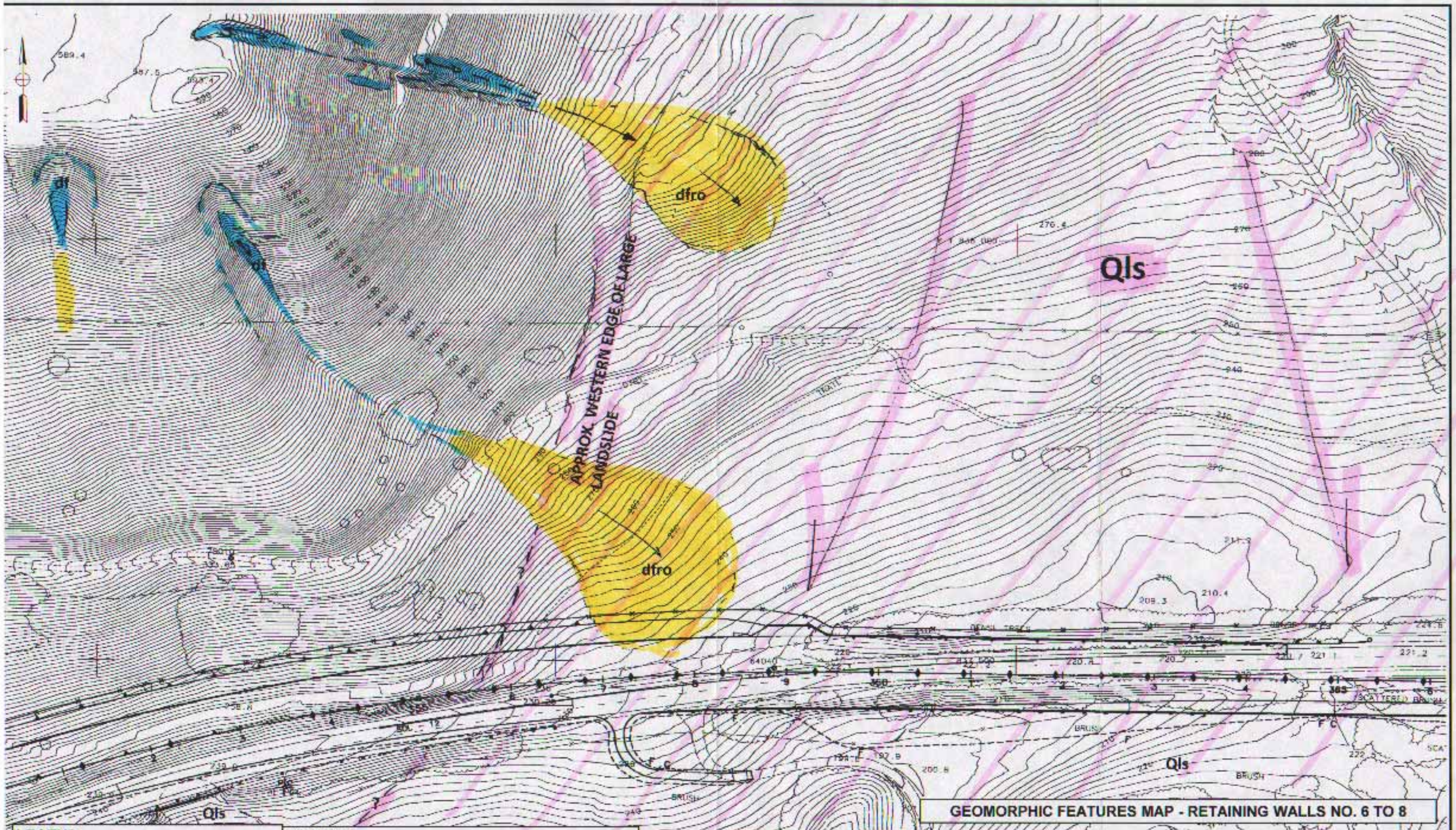
GEOMORPHIC FEATURES MAP - RETAINING WALL NO. 5

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: E-4



GEOMORPHIC FEATURES MAP - RETAINING WALLS NO. 6 TO 8

LEGEND
Qls - landslide mass
Qlsro - landslide runout deposits
df - debris flow source
dfro - debris flow runout deposits
er - erosion gullies

SOURCE
Topography data provided by Mark Thomas & Co.

SCALE: 1" = 100'

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: E-5

"SLIDE REPAIR" (CALTRANS, 1980)

Qls

Qlsro

df

dfro

Qal

LEGEND

Qls - landslide mass
Qlsro - landslide runout deposits
df - debris flow source
dfro - debris flow runout deposits
er - erosion gullies

SOURCE

1. Topography data provided by Mark Thomas & Co.
2. As-Built Plans, Slide Repair, Caltrans 1980

SCALE: 1" = 100'

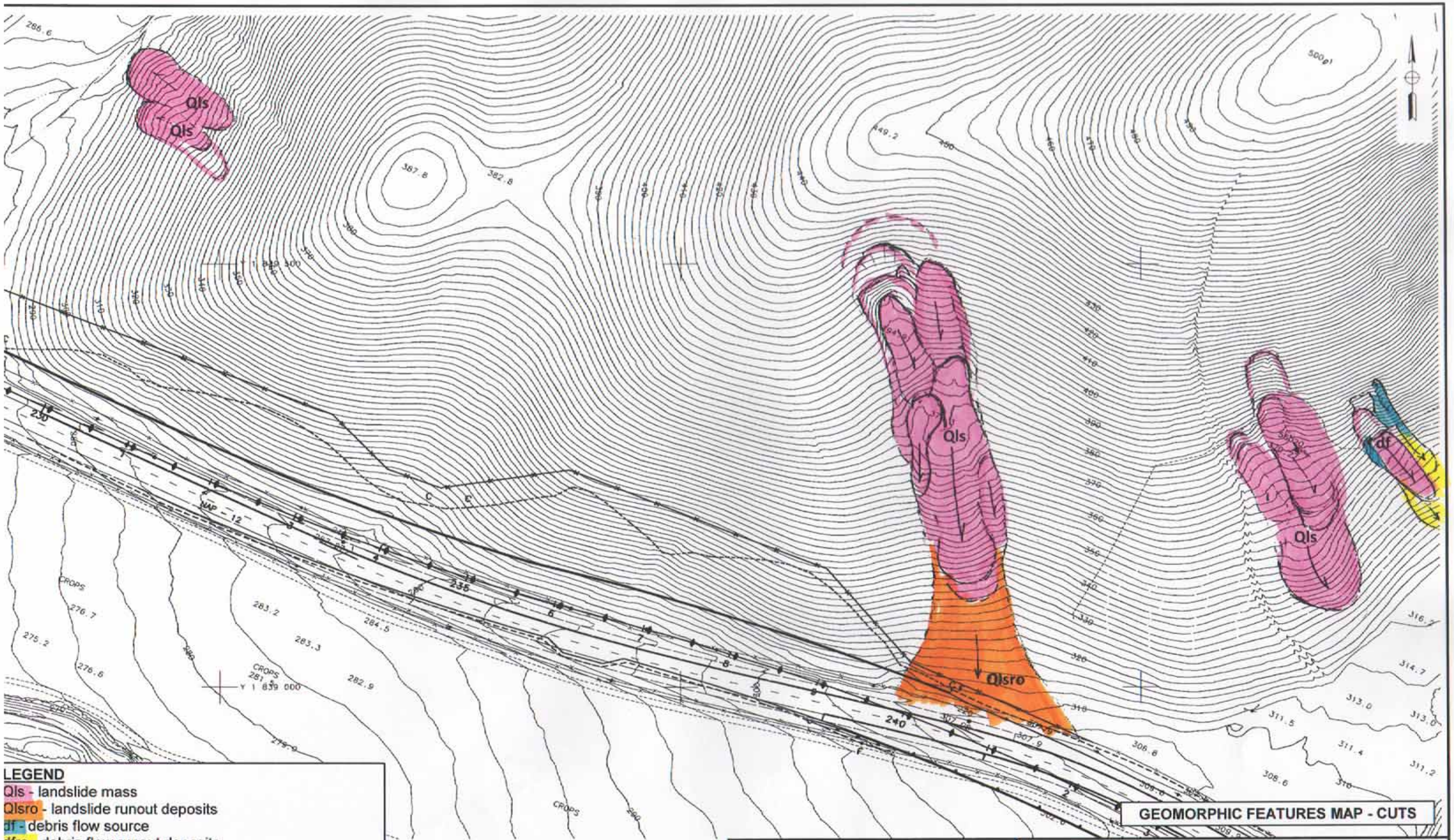
PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

GEOMORPHIC FEATURES MAP - CUTS

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: E-6



LEGEND

Qls - landslide mass
Qlsro - landslide runout deposits
df - debris flow source
dfro - debris flow runout deposits
er - erosion gullies

SOURCE

Topography data provided by Mark Thomas & Co.

SCALE: 1" = 100'

GEOMORPHIC FEATURES MAP - CUTS

PARIKH CONSULTANTS, INC.
GEOTECHNICAL CONSULTANTS
MATERIALS TESTING

JAMESON CANYON ROAD WIDENING PROJECT
NAPA/SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: E-7

APPENDIX F

Appendix F - Geologic Structure: Bedding, Faults, & Folds

Within the project vicinity, four published geologic maps (at a scale of 1 inch equals 2000 feet) show four different interpretations of the structural features (units, bedding, folds, and faults) in the Cordelia Quadrangle. In chronological order, they are:

- Manson, M.W.; (1988); "Geologic Map" (PLATE 13C) in Landslide Hazards in the Cordelia-Vallejo Area, Solano and Napa Counties, California; Division of Mines and Geology; Open-File Report 88-22.

- Graymer, R.W.; Brabb, E.E.; and Jones, D.L.; (1999); Geology of the Cordelia and the northern part of the Benicia 7.5 minute quadrangles, California: a digital map database; USGS Open-File Report 99-162.

- Bezore, S.P.; Randolph, C.E., Sowers, J.M., and Wagner, D.L.; (2002); Geologic Map of the Cordelia and Fairfield South 7.5' Quadrangles, Solano and Napa Counties, California; California Geological Survey CD 2002-07.

- Dibblee, T.W.; (2006*); Geologic Map of the Cordelia and Fairfield South Quadrangles, Napa and Solano Counties, California; (*published posthumously, edited by Minch, J.A., based on original field mapping by Dibblee, T.W.; 1977); Santa Barbara Museum of Natural History; Dibblee Geology Center Map # DF-190.

We present the map by Bezore, et. al. as the primary source of the geology discussion in this report. However, the map by Bezore differs from the other three maps in several significant ways.

Bezore's (2002) geologic map shows a number of bedding plane attitudes, faults, and fold axes that strike across the alignment of the project. However, there are several other published geologic maps that do not show those features and include others that are not

indicated on Bezore's map. These differences reflect different observations and interpretations made by different geologists. Under these circumstances, the uncertainty is large.

Beneath the eastern portion of the project, the map by Bezore (2002) indicates Miocene-age San Pablo Group ("Tsp"), to the west, is in depositional contact upon Eocene-age Markeley Formation ("Tmk"), to the east.

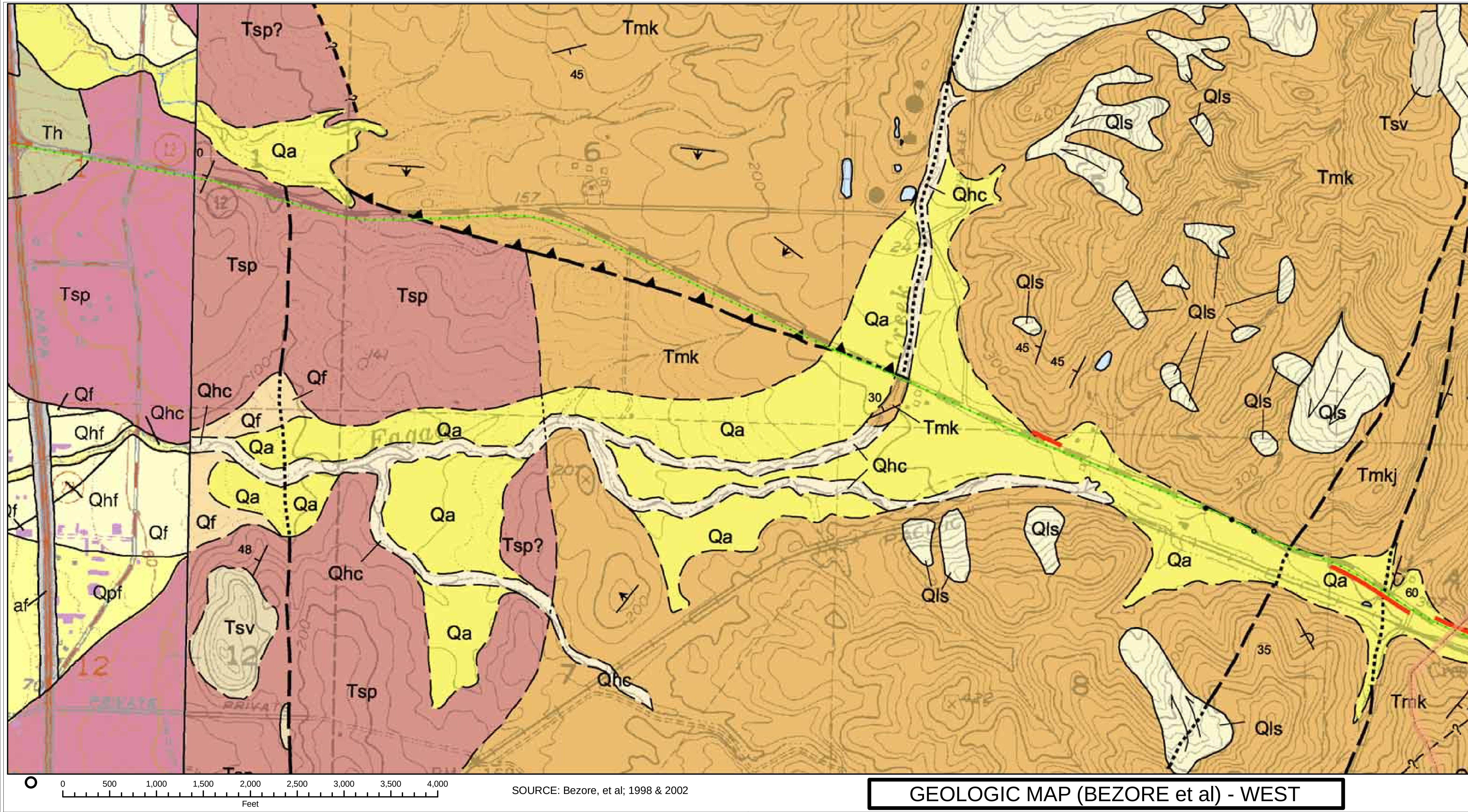
In contrast with Bezore's map, the map by Manson (1988) shows Miocene-age Briones Sandstone ("Tb") to the west, in contact upon the Eocene-age Markeley Sandstone member of the Kreyenhagen Formation to the east, without a fault (Refer to late F-2 (WEST)). That depositional contact is shown as crossing beneath Highway 12 at Station 156+00 by Manson. In addition, Manson mapped the axis of a syncline trending northeast beneath Station 161+50.

In additional contrast with Bezore's map, the map by Graymer, et. al. (1999) shows Cierbo Sandstone ("Tc") to the west, in contact with Markeley Sandstone ("Tmk") to the east, along a fault that passes beneath Highway12 at Station 117+50. The surface trace of a thrust fault similar to the one shown on Bezore's map is shown on Graymer's map as running entirely north of Highway 12 (i.e. not crossing beneath it). (Refer to PLATE F-3 (WEST))

Also in contrast with Bezore's map, Dibblee's (2006) map does not show any faults beneath the eastern portion of the project area. Markeley Sandstone Member of the Eocene-age Kreyenhagen Formation ("Tkm") is shown as the bedrock underlying most of the project area with Monterey Formation ("Tms") underlying the easternmost portion of the project area (east of Station 117+00). The contact is represented as depositional without faulting and striking approximately 20 degrees west of north where it crosses beneath Highway 12.

All four geologic maps show a large landslide (1600 to 2800 feet wide) on the south-facing hillside at the eastern end of the project. Although, the maps differ somewhat on the exact location of the western edge of the slide where Route 12 crosses it. (Refer to Plates F-1 (EAST), F-2 (EAST), F-3 (EAST), F-4 (EAST).)

Where there are no surface exposures and no definitive subsurface data that would allow us to confirm or deny the existence of features presented on those four published geologic maps, we are unable to determine if the inferred conditions actually exist. On the other hand, we have no evidence that any of the mapped faults or folds are "active" in the sense that future movements (fault rupture or fold growth) could be of an amount and rate that might adversely affect the proposed improvements. Where such adverse geologic conditions become exposed during construction, potential localized instabilities may need to be mitigated by temporary measures until wall construction can be completed.



SOURCE: Bezore, et al; 1998 & 2002

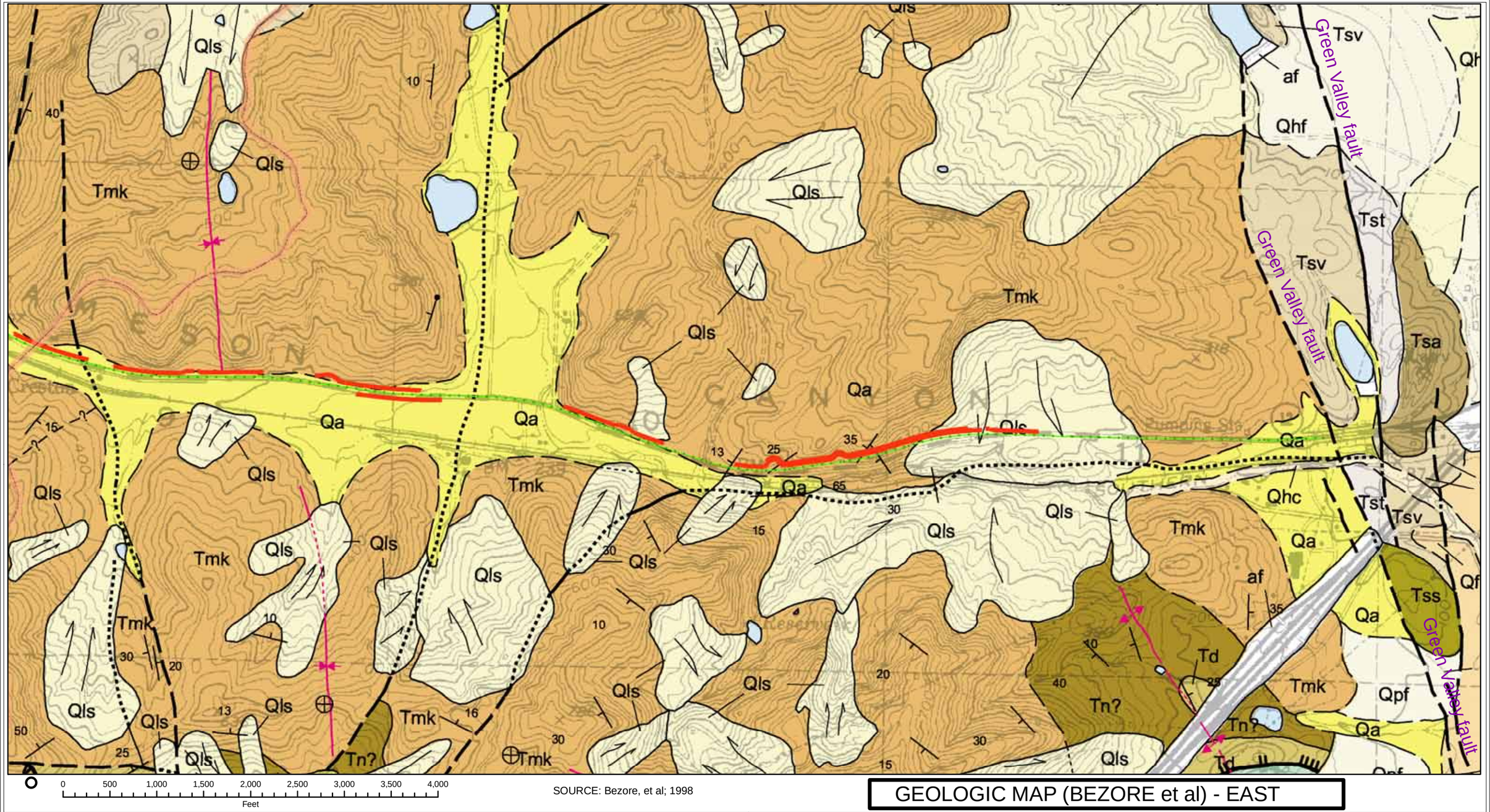
GEOLOGIC MAP (BEZORE et al) - WEST

PARIKH CONSULTANTS, INC.

ROUTE 12 / JAMESON CANYON ROAD WIDENING PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: F-1 (WEST)



SOURCE: Bezore, et al; 1998

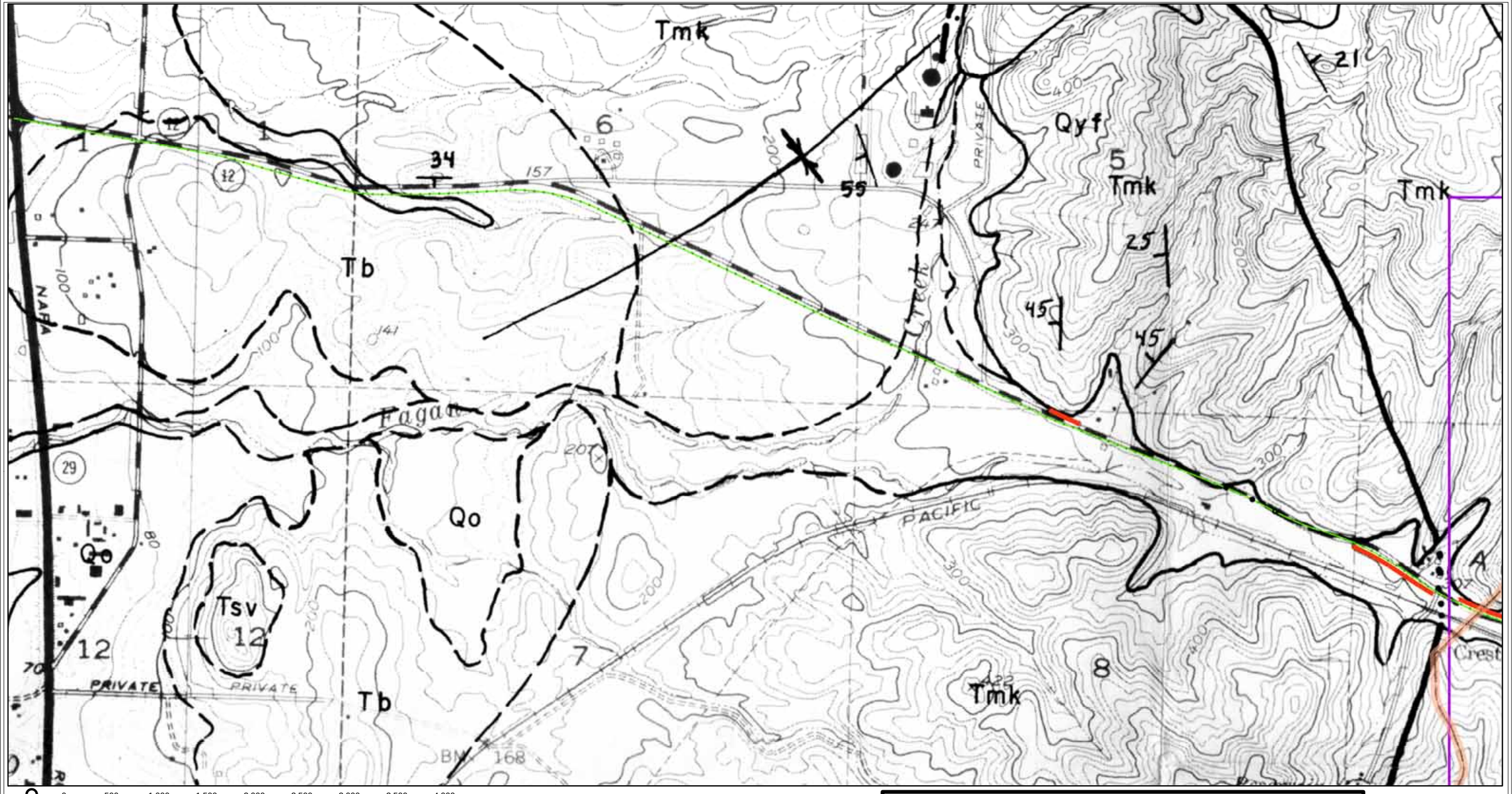
GEOLOGIC MAP (BEZORE et al) - EAST

PARIKH CONSULTANTS, INC.

ROUTE 12 / JAMESON CANYON ROAD WIDENING PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: F-1 (EAST)



0 500 1,000 1,500 2,000 2,500 3,000 3,500 4,000
Feet

SOURCE: Manson; 1988

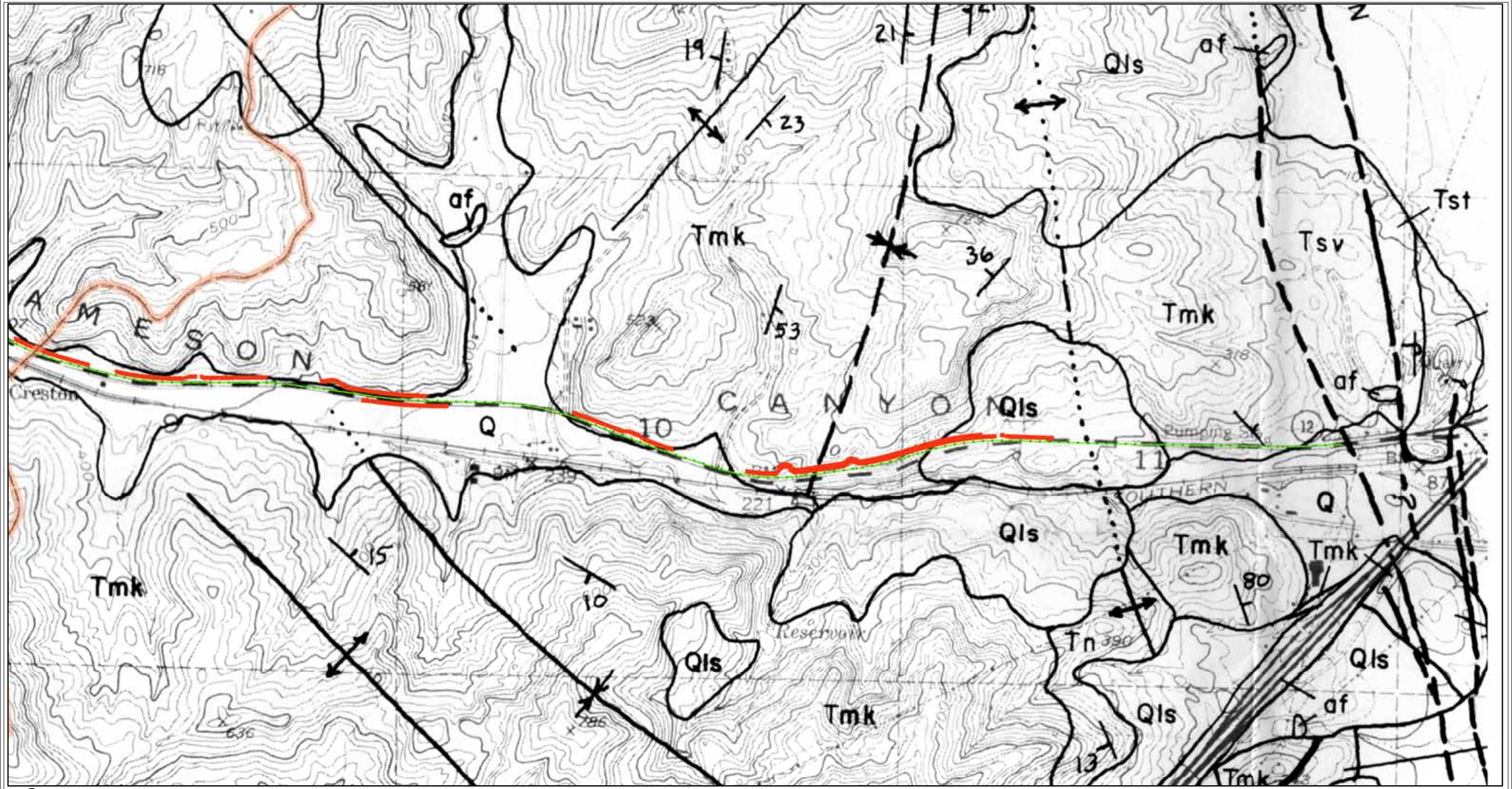
GEOLOGIC MAP (Manson) - WEST

PARIKH CONSULTANTS, INC.

ROUTE 12 / JAMESON CANYON ROAD WIDENING PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: F-2 (WEST)



SOURCE: Manson; 1988

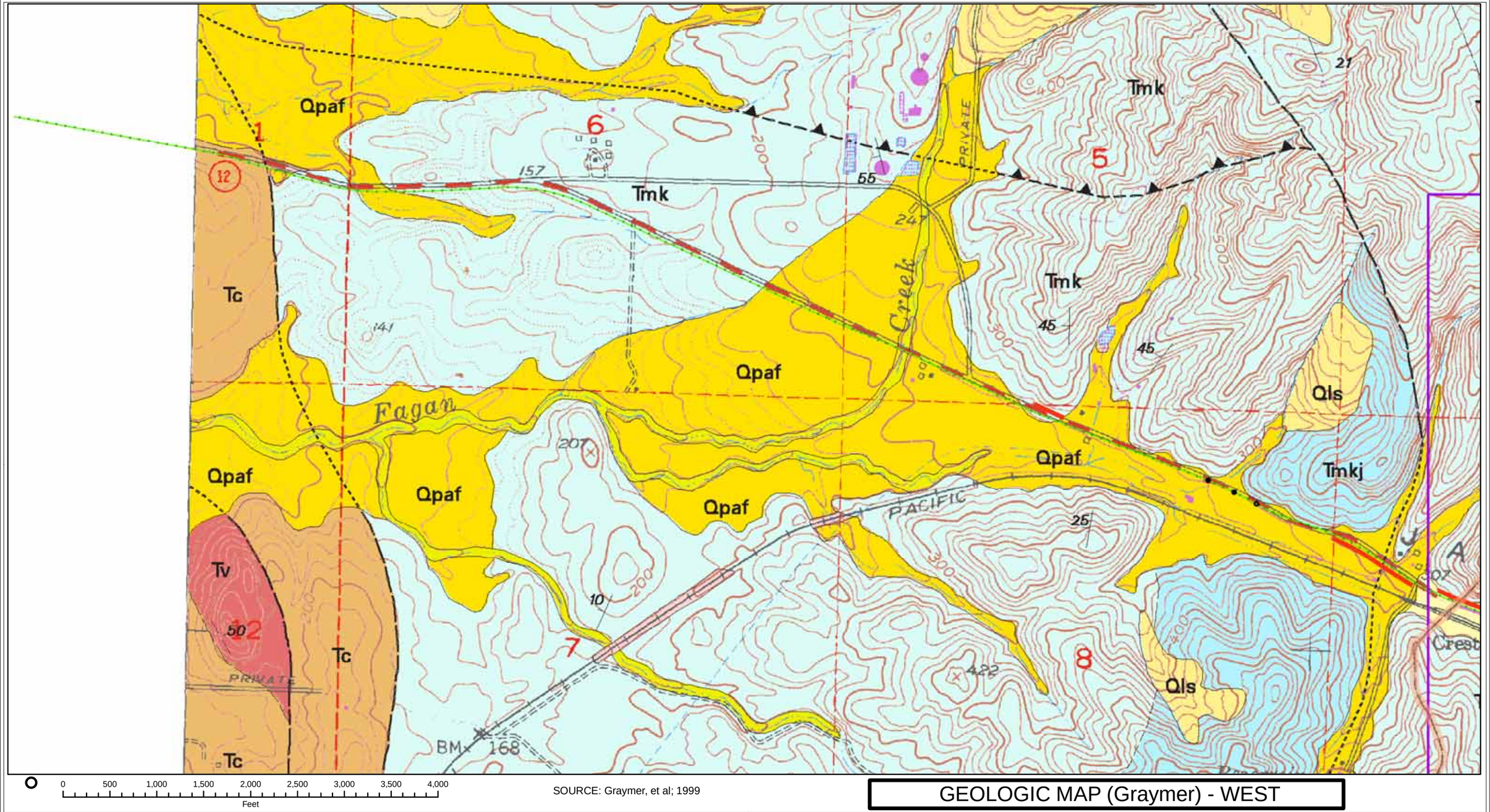
GEOLOGIC MAP (Manson) - EAST

PARIKH CONSULTANTS, INC.

ROUTE 12 / JAMESON CANYON ROAD WIDENING PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: F-2 (EAST)



SOURCE: Graymer, et al; 1999

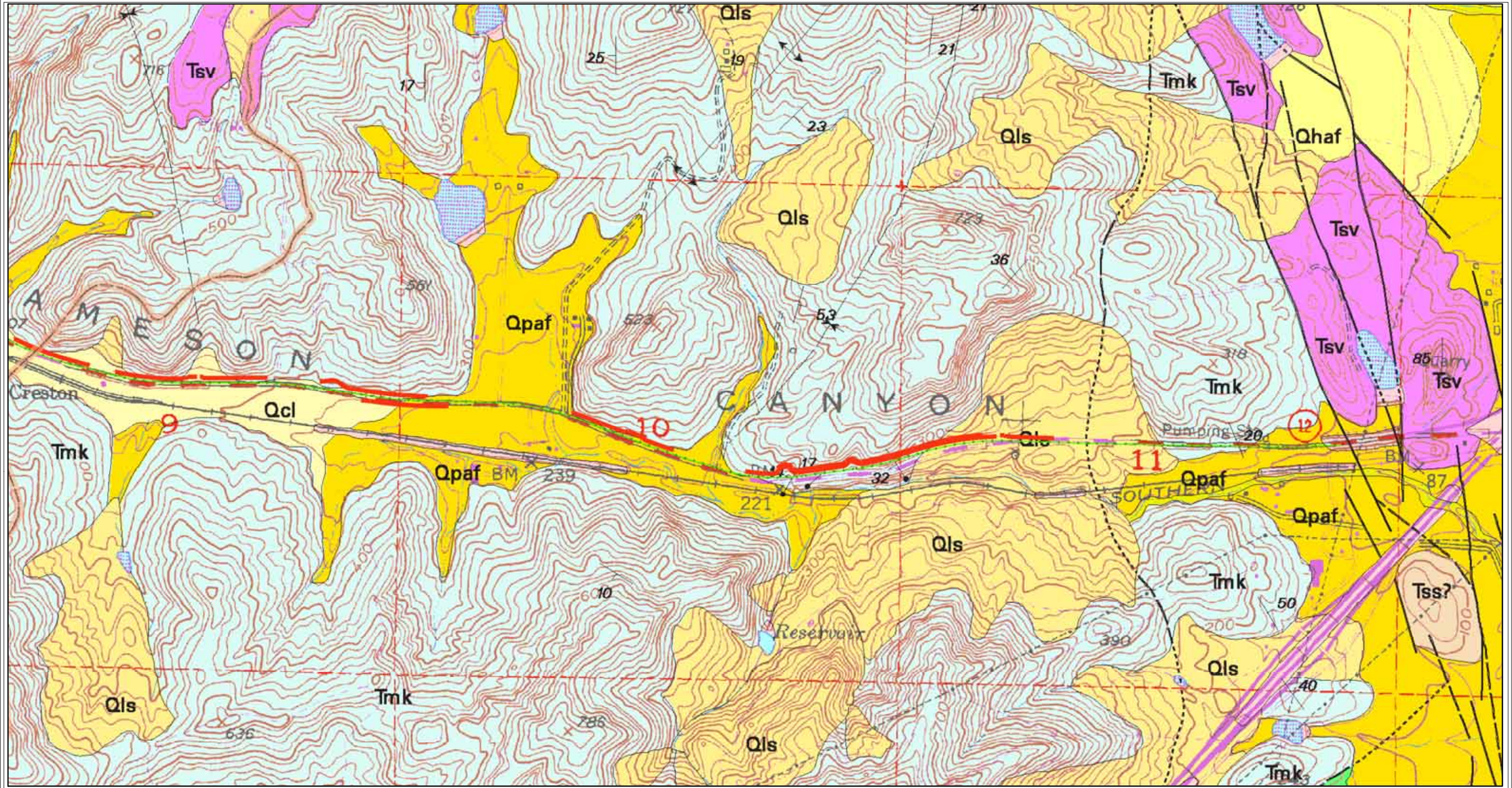
GEOLOGIC MAP (Graymer) - WEST

PARIKH CONSULTANTS, INC.

ROUTE 12 / JAMESON CANYON ROAD WIDENING PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: F-3 (WEST)



SOURCE: Graymer, et al; 1999

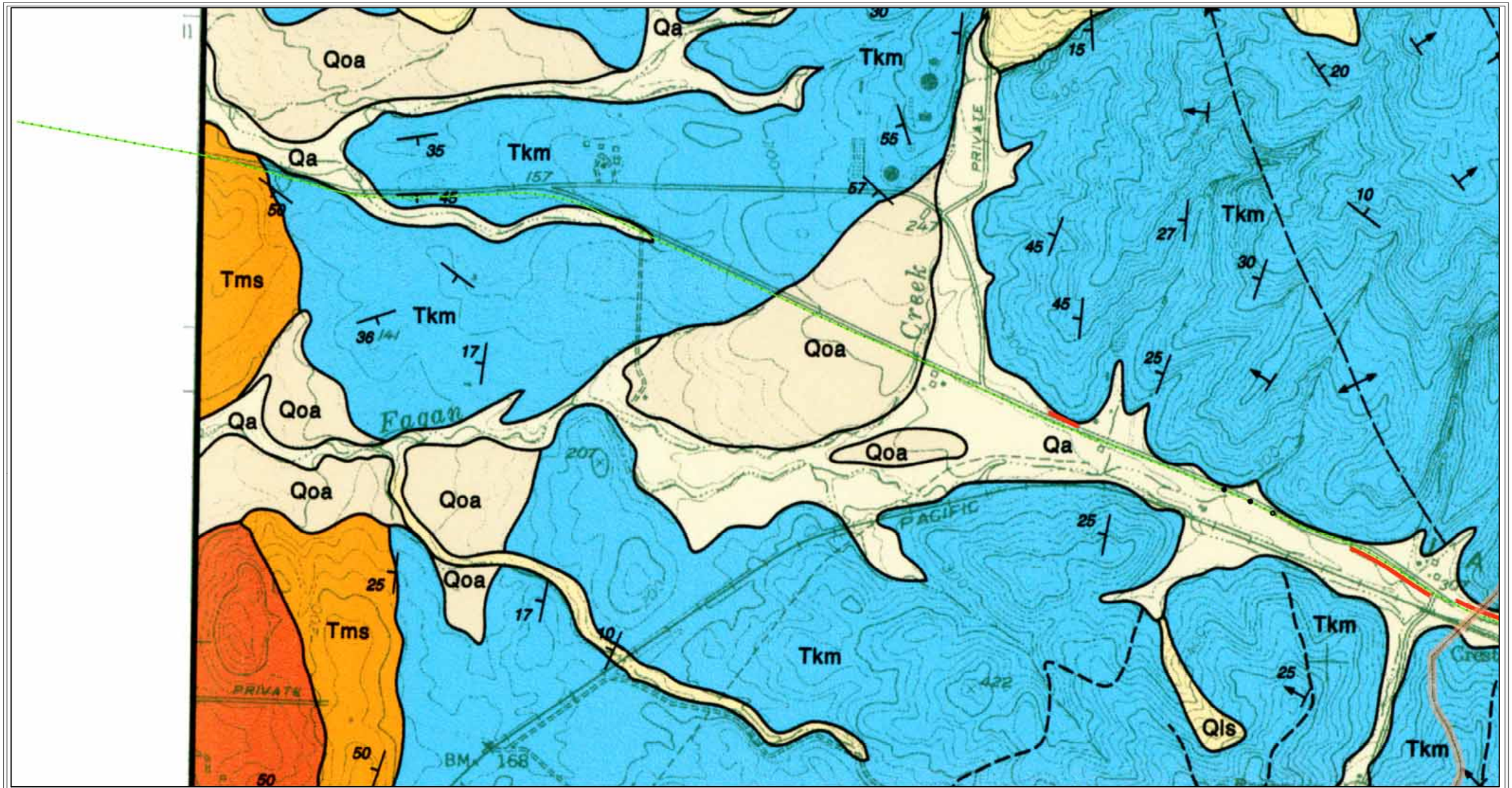
GEOLOGIC MAP (Graymer, et al) - EAST

PARIKH CONSULTANTS, INC.

ROUTE 12 / JAMESON CANYON ROAD WIDENING PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: F-3 (EAST)



SOURCE: Dibblee; 2006

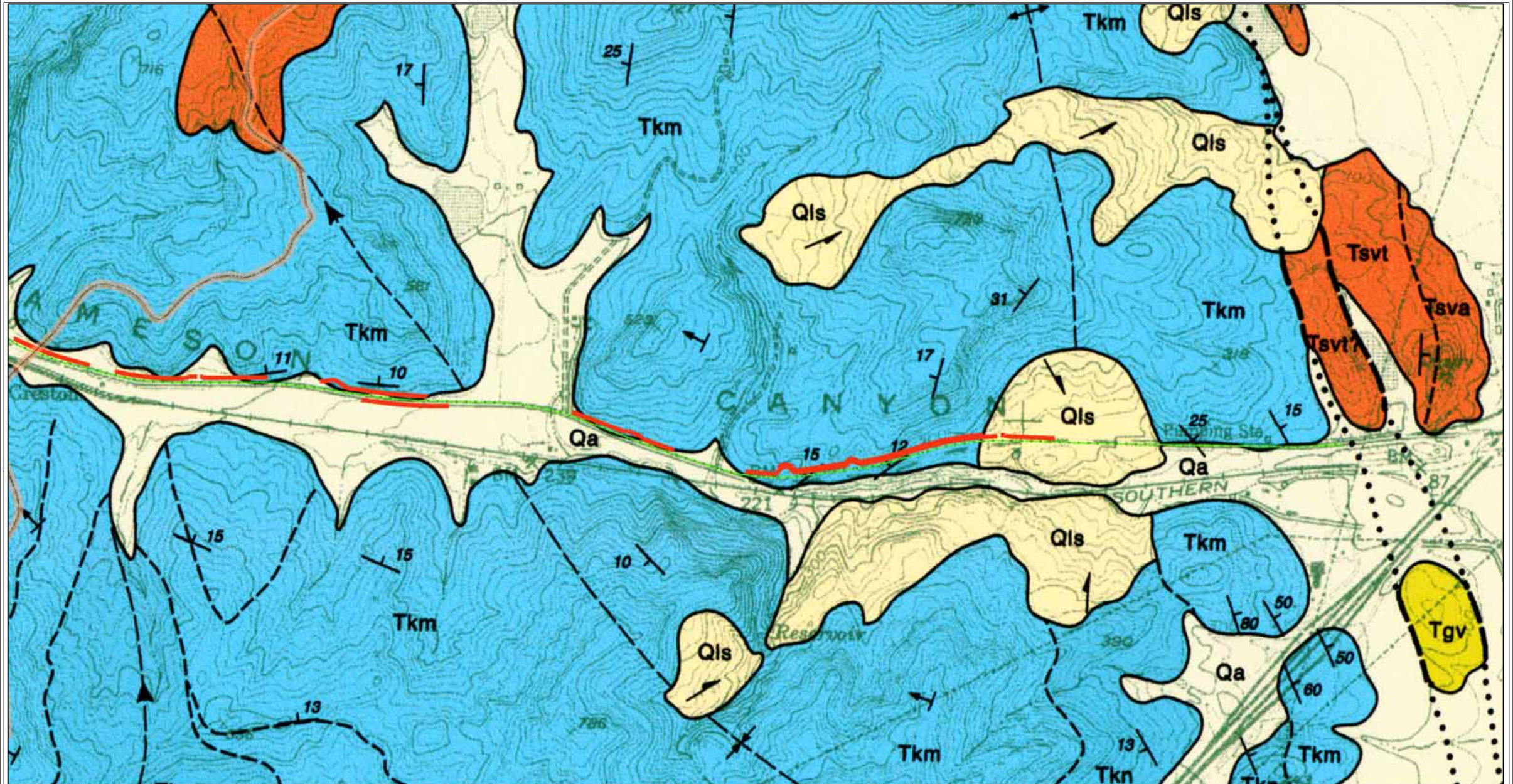
GEOLOGIC MAP (Dibblee) - WEST

PARIKH CONSULTANTS, INC.

ROUTE 12 / JAMESON CANYON ROAD WIDENING PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: F-4 (WEST)



SOURCE: Dibblee; 2006

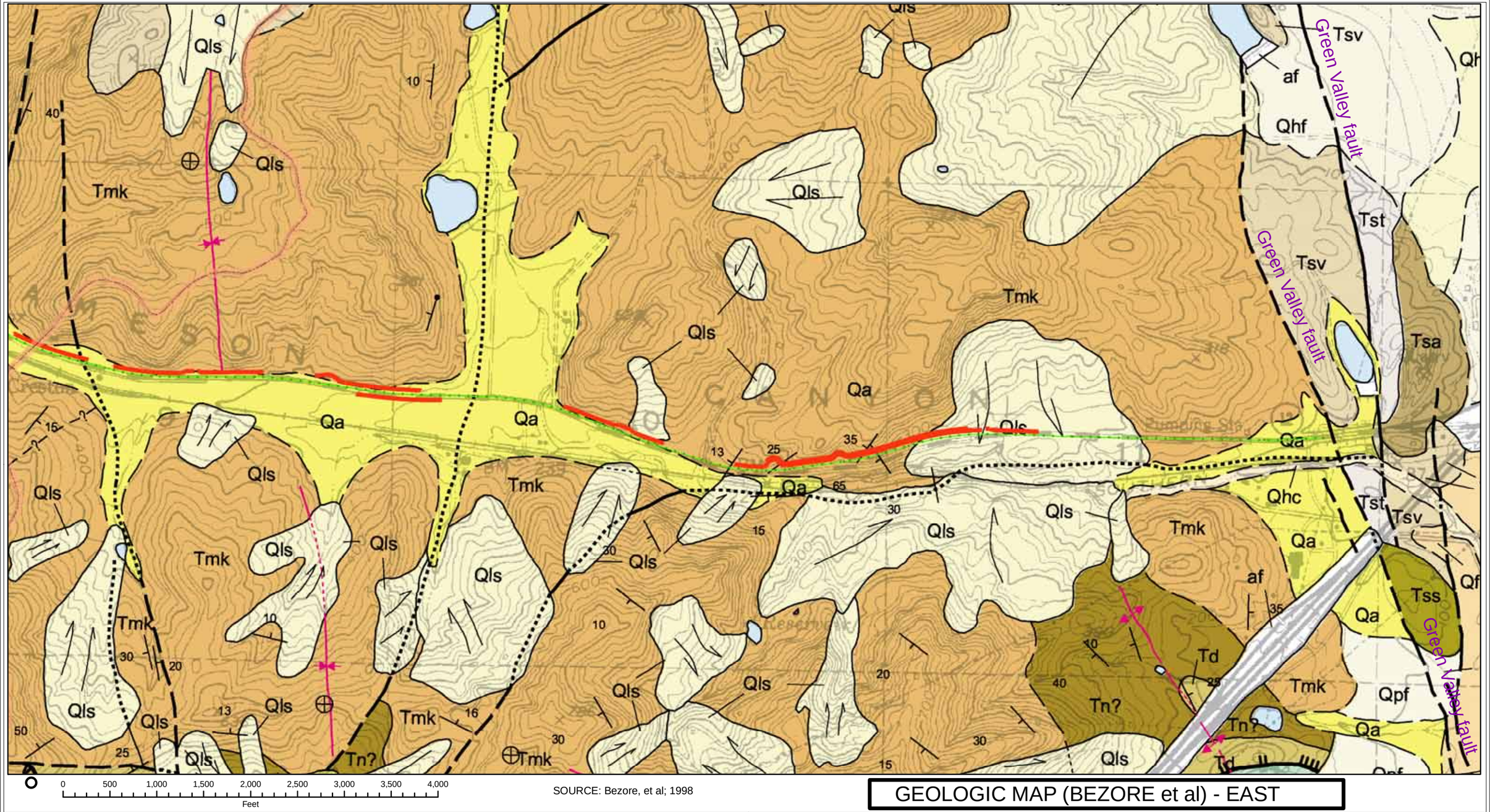
GEOLOGIC MAP (Dibblee) - EAST

PARIKH CONSULTANTS, INC.

ROUTE 12 / JAMESON CANYON ROAD WIDENING PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: F-4 (EAST)



SOURCE: Bezore, et al; 1998

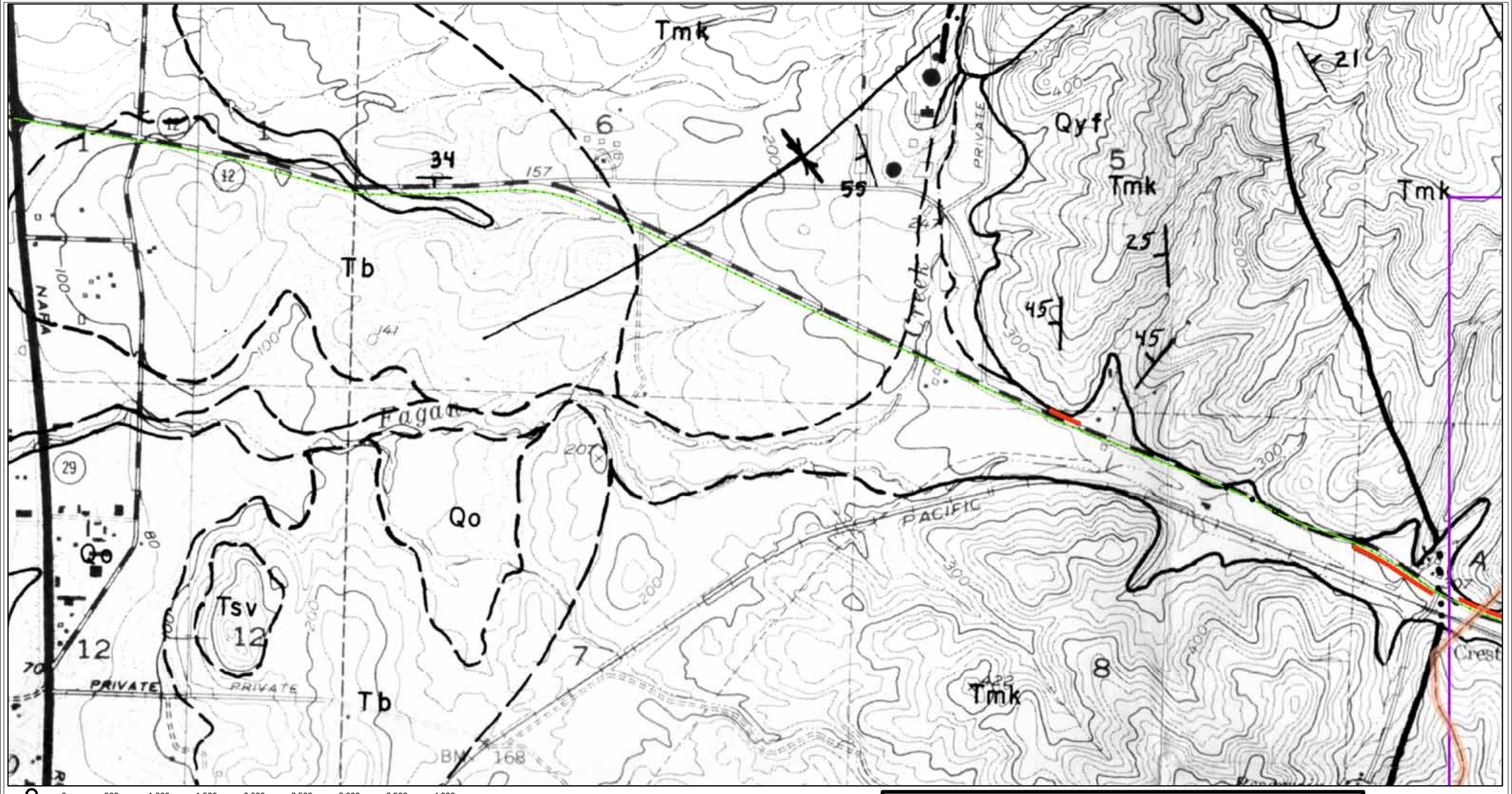
GEOLOGIC MAP (BEZORE et al) - EAST

PARIKH CONSULTANTS, INC.

ROUTE 12 / JAMESON CANYON ROAD WIDENING PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: F-1 (EAST)



0 500 1,000 1,500 2,000 2,500 3,000 3,500 4,000
Feet

SOURCE: Manson; 1988

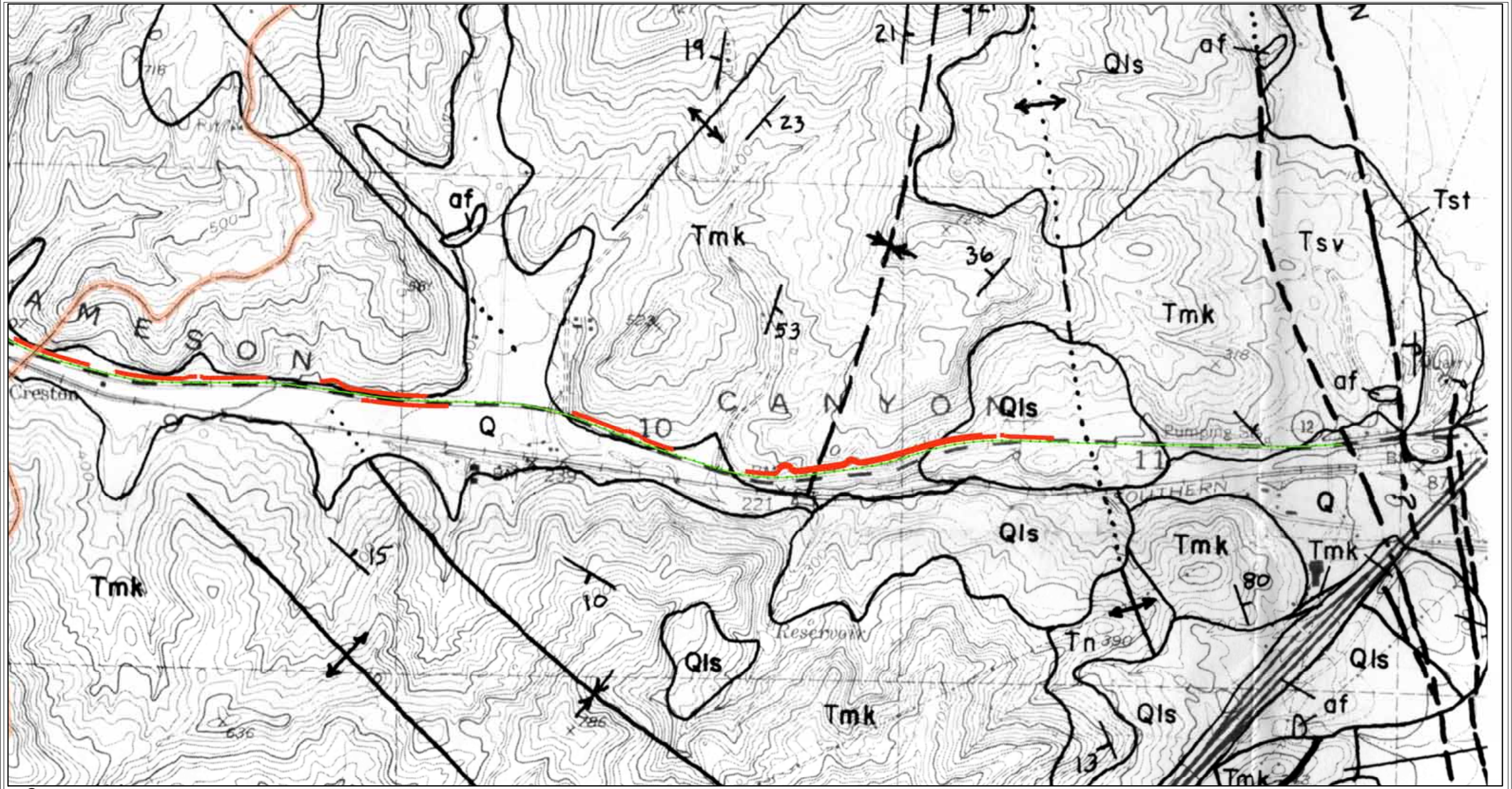
GEOLOGIC MAP (Manson) - WEST

PARIKH CONSULTANTS, INC.

ROUTE 12 / JAMESON CANYON ROAD WIDENING PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: F-2 (WEST)



SOURCE: Manson; 1988

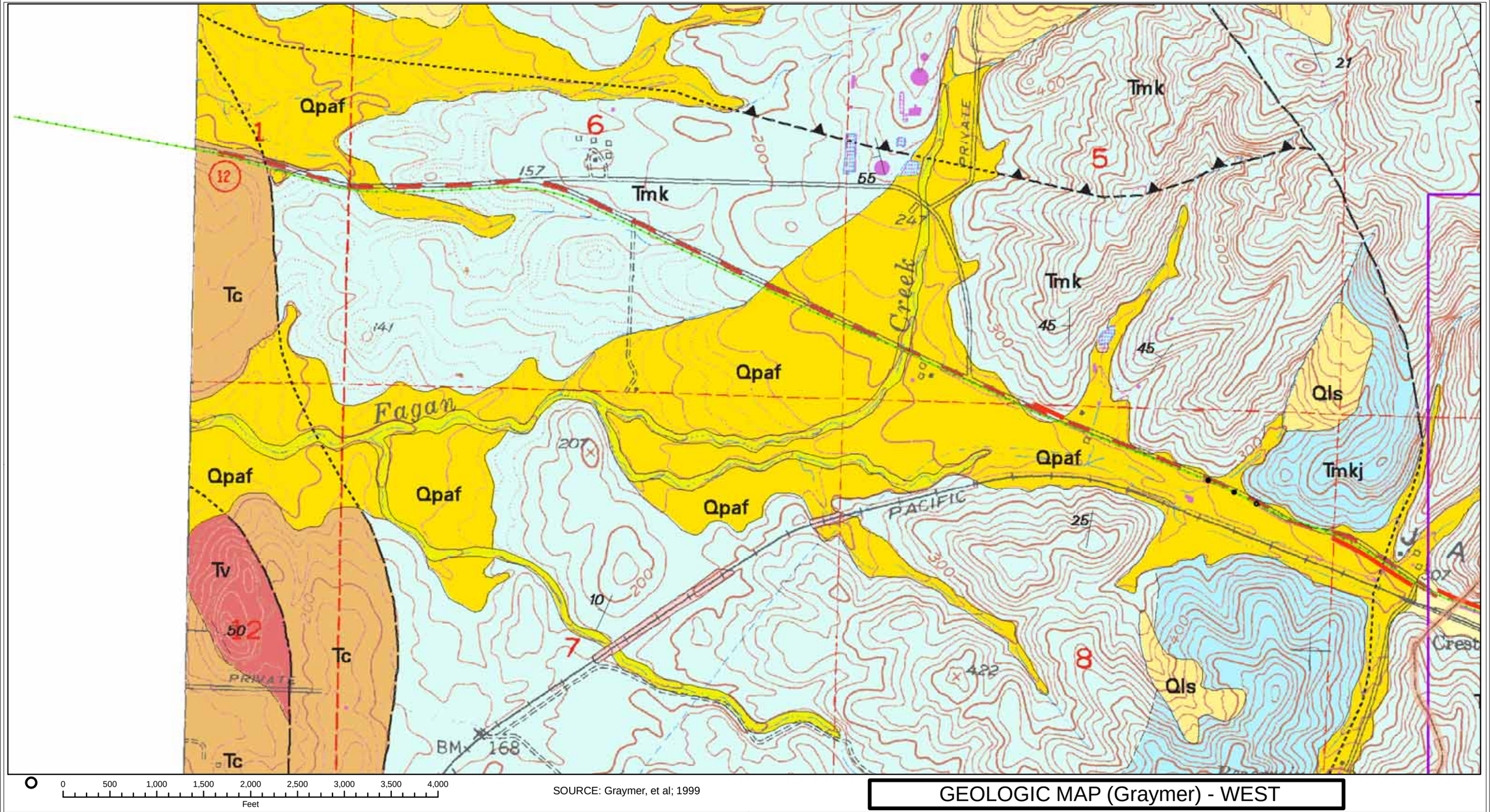
GEOLOGIC MAP (Manson) - EAST

PARIKH CONSULTANTS, INC.

ROUTE 12 / JAMESON CANYON ROAD WIDENING PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: F-2 (EAST)



SOURCE: Graymer, et al; 1999

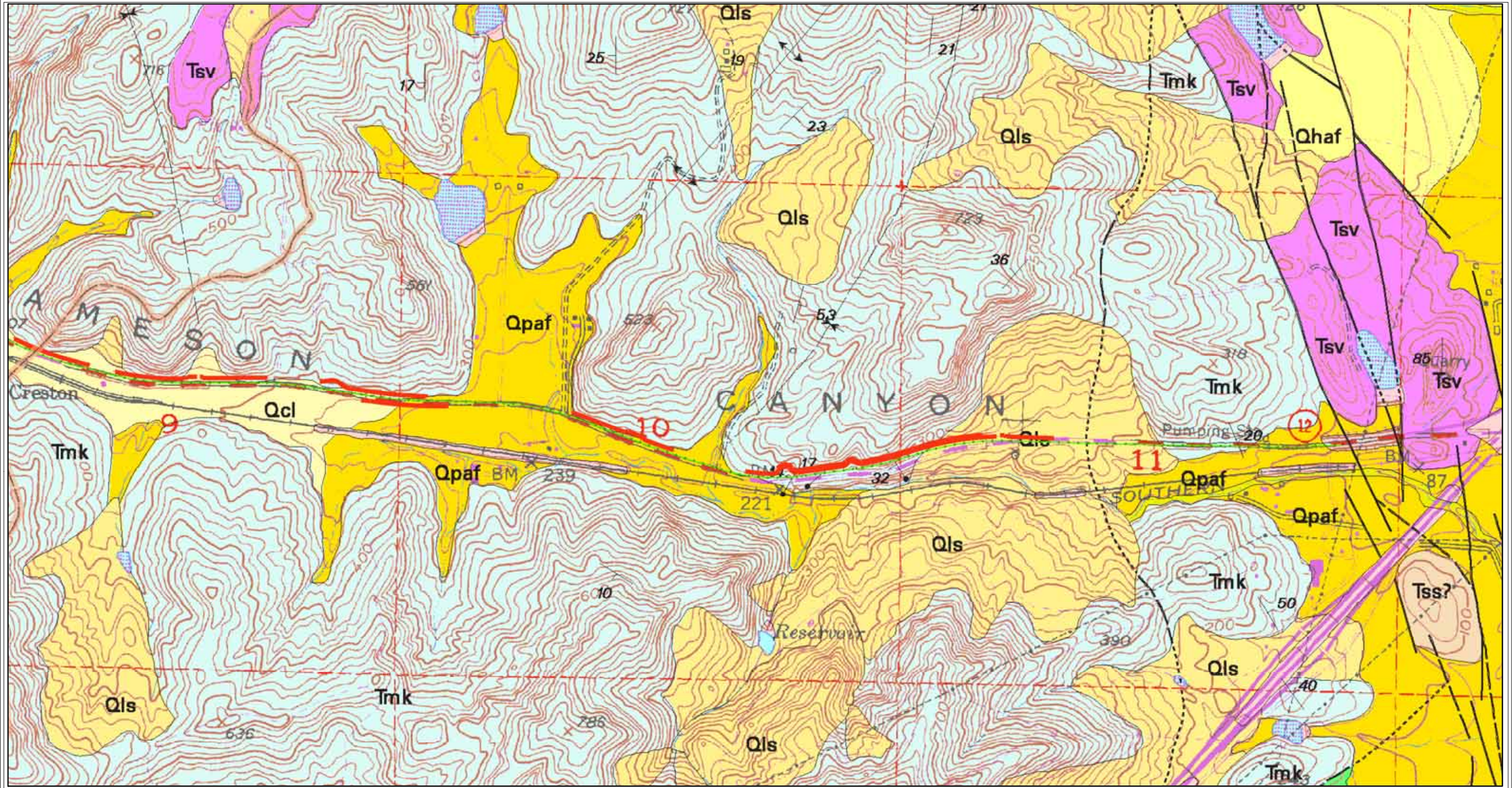
GEOLOGIC MAP (Graymer) - WEST

PARIKH CONSULTANTS, INC.

ROUTE 12 / JAMESON CANYON ROAD WIDENING PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: F-3 (WEST)



SOURCE: Graymer, et al; 1999

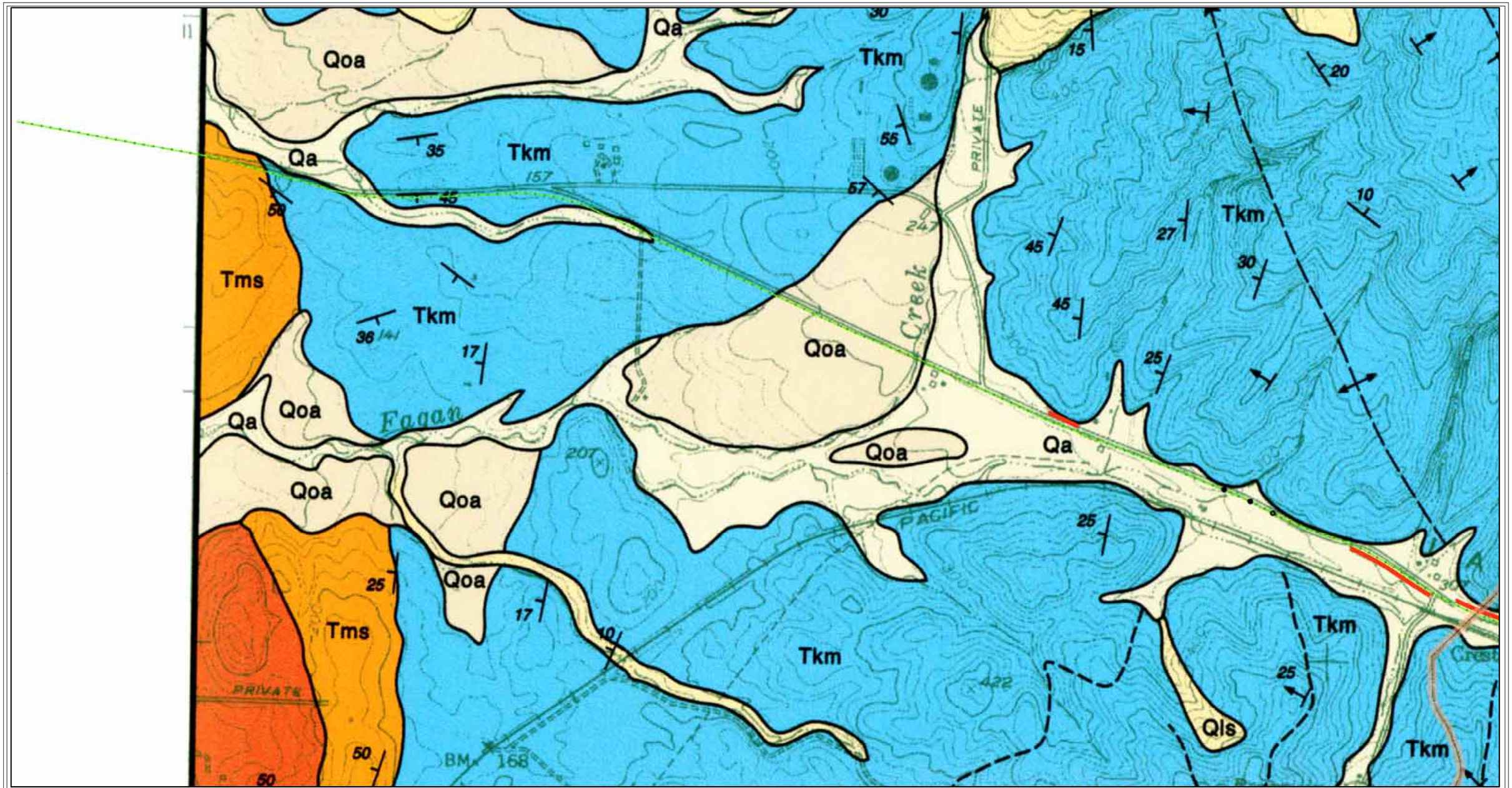
GEOLOGIC MAP (Graymer, et al) - EAST

PARIKH CONSULTANTS, INC.

ROUTE 12 / JAMESON CANYON ROAD WIDENING PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: F-3 (EAST)



SOURCE: Dibblee; 2006

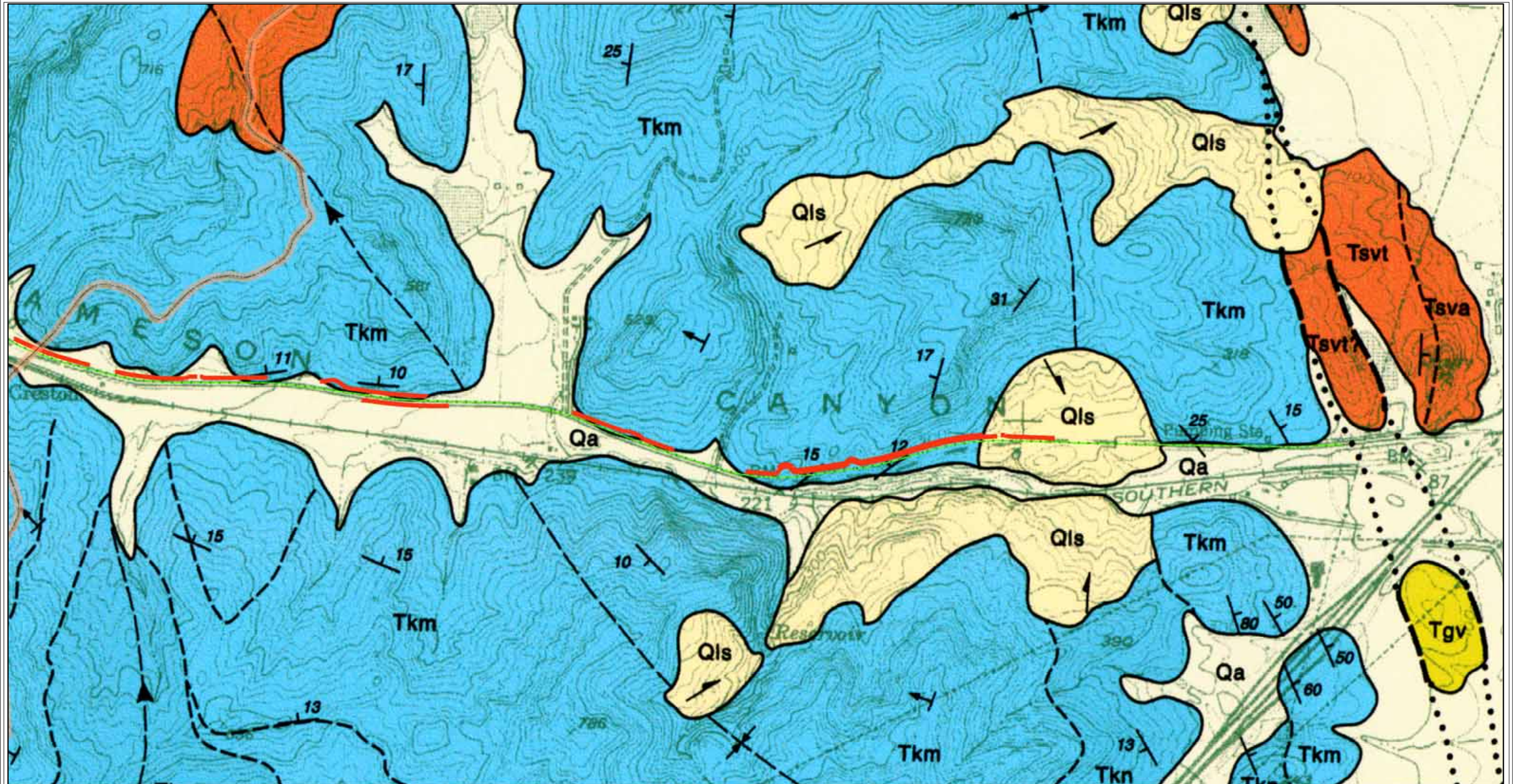
GEOLOGIC MAP (Dibblee) - WEST

PARIKH CONSULTANTS, INC.

ROUTE 12 / JAMESON CANYON ROAD WIDENING PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: F-4 (WEST)



SOURCE: Dibblee; 2006

GEOLOGIC MAP (Dibblee) - EAST

PARIKH CONSULTANTS, INC.

ROUTE 12 / JAMESON CANYON ROAD WIDENING PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA

JOB NO.: 208117.MAT

PLATE NO.: F-4 (EAST)

Comment and Response Form

Type (e.g., PR):__GDR (Sol & Nap), Plans (Nap), Spec (Nap)__Jameson Canyon Widening_____
Co:__NAP___ Rte:__12_____ KP(PM):__PM 0-3.3_____ Unit:_327_____ EA:_264111___ FA:__2_____AO:__255__ MSA:__O05_____

Reviewer's Name and Branch/Unit	Comments/Questions Please reference document section (e.g., paragraph, page #, etc.)	Circulator's Response to Comments/Questions
Mohammad Zabolzadeh/ Design West	GDR - Page 6 Section 5.1 - It is referred to additional borings are planned. This is a 100% submittal. The final report should be updated prior to finalizing the report.	More borings have been conducted recently. All borings, except B-201 for Retaining Wall No. 1 and B-14 for Retaining Wall No. 3C, were completed.
	GDR - Page 32 Section 8.2 - It is stated that field exploration has not yet been performed.... Again, this is a 100% submittal. The final report should be updated prior to finalizing the report.	The planned borings for the cut slopes have been conducted.
	GDR - Page 35 Section 8.2.2 - It is stated that more field exploration , including seismic refraction survey, will be conducted... Again, this is a 100% submittal. The final report should not contain such statement.	More borings have been conducted recently. All borings, except B-201 for Retaining Wall No. 1 and B-14 for Retaining Wall No. 3C, were completed.
	GDR - Page 39 Section 8.4 - Aggregate Base (AB) rock should be changed to Class 3 Aggregate Base (AB3). 2' thick LAB may be too expensive. We commend just using AB3. If agreeable, revise accordingly. This change should be reflected in SSP.	Will comply.

Comment and Response Form

Type (e.g., PR):__GDR (Sol & Nap), Plans (Nap), Spec (Nap)__Jameson Canyon Widening_____
Co:__NAP___ Rte:__12_____ KP(PM):__PM 0-3.3_____ Unit:_327_____ EA:_264111___ FA:__2_____AO:__255__ MSA:__O05_____

Reviewer's Name and Branch/Unit	Comments/Questions Please reference document section (e.g., paragraph, page #, etc.)	Circulator's Response to Comments/Questions
	GDR - Page 40 Section 8.4 - For any proposed subexcavation, we recommend placing a geosynthetic reinforcement at the bottom of the proposed AB3 to control bearing pressure and differential settlements. This should be reflected in all appropriate sections of this report. The Long Term Design Strength of the proposed geosynthetic reinforcement should be 1200 lb/lf.	Will comply.
	GDR - Page 43 Section 8.4 - It is stated that the design has not been finalized at this time for the proposed head walls at Cattle Creek Wildlife Undercrossing. This section should be updated for the final report.	Based on our discussion with the designer, the wall will be specially deisgned. Therefore, the recommendations will be provided in the Foundation Report.
	GDR - Page 43 Section 8.5.1 - It is stated that the configuration of the box culvert has not been finalized. Again, this section should be updated for the final report.	Will comply. This section has been updated and recommendations will be provided.
	Plans - The recommended (GDR) subexcavation below the proposed type 5 modified retaining walls, should be shown on the plans.	Will notify the designer.

Comment and Response Form

Type (e.g., PR):__GDR (Sol & Nap), Plans (Nap), Spec (Nap)__Jameson Canyon Widening_____
Co:__NAP___ Rte:__12_____ KP(PM):__PM 0-3.3_____ Unit:_327_____ EA:_264111___ FA:__2_____AO:__255__ MSA:__O05_____

Reviewer's Name and Branch/Unit	Comments/Questions Please reference document section (e.g., paragraph, page #, etc.)	Circulator's Response to Comments/Questions
	Plans - Sheet RW1, General Plan #2 (P- 439) - under soil /rock design parameter, 0-12.5'. Specify where the "0'" is referenced from.	Will notify the designer.

Review Discipline:	Caltrans						Various		
Comments Up To Date:	10/14/2009								
Date Reviewed By:									
Designer to Evaluate; C-Will Not Incorporate; D-Caltrans to Evaluate									
Agency	Comment No.	Sheet/Page No. (If Applicable)	Comments	Design Responses	Person Responsible	Responsible Engineer	Code	JRT Disp.	Final Disp.
			GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)						
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	18	General	All Log of Test boring sheets should conform to the new Caltrans Logging Manual dated June 2007. Check boring names (A-08-101,...), soil description and bench marks...etc.	Will comply.		PARIKH			
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	19	GDMR	The GDMR should only discuss and include Caltrans Standard Type walls. The proposed soil nail walls, Type 1 modified, and Type 5 modified all all special design walls that should be discusses in the Foundation Report (FR)	Will comply.		PARIKH			
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	20	Report	Page 5, paragraph 2 states that bridges will be widened as part of the Jameson Canyon improvements. This is not proposed; please correct.	Will comply.		PARIKH			
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	21	Report	p. 6, "Exploration", please provide numbers of how many borings were shallow, for structures, etc.	Will comply.		PARIKH			
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	22	Report	p. 7, Table 1, boring numbers should reflect the new Caltrans Soil and Rock Logging Manual from 2007, please correct.	Will comply.		PARIKH			
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	23	Report	p. 9, second paragraph, please identify the younger sandstone unit by name.	Will comply. The younger sandstone in the western-most portion of the project is San Pablo Formation.		PARIKH			
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	24	Report	p. 9, third paragraph, please identify the retaining walls for which this "mapping" applies. This is over a very limited extent and only covers a 1500' stretch of an alignment that is several miles in length.	Will comply.		PARIKH			
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	25	Report	p. 10, second paragraph, please identify how many borings had rock core collected from them. Avoid using words such as "some".	Will comply.		PARIKH			
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	26	Report	p. 10, second paragraph, please omit the statement that equipment to collect oriented core "is not locally available".	Will comply.		PARIKH			
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	27	Report	p. 12, paragraph 1, please elaborate on the stereonet plots. What can be inferred from them. This report is meant to analyze data and interpret it for the design of a highway widening. The plots are provided, but not discussed in any details.	Will comply. More discussion of stereonet plots will be proivded.		PARIKH			
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	28	Report	p. 12, "Landslide Hazard Mapping", please stop referring to the various plates in Manson's map as if they are in this report. It is very confusing. If Manson's map appears as some part of this report, then provide the relevant plate number. There are no plates 13A, B, C, etc.	Will comply.		PARIKH			
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	29	Report	p. 14, "Cut Slopes", this is the first mention of cut slopes in this report. This information should be provided to the reader in the form of a table at the beginning of the report. The table should list cut slope limits (stations), proposed heights, and lengths.	Will comply.		PARIKH			

Designer to Evaluate; C-Will Not Incorporate; D-Caltrans to Evaluate

Agency	Comment No.	Sheet/Page No. (If Applicable)	Comments	Design Responses	Person Responsible	Responsible Engineer	Code	JRT Disp.	Final Disp.
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	30	Report	p. 20, "Lithology", this section should describe the lithology of the units: bedrock, colluvium, debris flow deposits, etc. The lithology of the units is the description of the rock. For example: "medium grained, friable sandstone, with lenses of coarse sand and pebbles, for example" describes the lithology of the unit. In section 7.1 you've provided other peoples descriptions of the lithology. Several tens of holes have been drilled along the alignment and these samples should provide some context from which the lithology can be described. Please rewrite this section based on the data collected for this study.	Will comply.		PARIKH			
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	31	Report	p. 24, paragraph 5, at what depth did you encounter groundwater in borings B-216 and B-217?	Groundwater was encountered at Elev. 231± feet and 227± feet, respectively. The information will be included in the report.		PARIKH			
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	32	Report	p. 27, "Analysis", this section should provide an analysis of the standard retaining walls under seismic loading conditions. Please provide this analysis. In addition, stability analyses should be provided in this report for all standard retaining walls.	Structurally, Caltrans standard retaining walls have enough conservatism to account for the seismic condition. Global slope stability analysis will be provided for both static and seismic (psuedo-static) conditions for the standard retaining walls.		PARIKH			
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	33	Report	p. 27, "Liquefaction Potential", please provide analyses for the settlement values. The settlement should not be based on an "opinion", but rather an analysis. Please provide a liquefaction settlement analysis.	Will comply. The post-liquefaction settlement was estimated per Tokimatsu & Seed (1987), which is based on $N_{1,60,CS}$. The calculation will be provided.		PARIKH			
GEOTECHNICAL SERVICES - MOHAMMAD ZABOLZADEH (RECEIVED 09/22/09)	34	Report	p. 28, "Cuts and Excavations", please provide analyses for slope stability. This section should also describe the cuts in greater detail: height, slope, existing slope, stereonet analyses, etc.	Will comply.		PARIKH			
			MATERIALS - BRIAN BARBER (RECEIVED 09-10-09)						
MATERIALS - BRIAN BARBER (RECEIVED 09-10-09)	5	Materials Report	In the August 2009 Parikh Geotechnical Materials Report under "Toe Drains" the underdrain trench should extend for a minimum depth of 3 feet below the bottom of the proposed new pavement structural section sub-base layer.	Based on our discussion with the designer and the review comments, the recommendations have been revised that the underdrain should extend minimum 12 inches below the subgrade.		PARIKH			

PARIKH
Practicing in the Geosciences

Geotechnical ■
Environmental ■
Materials Testing ■
Construction Inspection ■

Mark Thomas & Co., Inc.
1960 Zanker Road
San Jose, CA 95112

November 5, 2009
Job No.: 208117.10

Attn.: Mr. John Kenyon

Sub: Response to Caltrans 100% PS&E Submittal Review (dated October, 22 2009)
Route 12/Jameson Canyon Road Widening Project
Napa County, California
04-NAPA-12, PM 0.0 to PM 3.2, 04-264131

Ref: Caltrans Review Comments (dated October 22, 2009)

Dear Mr. Kenyon:

We have received the review comments made by Caltrans on the above subject report. This letter documents our response to these comments, which have been incorporated in final GDMR.

100% Plan Review Comments:

Comment:
On Sheet DD-17, "Drainage Details-Section B-B": We recommend a minimum 6" of Aggregate Base (AB) be placed on over the proposed underdrain trench as a separation layer to protect the overlying LCB layer.

Response:
Based on our discussion with the designer, the underdrain design has been revised. It is recommended that the underdrain extend minimum 12" below the pavement subgrade. Therefore, the LCB will not be placed directly on the bedding materials.

Materials Report:

Comment:
In Section 9, "Structural Pavement" (page 44): We disagree with the Geotechnical/materials report statement that Subgrade Enhancement Fabric (SEG) should be included in the pavement sections. Plasticity Index (P.I.) test results in the report Appendix B show a significant percentage of the tested subgrade soil samples to have a relatively high expansion potential. The use of SEG may not mitigate the heaving characteristics caused by highly expansive soils and

therefore could impact pavement performance. Our office does not recommend using SEG on this project.

Response:
Will comply. The recommendation regarding SEG will be removed.

Please be advised that we are performing a professional service and that our conclusions are professional opinions only. All work done and all recommendations made are in accordance with generally accepted geotechnical engineering principles and practices. No warranty, expressed or implied, of merchantability or fitness, is made or intended in connection with our work.

Very truly yours,
PARIKH CONSULTANTS, INC.

Frank Y. Wang, P.E., 67751
Project Engineer

Gary Parikh, P.E., G.E., 666
Project Manager

REGISTERED PROFESSIONAL ENGINEER
GAURANG R. PARIKH
No. 666
EXP. 12-31-09
GEOTECHNICAL
STATE OF CALIFORNIA

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

Memorandum

Flex your power!
Be energy efficient!

To: MR. RONI BOUKHALIL
District Branch Chief
Office Of Design North Counties

Date: October 22, 2009

File: 04-NAPA-12 PM 0.0/3.2
04-264131
Widen 2 to 4 Lanes-Jameson Canyon

Attention: Arick Bayford

Brian W. Barber

From: BRIAN W. BARBER
Materials Design Engineer
Office Of Engineering Services I - Materials B

Subject: 100 % PS&E Submittal Review

In response to your October 7, 2009 submittal we provide herein our comments on the 100% PS&E for the proposed Jameson Canyon Road Route 12 widening project (EA 264131) located in Napa County from PM 0.0 to PM 3.2.

The PS&E design phase of this project is contracted to the consultant Mark Thomas Company, Inc. (MT).

We previously provided comments for the 95% PS&E submittal on this project in our memorandum dated August 10, 2009.

The information provided with the 100% PS&E submittal package included the following:

- 100% Project Plans, "State highway in Napa County Near Napa from Route 29 To 0.1 Miles West Of Solano County Lime", dated 10/7/09.
- 100% Special Provisions, "Route 12-Jameson Canyon Road Widening, Segment 1-Napa County", dated 10/7/09.
- "Geotechnical Design & Materials Report-Route12 / Jameson Canyon Road Widening Project, Napa & Solano Counties, California" by Parikh Consultants, Inc. (for Mark Thomas &Co, Inc.), dated August 2009.
- 100% Engineer's Estimate, dated 10/7/09 (Route 12 Jameson Canyon Widening (Napa Portion).

100% Plan Review Comments

1. On Sheet DD-17, "Drainage Details-Section B-B": We recommend a minimum 6" of Aggregate Base (AB) be placed on over the proposed underdrain trench as a separation layer to protect the overlying LCB layer.

Materials Report

1. In Section 9, "Structural Pavement" (page 44): We disagree with the Geotechnical/Materials report statement that Subgrade Enhancement Fabric (SEG) should be included in the pavement sections. Plasticity Index (P.I.) test results in the report Appendix B show a significant percentage of the tested subgrade soil samples to have a relatively high expansion potential. The use of SEG may not mitigate the heaving characteristics caused by highly expansive soils and therefore could impact pavement performance. Our office does not recommend using SEG on this project.

We request that our office be given the opportunity to review and comment on the final revised 100% updated PS&E for this project.

If you have comments or questions, please contact Brian Barber at (510) 622-5490.

c: Daily File, Route File
BBarber/BB/NAP-12, EA 264131 100% PS&E Submittal Review

Comment and Response Form

pe (e.g., PR):__Foundation Report_for proposed project to:__Jameson Canyon Widening_____
Co:__SOL___ Rte:__12_____ KP(PM):__PM 0.0-2.6_____ Unit:_327_____ EA:_264111___ FA:__2_____AO:__240__ MSA:__O80_____

Reviewer's Name and Branch/Unit	Comments/Questions Please reference document section (e.g., paragraph, page #, etc.)	Circulator's Response to Comments/Questions
	GDMR dated August 2009	
	The GDMR should only discuss and include Caltrans Standard Type walls. The proposed soil nail walls, Type 1 modified, and Type 5 modified all all special design walls that should be discusses in the Foundation Report (FR)	Will comply.
	Page 5, paragraph 2 states that bridges will be widened as part of the Jameson Canyon improvements. This is not proposed; please correct.	Will comply.
	p. 6, "Exploration", please provide numbers of how many borings were shallow, for structures, etc.	Will comply. Twenty shallow borings were drilled for pavement study, and forty-one borings were drilled for other improvements, ranging from 20 to 160 feet deep.
	p. 7, Table 1, boring numbers should reflect the new Caltrans Soil and Rock Logging Manual from 2007, please correct.	Will comply.
	p. 9, second paragraph, please identify the younger sandstone unit by name.	Will comply. The younger sandstone in the western-most portion of the project is San Pablo Formation.
	p. 9, third paragraph, please identify the retaining walls for which this "mapping" applies. This is over a very limited extent and only covers a 1500' stretch of an alignment that is several miles in length.	Will comply.

Comment and Response Form

pe (e.g., PR):__Foundation Report_for proposed project to:__Jameson Canyon Widening_____
Co:__SOL___ Rte:__12_____ KP(PM):__PM 0.0-2.6_____ Unit:_327_____ EA:_264111___ FA:__2_____AO:__240__ MSA:__O80_____

Reviewer's Name and Branch/Unit	Comments/Questions Please reference document section (e.g., paragraph, page #, etc.)	Circulator's Response to Comments/Questions
	p. 10, second paragraph, please identify how many borings had rock core collected from them. Avoid using words such as "some".	Will comply.
	p. 10, second paragraph, please omit the statement that equipment to collect oriented core "is not locally available".	Will comply.
	p. 12, paragraph 1, please elaborate on the stereonet plots. What can be inferred from them. This report is meant to analyze data and interpret it for the design of a highway widening. The plots are provided, but not discussed in any details.	Will comply. More discussion of stereonet plots will be proivded.
	p. 12, "Landslide Hazard Mapping", please stop referring to the various plates in Manson's map as if they are in this report. It is very confusing. If Manson's map appears as some part of this report, then provide the relevant plate number. There are no plates 13A, B, C, etc.	Will comply.
	p. 14, "Cut Slopes", this is the first mention of cut slopes in this report. This information should be provided to the reader in the form of a table at the beginning of the report. The table should list cut slope limits (stations), proposed heights, and lengths.	Will comply.

Comment and Response Form

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Co:__SOL___ Rte:__12_____ KP(PM):__PM 0.0-2.6_____ Unit:_327_____ EA:_264111___ FA:__2_____AO:__240__ MSA:__O80_____

Reviewer's Name and Branch/Unit	Comments/Questions Please reference document section (e.g., paragraph, page #, etc.)	Circulator's Response to Comments/Questions
	p. 20, "Lithology", this section should describe the lithology of the units: bedrock, colluvium, debris flow deposits, etc. The lithology of the units is the description of the rock. For example: "medium grained, friable sandstone, with lenses of coarse sand and pebbles, for example" describes the lithology of the unit. In section 7.1 you've provided other peoples descriptions of the lithology. Several tens of holes have been drilled along the alignment and these samples should provide some context from which the lithology can be described. Please rewrite this section based on the data collected for this study.	Will comply.
	p. 23, "Subsurface Soil Conditions", this is a poor description of the subsurface based on the LOTBs provided in the report. Please provide a more detailed description of the subsurface soils.	Will comply.
	p. 24, paragraph 5, at what depth did you encounter groundwater in borings B-216 and B-217?	Groundwater was encountered at Elev. 231± feet and 227± feet, respectively. The information will be included in the report.
	p. 27, "Analysis", this section should provide an analysis of the standard retaining walls under seismic loading conditions. Please provide this analysis. In addition, stability analyses should be provided in this report for all standard retaining walls.	Structurally, Caltrans standard retaining walls have enough conservatism to account for the seismic condition. Global slope stability analysis will be provided for both static and seismic (psuedo-static) conditions for the standard retaining walls.

Comment and Response Form

pe (e.g., PR):__Foundation Report_for proposed project to:__Jameson Canyon Widening_____
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Reviewer's Name and Branch/Unit	Comments/Questions Please reference document section (e.g., paragraph, page #, etc.)	Circulator's Response to Comments/Questions
	p. 27, "Liquefaction Potential", please provide analyses for the settlement values. The settlement should not be based on an "opinion", but rather an analysis. Please provide a liquefaction settlement analysis.	Will comply. The post-liquefaction settlement was estimated per Tokimatsu & Seed (1987), which is based on $N_{1,60,CS}$. The calculation will be provided.
	p. 28, "Cuts and Excavations", please provide analyses for slope stability. This section should also describe the cuts in greater detail: height, slope, existing slope, stereonet analyses, etc.	Due to the constraint of accessing the private property, no exploration has been conducted yet for these cut slopes. The analysis will be conducted as soon as more subsurface data is available. More description will be provided for the proposed cut slopes.

Review Discipline:	Caltrans			By:		Various		
Comments Up To Date:	4/16/2009			QRT Meeting Date:				
Date Reviewed By:				JRT Meeting Date:				
Comply; B-MTCo to Evaluate; C-Will Not Incorporate; D-Caltrans to Evaluate								
Agency	Comment No.	Sheet/Page No. (If Applicable)	Comments	Design Responses	Responsible Engineer	Code	JRT Disp.	Final Disp.
			OFFICE OF GEOTECHNICAL DESIGN - M.ZABOLZADEH/C.RISDEN (RECEIVED 4/15/09)					
	1	General	For the Geotechnical Design Report, please refer to comments made for the review of the Type Selection report for this project. Much of the language in this report is similar and many of the comments are applicable	It appears that the review comments were made based on the GDR dated 2/26/09. The review comments of Type Selection report were received immediately prior to the submittal. Most of the review comments have been incorporated into the latest version of GDR, dated 3/13/09.	F. Wang	A		
	2	GDR Pg 9	"Project specific mapping has been conducted…designer". Where is this mapping in the report?	We have provided more detail discussion and geologic information in the latest report dated 3/13/09.	F. Wang	A		
	3	GDR Pg 10	Provide a single sheet showing wall location (and numbers) along with seismic lines. The map provided by Norcal does not show walls as they relate to the seismic lines. Additionally, plates 4A through 4C do not show wall numbers. If these were on a single sheet, the relationship between specific wall and survey would be clearer.	New maps were prepared and presented in the GDR dated 3/13/09.	F. Wang	A		
	4	GDR Pg 10	Explain why instrumentation was determined not to be significant	The existing site condition along the project corridor appears to be relatively stable. Some slides were identified, but they are relatively shallow and do not pose significant impact to the proposed project. The potential impacts can be mitigated by engineering approach, such as using tieback wall system to retain potential slide (Retaining Wall No. 5). The site conditions were evaluated based on the field explorations. Therefore, no instrumentation was proposed for geotechnical investigation, and it is considered not applicable to the project.	F. Wang	A		

Review Discipline:	Caltrans			By:		Various		
Comments Up To Date:	4/16/2009			QRT Meeting Date:				
Date Reviewed By:				JRT Meeting Date:				

Comply; B-MTCo to Evaluate; C-Will Not Incorporate; D-Caltrans to Evaluate

Agency	Comment No.	Sheet/Page No. (If Applicable)	Comments	Design Responses	Responsible Engineer	Code	JRT Disp.	Final Disp.
	5	GDR Pg 12	While there is a thrust fault at Station 135+00 separating the Markley from the San Pablo, it is not the primary contact as shown on the geology map. Perhaps this section could be reworded to describe the contact as it crosses the roadway is a thrust fault contact, but otherwise is depositional.	Will provide more geologic discussion.	F. Wang	A		
	6	GDR Pg 13	The stereo net plots are from a limited section and do not adequately describe the structure of the overall project site. This section should be expanded to describe the significance of the stereo net plots. These are not adequately discussed in the report.	Will comply. This is considered more critical for Retaining Wall No. 6, and a more detail discussion has been provided in Foundation Report (dated March 13, 2009). In addition, although we expect joint surfaces that are oriented such that there will be some out-of-cut component of dip exposed during construction of retaining walls other than wall No. 6, the depth to which oxidation and weathering has advanced in the other areas has resulted in a significant weakening of the rock mass such that its mechanical behavior is more soil-like and the presence of discontinuities (bedding planes and joint surfaces) are less significant than they will be in higher cut slopes that will expose deeper, less weathered rocks.	F. Wang	A		
	7	GDR Pg 13	A tieback wall is proposed for RW-5 is this due to a landslide? If so, it should be discussed under the slope stability section. Additionally, a recommendation of shotcreting prior to nail placement due to adverse joint orientation is made on p.21 of the report. This recommendation is inconsistent with stable slopes.	Will comply. This is considered more critical for Retaining Walls No. 6 & 7, and more detail discussion has been provided in Foundation Report.	F. Wang	A		
	8	GDR Pg 14	Paragraph 3 should state that improvements will be made to the north side of Route 12 and the alignment will be shifted north, away from the slide-supporting-wall. It is for this reason that the retaining wall and the supported slide are of little impact.	Will comply.	F. Wang	A		

Review Discipline:	Caltrans			By:		Various		
Comments Up To Date:	4/16/2009			QRT Meeting Date:				
Date Reviewed By:				JRT Meeting Date:				
Comply; B-MTCo to Evaluate; C-Will Not Incorporate; D-Caltrans to Evaluate								
Agency	Comment No.	Sheet/Page No. (If Applicable)	Comments	Design Responses	Responsible Engineer	Code	JRT Disp.	Final Disp.
	9	GDR Pg 15	It is unclear as to whether groundwater was only encountered in auger borings. Mention is made of shallow borings (no water) and mud rotary borings (no groundwater measured), but in borings that groundwater was encountered, the type of boring is unclear.	Yes, groundwater was only encountered in auger borings. Type of boring will be specified.	F. Wang	A		
	10	GDR Pg 15	At what depth was groundwater encountered in borings B-216 and B-217?	Groundwater was encountered at 17.7 feet and 19.5 feet deep in Borings B-216 & B-217, respectively.	F. Wang	A		
	11	GDR Pg 16	Eliminate the year from the citation for the in progress Caltrans seismic hazard map. If it is in progress, then no date can be assigned yet.	Will comply.	F. Wang	A		
	12	GDR Pg 20	At cuts planned from Station 250+25 to 252+50 the bedrock dips to the southeast (according to the geologic map provided). Note, the change in bedding direction across the fault at about Station 245. According to the geology map provided, the bedrock between Station 235 and 245+/- may be overturned due to faulting. In addition, the structure section of the report should be expanded to include the extensive faulting throughout the site as well as the plunging syncline.	Will comply.	F. Wang	A		
	13	GDR Pg 23	To support the proposed spread footing foundation, bearing capacity of the foundation soil should be calculated and compared with Caltrans Standard Type I wall tabulated bearing capacities.	After the Type Selection meeting (04/14/09), it is our understanding that the wall type will be re-evaluated and soldier pile lagging wall may be considered. More detail discussion will be provided.	F. Wang	A		
	14	GDR Pg 24	The magnitude of the post settlement due to liquefaction should be calculated and discussed in this section.	Will comply.	F. Wang	A		

IT CORPORATION
A Member of The IT Group

SITE INVESTIGATION REPORT

WIDENING OF STATE ROUTE (SR) 12
SR 12 FROM SR 29 TO INTERSTATE 80
NAPA AND SOLANO COUNTY, CALIFORNIA

August 26, 2002

Prepared for:

California Department of Transportation
Office of Environmental Engineering
P.O. Box 23660
Oakland, California 94623-0660

Prepared by:

IT Corporation
1326 North Market Boulevard
Sacramento, California 95834

Task Order No. 04-264100-GU
Caltrans Contract No.: 43A0078

IT Project No.: 837393.0101

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Table of Contents

List of Figures iii
List of Tables iii
List of Appendices iii

Executive Summary ES-1
1.0 Introduction 1-1
1.1 Project Description 1-1
1.2 Project Objectives 1-2
2.0 Scope of Work 2-1
2.1 Planning and Permitting 2-1
2.2 Field Investigation 2-1
2.2.1 Aerially Deposited Lead Investigation, SR 12 2-3
2.2.2 Aerially Deposited Lead Investigation, EA No. 0A0400 2-3
2.2.3 Subsurface Investigation 2-4
2.2.3.1 Soil Sample Collection 2-4
2.2.3.2 Groundwater Grab Sample Collection 2-5
2.2.3.3 Waste Disposal 2-5
2.3 Laboratory Analysis 2-6
2.3.1 Aerially Deposited Lead Investigations, SR 12 and EA No. 0A0400 2-6
2.3.2 Subsurface Investigation 2-6
3.0 Site Investigation Results 3-1
3.1 Aerially Deposited Lead Investigation, SR 12 3-1
3.2 Aerially Deposited Lead Investigation, EA No. 0A0400 3-1
3.3 Subsurface Investigation 3-2
3.3.1 Soil Sample Results 3-2
3.3.2 Groundwater Grab Sample Results 3-2
4.0 Data Evaluation 4-1
4.1 Aerially Deposited Lead Investigation, SR 12 4-1
4.1.1 Lead Concentration and Distribution, SR 12 4-2
4.1.2 Lead Data Statistical Analysis, SR 12 4-3
4.1.3 Summary, SR 12 4-4
4.2 Aerially Deposited Lead Investigation, EA No. 0A0400 4-5
4.2.1 Lead Concentration and Distribution, EA No. 0A0400 4-7
4.2.2 Lead Data Statistical Analysis, EA No. 0A0400 4-8
4.2.3 Summary, EA No 0A0400 4-9
4.3 Subsurface Investigation 4-10
5.0 Conclusions and Recommendations 5-1
6.0 References 6-1

Table of Contents (continued)

List of Figures

Figure 1 Site Location Map
Figure 2 Boring Location Map, EA No. 0A0400
Figure 3 Boring and Subsurface Investigation Location Map, State Route 12

List of Tables

Table 1 Lead Analytical Data and GPS Coordinates, State Route 12
Table 2 Lead Analytical Data and GPS Coordinates, EA No. 0A0400
Table 3 Soil and Groundwater Analytical Results

List of Appendices

Appendix A Permits
Appendix B State Route 12, ADL Sample Locations
Appendix C Boring Logs
Appendix D Drilling and Sampling Procedures
Appendix E Waste Disposal Manifest
Appendix F Laboratory Analytical Reports and Chain-of-Custody Forms
Appendix G Statistical Analysis Spreadsheets, State Route 12
Appendix H Statistical Analysis Spreadsheets, EA No. 0A0400

Executive Summary

IT Corporation conducted an investigation in July 2002 to evaluate the presence and concentration of potential contaminants conducted within the California Department of Transportation (Caltrans) right-of-way along State Route (SR) 12 from SR 29 in Napa County to Interstate 80 in Solano County, California (Figure 1). Caltrans proposes to widen SR 12 from a two-lane conventional highway to a four-lane expressway. In addition, Caltrans proposes to install retaining walls at three locations along the westbound lane.

This report also presents the results of the aerially deposited lead (ADL) survey conducted along SR 12 under Task Order No.04-264100-GU, and at three locations along the westbound lane where retaining walls are proposed to be constructed under Expenditure Authorization 0A0400. In addition, this report presents the results of a soil and groundwater investigation performed within the Caltrans right-of-way adjacent to suspect parcels identified by Caltrans.

The first phase of the investigation was to determine if and to what concentrations ADL exist in soil along SR 12 in the shoulder areas and at the three proposed retaining wall locations. The second phase was to perform a soil and groundwater investigation within the SR 12 right-of-way adjacent to suspect parcels identified by Caltrans and are listed below.

- Parcel No. 148-260-04, owned by the city of Vallejo, where a power transmission station was located was investigated for polychlorinated biphenols (PCB) in soil.
- Parcel No. 148-260-03, a former farm equipment repair building, was investigated for petroleum hydrocarbons in soil and groundwater.
- Intersection of SR 12 and Red Top Road was investigated for petroleum hydrocarbons in soil and groundwater.

Petroleum hydrocarbons were not detected in soil or groundwater collected within Caltrans right-of-way adjacent to suspect parcels identified as a former farm equipment repair facility and a parcel at the intersection of Red Top Road and SR 12. PCBs were not detected in shallow soil collected adjacent to the city of Vallejo parcel.

The soil and groundwater data are interpreted to indicate that past uses at the suspect parcels identified by Caltrans have not impacted soil and groundwater within the right-of-way adjacent to these suspect parcels.

Lead was reported in soil samples collected from the site. The source for the lead is not known, however, it is thought to be related to accumulation of dust and debris containing lead from leaded gasoline emissions.

Lead concentrations were compared to Total Threshold Limit Concentration and Soluble Threshold Limit Concentration (STLC) values to evaluate whether the soil would be considered a hazardous waste, should it become a waste. Soil samples from various portions of the SR 12 corridor were reported to contain lead at concentrations that exceeded the STLC. Soil in specific locations may be considered a California hazardous waste based on the soluble concentrations of lead reported in certain soil samples.

The California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), issued Caltrans a variance for soil considered hazardous due to the presence of elevated lead concentrations. The variance allows Caltrans to reuse lead-contaminated soil within Caltrans right-of-way in the roadway corridor boundaries under certain conditions. Management of the soil within the DTSC variance is possible.

SR 12

The excavated soil from SR 12 will likely require soluble lead analysis by the Waste Extraction Test (WET) as the mean and 90% Upper Confidence Level (UCL) for total lead is greater than 50 milligram per kilogram (mg/kg), a level that generally triggers a requirement for WET analysis. If WET analyses are conducted, it is likely that composite soil samples would contain soluble lead at concentrations less than the STLC as the predicted value for soluble lead by the WET corresponding to the total lead 90% UCL is 3.17 milligrams per liter (mg/l). It is, therefore, unlikely that the waste soil, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities, would be considered a California hazardous was based on the statistical analysis conducted. However, if the construction work is staged in a manner that segregates the excavated soil, waste soil from the areas may be considered hazardous and might be able to be managed under the DTSC variance.

If management of the soil within the variance is required, the statistical data indicate that the soil may be able to be handled within condition two of the variance. This condition requires that the soil be used as fill beneath a pavement structure designed to protect the soil from water infiltration. The fill soil must be five feet above the water table if the soluble lead concentration reported by deionized Waste Extraction Test (DIWET) analysis is greater than 0.5 mg/l but less than 50 mg/l, and the total lead concentration is less than 350 mg/kg. This condition applies only if the soil is not a Resource Conservation and Recovery Act (RCRA) waste.

This conclusion is based on the total lead concentration reported from the project area and the predicted value of 1.19 mg/l for DIWET data within the 0 to 0.45 meter (0 to 1.5 feet) data set at the SR 12 project site.

EA No. 0A0400

The excavated soil from the proposed retaining wall locations will likely require soluble lead analysis by the WET as the mean and 90% UCL for total lead is greater than 50 mg/kg, a level that generally triggers a requirement for WET analysis. If WET analyses are conducted, it is likely that composite soil samples would contain soluble lead at concentrations greater than the STLC as the predicted value for soluble lead by the WET corresponding to the total lead 90% UCL is 7.00 mg/l. It is, therefore, possible that the waste soil would be considered a hazardous waste based on the statistical analysis conducted. However, if the construction work is staged in a manner that segregates the excavated soil, waste soil from the areas may be considered hazardous and might be able to be managed under the DTSC variance.

If management of the soil within the variance is required, the statistical data indicate that the soil may be able to be handled within condition two of the variance. This condition requires that the soil be used as fill beneath a pavement structure designated to protect the soil from water infiltration. In addition, the fill soil must be five feet above the water table if the soluble lead concentration reported by DIWET analysis is greater than 0.5 mg/l but less than 50 mg/l, and the total lead concentration is less than 350 mg/kg. This condition applies only if the soil is not a RCRA waste. This conclusion is based on the total lead concentration reported from the project area and the predicted value of 3.17 mg/l for DIWET data within the 0 to 0.45 meter (0 to 1.5 feet) data set at the project site.

1.0 Introduction

The investigation was conducted by IT Corporation (IT) in July 2002 to evaluate the presence and concentration of potential contaminants within the right-of-way prior to the implementation of improvement activities proposed by The California Department of Transportation (Caltrans).

This report presents the results of the aerially deposited lead (ADL) survey conducted within the Caltrans right-of-way along State Route (SR) 12 from SR 29 in Napa County to Interstate 80 in Solano County, California (Figure 1). This report also presents the results of the ADL survey conducted at three locations along the westbound lane where retaining walls are proposed to be constructed under Expenditure Authorization (EA) No. 0A0400. In addition, this report presents the results of a soil and groundwater investigation performed within the Caltrans right-of-way adjacent to suspect parcels identified by Caltrans

This investigation was conducted at the request and authorization of Ade Fagorala of Caltrans under Task Order No.04-264100-GU. The ADL survey conducted at three proposed retaining wall locations was conducted at the request and authorization of Naveen Aachi of Caltrans under EA No. 0A0400.

1.1 Project Description

Caltrans proposes to widen SR 12 from a two-lane conventional highway to a four-lane expressway. In addition, Caltrans proposes to install retaining walls at three locations along the westbound lane. The proposed construction will improve traffic capacity, safety, and access to motorists between SR 29 in Napa County to Interstate 80 in Solano County. The project area is also known as Jameson Canyon Road and covers approximately 9.5 kilometers

The first phase of the investigation was to determine if and to what concentrations ADL exist in soil along SR 12 in the shoulder areas and at the three proposed retaining wall locations. The second phase was to perform a soil and groundwater investigation within the SR 12 right-of-way adjacent to suspect parcels. The suspect parcels were identified by Caltrans and are listed below.

- Parcel No. 148-260-04, owned by the city of Vallejo, where a power transmission station was located was investigated for polychlorinated biphenols (PCBs) in soil.
- Parcel No. 148-260-03, a former farm equipment repair building, was investigated for petroleum hydrocarbons in soil and groundwater.
- Intersection of SR 12 and Red Top Road was investigated for petroleum hydrocarbons in soil and groundwater.

1.2 Project Objectives

The objective of this investigation was to evaluate the presence and concentration of ADL in shallow soil within the shoulder areas of SR 12 prior to the implementation of improvement activities proposed by Caltrans. Additional objectives were to evaluate soil and groundwater within SR 12 right-of-way adjacent to the suspect parcels where soil excavation may occur during construction activities.

This site investigation report will be used to help determine worker health and safety procedures, soil handling and disposal procedures, and use of the Department of Toxic Substance Control (DTSC) variance for ADL contaminated soil.

2.0 Scope of Work

The scope of work for the investigation was presented in IT's workplan dated June 28, 2002, which was approved for implementation by Caltrans (IT, 2001a). The following scope of work was conducted:

1. Planning and Permitting
2. Field Investigation
3. Laboratory Analyses
4. Investigation-Derived Waste Disposal
5. Site Investigation Report Preparation

2.1 Planning and Permitting

Planning and permitting included a pre-work site visit, preparation of a workplan and health and safety plan, and acquisition of required permits.

A pre-work site visit was conducted at the site on June 11, 2002, by Ian Moorhead and Martha Adams of IT and Ade Fagorala and Naveen Aachi of Caltrans. Soil boring locations were marked, and the scope of work and objectives were discussed.

A site-specific health and safety plan (IT, 2001b) was prepared for the site in general accordance with 29 CFR 1910.120 and Title 8, California Code of Regulations, Section 5192. The health and safety plan included safety procedures for work to be performed at the site, chemical hazard information, site safety officers, and preferred medical emergency locations.

Soil boring permits were obtained from the Solano County Environmental Health Department for the HydroPunch® borings advanced to groundwater by hollow stem auger. Soil boring permits were obtained from the Napa County Environmental Health Department for the shallow hand auger borings advanced within Napa County. Soil boring permits were not required for the shallow hand auger borings within Solano County. An encroachment permit was obtained from Caltrans District 4 for this project. Copies of the permits are presented in Appendix A.

2.2 Field Investigation

The field investigation was conducted from July 1 through July 8, 2002. The first phase of this investigation included the advancement of 184 shallow soil borings using hand auger sampling

equipment. The second phase of the investigation included the advancement of four deeper soil borings using hollow stem auger drilling equipment. The soil samples were labeled with the site location, boring number, and the sample collection depth. The distribution of soil borings and the sample designations are outlined below.

- SR 12 ADL survey: 159 hand auger borings. Borings identified as "SR 12-1". Soil sample location maps are presented in Appendix B.
- EA No. 0A0400, retaining wall ADL survey: 22 hand auger borings. Borings identified as "SR 12-RT-1" (Figure 2).
- Subsurface Investigation, Parcel No. 148-260-04, owned by the city of Vallejo: three hand auger borings for PCB analysis in soil. Borings identified as "SR 12-HA-1" (Figure 3).
- Subsurface Investigation, Intersection of SR 12 and Red Top Road: 2 borings to first groundwater by hollow stem auger drilling. Borings identified as "SR 12-SB1" and "SR 12-SB2" (Figure 3).
- Subsurface Investigation, Parcel No. 148-260-03, a former farm equipment repair building: two borings to first groundwater by hollow stem auger drilling. Borings identified as "SR 12-SB3" and "SR 12-SB4" (Figure 3).

The horizontal and vertical locations of the borings were established using a Trimble GPS Pathfinder™ Pro XRS global positioning system (GPS). The GPS utilized a GPS receiver and MSK radio beacon differential receiver. The GPS is reported to have sub-meter precision for horizontal location of the borings. The vertical precision is reported to be two to five times that of the horizontal precision. The GPS data were downloaded in the office and Trimble software utilized to provide differential corrections to the coordinates. The horizontal and vertical datums used for this investigation were the California Coordinate System of 1983 (CCS83), Zone 2, and the North American Vertical Datum of 1988 (NAVD88), respectively. The standard unit of measurement for both of these datums was the meter.

All equipment utilized during the field activities was washed prior to commencement of work, and between borings to minimize the likelihood of cross-contamination between the borings. Soil cuttings and decon water generated during the field investigation were contained in 280-liter (55-gallon) drums. The shallow borings were backfilled with the soil cuttings. The deeper hollow stem auger borings were back backfilled with bentonite cement grout from the bottom of the borehole to the ground surface. Drilling and sampling procedures are presented in Appendix C.

2.2.1 Aerially Deposited Lead Investigation, SR 12

One hundred fifty-nine soil borings were advanced for the SR 12 ADL investigation. These borings were generally spaced approximately 45 to 90 meters (150 to 300 feet) depending upon topography along both the east and westbound shoulders of SR 12 (Appendix B). The borings were located approximately 1 meter (3 feet) from the edge of pavement within the shoulder area.

The hand auger soil borings were advanced to a maximum depth of approximately 0.6 meters (2.0 feet) below ground surface (BGS). Three soil samples per boring were retained for chemical analysis. The soil samples were collected from the surface to 0.15 meters (0.5 feet), 0.15 to 0.3 meters (1 foot), and 0.3 to 0.45 meters (1.5 feet) BGS, resulting in a total of 477 soil samples being collected. Soil samples were collected directly from the hand auger and transferred to sealable plastic bags. Following sample collection, the borings were backfilled with the remaining borehole cuttings. The soil samples were labeled, packaged, and stored on ice in an insulated chest for transport under chain-of-custody manifest to a California-certified analytical laboratory.

2.2.2 Aerially Deposited Lead Investigation, EA No. 0A0400

This investigation included the advancement of 22 soil borings, using hand auger sampling equipment, at three locations where retaining walls are proposed to be constructed along the west bound shoulder. The borings were located 1 meter (3 feet) from the edge of pavement and were spaced every 20 meters (66 feet) at the following locations.

- Post Mile (PM) 14.80 to 16.20
- PM 19.85 to 21.15
- PM 21.45 to 22.65

The hand auger soil borings were advanced to a maximum depth of approximately 0.6 meters (2.0 feet) BGS. The soil samples were collected from the surface to 0.15 meters (0.5 feet), 0.15 to 0.3 meters (1 foot), and 0.3 to 0.45 meters (1.5 feet) BGS, resulting in a total of 66 samples being collected. Soil samples were collected directly from the hand auger and transferred to sealable plastic bags. Following sample collection, the borings were backfilled with the remaining borehole cuttings. The soil samples were labeled, packaged, and stored on ice in an insulated chest for transport under chain-of-custody manifest to a California-certified analytical laboratory.

2.2.3 Subsurface Investigation

2.2.3.1 Soil Sample Collection

Three soil borings were advanced by hand auger to investigate for PCBs adjacent to Parcel No. 148-260-04, where a city of Vallejo power transmission station was located. The hand-auger soil borings were advanced to a maximum depth of approximately 0.6 meters (2.0 feet) BGS. The soil samples were collected from the surface to 0.15 meters (0.5 feet), 0.15 to 0.3 meters (1 foot), and 0.3 to 0.45 meters (1.5 feet) BGS, resulting in a total of nine samples being collected. Soil samples were collected using a slide hammer soil sampler lined with metal tubes. Following sample collection, the borings were backfilled with the remaining borehole cuttings.

A subsurface soil investigation was performed within the Caltrans right-of-way adjacent to suspect parcels to identify potential contaminants in soil and groundwater at each respective location. A total of four soil borings were advanced using hollow stem auger drilling at depths ranging from approximately 4.57 to 9.15 meters (15.0 to 30.0 feet) BGS in an attempt to reach first groundwater.

Six soil borings were proposed to be drilled in the shoulder area adjacent to Parcel No. 148-260-03, a former farm equipment repair building. Only two borings were drilled at this location since site conditions including access, overhead clearance, and safety concerns eliminated four of the proposed boring locations. One boring, SR 12-SB4, was advanced to 4.57 meters (15 feet) BGS for soil sample collection. Boring SR 12-SB3 was advanced to a depth of 9.15 meters (30 feet) BGS to encounter first groundwater for groundwater grab sample collection.

Two borings were advanced to first groundwater at the intersection of SR 12 and Red Top Road. These deep soil borings were advanced to first encountered groundwater at a depth of approximately 6.10 meters (20 feet) BGS.

Soil samples from the four deep hollow stem auger borings were collected at 1.5 meter (5 feet) intervals to first groundwater. A total of 17 soil samples were collected and the soil samples were collected using a split-spoon sampler lined with metal sample tubes. The soil samples were labeled, packaged, and stored on ice in an insulated chest for transport under chain-of-custody manifest to a California-certified analytical laboratory.

Soil borings were screened for the presence of volatile organic compounds (VOCs) using an organic vapor meter equipped with a photo ionization detector (PID). The borings were logged

in general accordance with the Unified Soil Classification System (USCS) by an IT staff geologist under the supervision of a California-Registered Geologist. Boring logs are presented in Appendix C.

2.2.3.2 Groundwater Grab Sample Collection

Groundwater grab samples were collected from borings that encountered first groundwater and the groundwater samples were labeled with the site location and boring number. For example, "SR 12-SB1-GW" represents the groundwater sample collected from boring SB-1.

At the Red Top Road site, groundwater was generally first encountered approximately 5.18 meters (17.0 feet) BGS. The static water level was measured to be approximately 5.09 meters (16.7 feet) BGS in boring SR 12-SB1. First groundwater was encountered in the borings drilled and groundwater grab samples were collected from each respective boring location at the Red Top Road site.

At the former farm equipment repair facility site, first groundwater was encountered only in boring location SB-3 at approximately 8.84 meters (29.0) BGS. The static water level was measured to be approximately 8.84 meters (29.0 feet) BGS. First groundwater was not encountered in boring SB-4.

After soil samples were collected and first groundwater was encountered, a disposable bailer was used to obtain a groundwater grab sample in each undeveloped hollow stem auger soil boring location that encountered groundwater. Depth to groundwater, pH, conductivity, and temperature were recorded prior groundwater sampling.

The groundwater grab samples were labeled, packaged, and stored in an insulated chest for transport under chain-of-custody manifest to a California-certified analytical laboratory. Groundwater sampling procedures are presented in Appendix D.

2.2.3.3 Waste Disposal

Drill cuttings and wash water generated during the field investigation were contained for disposal in 208-liter (55-gallon) drums, approved by the United Nations for transport of liquid and solid wastes. Four drums of soil were generated during this investigation and the drums were removed from the site for disposal by ABCO Environmental Services, Inc. (ABCO), a licensed hazardous waste hauler. The four drums were transported by ABCO to the Altamont Landfill for disposal. A copy of the manifest is presented in Appendix E.

2.3 Laboratory Analysis

The soil and groundwater samples collected and retained for analysis were submitted to Sparger Technology, Inc. (Sparger), of Sacramento, California, a California-certified analytical laboratory. Chain of custody procedures, including the use of chain of custody forms, were used to document sample handling and transport from the time of collection to delivery to the laboratory for analysis. The chain of custody forms and laboratory analytical reports are included in Appendix F.

2.3.1 Aerially Deposited Lead Investigations, SR 12 and EA No. 0A0400

A total of 543 soil samples were analyzed for total lead in general accordance with U.S. Environmental Protection Agency (EPA) Method 6010. The analyses were conducted on a 48-hour turn-around basis in general accordance with U.S. Environmental Protection Agency (EPA) specified holding times. The analyses were performed in general accordance with the following EPA methods listed.

Matrix	Analyses
Soil	ICAP Element Scan EPA 6010: lead only (all ADL samples)
Soil	Waste Extraction Test (WET)/ deionized Water Extraction Test (DIWET) 22CCR 667000 Extract *
Soil	Toxicity Characteristic Leaching Procedure (TCLP) EPA 1311 Extraction and 6010 Analysis
Soil	pH EPA 9045 (10% of ADL samples)

Soil samples reported to contain lead at concentrations that exceeded 50 mg/kg were analyzed for soluble lead concentrations using the WET. Soil samples with soluble lead results that exceeded the Soluble Threshold Limit Concentration (STLC) of 5 milligrams per liter (mg/l) were further analyzed by the WET using a DIWET. Soil samples reported to contain lead at concentrations of 1,000 mg/kg or greater were further analyzed using the TCLP EPA 1311 Extraction and 6010 analysis.

2.3.2 Subsurface Investigation

A total of 17 soil samples were collected and submitted for laboratory analyses from the nine deep soil borings. A total of nine soil samples were collected from the three hand auger borings adjacent to the city of Vallejo parcel. Three groundwater grab samples were collected from borings that encountered first groundwater. The analyses were conducted on a 48-hour

turn-around basis in general accordance with EPA specified holding times. The analyses were performed in general accordance with the following EPA methods listed.

Matrix	Analyses
Soil/Water	Total Petroleum Hydrocarbons as Diesel (TPHd) Modified EPA Method 8015
Soil/Water	Total Petroleum Hydrocarbons as Gasoline (TPHg) Analyses Package EPA Method 8015/8020
Soil/Water	EPA 8260B, VOCs and fuel oxygenate compounds
Soil	PCBs EPA 8082, city of Vallejo Transmission Station Parcel only.

3.0 Site Investigation Results

3.1 Aerially Deposited Lead Investigation, SR 12

Lead analyses were conducted on 477 soil samples. A summary of lead results compared to 10-times STLC and Total Threshold Limit Concentration (TTLC) values are presented below. Results are presented on Table 1.

Heavy Metal	10 Times STLC (mg/kg)	No. Samples Exceeding 10 Times STLC	TTLC (mg/kg)	No. Samples that Exceed or equal TTLC	Concentration Range (mg/kg)
Lead	50	225	1,000	0	1.0 to 966

Two hundred twenty-five soil samples exceeded 10 times STLC (50 mg/kg) and were further analyzed for soluble lead concentrations by the WET. Ninety-one samples exceeded the STLC (5.0 mg/l) and were further analyzed by DIWET. A summary of soluble heavy metal results compared to STLC is presented below.

Heavy Metal	STLC (mg/l)	No. Samples Exceeding STLC	WET Concentration Range (mg/l)	DIWET Concentration Range (mg/l)
Lead	5.0	91	0.6 to 36.60	0.358 to 21.1

In the 49 soil samples tested, pH ranged from 6.0 to 7.2 (Table 1). The mean concentration for pH was 6.6 standard units.

3.2 Aerially Deposited Lead Investigation, EA No. 0A0400

Lead analyses were conducted on 66 soil samples. A summary of lead results compared to 10-times STLC and TTLC values are presented below. Results are presented on Table 2.

Heavy Metal	10 Times STLC (mg/kg)	No. Samples Exceeding 10 Times STLC	TTLC (mg/kg)	No. Samples Exceeding TTLC	Concentration Range (mg/kg)
Lead	50	51	1,000	0	6 to 451

Fifty-one soil samples exceeded 10 times STLC (50 mg/kg) and were further analyzed for soluble lead concentrations by the WET. Thirty-five samples exceeded the STLC (5.0 mg/l) and were further analyzed by DIWET. A summary of soluble heavy metal results compared to STLC is presented below.

Heavy Metal	STLC (mg/l)	No. Samples Exceeding STLC	WET Concentration Range (mg/l)	DIWET Concentration Range (mg/l)
Lead	5.0	51	1.05 to 22.50	0.295 to 12.30

In the seven soil samples tested, pH ranged from 6.5 to 8.0 (Table 2). The mean concentration for pH was 7.07 standard units.

3.3 Subsurface Investigation

3.3.1 Soil Sample Results

The soil samples collected from the three hand auger borings advanced adjacent to the city of Vallejo parcel were not reported to contain PCBs at concentrations exceeding the analytical method reporting limits (Table 3).

The soil samples collected from the four deeper hollow stem auger borings were not reported to contain TPHg, TPHd, and VOCs, including methyl-tert-butyl-ether (MTBE), and benzene, toluene, ethylbenzene, and xylenes (BTEX) at concentrations exceeding the analytical method reporting limits (Table 3).

3.3.2 Groundwater Grab Sample Results

Groundwater grab samples collected from the three deeper soil borings that encountered first groundwater were not reported to contain TPHg, TPHd, MTBE, and BTEX at concentrations exceeding the analytical method reporting limits (Table 3). One VOC compound, chloroform, was detected at a reported concentration of 2.3 micrograms per liter (µg/L).

4.0 Data Evaluation

4.1 Aerially Deposited Lead Investigation, SR 12

Lead concentrations were compared to TTLC and STLC values to evaluate whether the soil would be considered a California-hazardous waste, should it become a waste. Generally, TTLC and STLC values for lead are used to judge whether a waste is a California hazardous waste based on the total and soluble concentration of lead within the waste. The TCLP values are used to judge whether a waste is a Resource Conservation and Recovery Act (RCRA) hazardous waste (also known as a federal hazardous waste) based on the soluble concentration of lead within the waste.

The California Environmental Protection Agency, DTSC, granted Caltrans a variance for soil considered hazardous due to the presence of elevated lead concentrations (DTSC, 2000). The variance allows Caltrans to reuse lead-contaminated soil within Caltrans right-of-way in the roadway corridor boundaries under certain conditions if the soil is considered a non-RCRA waste. In accordance with the variance and AB 2784 Section 25157.8, the following conditions apply to Caltrans' re-use and management of soil impacted by ADL as fill material for construction and maintenance operations (DTSC, 2000):

1. As fill beneath at least one foot of clean (non-hazardous) soil and five feet above the water table if the soluble lead concentration reported by the DIWET analysis is less then 0.5 mg/l and the total lead concentration is less than 350 mg/kg. This condition applies only if the soil is not a RCRA waste.
2. As fill beneath a pavement structure designated to protect the soil from water infiltration and five feet above the water table if the soluble lead concentration reported by DIWET analysis is greater then 0.5 mg/l but less then 50 mg/l, and the total lead concentration is less than 350 mg/kg. This condition applies only if the soil is not a RCRA waste.
3. Lead-contaminated soil with a pH below 5 shall only be used as fill beneath the paved portion of the roadway. This condition applies only if the soil is not a RCRA waste.

To further evaluate the applicability of the DTSC variance (DTSC, 2000), IT conducted a statistical evaluation of lead analytical data for this project at the request of Caltrans. The statistical evaluation was conducted in general accordance with guidance provided in SW-846, "Test Methods for Evaluating Solid Waste, Volume II: Field Manual, Physical/Chemical Methods" (EPA, 1986). The statistical evaluation was conducted to further evaluate the concentration of lead within soil at the site.

The statistical evaluation addressed the following items:

- Calculation of mean;
- Determination of the distribution of the sample data; and
- Calculation of the 80% Confidence Interval (CI) which provides a corresponding 90% Upper Confidence Level (UCL), interpreted as a 0.90 probability that the true mean for a given population is no higher than the calculated UCL.

The data are not normally distributed. Therefore, the UCL of the 80% CI (90% UCL) can be approximated if the number of samples is sufficiently large. Gilbert (1987) states that for data with a highly skewed distribution a sample population of 50 or more samples may be needed for analysis of the UCL.

For samples with lead concentrations reported as non-detect above the analytical method reporting limit, a value of one-half of the reporting limit was used in the statistical evaluation. Calculations were performed within Statistix 7. The 90% UCL was calculated using the following equation from Gilbert (1987) (modified from SW-846 to provide the upper one-sided confidence limit):

$$90\%\ UCL = x + (t_{0.90})(s/n^{1/2})$$

where x = mean of the data

$t_{0.90}$ = the quantile for the "t" distribution for the 90% UCL

s = standard deviation of the data

n = number of samples

4.1.1 Lead Concentration and Distribution, SR 12

Soil samples collected from the site were reported to contain lead (Table 1). The source for the lead is not known. However, studies along the transportation corridors have attributed elevated lead concentrations within soil to accumulation of dust and debris containing lead from leaded gasoline emissions (Coltrin, et al., 1993).

A summary of the distribution of the elevated lead concentrations is presented below. The data set is restricted to those samples reported to contain greater than or equal to 50 mg/kg lead, a level selected because it is 10 times the STLC.

	Distribution of Samples from Total Sample Population with Greater Than 50 mg/kg Lead		Distribution of Samples from Interval with Greater Than 50 mg/kg Lead		Distribution of Samples from All Samples with Greater Than 50 mg/kg Lead	
Sample Interval	Number	Percentage	Number	Percentage	Number	Percentage
0.15 meters	71 of 477	14.9	71 of 159	44.7	71 of 225	31.6
0.30 meters	80 of 477	16.8	80 of 159	50.3	80 of 225	35.6
0.45 meters	74 of 477	15.5	74 of 159	46.5	74 of 225	32.9

Typically, accumulations of ADL and the concentrations of lead, as reported by Coltrin and others (1993), are observed to decrease with depth. An exception to this was in areas where accumulation of dust and debris continued following cessation of leaded gasoline use resulting in lower lead concentrations at shallower depths (Coltrin, et al., 1993). This may explain the results at some locations for this project where elevated concentrations of lead were present in the deeper soil samples.

No soil samples were reported to contain total lead concentrations that exceed the TTLC value of 1,000 mg/kg for lead. Two hundred twenty-five soil samples were above the TTLC value of 50 mg/kg and were further analyzed for soluble lead concentrations using the WET. Ninety-one soil samples exceeded the STLC of 5 mg/l by WET analysis. In addition, 87 of these soil samples were reported to contain soluble lead at concentrations in excess of the STLC of 0.5 mg/l by DIWET analysis. Soil samples reported to contain total lead exceeding the TTLC and soluble lead exceeding the STLC would be considered a California hazardous waste, should the soil become a waste.

No TCLP analyses were conducted. Therefore, evaluation of whether the soil would be considered a RCRA hazardous waste and whether the soil would be excluded from the variance based on a federal waste classification was not performed.

4.1.2 Lead Data Statistical Analysis, SR 12

The data from all intervals were combined into one data set for analysis as Caltrans construction plans typically call for excavation of soil to 0.6 meters (2 feet) for road base preparation. The number of samples in the total sample population is 477. Evaluation of the soil data resulted in a mean (average) concentration of total lead of 69.26 mg/kg (Appendix G).

A histogram of the total lead results was constructed to evaluate the distribution of the total lead concentrations within the data set. The data were found to be heavily skewed to lower concentrations. Results of the statistical calculations are provided in Appendix G.

The 90% UCL was calculated for total lead data and are presented below and in Appendix G.

Sample Population	Mean Concentration (mg/kg)	90% UCL (mg/kg)
All Samples	69.26	74.049

Pearson (product moment) correlation coefficients (Pearson values) were obtained from regression analysis for regression lines forced through the origin (Appendix G). Correlation coefficients for total/WET and total/DIWET lead data for samples were 0.8862 and 0.8976, respectively. The correlation coefficients for the data is within the desired correlation value of 0.8, per Caltrans contract 43A0012 indicating that an acceptable correlation exists and the relationships are linear.

An expected soluble lead concentration was obtained from regression analysis (model forced through the origin) developed from the total/WET and total/DIWET soluble lead data. The coefficient for the dependant variable (slope of regression lines) used in the regression analysis and the total lead versus soluble lead concentration plot is presented in Appendix G. The soluble lead concentration for WET data corresponding to the total lead 90% UCL is 5.96 mg/l. The soluble lead concentration for DIWET data corresponding to the total lead 90% UCL is 2.93 mg/l.

To compare with predicted soluble lead concentrations, 90% UCL concentrations for the WET and DIWET data set were calculated. The 90% UCL values for the WET and DIWET data are 3.17 and 1.188 mg/l, respectively (Appendix G). These calculations were conducted on data that are skewed to higher values by the sample selection criteria and therefore result in higher concentration values than the predicted soluble lead concentrations.

4.1.3 Summary, SR 12

Soil in specific locations may be considered a California hazardous waste based on the soluble concentrations of lead reported in certain soil samples. Management of the soil within the DTSC variance is possible.

The mean concentration and 90% UCL values for total lead data were less than 1,000 mg/kg. This suggests that the soil, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities, may not require Class I disposal and may be handled within the conditions of the variance.

The excavated soil from SR 12 will likely require soluble lead analysis by the WET as the mean and 90% UCL for total lead is greater than 50 mg/kg, a level that generally triggers a requirement for WET analysis. If WET analyses are conducted, it is likely that composite soil samples would contain soluble lead at concentrations less than the STLC as the predicted value for soluble lead by the WET corresponding to the total lead 90% UCL is 3.17 mg/l. It is, therefore, unlikely that the waste soil, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities, would be considered a California hazardous waste based on the statistical analysis conducted. However, if the construction work is staged in a manner that segregates the excavated soil, waste soil from the areas may be considered hazardous and might be able to be managed under the DTSC variance.

If management of the soil within the variance is required, the statistical data indicate that the soil may be able to be handled within condition two of the variance. This condition requires that the soil be used as fill beneath a pavement structure designated to protect the soil from water infiltration and five feet above the water table if the soluble lead concentration reported by DIWET analysis is greater than 0.5 mg/l but less than 50 mg/l, and the total lead concentration is less than 350 mg/kg. This condition applies only if the soil is not a RCRA waste. This conclusion is based on the total lead concentration reported from the project area and the predicted value of 1.19 mg/l for DIWET data within the 0 to 0.45 meter (0 to 1.5 feet) data set at the SR 12 project site.

4.2 Aerially Deposited Lead Investigation, EA No. 0A0400

Lead concentrations were compared to TTLC and STLC values to evaluate whether the soil would be considered a California hazardous waste, should it become a waste. Generally, TTLC and STLC values for lead are used to judge whether a waste is a California hazardous waste based on the total and soluble concentration of lead within the waste. The TCLP values are used to judge whether a waste is a RCRA hazardous waste (also known as a federal hazardous waste) based on the soluble concentration of lead within the waste.

The California Environmental Protection Agency, DTSC, granted Caltrans a variance for soil considered hazardous due to the presence of elevated lead concentrations (DTSC, 2000). The variance allows Caltrans to reuse lead-contaminated soil within Caltrans right-of-way in the

roadway corridor boundaries under certain conditions if the soil is considered a non-RCRA waste. In accordance with the variance and AB 2784 Section 25157.8, the following conditions apply to Caltrans' re-use and management of soil impacted by ADL as fill material for construction and maintenance operations (DTSC, 2000):

1. As fill beneath at least one foot of clean (non-hazardous) soil and five feet above the water table if the soluble lead concentration reported by the DIWET analysis is less then 0.5 mg/l and the total lead concentration is less than 350 mg/kg. This condition applies only if the soil is not a RCRA waste.
2. As fill beneath a pavement structure designated to protect the soil from water infiltration and five feet above the water table if the soluble lead concentration reported by DIWET analysis is greater then 0.5 mg/l but less then 50 mg/l, and the total lead concentration is less than 350 mg/kg. This condition applies only if the soil is not a RCRA waste.
3. Lead-contaminated soil with a pH below 5 shall only be used as fill beneath the paved portion of the roadway. This condition applies only if the soil is not a RCRA waste.

A statistical evaluation was conducted to further evaluate the concentration of lead within soil at the site. The statistical evaluation addressed the following items:

- Calculation of arithmetic mean;
- Determination of normal or lognormal distribution of the sample data; and
- Calculation of the 80% CI which provides a corresponding 90% UCL, interpreted as a 0.90 probability that the true mean for a given population is no higher than the calculated UCL.

The data from all intervals were combined into one data set for analysis. A histogram of the total lead results was constructed to evaluate the distribution of the total lead concentrations within the data set. The data were found to be heavily skewed to lower concentrations (Appendix H).

The statistical analysis for the total lead data was conducted using the Bootstrap method (Efron, 1982) to estimate the 90% UCL for the mean of the total lead data. Bootstrap methods are non-parametric techniques to infer the distribution of a statistic derived from a data set. Bootstrap methods construct a "distribution" for a statistic (in this case the mean) by resampling with replacement from the data set. A large number (B) of data subsets of size n (where n is the size of the data subset) are selected. The statistic is computed for each of the B data subsets of size n. This gives a sample of values of the statistic, rather than one value. Confidence limits for the population parameter that is estimated by the Bootstrapped statistic are then constructed

using percentiles of the sampled distribution of the statistic. Nondetects have been handled using the principle of Maximum Entropy, which treats the nondetect as an unobservable random variable drawn from a population that is uniform on the interval from zero to the detection limit.

The nonparametric bootstrap was used to compute the 90% UCL for the mean. There are several variations on the nonparametric Bootstrap. Efron's empirical quantile method (Efron, 1982) applied to the mean was used to estimate the 90% UCL for the mean for this data set. The 90% UCL calculated for total lead data is presented in Appendix H.

4.2.1 Lead Concentration and Distribution, EA No. 0A0400

Soil samples collected from the site were reported to contain lead (Table 2). The source for the lead is not known. However, studies along the transportation corridors have attributed elevated lead concentrations within soil to accumulation of dust and debris containing lead from leaded gasoline emissions (Coltrin, et al., 1993).

A summary of the distribution of the elevated lead concentrations is presented below. The data set is restricted to those samples reported to contain greater than or equal to 50 mg/kg lead, a level selected because it is 10 times the STLC.

	Distribution of Samples from Total Sample Population with Greater Than 50 mg/kg Lead		Distribution of Samples from Interval with Greater Than 50 mg/kg Lead		Distribution of Samples from All Samples with Greater Than 50 mg/kg Lead	
Sample Interval	Number	Percentage	Number	Percentage	Number	Percentage
0.15 meters	15 of 66	22.7	15 of 22	68.1	15 of 51	29.4
0.30 meters	19 of 66	28.8	19 of 22	86.4	19 of 51	37.3
0.45 meters	17 of 66	25.8	17 of 22	77.3	17 of 51	33.3

Typically, accumulations of ADL and the concentrations of lead, as reported by Coltrin and others (1993), are observed to decrease with depth. An exception to this was in areas where accumulation of dust and debris continued following cessation of leaded gasoline use resulting in lower lead concentrations at shallower depths (Coltrin, et al., 1993). This may explain the results for this project where elevated concentrations of lead were present in the deeper soil samples.

No soil samples were reported to contain total lead concentrations that exceed the TTLC value of 1,000 mg/kg for lead. Fifty-one soil samples were above the TTLC value of 50 mg/kg and were further analyzed for soluble lead concentrations using the WET. Thirty-five soil samples exceeded the STLC of 5 mg/l by WET analysis, in addition, 34 of these soil samples were

reported to contain soluble lead at concentrations in excess of the STLC of 0.5 mg/l by DIWET analysis. Soil samples reported to contain total lead exceeding the TTLC and soluble lead exceeding the STLC would be considered a California hazardous waste, should the soil become a waste.

No TCLP analyses were conducted. Therefore, evaluation of whether the soil would be considered a RCRA hazardous waste and whether the soil would be excluded from the variance based on a federal waste classification was not performed.

4.2.2 Lead Data Statistical Analysis, EA No. 0A0400

The data from all intervals were combined into one data set for analysis as Caltrans construction plans typically call for excavation of soil to 0.6 meters (2 feet) for road base preparation. The number of samples in the total sample population is 66. Evaluation of the soil data resulted in a mean (average) concentration of total lead of 139.70 mg/kg (Appendix H).

A histogram of the total lead results was constructed to evaluate the distribution of the total lead concentrations within the data set. Results of the statistical calculations are provided in Appendix H.

The 90% UCL was calculated for total lead data and are presented below and in Appendix H.

Sample Population	Mean Concentration (mg/kg)	90% UCL (mg/kg)
All Samples	139.70	157.40

A Pearson (product moment) correlation coefficient (Pearson value) was obtained from regression analysis for regression lines fit to the soluble lead data. The correlation coefficients for total and WET and total and DIWET lead data were 0.92 and 0.92, respectively. The correlation coefficients for the WET and DIWET data are above the acceptable correlation value of 0.8, per Caltrans contract 43A0078.

The soluble lead concentration for WET data corresponding to the total lead 90% UCL is 8.98 mg/l. The soluble lead concentration for DIWET data corresponding to the total lead 90% UCL is 4.76 mg/l. The predicted soluble lead concentration for WET data corresponding to the total lead 90% UCL is 7.00 mg/l. The predicted soluble lead concentration for DIWET data corresponding to the total lead 90% UCL is 3.17 mg/l.

A summary of 90% and 95% UCLs calculated for total lead data is presented below and in Appendix H. The summary also includes the predicted values for soluble lead by WET and DIWET methods.

4.2.3 Summary, EA No 0A0400

Soil in specific locations may be considered a California hazardous waste based on the soluble concentrations of lead reported in certain soil samples. Management of the soil within the DTSC variance is possible.

The mean concentration and 90% UCL values for total lead data were less than 1,000 mg/kg. This suggests that the soil, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities, may not require Class I disposal and may be handled within the conditions of the variance.

The excavated soil from the proposed retaining wall locations will likely require soluble lead analysis by the WET as the mean and 90% UCL for total lead is greater than 50 mg/kg, a level that generally triggers a requirement for WET analysis. If WET analyses are conducted, it is likely that composite soil samples would contain soluble lead at concentrations greater than the STLC as the predicted value for soluble lead by the WET corresponding to the total lead 90% UCL is 7.00 mg/l. It is, therefore, possible that the waste soil would be considered a hazardous waste based on the statistical analysis conducted. However, if the construction work is staged in a manner that segregates the excavated soil, waste soil from the areas may be considered hazardous and might be able to be managed under the DTSC variance.

If management of the soil within the variance is required, the statistical data indicate that the soil may be able to be handled within condition two of the variance. This condition requires that the soil be used as fill beneath a pavement structure designated to protect the soil from water infiltration and five feet above the water table if the soluble lead concentration reported by DIWET analysis is greater than 0.5 mg/l but less than 50 mg/l, and the total lead concentration is less than 350 mg/kg. This condition applies only if the soil is not a RCRA waste. This conclusion is based on the total lead concentration reported from the project area and the predicted value of 3.17 mg/l for DIWET data within the 0 to 0.45 meter (0 to 1.5 feet) data set at the SR 12 project site.

5.0 Conclusions and Recommendations

Based on the laboratory results, current regulatory guidelines, and the judgment of IT the following conclusions and recommendations are offered.

- Lead was reported in soil samples collected from SR 12 corridor. The source for the lead is not known. However, studies along the transportation corridors have attributed elevated lead concentrations within soil to accumulation of dust and debris containing lead from leaded gasoline emissions (Coltrin, et al., 1993).

ADL Investigation, SR 12

- Lead concentrations from the SR 12 survey compared to TTLC and STLC values to evaluate whether the soil would, should it become a waste, be considered a hazardous waste. No soil samples were reported to contain total lead concentrations that exceed the TTLC value of 1,000 mg/kg for lead. Two hundred twenty-five soil samples were reported to contain soluble lead at concentrations in excess of the STLC of 5 mg/l by WET analysis.

- The statistical evaluation for SR 12 resulted in the following data.

Sample Population	Total Lead Mean Concentration (mg/kg)	Total Lead 90% UCL (mg/kg)	Predicted Soluble Lead (WET) Concentration (mg/l)	Predicted Soluble Lead (DIWET) Concentration (mg/l)
SR 12	69.26	74.049	3.17	1.19

- Based on the statistical analysis, the soil, if treated as a whole and sampled on a composite basis from stockpiles generated during construction activities, may not be considered hazardous. However, if the construction work is staged in a manner that segregates the excavated soil, waste soil from some areas may be considered hazardous and might be able to be managed under the DTSC variance.

- If management of the soil within the variance is required, the statistical data indicate that the soil may be able to be handled within condition 2 of the variance. This condition requires that the soil be used as fill beneath a pavement structure designated to protect the soil from water infiltration and five feet above the water table if the soluble lead concentration reported by DIWET analysis is greater than 0.5 mg/l but less than 50 mg/l, and the total lead concentration is less than 350 mg/kg. This condition applies only if the soil is not a RCRA waste. This conclusion is based on the total lead concentration reported from the project area and the predicted value of 1.19 mg/l for DIWET data within the 0 to 0.45 meter (0 to 1.5 feet) data set at the SR 12 project site.

TABLE 1

LEAD ANALYTICAL DATA AND GPS COORDINATES
STATE ROUTE 12

Napa and Solano County, California
Task Order No. 04-264100-GU

Boring	Sample Designation (site #boring #-depth)	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead Total	Lead WET	Lead DI WET	pH
22	SR 12 - 22 -0.15	38.206502	-122.1753704	73.319	0.15	0.5	17.5			7.1
	SR 12 - 22 -0.30				0.30	1.0	**51.8**	1.33		
	SR 12 - 22 -0.45				0.45	1.5	36.6			
23	SR 12 - 23 -0.15	38.20643645	-122.1759062	74.597	0.15	0.5	13			
	SR 12 - 23 -0.30				0.30	1.0	12.6			
	SR 12 - 23 -0.45				0.45	1.5	31.2			
24	SR 12 - 24 -0.15	38.20635421	-122.1768051	70.946	0.15	0.5	17.4			
	SR 12 - 24 -0.30				0.30	1.0	20.7			7.2
	SR 12 - 24 -0.45				0.45	1.5	**107**	2.17		
25	SR 12 - 25 -0.15	38.20647861	-122.1780008	71.001	0.15	0.5	24			
	SR 12 - 25 -0.30				0.30	1.0	**98.3**	2.71		
	SR 12 - 25 -0.45				0.45	1.5	**65.4**	3.22		
26	SR 12 - 26 -0.15	38.20673969	-122.1790741	70.232	0.15	0.5	19.9			
	SR 12 - 26 -0.30				0.30	1.0	14.2			
	SR 12 - 26 -0.45				0.45	1.5	41.9			
27	SR 12 - 27 -0.15	38.20698167	-122.180067	71.801	0.15	0.5	**78.2**	2.38		
	SR 12 - 27 -0.30				0.30	1.0	**161**	4.58		
	SR 12 - 27 -0.45				0.45	1.5	**111**	**5.8**	0.487	
28	SR 12 - 28 -0.15	38.20754206	-122.1821769	72.536	0.15	0.5	**69.5**	3.57		
	SR 12 - 28 -0.30				0.30	1.0	**94.9**	**9.26**	1.50	7.0
	SR 12 - 28 -0.45				0.45	1.5	**88.1**	3.32		
29	SR 12 - 29 -0.15	38.20775918	-122.182932	74.206	0.15	0.5	16.4			
	SR 12 - 29 -0.30				0.30	1.0	37.4			
	SR 12 - 29 -0.45				0.45	1.5	**258**	3.26		
30	SR 12 - 30 -0.15	38.20808335	-122.1840024	74.774	0.15	0.5	27.4			
	SR 12 - 30 -0.30				0.30	1.0	**68**	1.27		
	SR 12 - 30 -0.45				0.45	1.5	**54.1**	1.26		
31	SR 12 - 31 -0.15	38.20847448	-122.1859116	75.299	0.15	0.5	**98**	0.64		
	SR 12 - 31 -0.30				0.30	1.0	**106**	1.22		
	SR 12 - 31 -0.45				0.45	1.5	46.5			
32	SR 12 - 32 -0.15	38.2084963	-122.1874705	76.817	0.15	0.5	**93.9**	2.70		
	SR 12 - 32 -0.30				0.30	1.0	**62.2**	2.08		
	SR 12 - 32 -0.45				0.45	1.5	38.3			
33	SR 12 - 33 -0.15	38.20848775	-122.1882711	76.181	0.15	0.5	**97.6**	3.27		
	SR 12 - 33 -0.30				0.30	1.0	**105**	3.75		6.9
	SR 12 - 33 -0.45				0.45	1.5	**142**	2.95		
34	SR 12 - 34 -0.15	38.20849812	-122.1890613	78.542	0.15	0.5	32.6			
	SR 12 - 34 -0.30				0.30	1.0	48.8			
	SR 12 - 34 -0.45				0.45	1.5	**51.3**	1.76		
35	SR 12 - 35 -0.15	38.20850375	-122.1898716	80.98	0.15	0.5	**158**	**6.29**	2.00	
	SR 12 - 35 -0.30				0.30	1.0	**131**	**5.84**	1.72	
	SR 12 - 35 -0.45				0.45	1.5	**183**	**32.30**	0.871	
36	SR 12 - 36 -0.15	38.20852123	-122.1905766	83.694	0.15	0.5	9.01			
	SR 12 - 36 -0.30				0.30	1.0	16			
	SR 12 - 36 -0.45				0.45	1.5	34.7			
37	SR 12 - 37 -0.15	38.20862572	-122.1917778	85.462	0.15	0.5	21.5			6.8
	SR 12 - 37 -0.30				0.30	1.0	**54.3**	1.33		
	SR 12 - 37 -0.45				0.45	1.5	48			
38	SR 12 - 38 -0.15	38.2088351	-122.1939492	92.606	0.15	0.5	6.76			
	SR 12 - 38 -0.30				0.30	1.0	12.2			
	SR 12 - 38 -0.45				0.45	1.5	42.5			
39	SR 12 - 39 -0.15	38.20893063	-122.1960628	94.616	0.15	0.5	33.1			
	SR 12 - 39 -0.30				0.30	1.0	7			
	SR 12 - 39 -0.45				0.45	1.5	22.3			
40	SR 12 - 40 -0.15	38.20892411	-122.1967999	96.185	0.15	0.5	11.3			
	SR 12 - 40 -0.30				0.30	1.0	30.8			
	SR 12 - 40 -0.45				0.45	1.5	29.5			6.8
41	SR 12 - 41 -0.15	38.20891397	-122.1977983	99.343	0.15	0.5	42.6			
	SR 12 - 41 -0.30				0.30	1.0	**114**	1.98		
	SR 12 - 41 -0.45				0.45	1.5	**51.1**	4.95		
42	SR 12 - 42 -0.15	38.20889085	-122.1990259	99.203	0.15	0.5	16.2			
	SR 12 - 42 -0.30				0.30	1.0	7.84			
	SR 12 - 42 -0.45				0.45	1.5	**89.8**	3.59		

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Task Order No. 04-264100-GU

Boring	Sample Designation (site #boring #-depth)	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead Total	Lead WET	Lead DI WET	pH
43	SR 12 - 43 -0.15	38.20907036	-122.2008759	100.912	0.15	0.5	49.9			
	SR 12 - 43 -0.30				0.30	1.0	29.4			6.6
	SR 12 - 43 -0.45				0.45	1.5	40			
44	SR 12 - 44 -0.15	38.20926679	-122.2019541	98.683	0.15	0.5	39.1			
	SR 12 - 44 -0.30				0.30	1.0	**51.2**	1.48		
	SR 12 - 44 -0.45				0.45	1.5	**87**	3.05		
45	SR 12 - 45 -0.15	38.20942999	-122.2028491	96.487	0.15	0.5	22.6			
	SR 12 - 45 -0.30				0.30	1.0	20.7			
	SR 12 - 45 -0.45				0.45	1.5	13			
46	SR 12 - 46 -0.15	38.20986783	-122.2044249	94.413	0.15	0.5	10.9			
	SR 12 - 46 -0.30				0.30	1.0	10.4			
	SR 12 - 46 -0.45				0.45	1.5	11.6			
47	SR 12 - 47 -0.15	38.21017223	-122.2051023	94.378	0.15	0.5	25.5			
	SR 12 - 47 -0.30				0.30	1.0	22.8			
	SR 12 - 47 -0.45				0.45	1.5	14.5			
48	SR 12 - 48 -0.15	38.21061748	-122.2059477	93.748	0.15	0.5	**102**	4.97		6.3
	SR 12 - 48 -0.30				0.30	1.0	**79.3**	2.83		
	SR 12 - 48 -0.45				0.45	1.5	30.2			
49	SR 12 - 49 -0.15	38.21093014	-122.2066157	93.552	0.15	0.5	**413**	1.95		
	SR 12 - 49 -0.30				0.30	1.0	**55.2**	3.30		
	SR 12 - 49 -0.45				0.45	1.5	**66**	2.97		
50	SR 12 - 50 -0.15	38.21139942	-122.2075684	94.209	0.15	0.5	48.5			
	SR 12 - 50 -0.30				0.30	1.0	**154**	**5.24**	0.40	6.8
	SR 12 - 50 -0.45				0.45	1.5	**129**	3.41		
51	SR 12 - 51 -0.15	38.21161736	-122.2082103	93.149	0.15	0.5	**101**	4.83		
	SR 12 - 51 -0.30				0.30	1.0	**132**	**5.50**	0.537	
	SR 12 - 51 -0.45				0.45	1.5	**90.7**	4.06		
52	SR 12 - 52 -0.15	38.21186658	-122.2094312	89.704	0.15	0.5	**50**	1.18		
	SR 12 - 52 -0.30				0.30	1.0	34			
	SR 12 - 52 -0.45				0.45	1.5	**65**	2.20		
53	SR 12 - 53 -0.15	38.21229645	-122.210885	86.387	0.15	0.5	41			
	SR 12 - 53 -0.30				0.30	1.0	39			6.6
	SR 12 - 53 -0.45				0.45	1.5	33			
54	SR 12 - 54 -0.15	38.21262062	-122.2117091	84.928	0.15	0.5	**50**	1.28		
	SR 12 - 54 -0.30				0.30	1.0	27			
	SR 12 - 54 -0.45				0.45	1.5	17			
55	SR 12 - 55 -0.15	38.21293137	-122.2125039	83.041	0.15	0.5	**110**	4.24		
	SR 12 - 55 -0.30				0.30	1.0	**80**	4.03		
	SR 12 - 55 -0.45				0.45	1.5	**99**	3.51		
56	SR 12 - 56 -0.15	38.21338732	-122.2139713	80.094	0.15	0.5	22			
	SR 12 - 56 -0.30				0.30	1.0	30			
	SR 12 - 56 -0.45				0.30	1.0	46			7.0
57	SR 12 - 57 -0.15	38.21378412	-122.2153347	77.54	0.15	0.5	17			
	SR 12 - 57 -0.30				0.30	1.0	17			
	SR 12 - 57 -0.45				0.45	1.5	13			
58	SR 12 - 58 -0.15	38.21403612	-122.2161997	76.808	0.15	0.5	8			
	SR 12 - 58 -0.30				0.30	1.0	11			
	SR 12 - 58 -0.45				0.45	1.5	10			
59	SR 12 - 59 -0.15	38.21433926	-122.2172421	75.496	0.15	0.5	7			
	SR 12 - 59 -0.30				0.30	1.0	6			
	SR 12 - 59 -0.45				0.45	1.5	12			7.0
60	SR 12 - 60 -0.15	38.21494359	-122.2193167	73.453	0.15	0.5	17			
	SR 12 - 60 -0.30				0.30	1.0	15			
	SR 12 - 60 -0.45				0.45	1.5	9			
61	SR 12 - 61 -0.15	38.21530209	-122.22039	73.045	0.15	0.5	34			
	SR 12 - 61 -0.30				0.30	1.0	27			
	SR 12 - 61 -0.45				0.45	1.5	31			
62	SR 12 - 62 -0.15	38.21575358	-122.2216503	72.651	0.15	0.5	38			
	SR 12 - 62 -0.30				0.30	1.0	47			
	SR 12 - 62 -0.45				0.45	1.5	**51**	0.60		
63	SR 12 - 63 -0.15	38.21643887	-122.2235628	67.984	0.15	0.5	37			6.3
	SR 12 - 63 -0.30				0.30	1.0	48			
	SR 12 - 63 -0.45				0.45	1.5	**53**	2.66		

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STATE ROUTE 12

Napa and Solano County, California
Task Order No. 04-264100-GU

Boring	Sample Designation (site #boring #-depth)	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead Total	Lead WET	Lead DI WET	pH
64	SR 12 - 64 -0.15	38.21671116	-122.2243339	65.875	0.15	0.5	83	3.56		
	SR 12 - 64 -0.30				0.30	1.0	81	4.05		
	SR 12 - 64 -0.45				0.45	1.5	70	2.88		
65	SR 12 - 65 -0.15	38.21728382	-122.2259523	65.087	0.15	0.5	59	4.53		
	SR 12 - 65 -0.30				0.30	1.0	39			
	SR 12 - 65 -0.45				0.45	1.5	15			
66	SR 12 - 66 -0.15	38.21781581	-122.2274253	63.187	0.15	0.5	34			
	SR 12 - 66 -0.30				0.30	1.0	51	1.01		
	SR 12 - 66 -0.45				0.45	1.5	64	1.96		7.0
67	SR 12 - 67 -0.15	38.21843644	-122.2291752	61.688	0.15	0.5	85	2.79		
	SR 12 - 67 -0.30				0.30	1.0	96	3.53		
	SR 12 - 67 -0.45				0.45	1.5	92	3.02		
68	SR 12 - 68 -0.15	38.21932966	-122.2317132	55.367	0.15	0.5	61	1.6		
	SR 12 - 68 -0.30				0.30	1.0	105	3.32		
	SR 12 - 68 -0.45				0.45	1.5	120	5.11	1.55	
69	SR 12 - 69 -0.15	38.22031548	-122.2344215	49.425	0.15	0.5	14			
	SR 12 - 69 -0.30				0.30	1.0	16			7.1
	SR 12 - 69 -0.45				0.45	1.5	13			
70	SR 12 - 70 -0.15	38.22071549	-122.2355757	48.179	0.15	0.5	45	1.1		
	SR 12 - 70 -0.30				0.30	1.0	33			
	SR 12 - 70 -0.45				0.45	1.5	25			6.4
71	SR 12 - 71 -0.15	38.22124304	-122.2371148	49.899	0.15	0.5	57	1.62		
	SR 12 - 71 -0.30				0.30	1.0	65	2.91		
	SR 12 - 71 -0.45				0.45	1.5	27			
72	SR 12 - 72 -0.15	38.22151669	-122.2386699	47.23	0.15	0.5	45	2.5		
	SR 12 - 72 -0.30				0.30	1.0	67	3.82		
	SR 12 - 72 -0.45				0.45	1.5	108	3.06		
73	SR 12 - 73 -0.15	38.2214851	-122.2396192	43.776	0.15	0.5	17			
	SR 12 - 73 -0.30				0.30	1.0	22			6.4
	SR 12 - 73 -0.45				0.45	1.5	21			
74	SR 12 - 74 -0.15	38.22141711	-122.2409279	40.363	0.15	0.5	99	5.81	0.358	
	SR 12 - 74 -0.30				0.30	1.0	64	4.47		
	SR 12 - 74 -0.45				0.45	1.5	130	5.20	0.95	
75	SR 12 - 75 -0.15	38.22133883	-122.242653	40.038	0.15	0.5	31			
	SR 12 - 75 -0.30				0.30	1.0	25			
	SR 12 - 75 -0.45				0.45	1.5	33			
76	SR 12 - 76 -0.15	38.22131384	-122.2438348	36.89	0.15	0.5	54	2.28		
	SR 12 - 76 -0.30				0.30	1.0	57	2.38		
	SR 12 - 76 -0.45				0.45	1.5	72	2.43		6.3
77	SR 12 - 77 -0.15	38.22131106	-122.2448678	33.256	0.15	0.5	129	8.95	2.40	
	SR 12 - 77 -0.30				0.30	1.0	72	6.10	1.09	
	SR 12 - 77 -0.45				0.45	1.5	117	5.99	1.59	
78	SR 12 - 78 -0.15	38.22141918	-122.2458514	32.663	0.15	0.5	94	7.41	1.82	
	SR 12 - 78 -0.30				0.30	1.0	300	7.83	2.91	
	SR 12 - 78 -0.45				0.45	1.5	121	5.73	1.33	
79	SR 12 - 79 -0.15	38.22177722	-122.2475926	31.397	0.15	0.5	145	10.90	2.59	
	SR 12 - 79 -0.30				0.30	1.0	129	10.40	2.26	
	SR 12 - 79 -0.45				0.45	1.5	138	9.67	2.25	6.3
80	SR 12 - 80 -0.15	38.22202112	-122.2487681	30.596	0.15	0.5	115	5.77	1.20	
	SR 12 - 80 -0.30				0.30	1.0	166	6.29	1.08	
	SR 12 - 80 -0.45				0.45	1.5	104	3.99		
81	SR 12 - 81 -0.15	38.22235477	-122.2506757	34.361	0.15	0.5	73	3.22		
	SR 12 - 81 -0.30				0.30	1.0	68	4.04		
	SR 12 - 81 -0.45				0.45	1.5	115	4.38		
82	SR 12 - 82 -0.15	38.22259262	-122.2523179	32.209	0.15	0.5	76	5.17	1.41	
	SR 12 - 82 -0.30				0.30	1.0	87	4.06		
	SR 12 - 82 -0.45				0.45	1.5	82	3.72		6.5
83	SR 12 - 83 -0.15	38.22273819	-122.2535961	29.848	0.15	0.5	109	5.55	2.47	
	SR 12 - 83 -0.30				0.30	1.0	152	6.64	2.52	
	SR 12 - 83 -0.45				0.45	1.5	129	7.15	3.15	
84	SR 12 - 84 -0.15	38.22287751	-122.2547143	26.553	0.15	0.5	186	12.50	2.57	
	SR 12 - 84 -0.30				0.30	1.0	91	5.66	1.83	
	SR 12 - 84 -0.45				0.45	1.5	162	8.67	2.26	

TABLE 1

LEAD ANALYTICAL DATA AND GPS COORDINATES
STATE ROUTE 12
Napa and Solano County, California
Task Order No. 04-264100-GU

Boring	Sample Designation (site #boring #-depth)	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead Total	Lead WET	Lead DI WET	pH
85	SR 12 - 85 -0.15	38.22299763	-122.2556934	24.321	0.15	0.5	107	4.75		
	SR 12 - 85 -0.30				0.30	1.0	56	2.40		
	SR 12 - 85 -0.45				0.45	1.5	45			
86	SR 12 - 86 -0.15	38.22334717	-122.2584075	21.424	0.15	0.5	14			
	SR 12 - 86 -0.30				0.30	1.0	14			
	SR 12 - 86 -0.45				0.45	1.5	12			6.5
87	SR 12 - 87 -0.15	38.22287435	-122.2573628	21.557	0.15	0.5	7			
	SR 12 - 87 -0.30				0.30	1.0	8			
	SR 12 - 87 -0.45				0.45	1.5	10			
88	SR 12 - 88 -0.15	38.22290705	-122.2563758	23.451	0.15	0.5	17			
	SR 12 - 88 -0.30				0.30	1.0	13			6.1
	SR 12 - 88 -0.45				0.45	1.5	14			
89	SR 12 - 89 -0.15	38.22270454	-122.2548742	26.913	0.15	0.5	16			
	SR 12 - 89 -0.30				0.30	1.0	17			
	SR 12 - 89 -0.45				0.45	1.5	20			
90	SR 12 - 90 -0.15	38.22243932	-122.2529985	32.231	0.15	0.5	15			
	SR 12 - 90 -0.30				0.30	1.0	10			
	SR 12 - 90 -0.45				0.45	1.5	8			
91	SR 12 - 91 -0.15	38.22234726	-122.2520907	33.667	0.15	0.5	8			
	SR 12 - 91 -0.30				0.30	1.0	7			
	SR 12 - 91 -0.45				0.45	1.5	8			
92	SR 12 - 92 -0.15	38.222087	-122.2498874	34.591	0.15	0.5	18			
	SR 12 - 92 -0.30				0.30	1.0	16			
	SR 12 - 92 -0.45				0.45	1.5	10			
93	SR 12 - 93 -0.15	38.22181826	-122.2485759	31.7	0.15	0.5	30			6.1
	SR 12 - 93 -0.30				0.30	1.0	21			
	SR 12 - 93 -0.45				0.45	1.5	16			
94	SR 12 - 94 -0.15	38.22148941	-122.2469525	33.069	0.15	0.5	15			
	SR 12 - 94 -0.30				0.30	1.0	21			
	SR 12 - 94 -0.45				0.45	1.5	7			
95	SR 12 - 95 -0.15	38.22118901	-122.2454213	34.751	0.15	0.5	25			
	SR 12 - 95 -0.30				0.30	1.0	27			
	SR 12 - 95 -0.45				0.45	1.5	18			6.1
96	SR 12 - 96 -0.15	38.22115822	-122.2438923	37.037	0.15	0.5	38			
	SR 12 - 96 -0.30				0.30	1.0	7			
	SR 12 - 96 -0.45				0.45	1.5	7			
97	SR 12 - 97 -0.15	38.22118191	-122.2428777	39.659	0.15	0.5	18			
	SR 12 - 97 -0.30				0.30	1.0	25			
	SR 12 - 97 -0.45				0.45	1.5	9			
98	SR 12 - 98 -0.15	38.22120671	-122.2421046	40.872	0.15	0.5	31			
	SR 12 - 98 -0.30				0.30	1.0	6			
	SR 12 - 98 -0.45				0.45	1.5	7			
99	SR 12 - 99 -0.15	38.22127131	-122.2403562	41.098	0.15	0.5	1			
	SR 12 - 99 -0.30				0.30	1.0	51	2.02		6.4
	SR 12 - 99 -0.45				0.45	1.5	7			
100	SR 12 - 100 -0.15	38.2213306	-122.2391347	45.334	0.15	0.5	18			
	SR 12 - 100 -0.30				0.30	1.0	13			
	SR 12 - 100 -0.45				0.45	1.5	9			
101	SR 12 - 101 -0.15	38.22130263	-122.2383667	47.579	0.15	0.5	37			
	SR 12 - 101 -0.30				0.30	1.0	28			
	SR 12 - 101 -0.45				0.45	1.5	34			
102	SR 12 - 102 -0.15	38.22105221	-122.2371722	48.353	0.15	0.5	34			
	SR 12 - 102 -0.30				0.30	1.0	41			6.4
	SR 12 - 102 -0.45				0.45	1.5	31			
103	SR 12 - 103 -0.15	38.2205529	-122.2356626	47.773	0.15	0.5	20			
	SR 12 - 103 -0.30				0.30	1.0	16			
	SR 12 - 103 -0.45				0.45	1.5	17			
104	SR 12 - 104 -0.15	38.21991127	-122.2339936	49.335	0.15	0.5	19			
	SR 12 - 104 -0.30				0.30	1.0	9			
	SR 12 - 104 -0.45				0.45	1.5	28			
105	SR 12 - 105 -0.15	38.21958931	-122.2330614	50.859	0.15	0.5	30			
	SR 12 - 105 -0.30				0.30	1.0	22			6.6
	SR 12 - 105 -0.45				0.45	1.5	17			

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LEAD ANALYTICAL DATA AND GPS COORDINATES
STATE ROUTE 12

Napa and Solano County, California
Task Order No. 04-264100-GU

Boring	Sample Designation (site #boring #-depth)	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead Total	Lead WET	Lead DI WET	pH
106	SR 12 - 106 -0.15	38.218993	-122.2312698	55.87	0.15	0.5	18			
	SR 12 - 106 -0.30				0.30	1.0	13			
	SR 12 - 106 -0.45				0.45	1.5	14			
107	SR 12 - 107 -0.15	38.21819961	-122.2291525	60.951	0.15	0.5	23			
	SR 12 - 107 -0.30				0.30	1.0	23			
	SR 12 - 107 -0.45				0.45	1.5	29			
108	SR 12 - 108 -0.15	38.2177483	-122.2277699	63.268	0.15	0.5	67	2.88		
	SR 12 - 108 -0.30				0.30	1.0	87	2.88		
	SR 12 - 108 -0.45				0.45	1.5	61	2.36		
109	SR 12 - 109 -0.15	38.21717575	-122.2261025	64.092	0.15	0.5	26			6.5
	SR 12 - 109 -0.30				0.30	1.0	19			
	SR 12 - 109 -0.45				0.45	1.5	24			
110	SR 12 - 110 -0.15	38.21657748	-122.224372	65.389	0.15	0.5	52	3.35		
	SR 12 - 110 -0.30				0.30	1.0	71	4.91		
	SR 12 - 110 -0.45				0.45	1.5	64	3.19		
111	SR 12 - 111 -0.15	38.21616561	-122.2232469	68.989	0.15	0.5	110	6.82	5.74	
	SR 12 - 111 -0.30				0.30	1.0	72	5.55	2.43	
	SR 12 - 111 -0.45				0.45	1.5	117	8.86	3.39	
112	SR 12 - 112 -0.15	38.21565337	-122.2220938	73.674	0.15	0.5	79	3.72		
	SR 12 - 112 -0.30				0.30	1.0	45			
	SR 12 - 112 -0.45				0.45	1.5	56	2.02		
113	SR 12 - 113 -0.15	38.21534984	-122.2209788	73.413	0.15	0.5	87	4.57		
	SR 12 - 113 -0.30				0.30	1.0	88	4.46		
	SR 12 - 113 -0.45				0.45	1.5	125	7.62	1.52	
114	SR 12 - 114 -0.15	38.21463928	-122.2187731	75.176	0.15	0.5	150	9.28	2.28	6.4
	SR 12 - 114 -0.30				0.30	1.0	140	7.45	2.41	
	SR 12 - 114 -0.45				0.45	1.5	135	4.67		
115	SR 12 - 115 -0.15	38.21410907	-122.2169559	77.52	0.15	0.5	110	7.57	1.10	
	SR 12 - 115 -0.30				0.30	1.0	58.3	3.94		6.2
	SR 12 - 115 -0.45				0.45	1.5	45.9			
116	SR 12 - 116 -0.15	38.21357951	-122.215143	78.701	0.15	0.5	91.4	6.48	1.29	
	SR 12 - 116 -0.30				0.30	1.0	99.8	4.89		
	SR 12 - 116 -0.45				0.45	1.5	117	5.10	0.453	
117	SR 12 - 117 -0.15	38.21309039	-122.2134546	81.998	0.15	0.5	121	8.96	1.58	
	SR 12 - 117 -0.30				0.30	1.0	130	7.91	1.56	
	SR 12 - 117 -0.45				0.45	1.5	124	6.84	1.41	
118	SR 12 - 118 -0.15	38.21270947	-122.212326	82.484	0.15	0.5	45.7			6.0
	SR 12 - 118 -0.30				0.30	1.0	48.2			
	SR 12 - 118 -0.45				0.45	1.5	40.7			
119	SR 12 - 119 -0.15	38.21233728	-122.2113726	85.162	0.15	0.5	148	9.92	2.74	
	SR 12 - 119 -0.30				0.30	1.0	150	8.06	2.00	
	SR 12 - 119 -0.45				0.45	1.5	153	7.83	1.59	
120	SR 12 - 120 -0.15	38.2119489	-122.2102962	88.316	0.15	0.5	75.3	3.34		
	SR 12 - 120 -0.30				0.30	1.0	74.5	3.41		
	SR 12 - 120 -0.45				0.45	1.5	89.8	8.71	0.64	
121	SR 12 - 121 -0.15	38.2116398	-122.2090064	91.308	0.15	0.5	108	7.33	0.801	
	SR 12 - 121 -0.30				0.30	1.0	161	6.08	0.77	6.2
	SR 12 - 121 -0.45				0.45	1.5	98.7	4.51		
122	SR 12 - 122 -0.15	38.21119416	-122.2074348	95.341	0.15	0.5	105	6.57	1.16	
	SR 12 - 122 -0.30				0.30	1.0	95.3	3.46		
	SR 12 - 122 -0.45				0.45	1.5	56.1	2.64		
123	SR 12 - 123 -0.15	38.21067204	-122.2064009	95.806	0.15	0.5	57	3.14		
	SR 12 - 123 -0.30				0.30	1.0	54.1	3.63		
	SR 12 - 123 -0.45				0.45	1.5	62.9	2.77		
124	SR 12 - 124 -0.15	38.2099901	-122.2050365	96.92	0.15	0.5	36.3			
	SR 12 - 124 -0.30				0.30	1.0	48.9			6.3
	SR 12 - 124 -0.45				0.45	1.5	41.8			
125	SR 12 - 125 -0.15	38.20946223	-122.2036264	95.844	0.15	0.5	106	5.45	1.81	
	SR 12 - 125 -0.30				0.30	1.0	74.7	3.73		
	SR 12 - 125 -0.45				0.45	1.5	57.8	2.17		
126	SR 12 - 126 -0.15	38.20915308	-122.2021712	98.929	0.15	0.5	118	5.74	1.23	
	SR 12 - 126 -0.30				0.30	1.0	110	3.86		
	SR 12 - 126 -0.45				0.45	1.5	99.9	3.8		

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LEAD ANALYTICAL DATA AND GPS COORDINATES
STATE ROUTE 12

Napa and Solano County, California
Task Order No. 04-264100-GU

Boring	Sample Designation (site #boring #-depth)	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead Total	Lead WET	Lead DI WET	pH
127	SR 12 - 127 -0.15	38.20894678	-122.2010257	100.975	0.15	0.5	**92.6**	3.51		6.2
	SR 12 - 127 -0.30				0.30	1.0	43.7			
	SR 12 - 127 -0.45				0.45	1.5	46.3			
128	SR 12 - 128 -0.15	38.20876848	-122.1991021	101.639	0.15	0.5	26.7			
	SR 12 - 128 -0.30				0.30	1.0	37.3			
	SR 12 - 128 -0.45				0.45	1.5	40			
129	SR 12 - 129 -0.15	38.20878109	-122.1979663	99.388	0.15	0.5	**50.4**	2.95		
	SR 12 - 129 -0.30				0.30	1.0	**54**	3.80		
	SR 12 - 129 -0.45				0.45	1.5	46.6			
130	SR 12 - 130 -0.15	38.20880285	-122.1963682	96.076	0.15	0.5	32.3			
	SR 12 - 130 -0.30				0.30	1.0	31.6			
	SR 12 - 130 -0.45				0.45	1.5	34.3			
131	SR 12 - 131 -0.15	38.2088025	-122.1950187	94.12	0.15	0.5	26.2			6.3
	SR 12 - 131 -0.30				0.30	1.0	22.8			
	SR 12 - 131 -0.45				0.45	1.5	26.6			
132	SR 12 - 132 -0.15	38.2086506	-122.1932975	90.382	0.15	0.5	**60.5**	3.00		
	SR 12 - 132 -0.30				0.30	1.0	41.7			
	SR 12 - 132 -0.45				0.45	1.5	45.9			6.6
133	SR 12 - 133 -0.15	38.20847762	-122.191516	86.369	0.15	0.5	38.3			
	SR 12 - 133 -0.30				0.30	1.0	**72.2**	2.63		
	SR 12 - 133 -0.45				0.45	1.5	**69.8**	2.49		
134	SR 12 - 134 -0.15	38.20842401	-122.1907366	85.087	0.15	0.5	24.1			
	SR 12 - 134 -0.30				0.30	1.0	27			
	SR 12 - 134 -0.45				0.45	1.5	6.29			
135	SR 12 - 135 -0.15	38.20838236	-122.1893104	80.419	0.15	0.5	41.2			
	SR 12 - 135 -0.30				0.30	1.0	17			
	SR 12 - 135 -0.45				0.45	1.5	13.8			
136	SR 12 - 136 -0.15	38.20836152	-122.1877668	78.308	0.15	0.5	**79.8**	3.53		6.5
	SR 12 - 136 -0.30				0.30	1.0	**112**	4.22		
	SR 12 - 136 -0.45				0.45	1.5	**67.9**	2.38		
137	SR 12 - 137 -0.15	38.20832957	-122.1862588	77.006	0.15	0.5	47.7			
	SR 12 - 137 -0.30				0.30	1.0	43.5			
	SR 12 - 137 -0.45				0.45	1.5	47.2			
138	SR 12 - 138 -0.15	38.20806184	-122.1844906	75.551	0.15	0.5	**151**	**6.11**	3.23	
	SR 12 - 138 -0.30				0.30	1.0	**146**	**7.90**	3.15	
	SR 12 - 138 -0.45				0.45	1.5	**178**	**8.42**	2.49	6.6
139	SR 12 - 139 -0.15	38.20771173	-122.1832093	75.131	0.15	0.5	**65.5**	2.63		
	SR 12 - 139 -0.30				0.30	1.0	**53.3**	2.47		
	SR 12 - 139 -0.45				0.45	1.5	46.4			
140	SR 12 - 140 -0.15	38.20733285	-122.1819021	73.785	0.15	0.5	47.8			
	SR 12 - 140 -0.30				0.30	1.0	40.4			
	SR 12 - 140 -0.45				0.45	1.5	16.2			
141	SR 12 - 141 -0.15	38.20690251	-122.1802325	74.527	0.15	0.5	11			
	SR 12 - 141 -0.30				0.30	1.0	11.9			
	SR 12 - 141 -0.45				0.45	1.5	8.36			
142	SR 12 - 142 -0.15	38.20650866	-122.1786906	72.439	0.15	0.5	13.7			6.5
	SR 12 - 142 -0.30				0.30	1.0	8.95			
	SR 12 - 142 -0.45				0.45	1.5	13.4			
143	SR 12 - 143 -0.15	38.20624702	-122.1767943	69.944	0.15	0.5	**74.6**	1.89		
	SR 12 - 143 -0.30				0.30	1.0	**180**	3.20		
	SR 12 - 143 -0.45				0.45	1.5	**207**	**6.60**	4.43	
144	SR 12 - 144 -0.15	38.20625256	-122.1767644	71.532	0.15	0.5	**162**	**6.15**	3.01	
	SR 12 - 144 -0.30				0.30	1.0	**156**	**6.87**	2.72	
	SR 12 - 144 -0.45				0.45	1.5	**142**	**5.76**	3.02	
145	SR 12 - 145 -0.15	38.20744314	-122.1691361	69.669	0.15	0.5	13.8			6.9
	SR 12 - 145 -0.30				0.30	1.0	45.6			
	SR 12 - 145 -0.45				0.45	1.5	40.1			
146	SR 12 - 146 -0.15	38.20761251	-122.167498	69.181	0.15	0.5	**161**	**7.45**	2.47	
	SR 12 - 146 -0.30				0.30	1.0	**208**	**7.60**	1.92	
	SR 12 - 146 -0.45				0.45	1.5	**262**	**14.10**	7.63	
147	SR 12 - 147 -0.15	38.20765125	-122.166016	68.762	0.15	0.5	18.7			
	SR 12 - 147 -0.30				0.30	1.0	17.9			
	SR 12 - 147 -0.45				0.45	1.5	22.6			

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Boring	Sample Designation (site #boring #-depth)	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead Total	Lead WET	Lead DI WET	pH
148	SR 12 - 148 -0.15	38.20760051	-122.1644445	66.196	0.15	0.5	**94.6**	4.30		6.5
	SR 12 - 148 -0.30				0.30	1.0	**71.9**	2.69		
	SR 12 - 148 -0.45				0.45	1.5	**103**	**6.83**	1.88	
149	SR 12 - 149 -0.15	38.20758193	-122.1635448	61.662	0.15	0.5	**55**	**13.00**	1.58	
	SR 12 - 149 -0.30				0.30	1.0	**68.5**	**17.50**	3.28	
	SR 12 - 149 -0.45				0.45	1.5	45.8			
150	SR 12 - 150 -0.15	38.20759165	-122.1629424	58.383	0.15	0.5	**56.4**	**9.78**	1.20	
	SR 12 - 150 -0.30				0.30	1.0	**64.7**	**11.20**	1.11	
	SR 12 - 150 -0.45				0.45	1.5	**61.3**	**17.20**	2.03	7.2
151	SR 12 - 151 -0.15	38.20757937	-122.162142	54.487	0.15	0.5	13.7			
	SR 12 - 151 -0.30				0.30	1.0	15.3			
	SR 12 - 151 -0.45				0.45	1.5	12.5			
152	SR 12 - 152 -0.15	38.20755078	-122.1613662	52.996	0.15	0.5	35.2			
	SR 12 - 152 -0.30				0.30	1.0	**50.5**	1.60		
	SR 12 - 152 -0.45				0.45	1.5	**66.8**	1.63		
153	SR 12 - 153 -0.15	38.20758844	-122.1598852	47.573	0.15	0.5	14.2			
	SR 12 - 153 -0.30				0.30	1.0	14.2			
	SR 12 - 153 -0.45				0.45	1.5	14.5			
154	SR 12 - 154 -0.15	38.20758075	-122.1572045	35.022	0.15	0.5	**77**	1.85		6.7
	SR 12 - 154 -0.30				0.30	1.0	40.4			
	SR 12 - 154 -0.45				0.45	1.5	25.9			
155	SR 12 - 155 -0.15	38.20759974	-122.1563223	33.542	0.15	0.5	**167**	4.74		
	SR 12 - 155 -0.30				0.30	1.0	**131**	4.28		
	SR 12 - 155 -0.45				0.45	1.5	**102**	4.99		
156	SR 12 - 156 -0.15	38.2076224	-122.1548816	32.017	0.15	0.5	25.1			
	SR 12 - 156 -0.30				0.30	1.0	32.7			
	SR 12 - 156 -0.45				0.45	1.5	**61.9**	2.65		
157	SR 12 - 157 -0.15	38.20772897	-122.1539234	33.92	0.15	0.5	**54.2**	2.10		
	SR 12 - 157 -0.30				0.30	1.0	**74.8**	2.74		7.1
	SR 12 - 157 -0.45				0.45	1.5	**64.7**	4.28		
158	SR 12 - 158 -0.15	38.20795701	-122.1528962	31.285	0.15	0.5	**57.9**	4.43		
	SR 12 - 158 -0.30				0.30	1.0	**117**	**10.40**	2.51	
	SR 12 - 158 -0.45				0.45	1.5	**66.4**	4.83		
159	SR 12 - 159 -0.15	38.20805485	-122.1520746	30.317	0.15	0.5	25.8			
	SR 12 - 159 -0.30				0.30	1.0	**73.7**	**5.05**	1.08	
	SR 12 - 159 -0.45				0.45	1.5	27.3			
TTLC							1,000			
STLC								5		
Reporting Limits							1.0	0.050	0.010	0.10

Notes:

1. *Analyses conducted in general accordance with EPA Method 6010 for lead and EPA Method 9045 for soil pH.*
2. *Sample depths reported in approximate meters (m) / feet (ft) below the ground surface.*
3. *TTLC = total threshold limit concentration. STLC = soluble threshold limit concentration. WET = waste extraction test. DI WET = WET with deionized water extraction solution.*
4. *WET conducted in general accordance with California Title 22 procedures.*
5. *Total lead results reported in milligrams per kilogram. WET and DI WET results reported in milligrams per liter. pH results reported in standard units.*
6. *Soil samples labeled as follows: route-boring no.-depth. Ex.: SR12-01-0.15 State Route 12, boring 01, 0.15-meter depth.*
7. *For total results, bold results exceed 10 times the STLC.*
8. *For WET results, bold results exceed the STLC.*
9. *ND = not detected above reporting limit.*
10. *Latitude and longitude converted to decimal format.*

TABLE 2

LEAD ANALYTICAL DATA AND GPS COORDINATES

EA No. 0A0400
Solano County, California
Task Order No. 04-264100-GU

Boring	Sample Designation (site #boring #-depth)	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead Total	Lead WET	Lead DI WET	pH
1	SR 12 - RT - 1 -0.15	38.20770043	-122.1591536	41.78	0.15	0.5	60	1.93		6.5
	SR 12 - RT - 1 -0.30				0.30	1.0	51	2.35		
	SR 12 - RT - 1 -0.45				0.45	1.5	189	3.57		
2	SR 12 - RT - 2 -0.15	38.20769553	-122.1593821	44.16	0.15	0.5	131	6.45	1.59	
	SR 12 - RT - 2 -0.30				0.30	1.0	288	22.50	5.04	7.0
	SR 12 - RT - 2 -0.45				0.45	1.5	339	15.40	5.18	
3	SR 12 - RT - 3 -0.15	38.20769668	-122.1596034	44.82	0.15	0.5	95	2.32		
	SR 12 - RT - 3 -0.30				0.30	1.0	77	2.56		
	SR 12 - RT - 3 -0.45				0.45	1.5	62	2.41		7.1
4	SR 12 - RT - 4 -0.15	38.20769478	-122.159827	46.23	0.15	0.5	39			
	SR 12 - RT - 4 -0.30				0.30	1.0	183	1.46		
	SR 12 - RT - 4 -0.45				0.45	1.5	18			
5	SR 12 - RT - 5 -0.15	38.20769436	-122.1600576	46.73	0.15	0.5	36			
	SR 12 - RT - 5 -0.30				0.30	1.0	29			
	SR 12 - RT - 5 -0.45				0.45	1.5	31			
6	SR 12 - RT - 6 -0.15	38.20769342	-122.1602908	48.51	0.15	0.5	412	9.24	4.78	
	SR 12 - RT - 6 -0.30				0.30	1.0	93	3.85		
	SR 12 - RT - 6 -0.45				0.45	1.5	48			
7	SR 12 - RT - 7 -0.15	38.20769191	-122.1605223	48.85	0.15	0.5	431	17.70	6.35	
	SR 12 - RT - 7 -0.30				0.30	1.0	192	3.60		
	SR 12 - RT - 7 -0.45				0.45	1.5	417	19.80	11.40	
8	SR 12 - RT - 8 -0.15	38.20769725	-122.1608705	51.01	0.15	0.5	190	6.48	3.96	
	SR 12 - RT - 8 -0.30				0.30	1.0	218	5.27	1.03	
	SR 12 - RT - 8 -0.45				0.45	1.5	218	10.10	2.50	
9	SR 12 - RT - 9 -0.15	38.20769904	-122.1610958	52.27	0.15	0.5	196	9.97	3.34	
	SR 12 - RT - 9 -0.30				0.30	1.0	315	11.00	3.87	
	SR 12 - RT - 9 -0.45				0.45	1.5	269	11.90	4.23	
10	SR 12 - RT - 10 -0.15	38.20769807	-122.1613272	52.53	0.15	0.5	92	2.72		6.8
	SR 12 - RT - 10 -0.30				0.30	1.0	180	9.12	2.27	
	SR 12 - RT - 10 -0.45				0.45	1.5	77	2.90		
11	SR 12 - RT - 11 -0.15	38.20769479	-122.1615595	52.87	0.15	0.5	48			
	SR 12 - RT - 11 -0.30				0.30	1.0	109	4.52		
	SR 12 - RT - 11 -0.45				0.45	1.5	85	5.89	0.80	
12	SR 12 - RT - 12 -0.15	38.20769142	-122.1617821	53.30	0.15	0.5	65	9.79	0.295	
	SR 12 - RT - 12 -0.30				0.30	1.0	195	8.33	5.58	8.0
	SR 12 - RT - 12 -0.45				0.45	1.5	153	18.00	2.32	
13	SR 12 - RT - 13 -0.15	38.20769787	-122.1620128	53.38	0.15	0.5	228	7.59	2.46	
	SR 12 - RT - 13 -0.30				0.30	1.0	63	3.27		
	SR 12 - RT - 13 -0.45				0.45	1.5	6			
14	SR 12 - RT - 14 -0.15	38.20770339	-122.1622435	53.81	0.15	0.5	83	5.90	1.15	
	SR 12 - RT - 14 -0.30				0.30	1.0	293	13.80	6.05	
	SR 12 - RT - 14 -0.45				0.45	1.5	76	2.50		
15	SR 12 - RT - 15 -0.15	38.20776222	-122.1665392	67.60	0.15	0.5	112	8.96	3.60	
	SR 12 - RT - 15 -0.30				0.30	1.0	232	12.70	7.31	
	SR 12 - RT - 15 -0.45				0.45	1.5	170	12.40	8.18	7.0

TABLE 2

LEAD ANALYTICAL DATA AND GPS COORDINATES

EA No. 0A0400
Solano County, California
Task Order No. 04-264100-GU

Boring	Sample Designation (site #boring #-depth)	Latitude	Longitude	MSL (meters)	Sample Depth (m)	Sample Depth (ft)	Lead Total	Lead WET	Lead DI WET	pH
16	SR 12 - RT - 16 -0.15	38.20775519	-122.1667606	64.97	0.15	0.5	48			
	SR 12 - RT - 16 -0.30				0.30	1.0	135	5.10	2.18	
	SR 12 - RT - 16 -0.45				0.45	1.5	103	5.89	2.80	
17	SR 12 - RT - 17 -0.15	38.20773796	-122.1669584	66.87	0.15	0.5	23			
	SR 12 - RT - 17 -0.30				0.30	1.0	22			
	SR 12 - RT - 17 -0.45				0.45	1.5	31			
18	SR 12 - RT - 18 -0.15	38.20772971	-122.1672284	67.35	0.15	0.5	26			
	SR 12 - RT - 18 -0.30				0.30	1.0	22			
	SR 12 - RT - 18 -0.45				0.45	1.5	64	8.05	1.37	7.1
19	SR 12 - RT - 19 -0.15	38.20773137	-122.1674568	65.56	0.15	0.5	39			
	SR 12 - RT - 19 -0.30				0.30	1.0	87	5.78	1.18	
	SR 12 - RT - 19 -0.45				0.45	1.5	86	5.29	1.77	
20	SR 12 - RT - 20 -0.15	38.2077123	-122.1677043	70.51	0.15	0.5	73	3.56		
	SR 12 - RT - 20 -0.30				0.30	1.0	103	5.17	2.39	
	SR 12 - RT - 20 -0.45				0.45	1.5	112	5.68	2.37	
21	SR 12 - RT - 21 -0.15	38.2077093	-122.1679948	67.79	0.15	0.5	63	1.05		
	SR 12 - RT - 21 -0.30				0.30	1.0	258	20.60	5.02	
	SR 12 - RT - 21 -0.45				0.45	1.5	451	15.40	12.30	
22	SR 12 - RT - 22 -0.15	38.20769772	-122.1682968	66.14	0.15	0.5	188	11.70	6.73	
	SR 12 - RT - 22 -0.30				0.30	1.0	244	10.40	9.26	
	SR 12 - RT - 22 -0.45				0.45	1.5	148	5.87	3.41	
TTLC							1,000			
STLC								5		
Reporting Limits							1.0	0.050	0.010	0.10

Notes:

1. *Analyses conducted in general accordance with EPA Method 6010 for lead and EPA Method 9045 for soil pH.*
2. *Sample depths reported in approximate meters (m) / feet (ft) below the ground surface.*
3. *TTLC = total threshold limit concentration. STLC = soluble threshold limit concentration. WET = waste extraction test. DI WET = WET with deionized water extraction solution.*
4. *WET conducted in general accordance with California Title 22 procedures.*
5. *Total lead results reported in milligrams per kilogram. WET and DI WET results reported in milligrams per liter. pH results reported in standard units.*
6. *Soil samples labeled as follows: route-boring no.-depth. Ex.: SR101-01-0.15 State Route 101, boring 01, 0.15-meter depth.*
7. *For total results, bold results exceed 10 times the STLC.*
8. *For WET results, bold results exceed the STLC.*
9. *ND = not detected above reporting limit.*
10. *Latitude and longitude converted to decimal format.*

Table 3
Soil and Groundwater Analytical Results
State Route 12
Task Order No. 04-264100-GU

Soil Analytical Results

Sample ID	Depth (meters)	Date	Benzene (mg/kg)	Toluene (mg/kg)	EthylBenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)	TPH Gas (mg/kg)	TPH Diesel (mg/kg)	EPA 8260B All Compounds (mg/kg)	EPA 8082 PCBs (mg/kg)
SR12-HA1	0.2	07/03/2002	—	—	—	—	—	—	—	—	ND
SR12-HA1	0.3	07/03/2002	—	—	—	—	—	—	—	—	ND
SR12-HA1	0.45	07/03/2002	—	—	—	—	—	—	—	—	ND
SR12-HA2	0.2	07/03/2002	—	—	—	—	—	—	—	—	ND
SR12-HA2	0.3	07/03/2002	—	—	—	—	—	—	—	—	ND
SR12-HA2	0.45	07/03/2002	—	—	—	—	—	—	—	—	ND
SR12-HA3	0.2	07/03/2002	—	—	—	—	—	—	—	—	ND
SR12-HA3	0.3	07/03/2002	—	—	—	—	—	—	—	—	ND
SR12-HA3	0.45	07/03/2002	—	—	—	—	—	—	—	—	ND
SR12-SB1	1.5	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB1	3.0	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB1	4.5	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB1	6.0	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB2	1.5	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB2	3.0	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB2	4.5	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB2	6.0	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB3	1.5	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB3	3.0	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB3	4.5	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB3	6.0	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB3	7.5	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB3	9.0	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB4	1.5	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB4	3.0	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
SR12-SB4	4.0	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	—
PQL			0.005	0.005	0.005	0.005	0.005	1.0	1	0.002-0.01	0.03

Groundwater Analytical Results

Sample ID	Date	Benzene (ug/L)	Toluene (ug/L)	EthylBenzene (ug/L)	Xylenes (ug/L)	MTBE (ug/L)	TPH Gas (ug/L)	TPH Diesel (ug/L)	EPA 8260B Chloroform (ug/L)	Conductivity (s/cm)	Temperature (Celsius)	pH
SR12-SB1-GW	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	1.74	20.1	7.29
SR12-SB2-GW	07/01/2002	ND	ND	ND	ND	ND	ND	ND	ND	1.69	20.6	7.35
SR12-SB3-GW	07/01/2002	ND	ND	ND	ND	ND	ND	ND	2.3	—	—	—
PQL		0.5	0.5	0.5	0.5	0.5	50	50	2.0			

Only organic compounds detected in one or more samples are listed.

MTBE = methyl tert-butyl ether

TPH = total petroleum hydrocarbons

mg/kg = milligrams per kilogram; ug/L = micrograms per liter

APPENDIX A
PERMITS

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

ENCROACHMENT PERMIT

TR-0120

Permit No. 0402-NSV1129	
Dist/Co/Rte/PM 04-Nap/Sol-12 0.0-3.3/0.0-2.6	
Date May 31, 2002	
Fee Paid $	Deposit $
Performance Bond Amount (1)	Payment Bond Amount (2)
Bond Company	
Bond Number (1)	Bond Number (2)

In compliance with (*Check one*):

☒ Your application of May 24, 2002

☐ Utility Notice No. _____ of _____

☐ Agreement No. _____ of _____

☐ R/W Contract No. _____ of _____

TO: IT CORPORATION
1326 North Market Boulevard
Sacramento, CA 95834-1912

Attn: Ms. Martha Adams
Phone: (916) 565 4183

, **PERMITTEE**

and subject to the following, **PERMISSION IS HEREBY GRANTED** to:
collect soil samples from up to 171 borings on State Highway 04-Nap/Sol-12, Post Mile 0.0-3.3/0.0-2.6. Work will be conducted in accordance with Caltrans Contract #43A0078 for hazardous waste site assessment, Task Order 04-264100-GU.

A minimum of one week prior to the start of work under this permit, notice shall be given and advance approval of construction details, operations, public safety and traffic control shall be obtained from State Representative Preetbir Walia, 2019 West Texas Street, Fairfield, CA, 94533, (707) 428-2004, weekdays between the hours of 7:30 A.M. and 4:00 P.M., holidays excluded.

All permitted work requiring traffic control, including shoulder closure, requires the permittee to apply for and obtain a lane closure number prior to the start of any work that may affect traffic. See the attached "Encroachment Permit Project Traffic Control Procedures" and the attached "Permit Project Traffic Control Request Form". Additional time beyond the minimum seven-day advanced notice required in the above paragraph may be required for obtaining the traffic control approval.

Immediately following completion of the work permitted herein, the Permittee shall fill out and mail the Notice of Completion attached to this permit.

The following attachments are also included as part of this permit (*Check applicable*):

☒ Yes	☐ No	General Provisions
☐ Yes	☒ No	Utility Maintenance Provisions
☐ Yes	☒ No	Special Provisions
☐ Yes	☒ No	A Cal-OSHA permit required prior to beginning work: # _____

In addition to fee, the permittee will be billed actual costs for:

☐ Yes	☒ No	Review
☐ Yes	☒ No	Inspection
☒ Yes	☐ No	Field Work

(If any Caltrans effort expended)

☐ Yes ☒ No The information in the environmental documentation has been reviewed and considered prior to approval of this permit.

This permit is void unless the work is completed before December 31, 2002

This permit is to be strictly construed and no other work other than specifically mentioned is hereby authorized.
No project work shall be commenced until all other necessary permits and environmental clearances have been obtained.

APPROVED:

RANDELL H. IWASAKI, Acting District Director

BY:

S. S. NOZZARI, District Permit Engineer

RECEIVED
JUN 17 2002
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

7014
~~8~~6 units

PERMIT APPLICATION
NAPA COUNTY DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Napa County Use Only
FEE EXEMPT SITE: Y / N
If NO, FEE $ 478.00
Date 6/17/02 By JKP
Receipt # 23381

Application for: Monitoring Wells ____ Extraction Wells ____ Other ____
Cathodic Protection Wells ____ Exploratory Hole (boring) ✓ (86)
(Please check one) (HAND Auger)

MW 336
NCDEM SITE NUMBER

NOT Applicable 057-060-000
ASSESSOR'S PARCEL NUMBER

The following **MUST** be included before this permit application can be processed:
1. Assessor's Parcel Number
2. Well location map (showing both proposed and existing wells)
3. Permission document(s) (if required)
4. Encroachment permit(s) (if required)
5. Clearance from public agency(ies) (if required)

Site Name: State Route 12
Property Owner: CALTRANS
Site Address: State Route 12 Napa Co. Line to Hwy 29
City: Napa County
Zip: —
Owner's Mailing Address: P.O. Box 23660
City: OAKLAND, CA
Zip: 94623

Drilling Contractor: SHAW E + I (hand Auger Borings)
Type of License:
Mailing Address: 1326 N. MARKET Blvd.
License #:
City: Sacramento
State: CA
Zip: 95834

Consultant: SHAW E + I (IT Corp.)
Telephone #: 916-565-4352
Address: 1326 N. Market Blvd.
City: Sacramento
State: CA
Zip: 95834

Responsible Person at Site: IAN MOORHEAD

Type of Work

New Construction of wells - No - # of wells —
Destruction of wells - No # of wells —
Reconditioning of wells (reconstruct or repair) - No - # of wells —
Wells currently on Site? - No - # of wells —
HAND Auger Borings To 25ft. (86)

Reason for Well Installation (Check as many as apply):

Underground tank site:	Surface Impoundment:
Tanks Still Present:	Landfill Site:
Spill or Discharge Site:	Cathodic Protection:
Baseline Study:	Other: (Sample in Shoulders of SR 12 for LEAD Prior To Construction Activities)

Other Site Information:

Closest Distance to:			
Septic System: N/A	Sewer Line: N/A	Water Wells: N/A	Rivers, Creeks, or Lakes: N/A
Underground Utilities:	Underground Storage Tanks: N/A		

Riparian Cover Permit Required? Yes ____ No ND
Issued by the County Public Works Dept. *(Attach Copy)*
May apply to any site outside City limits and within 150 feet of a designated waterway.

RECEIVED
JUN 17 2002
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Permit Application
Page 2 of 2

Well Location: Are all wells covered by this application on a single parcel and not on adjoining Parcels or public or utility rights-of-way? Yes X No If **no**, list other parcels, public rights-of-way or utility rights-of-way.

1. Owner or R/W Owner:	Site Address:		APN:
Owner address:	City:	State:	Zip:
Number of Wells:	Permission Document Attached:		
2. Owner or R/W Owner:	Site Address:		APN:
Owner address:	City:	State:	Zip:
Number of Wells:	Permission Document Attached:		
3. Owner or R/W Owner:	Site Address:		APN:
Owner address:	City:	State:	Zip:
Number of Wells:	Permission Document Attached:		

NOTE: For each parcel listed above which is under different ownership, a letter authorizing access and work on the property must be submitted. The letter must include address, Assessor's parcel number and the notarized signature of the owner or legal agent for the owner. If any wells are proposed on public or utility rights-of-way, a written clearance and/or encroachment permit must accompany this application.

Well Construction

Bore Hole Diameter: 2 in.	Maximum Depth: 2.5 ft.	Annular Space:
Casing: Diameter: NA	Gauge: N/A	Material:
Grout: Depth of Seal: NA	Type of Grout: NA	
Conductor Casing: Yes N/A No		

_____ Check if wells are intended to be constructed into aquifers below the first encountered one. Indicate how cross contamination will be prevented on a separate sheet.
Well reconstruction and destruction applications must include a written description of work proposed And existing well information.

Disposal Methods

Soil Cuttings: Backfill Boring with Cuttings Development/Rinsate Water Drum Wash Water

In applying for this permit, I understand that the drilling contractor and the consultant are responsible for the following:

1) Compliance with the State of California Worker's Compensation Laws;
2) Compliance with the State and Federal Worker Health and Safety Laws;
3) Location of all underground and aboveground utilities which might be impacted by the proposed work;
4) Compliance with the Napa County and State of California well requirements;
5) Notification of the Department of Environmental Management at least two (2) workdays before work is initiated, and
6) Filing a completed well log for each well within four (4) months of completion to Napa County Department of Environmental Management and State Department of Water Resources.

Martha Adam 6.13.02
Signature of Authorized Agent of Drilling Contractor Or Site Consultant — Date

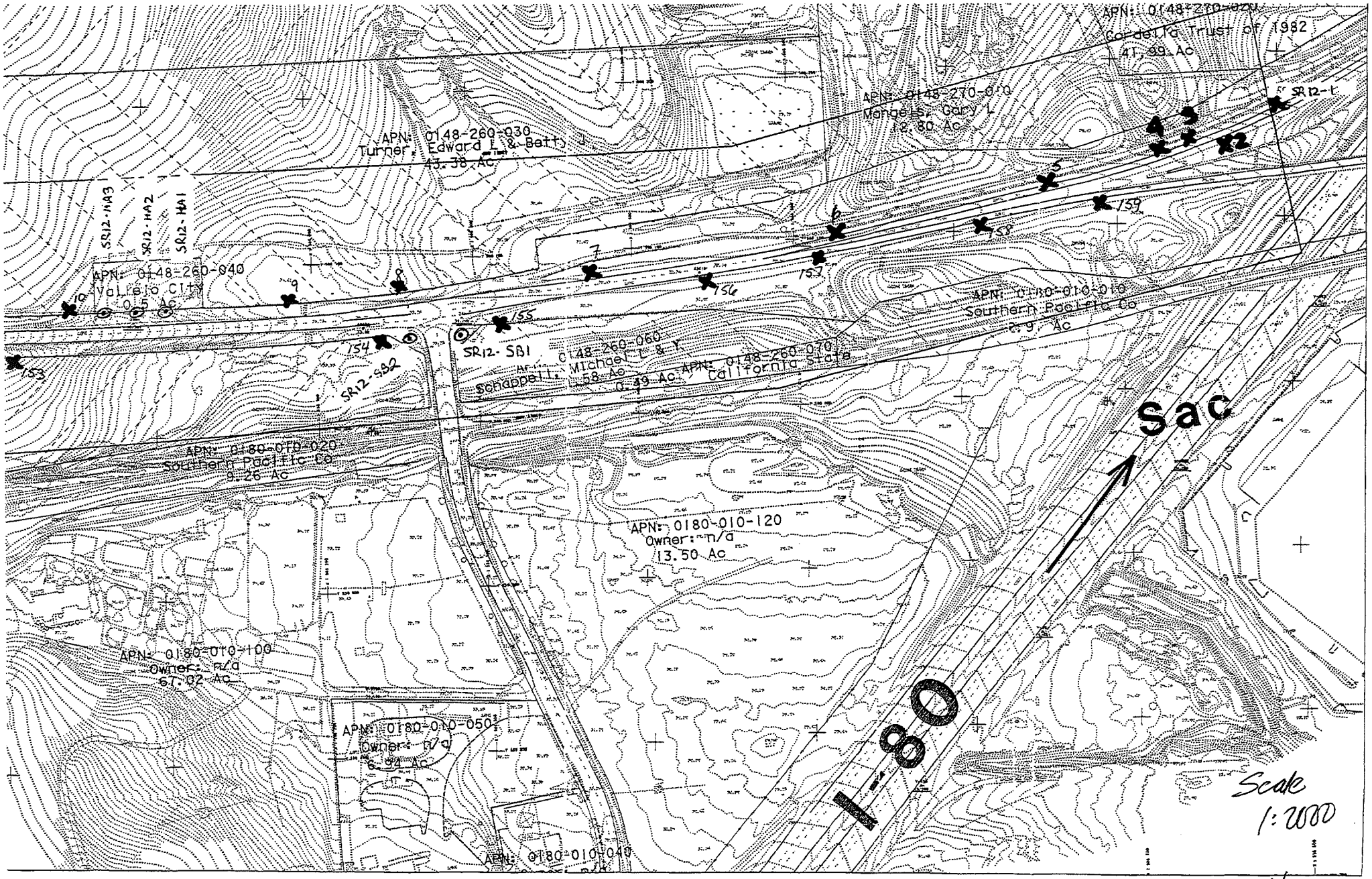
FOR OFFICIAL USE ONLY:
_____ Required certificate of current worker's compensation insurance is on file with DEM;
Consultant: Exp. Date: 9/1/02 Confirmed: MR
Contractor: Exp. Date: 9/1/02 Confirmed: MR

Permit Issued by: Date:

Permit is valid for two (2) years from date of issuance.

White – Office Yellow – Owner Pink – Consultant/Contractor

APPENDIX B
STATE ROUTE 12, ADL SAMPLE LOCATIONS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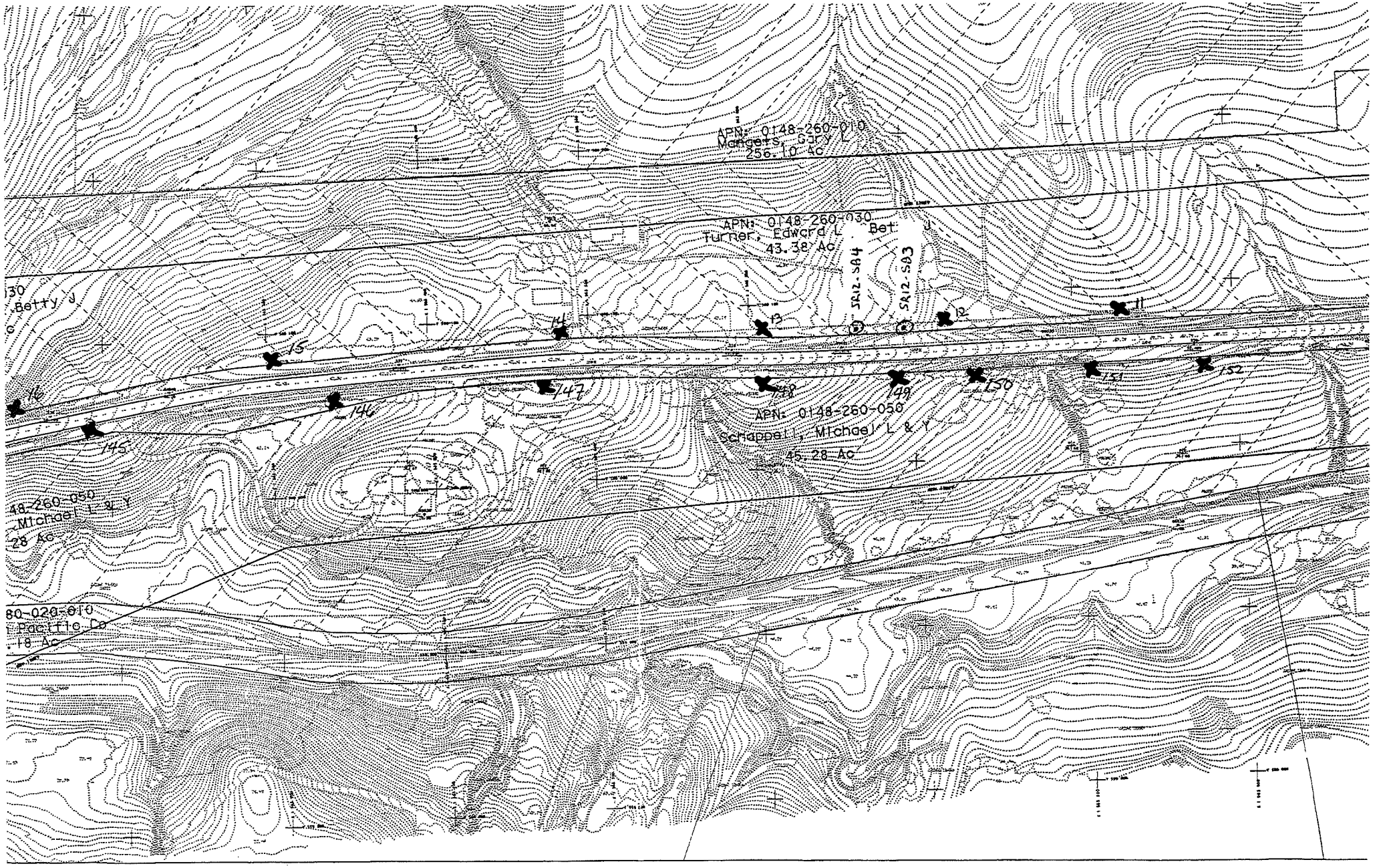
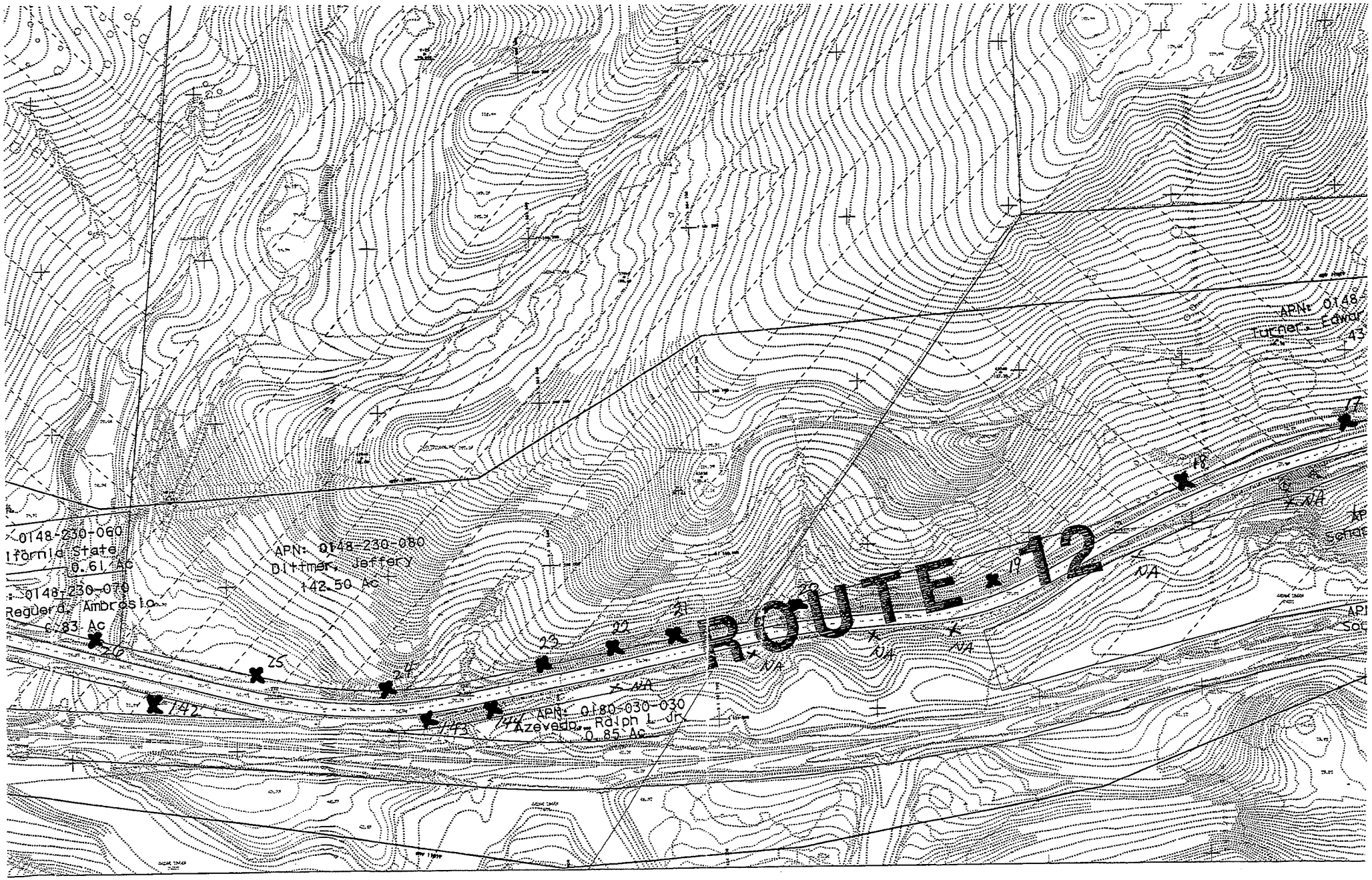
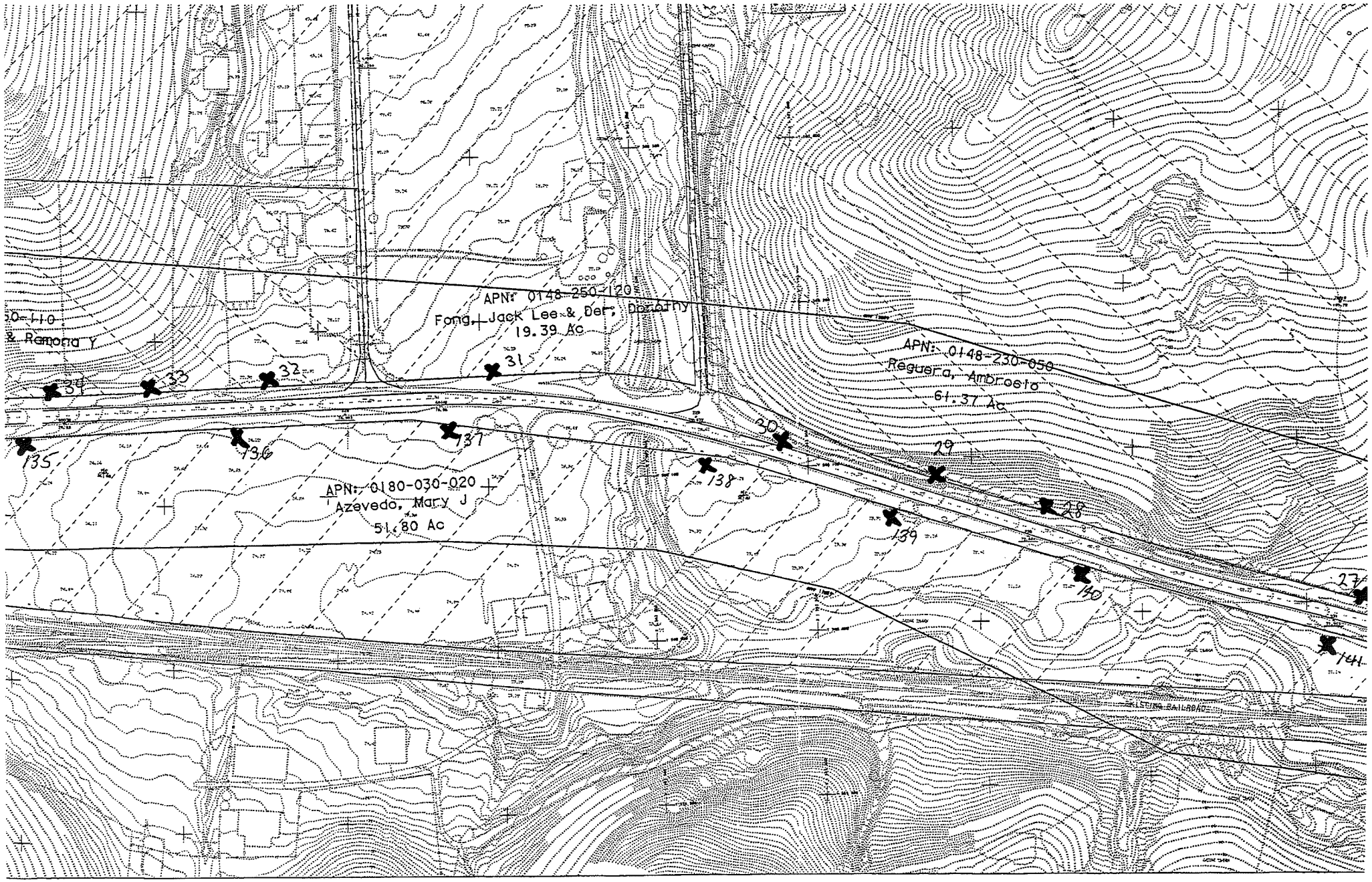
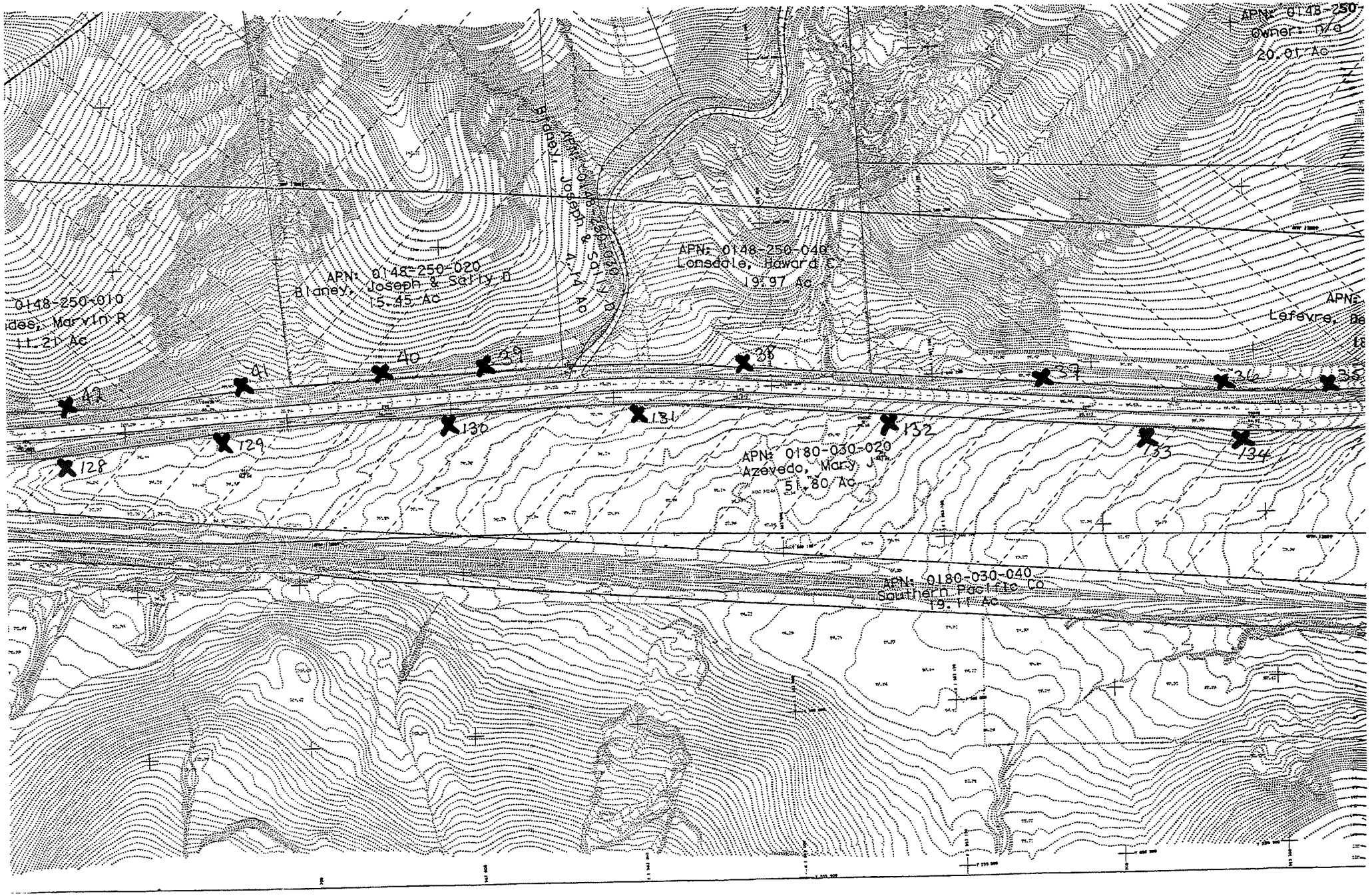
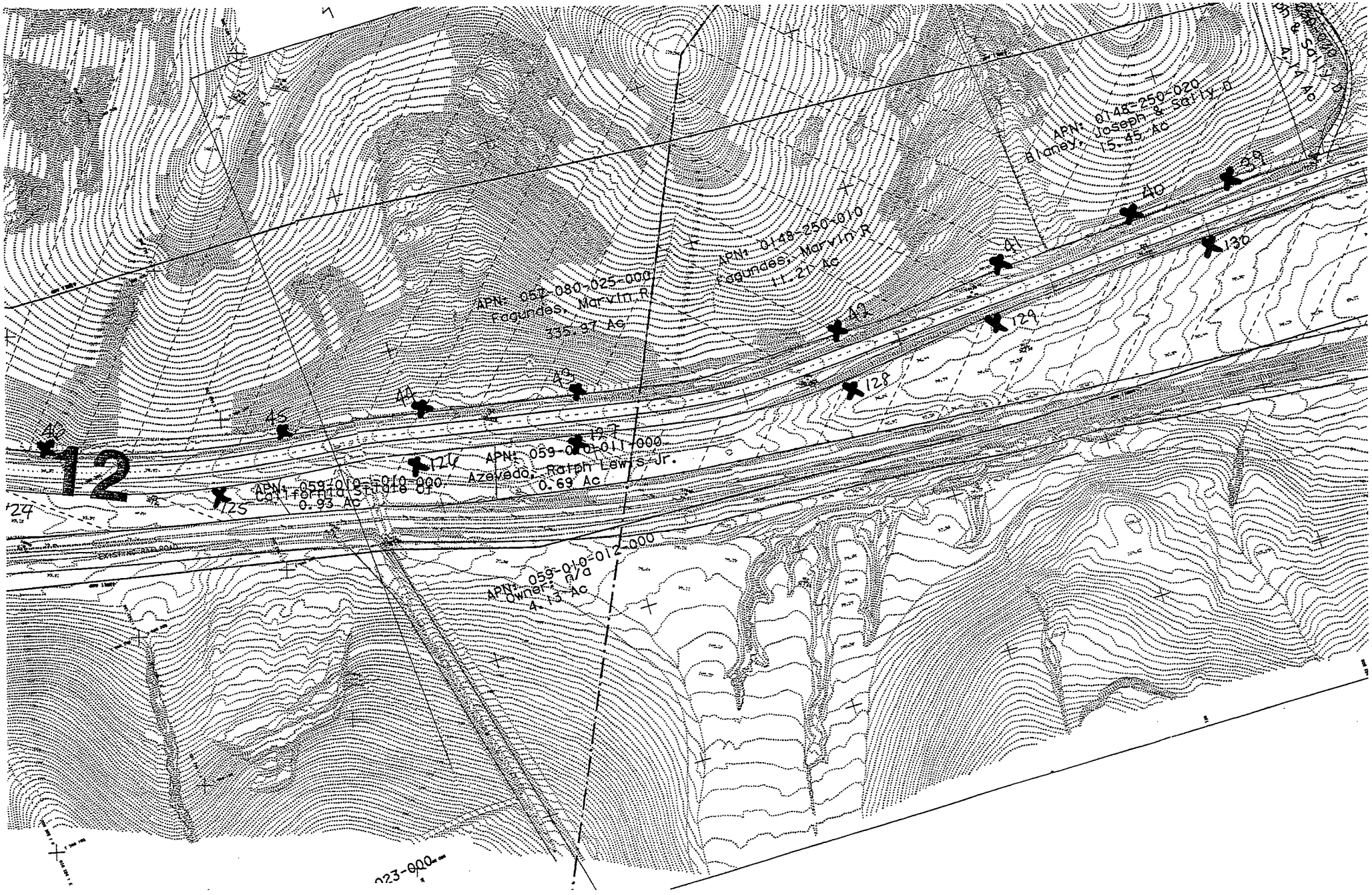
Cordelia Trust of 1982
41.99 Ac
APN: 0148-270-010
Mongels, Gary L.
12.80 Ac
APN: 0148-260-030
Turner, Edward L. & Betty J.
43.38 Ac
SR12-HA3
SR12-HA2
SR12-HA1
APN: 0148-260-040
Vallejo City
0.5 Ac
SR12-1
SR12-SB1
SR12-SB2
APN: 0148-260-060
Schappell, Michael L. & Y.
58 Ac
0.49 Ac
APN: 0148-260-070
California State
APN: 0180-010-010
Southern Pacific Co
2.9 Ac
APN: 0180-010-020
Southern Pacific Co
9.26 Ac
APN: 0180-010-120
Owner: n/a
13.50 Ac
APN: 0180-010-100
Owner: n/a
61.02 Ac
APN: 0180-010-050
Owner: n/a
6.54 Ac
APN: 0180-010-040
Sac
I-80
Scale
1:2000

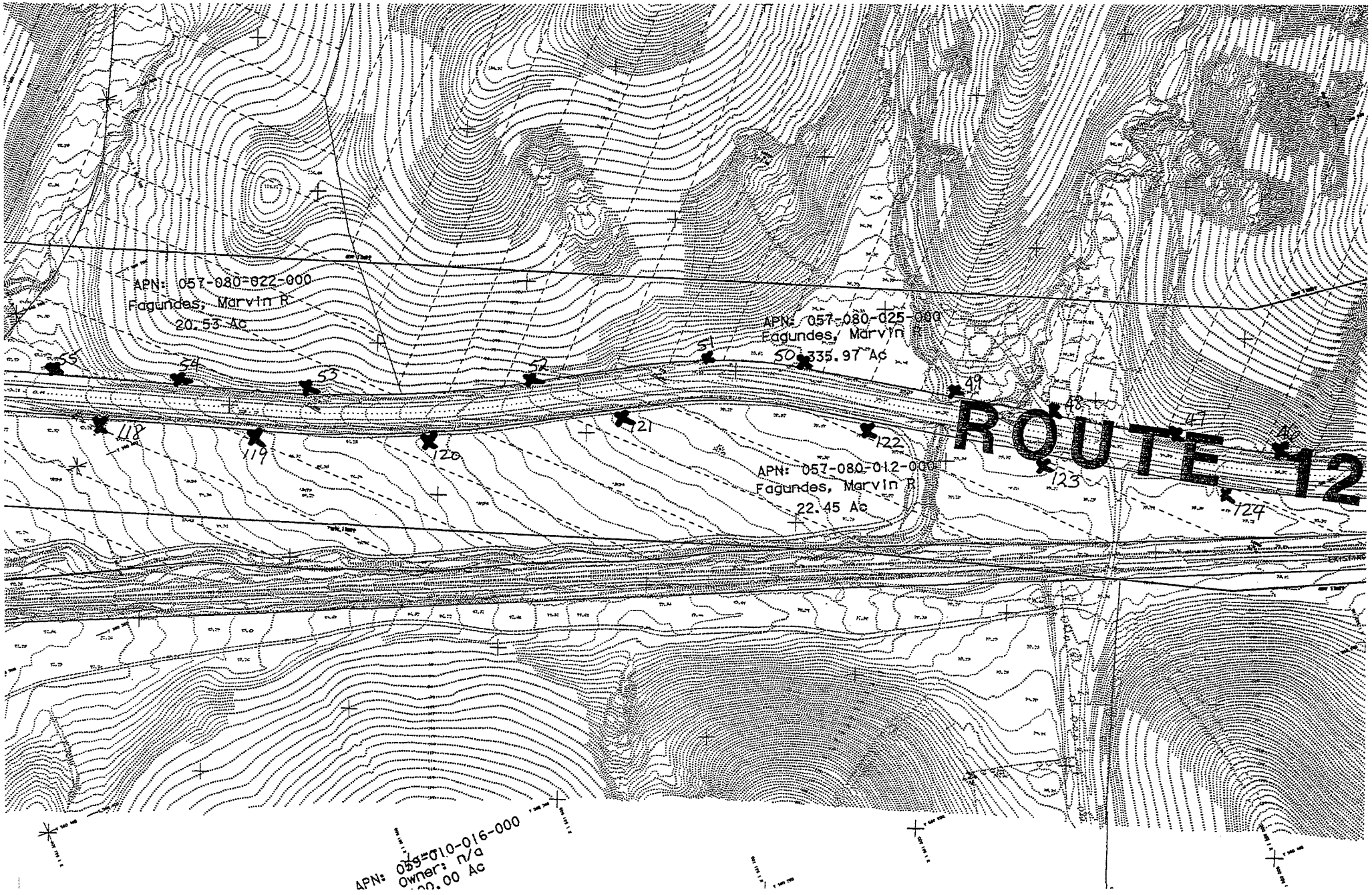

APN: 0148-260-010
Mangers, Gary L
256.10 Ac
APN: 0148-260-030
Turner, Edward L Bet
43.38 Ac
SR12-S04
SR12-S03
APN: 0148-260-050
Schappell, Michael L & Y
45.28 Ac
Betty J
Michael L & Y
Pacific Co

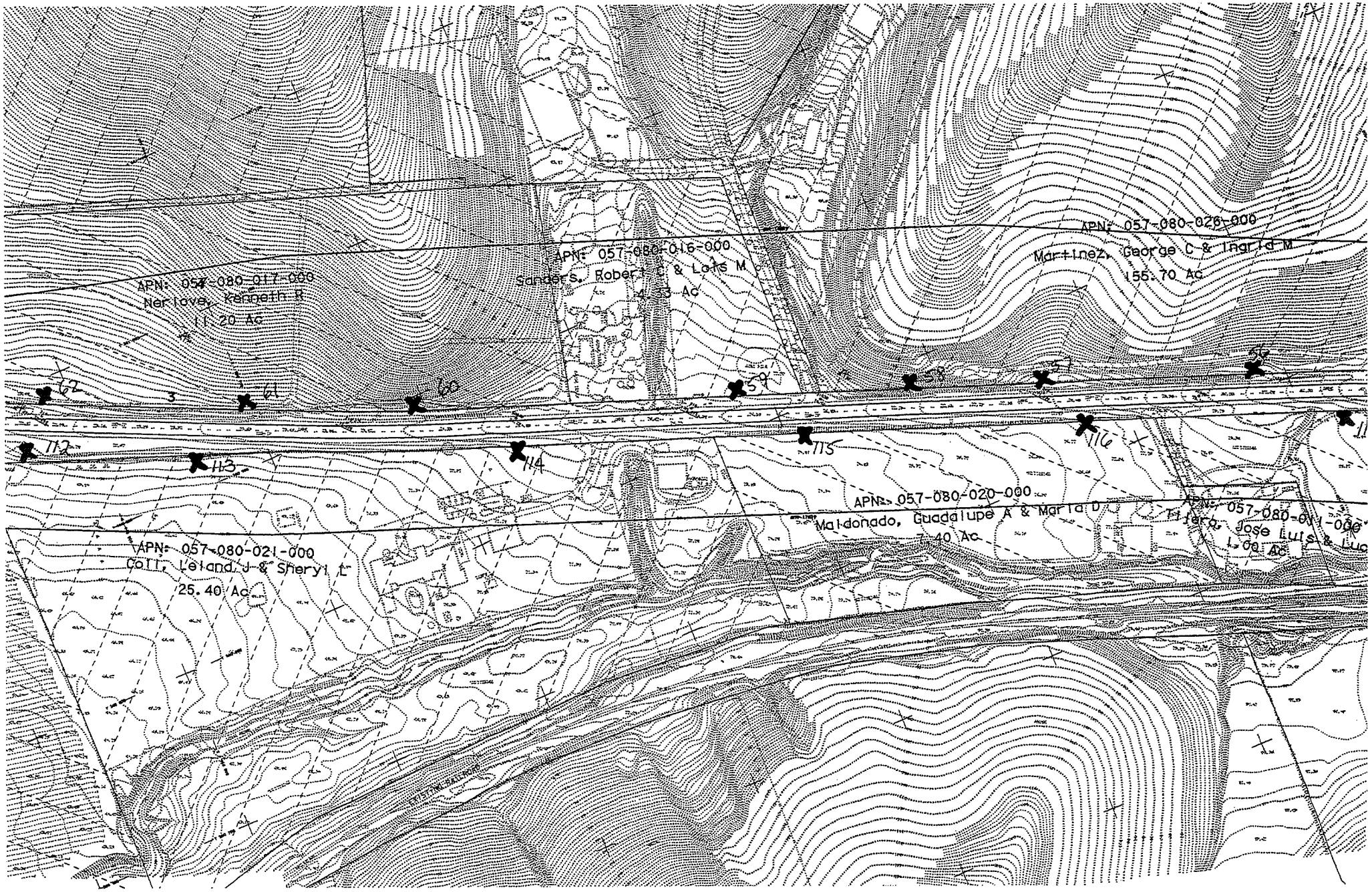

ROUTE 12
APN: 0148-230-080
Dittmer, Jeffery
142.50 Ac
0148-230-060
lfornia State
0.61 Ac
0148-230-070
Reguera, Ambrosio
0.83 Ac
APN: 0180-030-030
Azevedo, Ralph L Jr
0.85 Ac
Turner, Edwar
NA
17
18
19
20
21
22
23
24
25
26
142
143
144

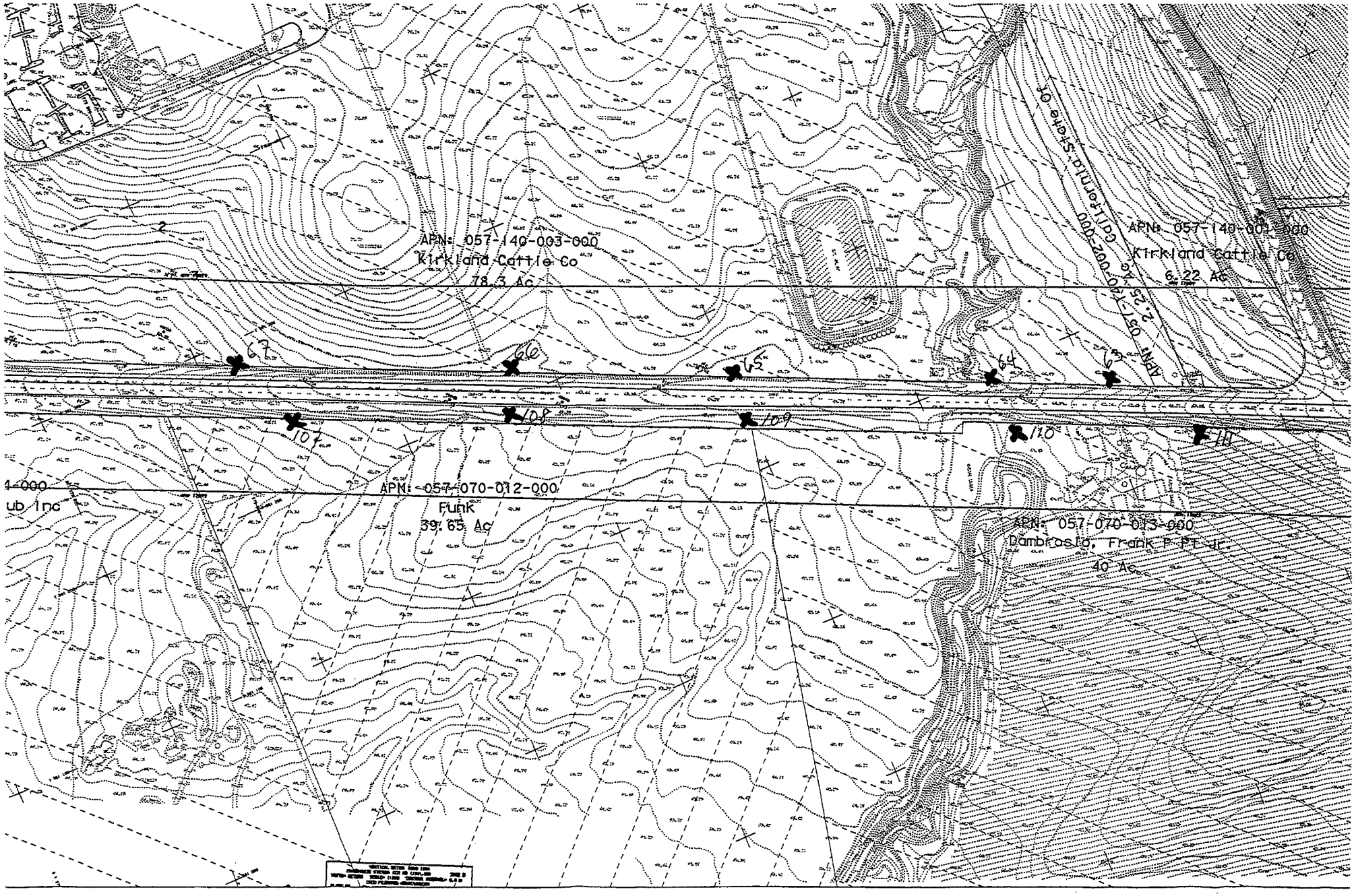

APN: 0148-250-120
Fong, Jack Lee & Der, Dorothy
19.39 Ac
APN: 0148-230-050
Reguera, Ambrosio
61.37 Ac
APN: 0180-030-020
Azevedo, Mary J
51.80 Ac
& Ramona Y
31
32
33
34
135
136
137
138
139
140
141
29
30
28
27
EXISTING RAILROAD

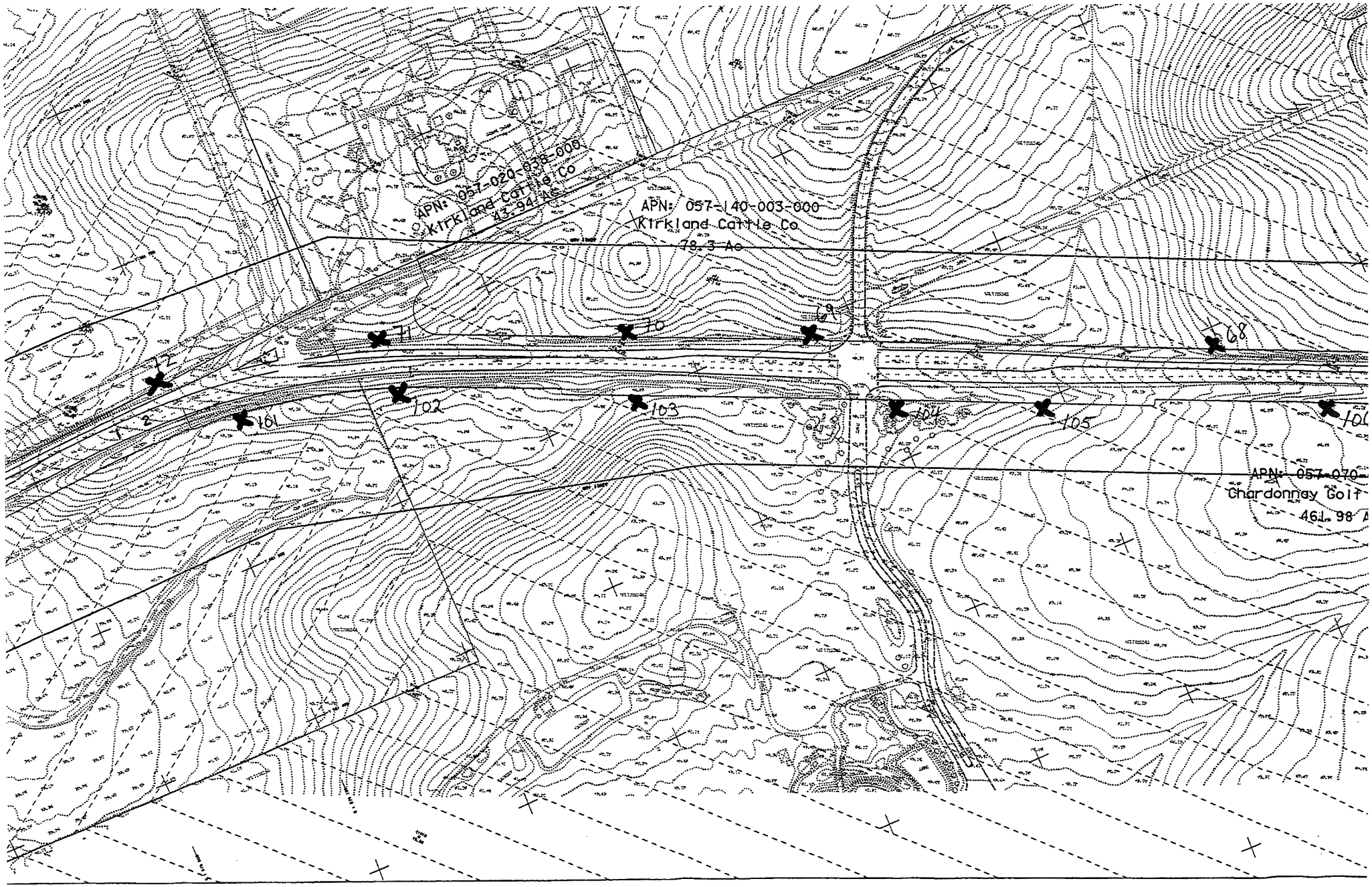

APN: 0148-250-
Owner: N/A
20.01 Ac
APN: 0148-250-020
Blaney, Joseph & Sally D
15.45 Ac
APN: 0148-250-040
Lonsdale, Howard E
19.97 Ac
0148-250-010
11.21 Ac
Lefevre,
42
41
40
39
38
37
36
128
129
130
131
132
133
134
APN: 0180-030-020
Azevedo, Mary J
51.80 Ac
APN: 0180-030-040
Southern Pacific Co
19.11 Ac

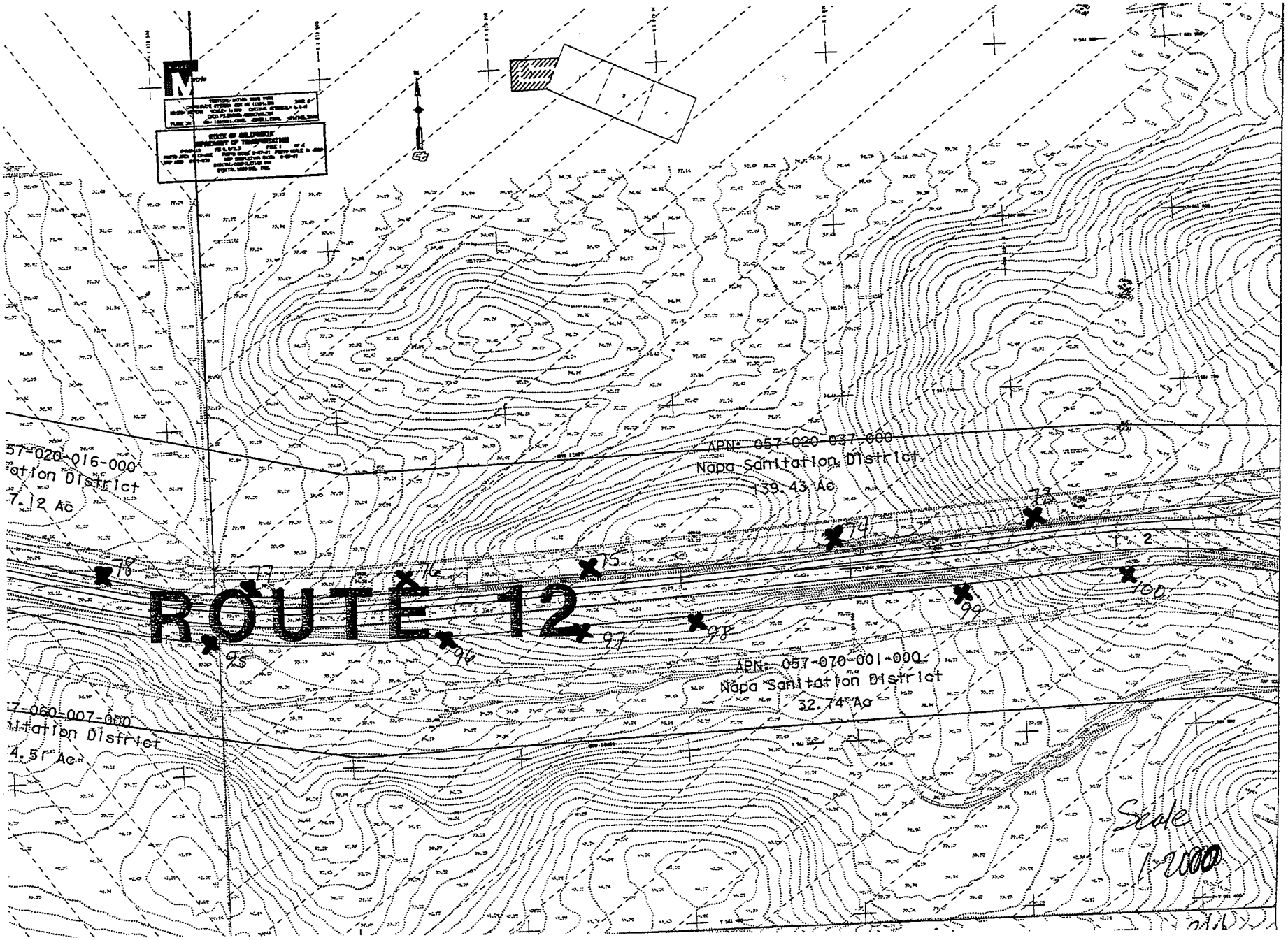

12
APN: 059-010-010-000
Azevedo, Ralph Lewis, Jr.
0.69 Ac
APN: 059-010-011-000
Azevedo, Ralph Lewis, Jr.
0.93 Ac
APN: 059-010-012-000
Owner: N/A
4.13 Ac
APN: 057-080-025-000
Fagundes, Marvin R.
335.97 Ac
APN: 0148-250-010
Fagundes, Marvin R.
11.21 Ac
APN: 0148-250-020
Blaney, Joseph & Sally D.
15.45 Ac
EXISTING RAILROAD
124
125
126
127
128
129
130
39
40
41
42
43
44
45
46

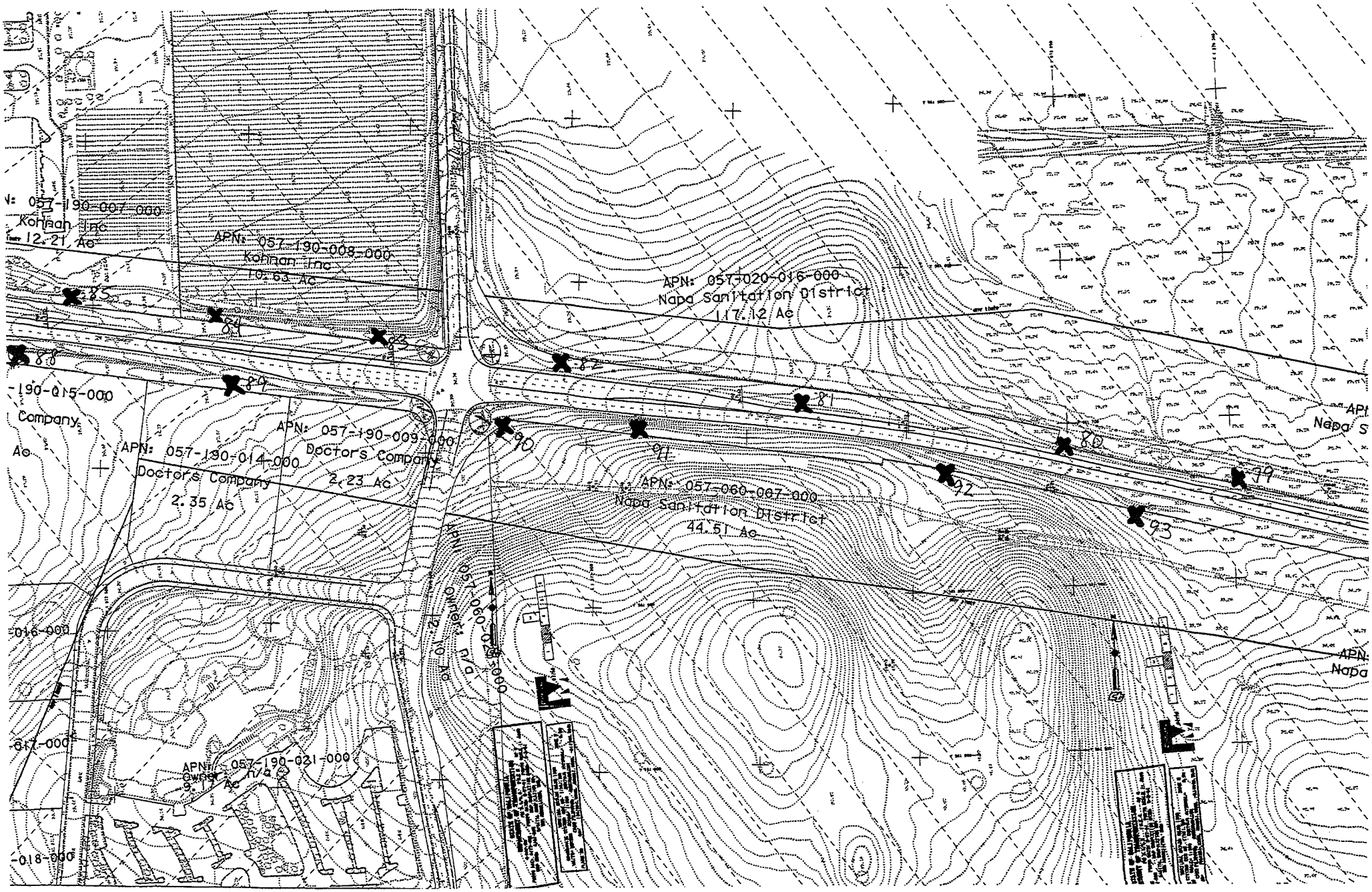

APN: 057-080-022-000
Fagundes, Marvin R
20.53 Ac
APN: 057-080-025-000
Fagundes, Marvin R
50.335.97 Ac
APN: 057-080-012-000
Fagundes, Marvin R
22.45 Ac
ROUTE 12
55
54
53
52
51
50
49
48
47
46
118
119
120
121
122
123
124
APN: 059-010-016-000
Owner: n/a
00.00 Ac


APN: 057-080-017-000
Nerlove, Kenneth R
11.20 Ac
APN: 057-080-016-000
Sanders, Robert C & Lois M
4.33 Ac
APN: 057-080-026-000
Martinez, George C & Ingrid M
155.70 Ac
APN: 057-080-020-000
Maldonado, Guadalupe A & Maria D
7.40 Ac
APN: 057-080-021-000
Coll, Leland J & Sheryl L
25.40 Ac
APN: 057-080-011-000
Tilera, Jose Luis & Luc
1.00 Ac
62
3
61
60
59
58
57
56
112
113
114
115
116


APN: 057-140-003-000
Kirkland Cattle Co
78.3 Ac
APN: 057-140-001-000
Kirkland Cattle Co
6.22 Ac
California State Q
APN: 057-140-002-000
2.25 Ac
67
66
65
64
63
108
107
109
110
111
4-000
ub Inc
APN: 057-070-012-000
Funk
39.65 Ac
APN: 057-070-013-000
Dambrosio, Frank P Ft Jr.
40 Ac


APN: 057-020-038-000
Kirkland Cattle Co
43.94 Ac
APN: 057-140-003-000
Kirkland Cattle Co
78.3 Ac
APN: 057-070-
Chardonnay Golf
461.98 A
72
71
70
69
68
101
102
103
104
105


57-020-016-000
ation District
7.12 Ac
APN: 057-020-037-000
Napa Sanitation District
139.43 Ac
ROUTE 12
APN: 057-070-001-000
Napa Sanitation District
32.74 Ac
7-060-007-000
ilitation District
4.51 Ac
Scale
1:2000


APN: 057-190-007-000
Kohnan Inc
12.21 Ac
APN: 057-190-008-000
Kohnan Inc
10.63 Ac
APN: 057-020-016-000
Napa Sanitation District
117.12 Ac
APN: 057-190-009-000
Doctors Company
2.23 Ac
APN: 057-190-014-000
Doctors Company
2.35 Ac
APN: 057-060-007-000
Napa Sanitation District
44.51 Ac
APN: 057-190-031-000
Owner: n/a
9.19 Ac
Owner: n/a
10 Ac
85
84
83
88
89
82
81
90
91
80
92
79
93

APPENDIX D
DRILLING AND SAMPLING PROCEDURES

Appendix D
Drilling and Sampling Procedures

The procedures used for drilling the borings and collecting soil samples are presented below.

- Soil boring permits were obtained from the Solano County Environmental Health Department for the hydropunch borings advanced to groundwater by hollow stem auger. Soil boring permits were obtained from the Napa County Environmental Health Department for the shallow hand auger borings advanced within Napa County. Soil boring permits were not required for the shallow hand auger borings within Solano County. An encroachment permit was obtained from Caltrans District 4 for this project.

Drilling and Soil Sample Collection

- 159 soil borings were advanced along SR 12 for widening of SR 12 investigation and sampled using hand auger sampling equipment.

- 22 soil borings were advanced along SR 12 under EA No. 0A0400 and sampled using hand auger sampling equipment.

- For ADL soil samples collected by the hand auger method, soil samples were transferred to sealable plastic bags.

- Three soil borings were advanced by hand auger to investigate for PCBs adjacent to Parcel No. 148-260-04.

- For soil samples collected by hand auger method for PCB analysis, soil samples were collected utilizing a slide hammer sampler lined with a stainless steel tube.

- Hand auger borings were backfilled with excess soil cuttings to ground surface.

- 4 soil borings were advanced to first groundwater using hollow stem auger drilling techniques. Two borings were drilled adjacent to Parcel No. 148-260-03, a former farm equipment repair building and two borings were drilled at the intersection of SR 12 and Red Top Road.

- For soil samples collected by hollow stem auger method, soil samples were collected using a split-spoon sampler lined with metal sample tubes.

- Hollow stem auger borings were backfilled with bentonite cement grout from the bottom of the borehole to ground surface.

- The drilling and sampling equipment was washed in a detergent rinse, two clear water rinses, and a final deionized/distilled water rinse prior to drilling.

- Soil cuttings generated by hollow stem auger drilling method and wastewater generated were contained in a United Nations-approved 208-liter (55-gallon) drum.

Groundwater Sampling Procedures

- Groundwater samples were collected from the undeveloped HAS boring using a new disposable polyethylene or Teflon bailer. The disposable bailers were discarded after each sample was collected.
- New nylon rope was used to lower the bailers into the wells. The nylon rope was discarded after each well.
- Groundwater samples were placed into laboratory-supplied containers containing preservatives.
- Discharge to the containers was conducted in a manner to minimize bubbling and agitation of the liquid. The containers were filled to the top forming a meniscus to minimize the headspace.
- Water removed from the well was contained in 208-liter (55-gallon) United Nations approved drums. Labels will be placed on the drums with the contents, date, well number, and job number recorded on the label. The drums will be stored at the site pending laboratory analysis of the groundwater.

Sample Retention and Analysis

- Chain-of-custody procedures, including the use of chain-of-custody forms, were used to document sample handling and transport from collection to delivery to the laboratory for analysis.
- The samples were placed on ice in insulated chests in the custody of an IT employee. The samples were delivered to the laboratory within approximately 24 hours of collection. The samples were transported to the laboratory in a motor vehicle.
- Soil samples were labeled with the boring number, and the sample collection depth. For example, "SR 12-1-1.0" represents the first boring (1) collected at a depth of 1.0 meter below the ground surface.
- Groundwater samples will be labeled with the boring number (SR 12-SB1-GW).
- Laboratory quality assurance/quality control procedures are summarized below:
    - Method Blank Frequency = one per 20 samples
    - Matrix Spike/Matrix Spike Duplicate = one per 20 samples
    - Laboratory Control Sample/Laboratory Control Sample Duplicate = one per 20 samples

APPENDIX E
WASTE DISPOSAL MANIFEST

Profile Number: _____
Expiration Date: _____

WASTE PROFILE SHEET
TERMS & CONDITIONS

Service Agreement on File? ☐ Yes ☐ No

This form is to be used to comply with the requirements of governmental waste screening criteria.

Profile Addendum Attached? ☐ Yes ☐ No

A. Waste Generator Information

1. Generator/Site Name: CALTRANS
2. SIC Code: NA
3. Site Address: SR 12
4. Site City: NAPA
5. Site State: CA
6. Site Country: USA
7. Zip Code: _____
8. Generator USEPA/Federal ID#: NA
9. Site Phone: 916-826-3803
10. Customer Name: ABCO ENVIRONMENTAL
11. Customer Phone: 916-826-3803
12. Customer Contact: TROY WILLIAMS
13. Customer FAX: 916-638-4960

B. Waste Stream and Billing Information

1. Waste Description, Category: NON HAZ SOIL
2. State Waste Code: NA
3. Billing Address: P.O. BOX 1005 RANCHO MURIETA, CA. 95683
4. Process Generating Waste: MONITOR WELL INSTALLATION
5. Transporter/Transfer Station: ABCO
6. Shipping Method: DRUM TRUCK
7. Estimated Quantity (Weight & Vol.): 2 x 55 GAL DRUM per ☐ Job ☐ Year ☐ Other _____
8. Delivery Date(s): ASAP
9. Personal Protective Equipment Requirements: LEVEL D PROTECTION
10. Is this a US Dept. of Transportation (USDOT) Hazardous Material? ☐ Yes ☑ No (If no, skip 10, 11 and 12)
11. Reportable Quantity: NA
12. Hazard Class / I.D. #: NA
13. Shipping Name: NON HAZ WASTE SOLID

☐ Check if additional information is attached. Indicate the number of attached pages: _____

C. Generator's Certification

	Yes	No	
1. Is the waste represented by this waste profile sheet a "Hazardous Waste" as defined by USEPA, Canadian, Mexican, State, or Provincial regulation?	☐	☑	
2. Does the waste represented by this waste profile sheet contain regulated radioactive material or regulated concentrations of Polychlorinated Biphenyls (PCBs)?	☐	☑	
3. Does this waste profile sheet and all attachments contain true and accurate descriptions of the waste material?	☑	☐	
4. Has all relevant information within the possession of the Generator and Customer regarding known or suspected hazards pertaining to the waste been disclosed to the Contractor?	☑	☐	
5. Is the analytical data attached hereto derived from testing a representative sample in accordance with 40 CFR 261.20(c) or equivalent rules?	☑	☐	☐ N/A
6. Will all changes that occur in the character of the waste be identified by the Generator and disclosed to the Contractor prior to providing the waste to the Contractor?	☑	☐	

D. WM Management's Decision

1. Management Method: _____
2. Designated Facility: _____
3. Hours of acceptance: _____ ☐ N/A
4. Precautions, Special Handling Procedures, or Limitations on Approval: _____

Generic Approval: ☐ Yes ☐ No Special Waste Decision: ☐ Approved ☐ Disapproved

Sales Person: _____ Date: _____ Technical Manager: _____ Date: _____

GENERATOR AND CUSTOMER MUST READ AND SIGN REVERSE HEREOF INITIAL _____ INITIAL _____

TERMS AND CONDITIONS

1. **ACCEPTABLE WASTE.** Customer shall deliver and Company shall accept for disposal or other management purpose only Acceptable Waste. As used herein, "Customer" shall mean both Customer and Generator listed on the reverse hereof. Customer shall deliver the full quantity of Acceptable Waste generated and/or handled by Customer as estimated on the reverse hereof. Acceptable Waste means and includes only such waste as is described on the reverse and which is approved and permitted for management at the Designated Facility listed on the reverse, and shall not include any Nonconforming Waste. As used herein, Nonconforming Waste means waste that: (a) is not in conformance with the description and/or estimated quantity of the waste set forth on the reverse; (b) is or contains any infectious waste, or radioactive, volatile, corrosive, highly flammable, explosive, biomedical, biohazardous material or hazardous, dangerous, or toxic substances, as defined pursuant to or listed or regulated under applicable federal, state or local law, except as stated on the reverse; or (c) is prohibited from being received, managed or disposed of at the Designated Facility by federal, state or local law, regulation, rule, code, ordinance, order, permit or permit condition;

2. **REPRESENTATIONS & WARRANTIES.** Customer represents and warrants that: (a) the description of the waste set forth on the reverse hereof is true and correct in all material respects; (b) all waste delivered to the Designated Facility by Customer shall be Acceptable Waste as defined above and shall not be or contain Nonconforming Waste; (c) Customer shall, and shall cause any carrier with which it contracts to, handle and transport the waste in a safe and workmanlike manner in full compliance with all applicable federal, state and local laws, ordinances, decisions, orders, rules or regulations; and (d) Customer has advised its drivers of Company's prohibition on delivery of Nonconforming Waste, of the definitions and listing of hazardous waste and hazardous substances under applicable federal and state law and regulations and of the definition of Acceptable Waste herein. Company represents and warrants that it shall manage the Acceptable Waste in a safe and workmanlike manner in full compliance with all applicable federal, state and local laws, ordinances, decisions, orders, rules or regulations.

3. **WASTE REJECTION.** Company may inspect, analyze or test any waste delivered by Customer and/or may reject, refuse or revoke acceptance of any waste if, in the opinion of Company, the waste or tender of delivery fails to conform to or Customer fails to comply with the terms of this Agreement, including by delivery of Nonconforming Waste. Company may also reject any waste which (a) Company reasonably believes would, as a result of or upon disposal or other management, be a violation of local, state or federal law, regulation, ordinance or permits, including land use restrictions or conditions applicable to the Designated Facility; or (b) in Company's opinion would present a significant risk to human health or the environment, cause a nuisance or otherwise create or expose Company or Customer to potential liability. Company also shall have the right to refuse to accept or to reject any Acceptable Waste in the event of Customer's failure to pay fees owed by Customer hereunder. In the event Company rejects or revokes acceptance of waste hereunder, Customer shall, at its sole cost, immediately remove or arrange to have the rejected waste removed from Company's control or property. Customer shall pay and/or reimburse Company for any and all costs, damages and/or fines incurred as a result of or relating to Customer's tender or delivery of Nonconforming Waste or other failure to comply or conform to this Agreement, including costs of inspection, testing and analysis.

4. **SPECIAL HANDLING; TITLE.** If Company elects, in its sole discretion, to handle, rather than reject, Nonconforming Waste, Company shall have the right to manage such Nonconforming Waste in the manner deemed most appropriate by Company given the characteristics of the Nonconforming Waste. Company may assess and Customer shall pay additional fees associated with delivery of Nonconforming Waste, including, but not limited to, special handling or disposal charges, and costs associated with different quantities of waste, different delivery dates, modifications in operations, specialized equipment, and other operational, environmental, health, safety or regulatory requirements. Title to and ownership of Acceptable Waste shall transfer to Company upon its final acceptance of Acceptable Waste. Title to, ownership of and liability for Nonconforming Waste shall at all times remain with Customer. Revocation of acceptance by Company shall operate to re-vest all incidents of ownership in Customer.

5. **INDEMNITY.** Each party hereto (the "Indemnitor") hereby agrees to indemnify, hold harmless and defend the other party, and its owners, officers, directors, employees and agents (collectively, the "Indemnitees"), from and against any and all liabilities, penalties, fines, forfeitures, fees, demands, claims, causes of action, suits, judgments and costs and expenses incidental thereto, including attorneys' fees (collectively, "Damages"), which any or all of the Indemnitees may hereafter suffer, incur, be responsible for or pay out, including for personal injuries, property damage, or contamination of or adverse effects on the environment, to the extent caused by, or arising from or in connection with the breach of any representations or warranties of the Indemnitor set forth in this Agreement, or any negligent actions or omissions or willful misconduct of the Indemnitor, its employees, officers, owners, directors or agents, or the violation of any law, ordinance or regulation, including, without limitation, the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9601 et seq., as amended. Such indemnity shall exclude Damages to the extent they arise as a result of any negligent actions or omissions or willful misconduct of the Indemnitees or their employees, officers, owners, directors or agents. The indemnification obligation hereunder shall arise only in excess of any available and collectible insurance proceeds and the Indemnitor shall be liable hereunder to pay only its share of the amount of Damages, if any, that exceeds the total amount that all insurance has paid for the Damages, plus the total of all deductible and self-insured expenses paid under all insurance policies. The obligations in this Section 5 shall survive the performance and termination of this Agreement.

6. **UNCONTROLLABLE CIRCUMSTANCES; TERMINATION.** Except for the obligation to pay fees hereunder, the performance of this Agreement may be discontinued or temporarily suspended by either party, and neither party shall be deemed to be in breach of this Agreement, in the event performance is prevented by a cause or causes beyond the reasonable control of the affected party. Such causes shall include, but not be limited to, acts of God, acts of war, riot, fire, explosion, accident, flood or sabotage, governmental laws (including nuisance), permit conditions, regulations, restrictions (including land use), condition of the waste, injunction or actions or omissions of third party transporters or other contractors, suppliers or vendors. Company may immediately terminate management services hereunder upon written notice to Customer in the event Customer breaches any term, provision or obligation under this Agreement, in which case, Customer shall be liable for and shall pay to Company all costs and losses incurred by Company as a result of or relating to any such termination.

7. **MISCELLANEOUS.** This Agreement shall be governed by the laws of the state in which the Designated Facility is located. Every provision of this Agreement shall be severable. This Agreement represents the entire understanding and Agreement between the parties relating to the management of waste, except that, if the parties, or their parent companies, are parties to a national service agreement, the terms of such national service agreement shall govern over any inconsistent terms in this Agreement. No representations, statements or Agreements, unless agreed to by the parties in writing, shall modify, change, amend or otherwise affect the obligations undertaken in this Agreement. No waiver by either party of any one or more defaults or breaches by the other in the performance of this Agreement shall operate or be construed as a waiver of any future defaults or breaches. Customer may not assign this Agreement without the prior written consent of Company. This Agreement shall be binding upon and shall inure to the benefit of the parties' successors and assigns.

THIS IS A LEGALLY BINDING CONTRACT. EACH UNDERSIGNED INDIVIDUAL ACKNOWLEDGES THAT HE/SHE HAS READ AND UNDERSTANDS THE TERMS AND CONDITIONS OF THIS AGREEMENT SET FORTH ABOVE AND ON THE REVERSE HEREOF AND THAT HE/SHE HAS THE AUTHORITY TO SIGN ON BEHALF OF CUSTOMER/GENERATOR AND COMPANY. BY SIGNING BELOW, CUSTOMER AND GENERATOR INDICATE A FIRST HAND KNOWLEDGE OF THE WASTE'S CHARACTERISTICS AND CERTIFY THE TRUTH OF THE INFORMATION ON THE REVERSE HEREOF. AGREED TO AS OF THE DATES BELOW.

CUSTOMER: ABCO ENVIRONMENTAL	GENERATOR: CALTRANS	COMPANY: ALTAMONT LANDFILL
(AUTHORIZED SIGNATURE)	Martha Adams (AUTHORIZED SIGNATURE)	(AUTHORIZED SIGNATURE)
GARY FELTON, OPS. MGR. (NAME, TITLE)	Martha Adams, PM (NAME, TITLE)	(NAME, TITLE)
DATE: 7/9/02	DATE: July 9/02	DATE:

APPENDIX F
LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY FORMS

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Martha Adams
Shaw Environmental & Infrastructure
1326 N. Market Blvd.
Sacramento, CA 95834

Client	Shaw Environmental & Infrastructure
Workorder	14887 837393 Caltrans SR 12 Napa
Received	07/03/02

The samples were received in EPA specified containers. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

Sparger Technology, Inc. ID Suffix Keys - These descriptors will follow the Sparger Technology, Inc. ID numbers and help identify the specific sample and clarify the report.

DUP - Matrix Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
LCS - Lab Control Sample
LCSD - Lab Control Sample Duplicate
RPD - Relative Percent Difference
QC - Additional Quality Control
DIL - Results from a diluted sample
ND - None Detected
RL - Reporting Limit

Note: In an effort to conserve paper, the results are printed on both sides of the paper.

Ray James
Laboratory Director

3050 Fite Circle, Suite 112 • Sacramento, California 95827 • (916) 362-8947 • FAX (916) 362-0947

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887001	**Received**	07/02/02
Sample ID	SR12-SB1-1.5	**Reported**	07/03/02
Matrix	Soil		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.0167mg/Kg	84 %	(70 - 130)

3050 Fite Circle, Suite 112 • Sacramento, California 95827 • (916) 362-8947 • FAX (916) 362-0947

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887001	**Received**	07/02/02
Sample ID	SR12-SB1-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	42.6 ug/kg	85 %	(76 - 135)

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887001	**Received**	07/02/02
Sample ID	SR12-SB1-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887001	**Received**	07/02/02
Sample ID	SR12-SB1-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887001	**Received**	07/02/02
Sample ID	SR12-SB1-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	53.4 ug/kg	107 %	(76 - 130)
Toluene d8	49.6 ug/kg	99 %	(88 - 118)
4-Bromofluorobenzene	50.6 ug/kg	101 %	(86 - 121)

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Scientific Division

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Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887002	**Received**	07/02/02
Sample ID	SR12-SB1-3.0	**Reported**	07/03/02
Matrix	Soil		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.0186mg/Kg	93 %	(70 - 130)

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Mobile Laboratory Division
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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887002	**Received**	07/02/02
Sample ID	SR12-SB1-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	42.6 ug/kg	85 %	(76 - 135)

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Test Certificate of Analysis

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Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887002	**Received**	07/02/02
Sample ID	SR12-SB1-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887002	**Received**	07/02/02
Sample ID	SR12-SB1-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887002	**Received**	07/02/02
Sample ID	SR12-SB1-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	52 ug/kg	104 %	(76 - 130)
Toluene d8	49 ug/kg	98 %	(88 - 118)
4-Bromofluorobenzene	50.5 ug/kg	101 %	(86 - 121)

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Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887003	**Received**	07/02/02
Sample ID	SR12-SB1-4.5	**Reported**	07/03/02
Matrix	Soil		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.0189mg/Kg	94 %	(70 - 130)

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Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887003	**Received**	07/02/02
Sample ID	SR12-SB1-4.5	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	43.4 ug/kg	87 %	(76 - 135)

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887003	**Received**	07/02/02
Sample ID	SR12-SB1-4.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887003	**Received**	07/02/02
Sample ID	SR12-SB1-4.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887003	**Received**	07/02/02
Sample ID	SR12-SB1-4.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	49.3 ug/kg	99 %	(76 - 130)
Toluene d8	49.8 ug/kg	100 %	(88 - 118)
4-Bromofluorobenzene	50.8 ug/kg	102 %	(86 - 121)

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Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887004	**Received**	07/02/02
Sample ID	SR12-SB1-6.0	**Reported**	07/03/02
Matrix	Soil		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.0163mg/Kg	82 %	(70 - 130)

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Mobile Laboratory Division
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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887004	**Received**	07/02/02
Sample ID	SR12-SB1-6.0	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	42.8 ug/kg	86 %	(76 - 135)

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Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887004	**Received**	07/02/02
Sample ID	SR12-SB1-6.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Laboratory ID	14887004	**Received**	07/02/02
Sample ID	SR12-SB1-6.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Laboratory ID	14887004	**Received**	07/02/02
Sample ID	SR12-SB1-6.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	49.3 ug/kg	99 %	(76 - 130)
Toluene d8	50.6 ug/kg	101 %	(88 - 118)
4-Bromofluorobenzene	50.9 ug/kg	102 %	(86 - 121)

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Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887005	**Received**	07/02/02
Sample ID	SR12-SB2-1.5	**Reported**	07/03/02
Matrix	Soil		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.0189mg/Kg	94 %	(70 - 130)

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Environmental Laboratories

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Mobile Laboratory Division
Scientific Division

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Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887005	**Received**	07/02/02
Sample ID	SR12-SB2-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	42 ug/kg	84 %	(76 - 135)

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Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887005	**Received**	07/02/02
Sample ID	SR12-SB2-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887005	**Received**	07/02/02
Sample ID	SR12-SB2-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887005	**Received**	07/02/02
Sample ID	SR12-SB2-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	55.8 ug/kg	112 %	(76 - 130)
Toluene d8	52.4 ug/kg	105 %	(88 - 118)
4-Bromofluorobenzene	51.4 ug/kg	103 %	(86 - 121)

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Scientific Division

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Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887006	**Received**	07/02/02
Sample ID	SR12-SB2-3.0	**Reported**	07/03/02
Matrix	Soil		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.0174mg/Kg	87 %	(70 - 130)

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Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887006	**Received**	07/02/02
Sample ID	SR12-SB2-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	42.6 ug/kg	85 %	(76 - 135)

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887006	**Received**	07/02/02
Sample ID	SR12-SB2-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887006	**Received**	07/02/02
Sample ID	SR12-SB2-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887006	**Received**	07/02/02
Sample ID	SR12-SB2-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	49.4 ug/kg	99 %	(76 - 130)
Toluene d8	48.5 ug/kg	97 %	(88 - 118)
4-Bromofluorobenzene	50.8 ug/kg	102 %	(86 - 121)

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887007	**Received**	07/02/02
Sample ID	SR12-SB2-4.5	**Reported**	07/03/02
Matrix	Soil		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.018 mg/Kg	90 %	(70 - 130)

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Sparger Technology, Inc.
Environmental Laboratories

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Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887007	**Received**	07/02/02
Sample ID	SR12-SB2-4.5	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	42 ug/kg	84 %	(76 - 135)

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Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887007	**Received**	07/02/02
Sample ID	SR12-SB2-4.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilutio
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887007	**Received**	07/02/02
Sample ID	SR12-SB2-4.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887007	**Received**	07/02/02
Sample ID	SR12-SB2-4.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilutio
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	52.2 ug/kg	104 %	(76 - 130)
Toluene d8	52.2 ug/kg	104 %	(88 - 118)
4-Bromofluorobenzene	51.2 ug/kg	102 %	(86 - 121)

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Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887008	**Received**	07/02/02
Sample ID	SR12-SB2-6.0	**Reported**	07/03/02
Matrix	Soil		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.0178mg/Kg	89 %	(70 - 130)

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Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887008	**Received**	07/02/02
Sample ID	SR12-SB2-6.0	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilutio
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	43.4 ug/kg	87 %	(76 - 135)

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887008	**Received**	07/02/02
Sample ID	SR12-SB2-6.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887008	**Received**	07/02/02
Sample ID	SR12-SB2-6.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887008	**Received**	07/02/02
Sample ID	SR12-SB2-6.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	49.1 ug/kg	98 %	(76 - 130)
Toluene d8	52.4 ug/kg	105 %	(88 - 118)
4-Bromofluorobenzene	49.3 ug/kg	99 %	(86 - 121)

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887009	**Received**	07/02/02
Sample ID	SR12-SB3-1.5	**Reported**	07/03/02
Matrix	Soil		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.018 mg/Kg	90 %	(70 - 130)

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Sparger Technology, Inc.
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Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887009	**Received**	07/02/02
Sample ID	SR12-SB3-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	42.8 ug/kg	86 %	(76 - 135)

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Sparger Technology, Inc.
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Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887009	**Received**	07/02/02
Sample ID	SR12-SB3-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilutio
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887009	**Received**	07/02/02
Sample ID	SR12-SB3-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Analytical Laboratory Division
Mobile Laboratory Division
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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887009	**Received**	07/02/02
Sample ID	SR12-SB3-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	47.4 ug/kg	95 %	(76 - 130)
Toluene d8	50.9 ug/kg	102 %	(88 - 118)
4-Bromofluorobenzene	49.3 ug/kg	99 %	(86 - 121)

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Environmental Laboratories

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Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887010	**Received**	07/02/02
Sample ID	SR12-SB3-3.0	**Reported**	07/03/02
Matrix	Soil		

3015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.0179mg/Kg	90 %	(70 - 130)

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887010	**Received**	07/02/02
Sample ID	SR12-SB3-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	42.1 ug/kg	84 %	(76 - 135)

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Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887010	**Received**	07/02/02
Sample ID	SR12-SB3-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887010	**Received**	07/02/02
Sample ID	SR12-SB3-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887010	**Received**	07/02/02
Sample ID	SR12-SB3-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	52.3 ug/kg	105 %	(76 - 130)
Toluene d8	50.5 ug/kg	101 %	(88 - 118)
4-Bromofluorobenzene	51.2 ug/kg	102 %	(86 - 121)

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887011	**Received**	07/02/02
Sample ID	SR12-SB3-4.5	**Reported**	07/03/02
Matrix	Soil		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.018 mg/Kg	90 %	(70 - 130)

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887011	**Received**	07/02/02
Sample ID	SR12-SB3-4.5	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	41.7 ug/kg	83 %	(76 - 135)

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887011	**Received**	07/02/02
Sample ID	SR12-SB3-4.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Sparger Technology, Inc.
Environmental Laboratories

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887011	**Received**	07/02/02
Sample ID	SR12-SB3-4.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887011	**Received**	07/02/02
Sample ID	SR12-SB3-4.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	50.4 ug/kg	101 %	(76 - 130)
Toluene d8	50.6 ug/kg	101 %	(88 - 118)
4-Bromofluorobenzene	50.8 ug/kg	102 %	(86 - 121)

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Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887012	**Received**	07/02/02
Sample ID	SR12-SB3-6.0	**Reported**	07/03/02
Matrix	Soil		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.0163mg/Kg	82 %	(70 - 130)

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

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Sample ID	SR12-SB3-6.0	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	42.5 ug/kg	85 %	(76 - 135)

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Analytical Laboratory Division
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Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887012	**Received**	07/02/02
Sample ID	SR12-SB3-6.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Sparger Technology, Inc.
Environmental Laboratories

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Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887012	**Received**	07/02/02
Sample ID	SR12-SB3-6.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Environmental Laboratories

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887012	**Received**	07/02/02
Sample ID	SR12-SB3-6.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	49.2 ug/kg	98 %	(76 - 130)
Toluene d8	50 ug/kg	100 %	(88 - 118)
4-Bromofluorobenzene	51.3 ug/kg	103 %	(86 - 121)

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887013	**Received**	07/02/02
Sample ID	SR12-SB3-7.5	**Reported**	07/03/02
Matrix	Soil		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.017 mg/Kg	85 %	(70 - 130)

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

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Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887013	**Received**	07/02/02
Sample ID	SR12-SB3-7.5	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	41.9 ug/kg	84 %	(76 - 135)

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

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Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887013	**Received**	07/02/02
Sample ID	SR12-SB3-7.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887013	**Received**	07/02/02
Sample ID	SR12-SB3-7.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
O-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887013	**Received**	07/02/02
Sample ID	SR12-SB3-7.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	50.9 ug/kg	102 %	(76 - 130)
Toluene d8	51.1 ug/kg	102 %	(88 - 118)
4-Bromofluorobenzene	50.8 ug/kg	102 %	(86 - 121)

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Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887014	**Received**	07/02/02
Sample ID	SR12-SB3-9.0	**Reported**	07/03/02
Matrix	Soil		

3015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.0172mg/Kg	86 %	(70 - 130)

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Environmental Laboratories

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Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887014	**Received**	07/02/02
Sample ID	SR12-SB3-9.0	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	42.5 ug/kg	85 %	(76 - 135)

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887014	**Received**	07/02/02
Sample ID	SR12-SB3-9.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887014	**Received**	07/02/02
Sample ID	SR12-SB3-9.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887014	**Received**	07/02/02
Sample ID	SR12-SB3-9.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	50.1 ug/kg	100 %	(76 - 130)
Toluene d8	51.6 ug/kg	103 %	(88 - 118)
4-Bromofluorobenzene	51.4 ug/kg	103 %	(86 - 121)

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Sparger Technology, Inc.
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Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887015	**Received**	07/02/02
Sample ID	SR12-SB4-1.5	**Reported**	07/03/02
Matrix	Soil		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.0162mg/Kg	81 %	(70 - 130)

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887015	**Received**	07/02/02
Sample ID	SR12-SB4-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	42.7 ug/kg	85 %	(76 - 135)

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Sparger Technology, Inc.
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Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887015	**Received**	07/02/02
Sample ID	SR12-SB4-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887015	**Received**	07/02/02
Sample ID	SR12-SB4-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887015	**Received**	07/02/02
Sample ID	SR12-SB4-1.5	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	48.4 ug/kg	97 %	(76 - 130)
Toluene d8	50 ug/kg	100 %	(88 - 118)
4-Bromofluorobenzene	50.4 ug/kg	101 %	(86 - 121)

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887016	**Received**	07/02/02
Sample ID	SR12-SB4-3.0	**Reported**	07/03/02
Matrix	Soil		

3015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.0164mg/Kg	82 %	(70 - 130)

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Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

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Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887016	**Received**	07/02/02
Sample ID	SR12-SB4-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	42.8 ug/kg	86 %	(76 - 135)

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887016	**Received**	07/02/02
Sample ID	SR12-SB4-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

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Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887016	**Received**	07/02/02
Sample ID	SR12-SB4-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887016	**Received**	07/02/02
Sample ID	SR12-SB4-3.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	48.3 ug/kg	97 %	(76 - 130)
Toluene d8	49.7 ug/kg	99 %	(88 - 118)
4-Bromofluorobenzene	51.8 ug/kg	104 %	(86 - 121)

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887017	**Received**	07/02/02
Sample ID	SR12-SB4-4.0	**Reported**	07/03/02
Matrix	Soil		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Benzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Toluene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
Xylene (Total)	07/02/02	07/02/02	ND	0.005	mg/Kg	1:1
TPHgas	07/02/02	07/02/02	ND	1.0	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	0.0166mg/Kg	83 %	(70 - 130)

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

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Laboratory ID	14887017	**Received**	07/02/02
Sample ID	SR12-SB4-4.0	**Reported**	07/03/02
Matrix	Soil		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/kg	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	41.2 ug/kg	82 %	(76 - 135)

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Sparger Technology, Inc.
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Mobile Laboratory Division
Scientific Division

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Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887017	**Received**	07/02/02
Sample ID	SR12-SB4-4.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Analytical Laboratory Division
Mobile Laboratory Division
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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887017	**Received**	07/02/02
Sample ID	SR12-SB4-4.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

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Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887017	**Received**	07/02/02
Sample ID	SR12-SB4-4.0	**Reported**	07/03/02
Matrix	Soil		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/kg	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	52.7 ug/kg	105 %	(76 - 130)
Toluene d8	52 ug/kg	104 %	(88 - 118)
4-Bromofluorobenzene	51.2 ug/kg	102 %	(86 - 121)

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Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887018	**Received**	07/02/02
Sample ID	SR12-SB2--GW	**Reported**	07/03/02
Matrix	Water		

3015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/03/02	07/03/02	ND	0.5	ug/L	1:1
Benzene	07/03/02	07/03/02	ND	0.5	ug/L	1:1
Toluene	07/03/02	07/03/02	ND	0.5	ug/L	1:1
Ethylbenzene	07/03/02	07/03/02	ND	0.5	ug/L	1:1
Xylene (Total)	07/03/02	07/03/02	ND	0.5	ug/L	1:1
TPHgas	07/03/02	07/03/02	ND	50	ug/L	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	22.4 ug/L	112 %	(70 - 130)

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Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887018	**Received**	07/02/02
Sample ID	SR12-SB2--GW	**Reported**	07/03/02
Matrix	Water		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/L	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/L	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/L	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/L	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	43.3 ug/L	87 %	(76 - 135)

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Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887018	**Received**	07/02/02
Sample ID	SR12-SB2--GW	**Reported**	07/03/02
Matrix	Water		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/L	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/L	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/L	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/L	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/L	1:1

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Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887018	**Received**	07/02/02
Sample ID	SR12-SB2--GW	**Reported**	07/03/02
Matrix	Water		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/L	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1

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Test Certificate of Analysis

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Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887018	**Received**	07/02/02
Sample ID	SR12-SB2--GW	**Reported**	07/03/02
Matrix	Water		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	48.5 ug/L	97 %	(76 - 135)
Toluene d8	49.4 ug/L	99 %	(88 - 118)
4-Bromofluorobenzene	48.8 ug/L	98 %	(86 - 121)

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Sparger Technology, Inc.
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Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887019	**Received**	07/02/02
Sample ID	SR12-SB3--GW	**Reported**	07/03/02
Matrix	Water		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/03/02	07/03/02	ND	0.5	ug/L	1:1
Benzene	07/03/02	07/03/02	ND	0.5	ug/L	1:1
Toluene	07/03/02	07/03/02	ND	0.5	ug/L	1:1
Ethylbenzene	07/03/02	07/03/02	ND	0.5	ug/L	1:1
Xylene (Total)	07/03/02	07/03/02	ND	0.5	ug/L	1:1
TPHgas	07/03/02	07/03/02	ND	50	ug/L	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	22.4 ug/L	112 %	(70 - 130)

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887019	**Received**	07/02/02
Sample ID	SR12-SB3--GW	**Reported**	07/03/02
Matrix	Water		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/L	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/L	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/L	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/L	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	42.5 ug/L	85 %	(76 - 135)

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887019	**Received**	07/02/02
Sample ID	SR12-SB3--GW	**Reported**	07/03/02
Matrix	Water		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/L	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/L	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Chloroform	**07/02/02**	**07/02/02**	**2.3**	**2.0**	**ug/L**	**1:1**
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/L	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/L	1:1

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Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

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Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887019	**Received**	07/02/02
Sample ID	SR12-SB3--GW	**Reported**	07/03/02
Matrix	Water		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/L	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1

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Environmental Laboratories

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Scientific Division

Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887019	**Received**	07/02/02
Sample ID	SR12-SB3--GW	**Reported**	07/03/02
Matrix	Water		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	51.5 ug/L	103 %	(76 - 135)
Toluene d8	49.9 ug/L	100 %	(88 - 118)
4-Bromofluorobenzene	49.3 ug/L	99 %	(86 - 121)

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887020	**Received**	07/02/02
Sample ID	SR12-SB1--GW	**Reported**	07/03/02
Matrix	Water		

8015M/8020M - 8020M/8015M

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Methyl-tert-butyl-ether	07/03/02	07/03/02	ND	0.5	ug/L	1:1
Benzene	07/03/02	07/03/02	ND	0.5	ug/L	1:1
Toluene	07/03/02	07/03/02	ND	0.5	ug/L	1:1
Ethylbenzene	07/03/02	07/03/02	ND	0.5	ug/L	1:1
Xylene (Total)	07/03/02	07/03/02	ND	0.5	ug/L	1:1
TPHgas	07/03/02	07/03/02	ND	50	ug/L	1:1

Surrogates	Result	Recovery	Limits
Trifluorotoluene	21.9 ug/L	110 %	(70 - 130)

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887020	**Received**	07/02/02
Sample ID	SR12-SB1--GW	**Reported**	07/03/02
Matrix	Water		

8260B Oxygenates - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Tertiary butanol	07/02/02	07/02/02	ND	10	ug/L	1:1
Methyl-tert-butyl-ether	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Di-isopropyl ether	07/02/02	07/02/02	ND	5.0	ug/L	1:1
Ethyl tert-butyl ether	07/02/02	07/02/02	ND	5.0	ug/L	1:1
Tertiaryamyl methylether	07/02/02	07/02/02	ND	5.0	ug/L	1:1

Surrogates	Result	Recovery	Limits
Dibromodifluoromethane	42.1 ug/L	84 %	(76 - 135)

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887020	**Received**	07/02/02
Sample ID	SR12-SB1--GW	**Reported**	07/03/02
Matrix	Water		

8260B GC/MS Volatiles - 8260B

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
Dichlorodifluoromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Chloromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Vinyl chloride	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Bromomethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Chloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Trichlorofluoromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Acrolein	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Acetone	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Methyl iodide	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Carbon disulfide	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Dichloromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Acrylonitrile	07/02/02	07/02/02	ND	2.0	ug/L	1:1
trans-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Vinyl acetate	07/02/02	07/02/02	ND	2.0	ug/L	1:1
cis-1,2-Dichloroethene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
2-Butanone (MEK)	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Bromochloromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Chloroform	07/02/02	07/02/02	ND	2.0	ug/L	1:1
2,2-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1,1-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1-dichloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Carbon tetrachloride	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Benzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2-Dichloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Dibromomethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Bromodichloromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Trichloroethene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
2-Chloroethylvinyl ether	07/02/02	07/02/02	ND	2.0	ug/L	1:1
cis-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/L	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887020	**Received**	07/02/02
Sample ID	SR12-SB1--GW	**Reported**	07/03/02
Matrix	Water		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
4-Methyl-2-pentanone	07/02/02	07/02/02	ND	2.0	ug/L	1:1
trans-1,3-Dichloropropene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1,2-Trichloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Toluene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2-Dibromoethane (EDB)	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,3-Dichloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
2-Hexanone	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Dibromochloromethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Tetrachloroethene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1,1,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Chlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Ethylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
M+P-Xylene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Bromoform	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Styrene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
o-Xylene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,1,2,2-Tetrachloroethane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2,3-Trichloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Isopropylbenzene (Cumene)	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Bromobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
n-Propylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
2-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
4-Chlorotoluene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,3,5-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
tert-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2,4-Trimethylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
sec-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,3-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,4-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
4-Isopropyltoluene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2-Dichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
n-Butylbenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 Caltrans SR 12 Napa
Workorder #	14887	**Sampled**	07/01/02
Laboratory ID	14887020	**Received**	07/02/02
Sample ID	SR12-SB1--GW	**Reported**	07/03/02
Matrix	Water		

8260B GC/MS Volatiles - 8260B (continued)

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
1,2-Dibromo-3-chloropropane	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2,4-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Naphthalene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
Hexachlorobutadiene	07/02/02	07/02/02	ND	2.0	ug/L	1:1
1,2,3-Trichlorobenzene	07/02/02	07/02/02	ND	2.0	ug/L	1:1

Surrogates	Result	Recovery	Limits
1,2-Dichloroethane-d4	51.7 ug/L	103 %	(76 - 135)
Toluene d8	50.6 ug/L	101 %	(88 - 118)
4-Bromofluorobenzene	50.1 ug/L	100 %	(86 - 121)

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Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14887 **Workorder ID** 837393 Caltrans SR 12 Napa

Parameter TPHdiesel
Method 8015M DHS

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14887001	SR12-SB1-1.5	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887002	SR12-SB1-3.0	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887003	SR12-SB1-4.5	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887004	SR12-SB1-6.0	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887005	SR12-SB2-1.5	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887006	SR12-SB2-3.0	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887007	SR12-SB2-4.5	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887008	SR12-SB2-6.0	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887009	SR12-SB3-1.5	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887010	SR12-SB3-3.0	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887011	SR12-SB3-4.5	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887012	SR12-SB3-6.0	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887013	SR12-SB3-7.5	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887014	SR12-SB3-9.0	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887015	SR12-SB4-1.5	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887016	SR12-SB4-3.0	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887017	SR12-SB4-4.0	ND	1.0	mg/Kg	07/01/02	07/02/02	Soil	1:1
14887018	SR12-SB2--GW	ND	50	ug/L	07/01/02	07/02/02	Water	1:1
14887019	SR12-SB3--GW	ND	50	ug/L	07/01/02	07/02/02	Water	1:1
14887020	SR12-SB1--GW	ND	50	ug/L	07/01/02	07/02/02	Water	1:1

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R1-1-1 / B1-2

CHAIN CUSTODY

Company:
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834
Phone: (916) 928-3300 Fax: (916) 928-3341

Laboratory:
Sparger Technology
30550 Fite Circle, Suite 112, Sacramento, CA 95827
Phone: 916-362-8947
Fax: 916-362-0947

Send Results To:
Martha Adams
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834

Project:
Caltrans SR 12 Napa
Location: SR 12, Napa and Solano County
Project #:837393
Contract: 43A0078 Task Order #:

Sampler: Ian Moorehead

	Sample ID:	Date	Time	Container	Total	Preservative Used	Matrix	Analysis: 8015/8020 Gas Analysis Package	Analysis: EPA 8015: TPHD	Analysis: EPA 8260B, VOCs & Fuel Oxygenates combined	Analysis: 9045A: pH	TAT
1	SR12-SB1-1.5	07/01/02	0945	Stainless tube	1	Ice	Soil	X	X	X		48 HR
2	SR12-SB1-3.0		0950	Stainless tube	1	Ice	Soil	X	X	X		48 HR
3	SR12-SB1-4.5		0955	Stainless tube	1	Ice	Soil	X	X	X		48 HR
4	SR12-SB1-6.0		1000	Stainless tube	1	Ice	Soil	X	X	X		48 HR
5	SR12-SB2-1.5		1050	Stainless tube	1	Ice	Soil	X	X	X		48 HR
6	SR12-SB2-3.0		1052	Stainless tube	1	Ice	Soil	X	X	X		48 HR
7	SR12-SB2-4.5		1100	Stainless tube	1	Ice	Soil	X	X	X		48 HR
8	SR12-SB2-6.0		1105	Stainless tube	1	Ice	Soil	X	X	X		48 HR
9	SR12-SB3-1.5		1300	Stainless tube	1	Ice	Soil	X	X	X		48 HR
10	SR12-SB3-3.0		1305	Stainless tube	1	Ice	Soil	X	X	X		48 HR
11	SR12-SB3-4.5		1309	Stainless tube	1	Ice	Soil	X	X	X		48 HR
12	SR12-SB3-6.0		1310	Stainless tube	1	Ice	Soil	X	X	X		48 HR
13	SR12-SB3-7.5		1317	Stainless tube	1	Ice	Soil	X	X	X		48 HR
14	SR12-SB3-9.0		1320	Stainless tube	1	Ice	Soil	X	X	X		48 HR
15	SR12-SB4-1.5		1432	Stainless tube	1	Ice	Soil	X	X	X		48 HR
16	SR12-SB4-3.0		1438	Stainless tube	1	Ice	Soil	X	X	X		48 HR
17	SR12-SB4-4.0	07/01/02	1440	Stainless tube	1	Ice	Soil	X	X	X		48 HR
18				Stainless tube	1	Ice	Soil					48 HR

48 HOUR Rush!

Reliquished By: Sheila Richards
Print Name: Sheila Richards
Date: 7/2/02
Time: 12:10

Received By: [illegible]
Print Name: [illegible]
Date: 7/2/02
Time: 12:10

Received By:
Print Name:
Date:
Time:

48 HOUR
Rush!

CHAIN CUSTODY

14887

Company:
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834
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Laboratory:
Sparger Technology
30550 Fite Circle, Suite 112, Sacramento, CA 95827
Phone: 916-362-8947
Fax: 916-362-0947

Send Results To:
Martha Adams
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834

Project:
Caltrans SR 12 Napa
Location: SR 12, Napa and Solano County
Project #:837393
Contract: 43A0078
Task Order #:

Sampler: Ian Moorehead

	Sample ID:	Date	Time	Container	Total	Preservative Used	Matrix	Analysis: 8015/8020 Gas Analysis Package	Analysis: EPA 8015: TPHD	Analysis: EPA 8260B, VOCs & Fuel Oxygenates combined	Analysis: 9045A: pH	TAT
1	SR12-SB2-GW	07/01/02	1115	VOA	5	Ice	Water	X		X		48 HR
2	SR12-SB2-GW	07/01/02	1115	1L Amb.	1	Ice	Water		X			48 HR
3	SR12-SB3-GW	↓	1345	VOA	5	Ice	Water	X		X		48 HR
4	SR12-SB3-GW	↓	1345	1L Amb.	1	Ice	Water		X			48 HR
5	SR12-SB1-GW		1515	VOA	5	Ice	Water	X		X		48 HR
6	SR12-SB1-GW		1515	1L Amber	1	Ice	Water		X			48 HR
7						Ice	Water					48 HR
8						Ice	Water					48 HR
9						Ice	Water					48 HR
10						Ice	Water					48 HR
11						Ice	Water					48 HR
12						Ice	Water					48 HR
13						Ice	Water					48 HR
14						Ice	Water					48 HR
15						Ice	Water					48 HR
16						Ice	Water					48 HR
17						Ice	Water					48 HR
18						Ice	Water					48 HR

48 HOUR Rush!

Reliquished By: Sheila Richgels
Print Name: Sheila Richgels
Date: 7/2/02
Time: 12:10

Received By: [illegible]
Print Name: [illegible]
Date: 7/2/02
Time: 12:50

Received By:
Print Name:
Date:
Time:

48 HOUR
Rush!

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Martha Adams
Shaw Environmental & Infrastructure
1326 N. Market Blvd.
Sacramento, CA 95834

Client	Shaw Environmental & Infrastructure
Workorder	14892 Caltrans SR 12 NAPA
Received	07/08/02

The samples were received in EPA specified containers. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

Sparger Technology, Inc. ID Suffix Keys - These descriptors will follow the Sparger Technology, Inc. ID numbers and help identify the specific sample and clarify the report.

DUP - Matrix Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
LCS - Lab Control Sample
LCSD - Lab Control Sample Duplicate
RPD - Relative Percent Difference
QC - Additional Quality Control
DIL - Results from a diluted sample
ND - None Detected
RL - Reporting Limit

Note: In an effort to conserve paper, the results are printed on both sides of the paper.

Ray James
Laboratory Director

3050 Fite Circle, Suite 112 • Sacramento, California 95827 • (916) 362-8947 • FAX (916) 362-0947

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14892 **Workorder ID** Caltrans SR 12 NAPA

Parameter Lead
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14892001	SR 12-1-0.15	426	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892002	SR12-1-0.30	78.9	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892003	SR12-1-0.45	3.83	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892004	SR12-2-0.15	299	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892005	SR12-2-0.30	245	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892006	SR12-2-0.45	90.9	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892007	SR12-3-0.15	115	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892008	SR12-3-0.30	113	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892009	SR12-3-0.45	228	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892010	SR12-4-0.15	205	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892011	SR12-4-0.30	62.1	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892012	SR12-4-0.45	117	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892013	SR12-5-0.15	176	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892014	SR12-5-0.30	381	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892015	SR12-5-0.45	356	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892016	SR12-6-0.15	511	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892017	SR12-6-0.30	294	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892018	SR12-6-0.45	504	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892019	SR12-7-0.15	109	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892020	SR12-7-0.30	124	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892021	SR12-7-0.45	119	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892022	SR12-8-0.15	76.7	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892023	SR12-8-0.30	98.0	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892024	SR12-8-0.45	22.2	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892025	SR12-9-0.15	179	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892026	SR12-9-0.30	208	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892027	SR12-9-0.45	153	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892028	SR12-10-0.15	40.7	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892029	SR12-10-0.30	51.5	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892030	SR12-10-0.45	60.2	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892031	SR12-11-0.15	40.2	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892032	SR12-11-0.30	147	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892033	SR12-11-0.45	92.7	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892034	SR12-12-0.15	37.3	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14892 **Workorder ID** Caltrans SR 12 NAPA

Parameter Lead (continued)
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14892035	SR12-12-0.30	153	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892036	SR12-12-0.45	161	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892037	SR12-13-0.15	966	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892038	SR12-13-0.30	337	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892039	SR12-13-0.45	358	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892040	SR12-14-0.15	14.5	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892041	SR12-14-0.30	7.65	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892042	SR12-14-0.45	6.68	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892043	SR12-15-0.15	85.4	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892044	SR12-15-0.30	229	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892045	SR12-15-0.45	281	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892046	SR12-16-0.15	43.7	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892047	SR12-16-0.30	41.9	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892048	SR12-16-0.45	37.4	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892049	SR12-17-0.15	16.1	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892050	SR12-17-0.30	22.6	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892051	SR12-17-0.45	16.5	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892052	SR12-18-0.15	14.2	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892053	SR12-18-0.30	29.6	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892054	SR12-18-0.45	22.4	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892055	SR12-19-0.15	9.83	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892056	SR12-19-0.30	6.21	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892057	SR12-19-0.45	6.01	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892058	SR12-20-0.15	13.1	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892059	SR12-20-0.30	7.12	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892060	SR12-20-0.45	9.77	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892061	SR12-21-0.15	7.91	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892062	SR12-21-0.30	7.91	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892063	SR12-21-0.45	15.1	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892064	SR12-22-0.15	17.5	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892065	SR12-22-0.30	51.8	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892066	SR12-22-0.45	36.6	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892067	SR12-23-0.15	13.0	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892068	SR12-23-0.30	12.6	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1

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Environmental Laboratories

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Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14892 **Workorder ID** Caltrans SR 12 NAPA

Parameter Lead (continued)
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14892069	SR12-23-0.45	31.2	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892070	SR12-24-0.15	17.4	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892071	SR12-24-0.30	20.7	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892072	SR12-24-0.45	107	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892073	SR12-25-0.15	24.0	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892074	SR12-25-0.30	98.3	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892075	SR12-25-0.45	65.4	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892076	SR12-26-0.15	19.9	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892077	SR12-26-0.30	14.2	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892078	SR12-26-0.45	41.9	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892079	SR12-27-0.15	78.2	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892080	SR12-27-0.30	161	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892081	SR12-27-0.45	111	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892082	SR12-28-0.15	69.5	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892083	SR12-28-0.30	94.9	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892084	SR12-28-0.45	88.1	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892085	SR12-29-0.15	16.4	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892086	SR12-29-0.30	37.4	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892087	SR12-29-0.45	258	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892088	SR12-30-0.15	27.4	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892089	SR12-30-0.30	68.0	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892090	SR12-30-0.45	54.1	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892091	SR12-31-0.15	98.0	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892092	SR12-31-0.30	106	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892093	SR12-31-0.45	46.5	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892094	SR12-32-0.15	93.9	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892095	SR12-32-0.30	62.2	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892096	SR12-32-0.45	38.3	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892097	SR12-33-0.15	97.6	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892098	SR12-33-0.30	105	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892099	SR12-33-0.45	142	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892100	SR12-34-0.15	32.6	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892101	SR12-34-0.30	48.8	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892102	SR12-34-0.45	51.3	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1

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Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14892 **Workorder ID** Caltrans SR 12 NAPA

Parameter Lead (continued)
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14892103	SR12-35-0.15	158	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892104	SR12-35-0.30	131	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892105	SR12-35-0.45	183	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892106	SR12-36-0.15	9.01	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892107	SR12-36-0.30	16.0	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892108	SR12-36-0.45	34.7	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892109	SR12-37-0.15	21.5	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892110	SR12-37-0.30	54.3	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892111	SR12-37-0.45	48.0	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892112	SR12-38-0.15	6.76	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892113	SR12-38-0.30	12.2	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892114	SR12-38-0.45	42.5	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892115	SR12-39-0.15	33.1	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892116	SR12-39-0.30	7.00	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892117	SR12-39-0.45	22.3	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892118	SR12-40-0.15	11.3	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892119	SR12-40-0.30	30.8	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892120	SR12-40-0.45	29.5	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892121	SR12-41-0.15	42.6	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892122	SR12-41-0.30	114	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892123	SR12-41-0.45	51.1	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892124	SR12-42-0.15	16.2	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892125	SR12-42-0.30	7.84	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892126	SR12-42-0.45	89.8	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892127	SR12-43-0.15	49.9	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892128	SR12-43-0.30	29.4	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892129	SR12-43-0.45	40.0	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892130	SR12-44-0.15	39.1	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892131	SR12-44-0.30	51.2	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892132	SR12-44-0.45	87.0	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892133	SR12-45-0.15	22.6	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892134	SR12-45-0.30	20.7	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892135	SR12-45-0.45	13.0	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892136	SR12-46-0.15	10.9	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1

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Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14892 **Workorder ID** Caltrans SR 12 NAPA

Parameter Lead (continued)
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14892137	SR12-46-0.30	10.4	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892138	SR12-46-0.45	11.6	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892139	SR12-47-0.15	25.5	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892140	SR12-47-0.30	22.8	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892141	SR12-47-0.45	14.5	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892142	SR12-48-0.15	102	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892143	SR12-48-0.30	79.3	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892144	SR12-48-0.45	30.2	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892145	SR12-49-0.15	413	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892146	SR12-49-0.30	55.2	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892147	SR12-49-0.45	66.0	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892148	SR12-50-0.15	48.5	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892149	SR12-50-0.30	154	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892150	SR12-50-0.45	129	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892151	SR12-51-0.15	101	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892152	SR12-51-0.30	132	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1
14892153	SR12-51-0.45	90.7	1.0	mg/Kg	07/02/02	07/05/02	Soil	1:1

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14892 **Workorder ID** Caltrans SR 12 NAPA

Parameter pH
Method 9045 PH

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14892006	SR12-2-0.45	6.9	0.10	units	07/02/02	07/03/02	Soil	1:1
14892016	SR12-6-0.15	6.7	0.10	units	07/02/02	07/03/02	Soil	1:1
14892025	SR12-9-0.15	6.7	0.10	units	07/02/02	07/03/02	Soil	1:1
14892035	SR12-12-0.30	7.2	0.10	units	07/02/02	07/03/02	Soil	1:1
14892048	SR12-16-0.45	7.0	0.10	units	07/02/02	07/03/02	Soil	1:1
14892055	SR12-19-0.15	7.1	0.10	units	07/02/02	07/03/02	Soil	1:1
14892064	SR12-22-0.15	7.1	0.10	units	07/02/02	07/03/02	Soil	1:1
14892071	SR12-24-0.30	7.2	0.10	units	07/02/02	07/03/02	Soil	1:1
14892083	SR12-28-0.30	7.0	0.10	units	07/02/02	07/03/02	Soil	1:1
14892098	SR12-33-0.30	6.9	0.10	units	07/02/02	07/03/02	Soil	1:1
14892109	SR12-37-0.15	6.8	0.10	units	07/02/02	07/03/02	Soil	1:1
14892120	SR12-40-0.45	6.8	0.10	units	07/02/02	07/03/02	Soil	1:1
14892128	SR12-43-0.30	6.6	0.10	units	07/02/02	07/03/02	Soil	1:1
14892142	SR12-48-0.15	6.3	0.10	units	07/02/02	07/03/02	Soil	1:1
14892149	SR12-50-0.30	6.8	0.10	units	07/02/02	07/03/02	Soil	1:1

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Method Blank Report

Client ID Shaw Environmental & Infrastructure
Workorder ID Caltrans SR 12 NAPA
Laboratory ID 45926
Sample ID MB for HBN 150348 [ICPV/3799]
Matrix Soil

Parameter	Method	Prep Date	Analyzed	Result	RL	Units	Dilution
Lead	6010B Soil Pb	07/03/02	07/05/02	ND	1.0	mg/Kg	1:1

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CHAIN OF CUSTODY

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Phone: (916) 928-3300 Fax: (916) 928-33

Rush!

Laboratory:
Sparger Technology
30550 Fite Circle, Suite 112, Sacramento, CA 95827
Phone: 916-362-8947
Fax: 916-362-0947

Send Results To:
Martha Adams
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834

Project:
Caltrans SR 12 Napa
Location: SR 12 Napa and Solano County
Project #:837393
Contract: 43A0078

SAMPLERS:
IAN MOORHEAD
DARREN HART

	Sample ID:	Date	Time	Container	Total	Preservative Used	Matrix	Analyses: EPA 6010 Lead only	Analyses: 9045A: pH	TAT
1	SR 12- 1 -0.15	07/ 02 /2002	0920	baggie	1	Ice	Soil	X		48 HR
2	SR 12- -0.30	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
3	SR 12- -0.45	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
4	SR 12- 2 -0.15	07/ / /2002	0930	baggie	1	Ice	Soil	X		48 HR
5	SR 12- -0.30	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
6	SR 12- -0.45	07/ / /2002		baggie	1	Ice	Soil	X	X	48 HR
7	SR 12- 3 -0.15	07/ / /2002	0935	baggie	1	Ice	Soil	X		48 HR
8	SR 12- -0.30	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
9	SR 12- -0.45	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
10	SR 12- 4 -0.15	07/ / /2002	0940	baggie	1	Ice	Soil	X		48 HR
11	SR 12- -0.30	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
12	SR 12- -0.45	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
13	SR 12- 5 -0.15	07/ / /2002	0948	baggie	1	Ice	Soil	X		48 HR
14	SR 12- -0.30	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
15	SR 12- -0.45	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
16	SR 12- 6 -0.15	07/ / /2002	0950	baggie	1	Ice	Soil	X	X	48 HR
17	SR 12- -0.30	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
18	SR 12- -0.45	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
19	SR 12- 7 -0.15	07/ / /2002	0952	baggie	1	Ice	Soil	X		48 HR
20	SR 12- -0.30	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
21	SR 12- -0.45	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
22	SR 12- 8 -0.15	07/ / /2002	0958	baggie	1	Ice	Soil	X		48 HR
23	SR 12- -0.30	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
24	SR 12- -0.45	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
25	SR 12- 9 -0.15	07/ / /2002	1000	baggie	1	Ice	Soil	X	X	48 HR
26	SR 12- -0.30	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
27	SR 12- -0.45	07/ 02 /2002		baggie	1	Ice	Soil	X		48 HR
~~28~~	~~SR 12- -0.45~~	~~07/ /2002~~		~~baggie~~	~~1~~	~~Ice~~	~~Soil~~			~~48 HR~~
~~29~~	~~SR 12- -0.30~~	~~07/ /2002~~		~~baggie~~	~~1~~	~~Ice~~	~~Soil~~			~~48 HR~~
30	SR 12- 10 -0.15	07/ 02 /2002	1014	baggie	1	Ice	Soil	X		48 HR
31	SR 12- -0.30	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
32	SR 12- -0.45	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
33	SR 12- 11 -0.15	07/ / /2002	1025	baggie	1	Ice	Soil	X		48 HR
34	SR 12- -0.30	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
35	SR 12- -0.45	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
36	SR 12- 12 -0.15	07/ / /2002	1027	baggie	1	Ice	Soil	X		48 HR
37	SR 12- -0.30	07/ / /2002		baggie	1	Ice	Soil	X	X	48 HR
38	SR 12- -0.45	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
39	SR 12- 13 -0.15	07/ / /2002	1034	baggie	1	Ice	Soil	X		48 HR
40	SR 12- -0.30	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
41	SR 12- -0.45	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
42	SR 12- 14 -0.15	07/ / /2002	1040	baggie	1	Ice	Soil	X		48 HR
43	SR 12- -0.30	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
44	SR 12- -0.45	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
45	SR 12- 15 -0.15	07/ / /2002	1051	baggie	1	Ice	Soil	X		48 HR
46	SR 12- -0.30	07/ / /2002		baggie	1	Ice	Soil	X		48 HR
47	SR 12- -0.45	07/ 02 /2002		baggie	1	Ice	Soil	X		48 HR

IM 07/02/01

Relinquished By: Martha Adam
Print Name: Martha Adam
Date: 7.3.02
Time: 11:17

Received By: [signature]
Print Name: W.L. Fleming
Date: 7-3-02
Time: 11:17

Received By: [signature]
Print Name: SOL
Date: 07-03-02
Time: 3:30

CHAIN OF CUSTODY

14892

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Phone: 916-362-8947
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Send Results To:
Martha Adams
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834

Project:
Caltrans SR 12 Napa
Location: SR 12 Napa and Solano County
Project #:837393
Contract: 43A0078

Samplers:
I. Moorhead
D. Hart

	Sample ID:	Date	Time	Container	Total	Preservative Used	Matrix	Analyses: EPA 6010 Lead only	Analyses: 9045A: pH	TAT
1	SR 12- 16 -0.15	07/02/2002	1057	baggie	1	Ice	Soil	X		48 HR
2	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
3	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
4	SR 12- 17 -0.15	07/02/2002	1103	baggie	1	Ice	Soil	X		48 HR
5	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
6	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
7	SR 12- 18 -0.15	07/ /2002	1109	baggie	1	Ice	Soil	X		48 HR
8	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
9	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
10	SR 12- 19 -0.15	07/ /2002	1116	baggie	1	Ice	Soil	X	X	48 HR
11	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
12	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
13	SR 12- 20 -0.15	07/ /2002	1123	baggie	1	Ice	Soil	X		48 HR
14	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
15	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
16	SR 12- 21 -0.15	07/ /2002	1130	baggie	1	Ice	Soil	X		48 HR
17	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
18	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
19	SR 12- 22 -0.15	07/ /2002	1138	baggie	1	Ice	Soil	X	X	48 HR
20	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
21	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
22	SR 12- 23 -0.15	07/ /2002	1143	baggie	1	Ice	Soil	X		48 HR
23	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
24	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
25	SR 12- 24 -0.15	07/ /2002	1149	baggie	1	Ice	Soil	X		48 HR
26	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
27	SR 12- -0.45	07/02/2002		baggie	1	Ice	Soil	X		48 HR
~~28~~	~~SR 12- -0.15~~	~~07/ /2002~~		~~baggie~~	~~1~~	~~Ice~~	~~Soil~~			~~48 HR~~
~~29~~	~~SR 12- -0.30~~	~~07/ /2002~~		~~baggie~~	~~1~~	~~Ice~~	~~Soil~~			~~48 HR~~
30	SR 12- 25 -0.15	07/02/2002	1154	baggie	1	Ice	Soil	X		48 HR
31	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
32	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
33	SR 12- 26 -0.15	07/ /2002	1200	baggie	1	Ice	Soil	X		48 HR
34	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
35	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
36	SR 12- 27 -0.15	07/ /2002	1208	baggie	1	Ice	Soil	X		48 HR
37	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
38	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
39	SR 12- 28 -0.15	07/ /2002	1320	baggie	1	Ice	Soil	X		48 HR
40	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
41	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
42	SR 12- 29 -0.15	07/ /2002	1325	baggie	1	Ice	Soil	X		48 HR
43	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
44	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
45	SR 12- 30 -0.15	07/ /2002	1335	baggie	1	Ice	Soil	X		48 HR
46	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
47	SR 12- -0.45	07/02/2002		baggie	1	Ice	Soil	X		48 HR

IM 7/02/02
I.M.

Relinquished By: Martha Adams
Print Name: Martha Adams
Date: 7.2.02
Time: 11:17

Received By: [signature]
Print Name: Wil Henry
Date: 7-3-02
Time: 11:17

Received By: [signature]
Print Name: SOL
Date: 07-03-02
Time: 3:30

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Send Results To:
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1326 North Market Boulevard
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Project:
Caltrans SR 12 Napa
Location: SR 12 Napa and Solano County
Project #:837393
Contract: 43A0078

Samplers:
I. Moorhead
D. Hart

	Sample ID:	Date	Time	Container	Total	Preservative Used	Matrix	Analyses: EPA 6010 Lead only	Analyses: 9045A: pH	TAT
1	SR 12- 31 -0.15	07/02/2002	1340	baggie	1	Ice	Soil	X		48 HR
2	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
3	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
4	SR 12- 32 -0.15	07/ /2002	1347	baggie	1	Ice	Soil	X		48 HR
5	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
6	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
7	SR 12- 33 -0.15	07/ /2002	1353	baggie	1	Ice	Soil	X		48 HR
8	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X	X	48 HR
9	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
10	SR 12- 34 -0.15	07/ /2002	1400	baggie	1	Ice	Soil	X		48 HR
11	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
12	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
13	SR 12- 35 -0.15	07/ /2002	1405	baggie	1	Ice	Soil	X		48 HR
14	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
15	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
16	SR 12- 36 -0.15	07/ /2002	1410	baggie	1	Ice	Soil	X		48 HR
17	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
18	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
19	SR 12- 37 -0.15	07/ /2002	1415	baggie	1	Ice	Soil	X	X	48 HR
20	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
21	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
22	SR 12- 38 -0.15	07/ /2002	1420	baggie	1	Ice	Soil	X		48 HR
23	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
24	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
25	SR 12- 39 -0.15	07/ /2002	1425	baggie	1	Ice	Soil	X		48 HR
26	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
27	SR 12- -0.45	07/02/2002	↓	baggie	1	Ice	Soil	X		48 HR
~~28~~	~~SR 12- -0.45~~	~~07/ /2002~~		~~baggie~~	~~1~~	~~Ice~~	~~Soil~~			~~48 HR~~
~~29~~	~~SR 12- -0.30~~	~~07/ /2002~~		~~baggie~~	~~1~~	~~Ice~~	~~Soil~~			~~48 HR~~
30	SR 12- 40 -0.15	07/02/2002	1435	baggie	1	Ice	Soil	X		48 HR
31	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
32	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X	X	48 HR
33	SR 12- 41 -0.15	07/ /2002	1439	baggie	1	Ice	Soil	X		48 HR
34	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
35	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
36	SR 12- 42 -0.15	07/ /2002	1446	baggie	1	Ice	Soil	X		48 HR
37	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
38	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
39	SR 12- 43 -0.15	07/ /2002	1452	baggie	1	Ice	Soil	X		48 HR
40	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X	X	48 HR
41	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
42	SR 12- 44 -0.15	07/ /2002	1457	baggie	1	Ice	Soil	X		48 HR
43	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
44	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
45	SR 12- 45 -0.15	07/ /2002	1504	baggie	1	Ice	Soil	X		48 HR
46	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
47	SR 12- -0.45	07/02/2002	↓	baggie	1	Ice	Soil	X		48 HR

I.M. 7/02/01

Relinquished By: Martha Adam
Print Name: Martha Adam
Date: 7.3.02
Time: 11:17

Received By: [signature]
Print Name: WIL FLEMING
Date: 7-3-02
Time: 11:17

Received By: [signature]
Print Name: SOL
Date: 07-3-02
Time: 3:30

CHAIN OF CUSTODY

14892

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Laboratory:
Sparger Technology
30550 Fite Circle, Suite 112, Sacramento, CA 95827
Phone: 916-362-8947
Fax: 916-362-0947

Send Results To:
Martha Adams
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834

Project:
Caltrans SR 12 Napa
Location: SR 12 Napa and Solano County
Project #:837393
Contract: 43A0078

Samplers:
I. MORHEAD
D. HART

	Sample ID:	Date	Time	Container	Total	Preservative Used	Matrix	Analyses: EPA 6010 Lead only	Analyses: 9045A: pH	TAT
1	SR 12- 46 -0.15	07/02/2002	1511	baggie	1	Ice	Soil	X		48 HR
2	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
3	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
4	SR 12- 47 -0.15	07/ /2002	1518	baggie	1	Ice	Soil	X		48 HR
5	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
6	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
7	SR 12- 48 -0.15	07/ /2002	1524	baggie	1	Ice	Soil	X	X	48 HR
8	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
9	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
10	SR 12- 49 -0.15	07/ /2002	1532	baggie	1	Ice	Soil	X		48 HR
11	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
12	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
13	SR 12- 50 -0.15	07/ /2002	1539	baggie	1	Ice	Soil	X		48 HR
14	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
15	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
16	SR 12- 51 -0.15	07/ /2002	1546	baggie	1	Ice	Soil	X		48 HR
17	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
18	SR 12- -0.45	07/02/2002		baggie	1	Ice	Soil	X		48 HR
19	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
20	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
21	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
22	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
23	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
24	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
25	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
26	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
27	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
28	SR 12- -0.15	07/ /2002	I.M. 07/02/02	baggie	1	Ice	Soil			48 HR
29	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
30	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
31	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
32	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
33	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
34	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
35	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
36	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
37	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
38	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
39	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
40	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
41	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
42	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
43	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
44	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
45	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
46	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
47	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR

NO Samples

NO Samples

Relinquished By: Martha Adams
Print Name: Martha Adams
Date: 7.3.02
Time: 11:17

Received By: [signature]
Print Name: WILL FLEMING
Date: 7-5-02
Time: 1112

Received By: [signature]
Print Name: SOL
Date: 07-03-02
Time: 3:30

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Martha Adams
Shaw Environmental & Infrastructure
1326 N. Market Blvd.
Sacramento, CA 95834

Client	Shaw Environmental & Infrastructure
Workorder	14897 837393 SR12 Napa
Received	07/08/02

The samples were received in EPA specified containers. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

Sparger Technology, Inc. ID Suffix Keys - These descriptors will follow the Sparger Technology, Inc. ID numbers and help identify the specific sample and clarify the report.

DUP - Matrix Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
LCS - Lab Control Sample
LCSD - Lab Control Sample Duplicate
RPD - Relative Percent Difference
QC - Additional Quality Control
DIL - Results from a diluted sample
ND - None Detected
RL - Reporting Limit

Note: In an effort to conserve paper, the results are printed on both sides of the paper.

Ray James
Laboratory Director

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 SR12 Napa
Workorder #	14897	**Sampled**	07/03/02
Laboratory ID	14897001	**Received**	07/05/02
Sample ID	SR 12-HA1-0.15	**Reported**	07/09/02
Matrix	Soil		

GC PCBs - 8082

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilutio
PCB 1016[1]	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1221	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1232	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1242	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1248	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1254	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1260	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Decachlorobiphenyl (DCB)	0.015 mg/Kg	90 %	(45 - 145)
Tetrachlorometaxylene (TCMX)	0.012 mg/Kg	72 %	(45 - 145)

1 - TECHNICAL CHLORDANE PRESENT IN SAMPLES 1 THROUGH 6

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 SR12 Napa
Workorder #	14897	**Sampled**	07/03/02
Laboratory ID	14897002	**Received**	07/05/02
Sample ID	SR 12-HA1-0.30	**Reported**	07/09/02
Matrix	Soil		

GC PCBs - 8082

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
PCB 1016	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1221	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1232	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1242	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1248	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1254	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1260	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Decachlorobiphenyl (DCB)	0.013 mg/Kg	78 %	(45 - 145)
Tetrachlorometaxylene (TCMX)	0.012 mg/Kg	72 %	(45 - 145)

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Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 SR12 Napa
Workorder #	14897	**Sampled**	07/03/02
Laboratory ID	14897003	**Received**	07/05/02
Sample ID	SR 12-HA1-0.45	**Reported**	07/09/02
Matrix	Soil		

GC PCBs - 8082

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilutio
PCB 1016	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1221	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1232	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1242	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1248	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1254	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1260	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Decachlorobiphenyl (DCB)	0.014 mg/Kg	84 %	(45 - 145)
Tetrachlorometaxylene (TCMX)	0.012 mg/Kg	72 %	(45 - 145)

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 SR12 Napa
Workorder #	14897	**Sampled**	07/03/02
Laboratory ID	14897004	**Received**	07/05/02
Sample ID	SR 12-HA2-0.15	**Reported**	07/09/02
Matrix	Soil		

GC PCBs - 8082

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
PCB 1016	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1221	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1232	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1242	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1248	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1254	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1260	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Decachlorobiphenyl (DCB)	0.013 mg/Kg	78 %	(45 - 145)
Tetrachlorometaxylene (TCMX)	0.012 mg/Kg	72 %	(45 - 145)

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Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 SR12 Napa
Workorder #	14897	**Sampled**	07/03/02
Laboratory ID	14897005	**Received**	07/05/02
Sample ID	SR 12-HA2-0.30	**Reported**	07/09/02
Matrix	Soil		

GC PCBs - 8082

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilutio
PCB 1016	07/08/02	07/08/02	ND	0.03	mg/Kg	1:
PCB 1221	07/08/02	07/08/02	ND	0.03	mg/Kg	1:
PCB 1232	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1242	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1248	07/08/02	07/08/02	ND	0.03	mg/Kg	1:
PCB 1254	07/08/02	07/08/02	ND	0.03	mg/Kg	1:
PCB 1260	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Decachlorobiphenyl (DCB)	0.015 mg/Kg	90 %	(45 - 145)
Tetrachlorometaxylene (TCMX)	0.012 mg/Kg	72 %	(45 - 145)

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Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 SR12 Napa
Workorder #	14897	**Sampled**	07/03/02
Laboratory ID	14897004	**Received**	07/05/02
Sample ID	SR 12-HA2-0.15	**Reported**	07/09/02
Matrix	Soil		

GC PCBs - 8082

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
PCB 1016	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1221	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1232	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1242	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1248	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1254	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1260	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Decachlorobiphenyl (DCB)	0.013 mg/Kg	78 %	(45 - 145)
Tetrachlorometaxylene (TCMX)	0.012 mg/Kg	72 %	(45 - 145)

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Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 SR12 Napa
Workorder #	14897	**Sampled**	07/03/02
Laboratory ID	14897005	**Received**	07/05/02
Sample ID	SR 12-HA2-0.30	**Reported**	07/09/02
Matrix	Soil		

GC PCBs - 8082

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilutio
PCB 1016	07/08/02	07/08/02	ND	0.03	mg/Kg	1:
PCB 1221	07/08/02	07/08/02	ND	0.03	mg/Kg	1:
PCB 1232	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1242	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1248	07/08/02	07/08/02	ND	0.03	mg/Kg	1:
PCB 1254	07/08/02	07/08/02	ND	0.03	mg/Kg	1:
PCB 1260	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Decachlorobiphenyl (DCB)	0.015 mg/Kg	90 %	(45 - 145)
Tetrachlorometaxylene (TCMX)	0.012 mg/Kg	72 %	(45 - 145)

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Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 SR12 Napa
Workorder #	14897	**Sampled**	07/03/02
Laboratory ID	14897006	**Received**	07/05/02
Sample ID	SR 12-HA2-0.45	**Reported**	07/09/02
Matrix	Soil		

GC PCBs - 8082

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
PCB 1016	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1221	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1232	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1242	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1248	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1254	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1260	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Decachlorobiphenyl (DCB)	0.015 mg/Kg	90 %	(45 - 145)
Tetrachlorometaxylene (TCMX)	0.012 mg/Kg	72 %	(45 - 145)

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Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 SR12 Napa
Workorder #	14897	**Sampled**	07/03/02
Laboratory ID	14897007	**Received**	07/05/02
Sample ID	SR 12-HA3-0.15	**Reported**	07/09/02
Matrix	Soil		

GC PCBs - 8082

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilutio
PCB 1016	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1221	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1232	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1242	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1248	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1254	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1260	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Decachlorobiphenyl (DCB)	0.013 mg/Kg	78 %	(45 - 145)
Tetrachlorometaxylene (TCMX)	0.011 mg/Kg	66 %	(45 - 145)

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Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 SR12 Napa
Workorder #	14897	**Sampled**	07/03/02
Laboratory ID	14897008	**Received**	07/05/02
Sample ID	SR 12-HA3-0.30	**Reported**	07/09/02
Matrix	Soil		

GC PCBs - 8082

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilution
PCB 1016	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1221	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1232	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1242	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1248	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1254	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1260	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Decachlorobiphenyl (DCB)	0.013 mg/Kg	78 %	(45 - 145)
Tetrachlorometaxylene (TCMX)	0.011 mg/Kg	66 %	(45 - 145)

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Test Certificate of Analysis

Client ID	Shaw Environmental & Infrastructure	**Workorder ID**	837393 SR12 Napa
Workorder #	14897	**Sampled**	07/03/02
Laboratory ID	14897009	**Received**	07/05/02
Sample ID	SR 12-HA3-0.45	**Reported**	07/09/02
Matrix	Soil		

GC PCBs - 8082

Parameter	Prep Date	Analyzed	Result	RL	Units	Dilutic
PCB 1016	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1221	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1232	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1242	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1248	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1254	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1
PCB 1260	07/08/02	07/08/02	ND	0.03	mg/Kg	1:1

Surrogates	Result	Recovery	Limits
Decachlorobiphenyl (DCB)	0.012 mg/Kg	72 %	(45 - 145)
Tetrachlorometaxylene (TCMX)	0.012 mg/Kg	72 %	(45 - 145)

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Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14897 **Workorder ID** 837393 SR12 Napa

Parameter Lead
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14897010	SR 12-52-0.15	50.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897011	SR 12-52-0.30	34.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897012	SR 12-52-0.45	65.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897013	SR 12-53-0.15	41.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897014	SR 12-53-0.30	39.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897015	SR 12-53-0.45	33.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897016	SR 12-54-0.15	50.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897017	SR 12-54-0.30	27.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897018	SR 12-54-0.45	17.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897019	SR 12-55-0.15	110	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897020	SR 12-55-0.30	80.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897021	SR 12-55-0.45	99.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897022	SR 12-56-0.15	22.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897023	SR 12-56-0.30	30.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897024	SR 12-56-0.45	46.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897025	SR 12-57-0.15	17.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897026	SR 12-57-0.30	17.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897027	SR 12-57-0.45	13.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897028	SR 12-58-0.15	8.00	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897029	SR 12-58-0.30	11.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897030	SR 12-58-0.45	10.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897031	SR 12-59-0.15	7.00	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897032	SR 12-59-0.30	6.00	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897033	SR 12-59-0.45	12.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897034	SR 12-60-0.15	17.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897035	SR 12-60-0.30	15.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897036	SR 12-60-0.45	9.00	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897037	SR 12-61-0.15	34.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897038	SR 12-61-0.30	27.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897039	SR 12-61-0.45	31.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897040	SR 12-62-0.15	38.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897041	SR 12-62-0.30	47.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897042	SR 12-62-0.45	51.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897043	SR 12-63-0.15	37.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14897 **Workorder ID** 837393 SR12 Napa

Parameter Lead (continued)
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14897044	SR 12-63-0.30	48.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897045	SR 12-63-0.45	53.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897046	SR 12-64-0.15	83.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897047	SR 12-64-0.30	81.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897048	SR 12-64-0.45	70.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897049	SR 12-65-0.15	59.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897050	SR 12-65-0.30	39.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897051	SR 12-65-0.45	15.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897052	SR 12-66-0.15	34.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897053	SR 12-66-0.30	51.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897054	SR 12-66-0.45	64.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897055	SR 12-67-0.15	85.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897056	SR 12-67-0.30	96.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897057	SR 12-67-0.45	92.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897058	SR 12-68-0.15	61.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897059	SR 12-68-0.30	105	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897060	SR 12-68-0.45	120	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897061	SR 12-69-0.15	14.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897062	SR 12-69-0.30	16.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14897063	SR 12-69-0.45	13.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14897 **Workorder ID** 837393 SR12 Napa

Parameter pH
Method 9045 PH

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14897014	SR 12-53-0.30	6.6	0.10	units	07/03/02	07/08/02	Soil	1:1
14897024	SR 12-56-0.45	7.0	0.10	units	07/03/02	07/08/02	Soil	1:1
14897033	SR 12-59-0.45	7.0	0.10	units	07/03/02	07/08/02	Soil	1:1
14897043	SR 12-63-0.15	6.8	0.10	units	07/03/02	07/08/02	Soil	1:1
14897054	SR 12-66-0.45	7.0	0.10	units	07/03/02	07/08/02	Soil	1:1
14897062	SR 12-69-0.30	7.1	0.10	units	07/03/02	07/08/02	Soil	1:1

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CHAIN OF CUSTODY

14898

Company:
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834
Phone: (916) 928-3300 Fax: (916) 928-3341

Laboratory:
Sparger Technology
3050 Fite Circle, Suite 112, Sacramento, CA 95827
Phone: 916-362-8947
Fax: 916-362-0947

Send Results To:
Martha Adams
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834

Project:
Caltrans SR 12 Napa
Location: SR 12 Napa and Solano County
Project #:837393
Contract: 43A0078

Samplers:
I. Moorhead, D.Hart

	Sample ID:	Date	Time	Container	Total	Preservative Used	Matrix	ANALYSES: EPA 6010, Lead Only	ANALYSES: 9045A: pH	TAT
1	SR 12- 65 -0.15	07/ 03 /2002	1358	baggie	1	Ice	Soil	X		48 HR
2	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
3	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
4	SR 12- 66 -0.15	07/ /2002	1403	baggie	1	Ice	Soil	X		48 HR
5	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
6	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
7	SR 12- 67 -0.15	07/ /2002	1409	baggie	1	Ice	Soil	X		48 HR
8	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
9	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
10	SR 12- 68 -0.15	07/ /2002	1415	baggie	1	Ice	Soil	X		48 HR
11	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
12	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
13	SR 12- 69 -0.15	07/ /2002	1422	baggie	1	Ice	Soil	X		48 HR
14	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
15	SR 12- -0.45	07/ 03 /2002		baggie	1	Ice	Soil	X		48 HR
16	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
17	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
18	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
19	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
20	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
21	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
22	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
23	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
24	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
25	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
26	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
27	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
28	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
29	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
30	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
31	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
32	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
33	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
34	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
35	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
36	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
37	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
38	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
39	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
40	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
41	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
42	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
43	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
44	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
45	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
46	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
47	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
48	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR

Relinquished By: Martha Adams
Print Name: Martha Adams
Date: 7.5.02
Time: 10:39

Received By: [signature]
Print Name: Will Fleming
Date: 7/5/02
Time: 10:40

Received By:
Print Name:
Date:
Time:

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Martha Adams
Shaw Environmental & Infrastructure
1326 N. Market Blvd.
Sacramento, CA 95834

Client	Shaw Environmental & Infrastructure
Workorder	14898 837393 SR12 Napa
Received	07/08/02

The samples were received in EPA specified containers. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

Sparger Technology, Inc. ID Suffix Keys - These descriptors will follow the Sparger Technology, Inc. ID numbers and help identify the specific sample and clarify the report.

DUP - Matrix Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
LCS - Lab Control Sample
LCSD - Lab Control Sample Duplicate
RPD - Relative Percent Difference
QC - Additional Quality Control
DIL - Results from a diluted sample
ND - None Detected
RL - Reporting Limit

Note: In an effort to conserve paper, the results are printed on both sides of the paper.

Ray James
Laboratory Director

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14898 **Workorder ID** 837393 SR12 Napa

Parameter pH
Method 9045 PH

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14898001	SR12-RT-1-0.15	6.5	0.10	units	07/03/02	07/09/02	Soil	1:1
14898005	SR12-RT-2-0.30	7.0	0.10	units	07/03/02	07/09/02	Soil	1:1
14898009	SR12-RT-3-0.45	7.1	0.10	units	07/03/02	07/09/02	Soil	1:1
14898028	SR12-RT-10-0.15	6.8	0.10	units	07/03/02	07/09/02	Soil	1:1
14898035	SR12-RT-12-0.30	8.0	0.10	units	07/03/02	07/09/02	Soil	1:1
14898045	SR12-RT-15-0.45	7.0	0.10	units	07/03/02	07/09/02	Soil	1:1
14898054	SR12-RT-18-0.45	7.1	0.10	units	07/03/02	07/09/02	Soil	1:1

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Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14898 **Workorder ID** 837393 SR12 Napa

Parameter Lead
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14898001	SR12-RT-1-0.15	60.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898002	SR12-RT-1-0.30	51.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898003	SR12-RT-1-0.45	189	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898004	SR12-RT-2-0.15	131	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898005	SR12-RT-2-0.30	288	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898006	SR12-RT-2-0.45	339	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898007	SR12-RT-3-0.15	95.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898008	SR12-RT-3-0.30	77.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898009	SR12-RT-3-0.45	62.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898010	SR12-RT-4-0.15	39.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898011	SR12-RT-4-0.30	183	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898012	SR12-RT-4-0.45	18.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898013	SR12-RT-5-0.15	36.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898014	SR12-RT-5-0.30	29.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898015	SR12-RT-5-0.45	31.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898016	SR12-RT-6-0.15	412	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898017	SR12-RT-6-0.30	93.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898018	SR12-RT-6-0.45	48.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898019	SR12-RT-7-0.15	431	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898020	SR12-RT-7-0.30	192	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898021	SR12-RT-7-0.45	417	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898022	SR12-RT-8-0.15	190	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898023	SR12-RT-8-0.30	218	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898024	SR12-RT-8-0.45	218	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898025	SR12-RT-9-0.15	196	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898026	SR12-RT-9-0.30	315	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898027	SR12-RT-9-0.45	269	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898028	SR12-RT-10-0.15	92.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898029	SR12-RT-10-0.30	180	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898030	SR12-RT-10-0.45	77.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898031	SR12-RT-11-0.15	48.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898032	SR12-RT-11-0.30	109	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898033	SR12-RT-11-0.45	85.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898034	SR12-RT-12-0.15	65.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1

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Sparger Technology, Inc.
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Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14898 **Workorder ID** 837393 SR12 Napa

Parameter Lead (continued)
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14898035	SR12-RT-12-0.30	195	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898036	SR12-RT-12-0.45	153	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898037	SR12-RT-13-0.15	228	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898038	SR12-RT-13-0.30	63.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898039	SR12-RT-13-0.45	6.00	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898040	SR12-RT-14-0.15	83.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898041	SR12-RT-14-0.30	293	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898042	SR12-RT-14-0.45	76.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898043	SR12-RT-15-0.15	112	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898044	SR12-RT-15-0.30	232	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898045	SR12-RT-15-0.45	170	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898046	SR12-RT-16-0.15	48.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898047	SR12-RT-16-0.30	135	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898048	SR12-RT-16-0.45	103	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898049	SR12-RT-17-0.15	23.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898050	SR12-RT-17-0.30	22.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898051	SR12-RT-17-0.45	31.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898052	SR12-RT-18-0.15	26.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898053	SR12-RT-18-0.30	22.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898054	SR12-RT-18-0.45	64.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898055	SR12-RT-19-0.15	39.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898056	SR12-RT-19-0.30	87.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898057	SR12-RT-19-0.45	86.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898058	SR12-RT-20-0.15	73.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898059	SR12-RT-20-0.30	103	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898060	SR12-RT-20-0.45	112	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898061	SR12-RT-21-0.15	63.0	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898062	SR12-RT-21-0.30	258	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898063	SR12-RT-21-0.45	451	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898064	SR12-RT-22-0.15	188	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898065	SR12-RT-22-0.30	244	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1
14898066	SR12-RT-22-0.45	148	1.0	mg/Kg	07/03/02	07/08/02	Soil	1:1

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CHAIN OF CUSTODY

15' Hoov

Company:
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834
Phone: (916) 928-3300 Fax: (916) 928-3341

Laboratory:
Sparger Technology
3050 Fite Circle, Suite 112, Sacramento, CA 95827
Phone: 916-362-8947
Fax: 916-362-0947

Send Results To:
Martha Adams
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834

Project:
Caltrans SR 12 Napa
Location: SR 12 Napa and Solano County
Project #:837393
Contract: 43A0078

Samplers:
I. Moorhead, D.Hart

	Sample ID:	Date	Time	Container	Total	Preservative Used	Matrix	ANALYSES: EPA 6010, Lead Only	ANALYSES: 9045A: pH	TAT
1	SR12-RT- 1 -0.15	07/03/2002	1028	baggie	1	Ice	Soil	X	X	48HR
2	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
3	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
4	SR12-RT- 2 -0.15	07/ /2002	1033	baggie	1	Ice	Soil	X		
5	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X	X	
6	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
7	SR12-RT- 3 -0.15	07/ /2002	1039	baggie	1	Ice	Soil	X		
8	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
9	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X	X	
10	SR12-RT- 4 -0.15	07/ /2002	1046	baggie	1	Ice	Soil	X		
11	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
12	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
13	SR12-RT- 5 -0.15	07/ /2002	1053	baggie	1	Ice	Soil	X		
14	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
15	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
16	SR12-RT- 6 -0.15	07/ /2002	1100	baggie	1	Ice	Soil	X		
17	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
18	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
19	SR12-RT- 7 -0.15	07/ /2002	1110	baggie	1	Ice	Soil	X		
20	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
21	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
22	SR12-RT- 8 -0.15	07/ /2002	1125	baggie	1	Ice	Soil	X		
23	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
24	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
25	SR12-RT- 9 -0.15	07/ /2002	1133	baggie	1	Ice	Soil	X		
26	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
27	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
28	SR12-RT- 10 -0.15	07/ /2002	1136	baggie	1	Ice	Soil	X	X	
29	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
30	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
31	SR12-RT- 11 -0.15	07/ /2002	1142	baggie	1	Ice	Soil	X		
32	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
33	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
34	SR12-RT- 12 -0.15	07/ /2002	1154	baggie	1	Ice	Soil	X		
35	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X	X	
36	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
37	SR12-RT- 13 -0.15	07/ /2002	1158	baggie	1	Ice	Soil	X		
38	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
39	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
40	SR12-RT- 14 -0.15	07/ /2002	1206	baggie	1	Ice	Soil	X		
41	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
42	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
43	SR12-RT- 15 -0.15	07/ /2002	1210	baggie	1	Ice	Soil	X		
44	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
45	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X	X	
46	SR12-RT- 16 -0.15	07/ /2002	1216	baggie	1	Ice	Soil	X		
47	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
48	SR12-RT- -0.45	07/03/2002		baggie	1	Ice	Soil	X		48HR

48 Hour Rush!

Reliquished By: Martha Adams
Print Name: Martha Adams
Date: 7.5.02
Time: 10:41

Received By: [signature]
Print Name: Will Flemmy
Date: 7/5/02
Time: 10:42

Received By:
Print Name:
Date:
Time:

CHAIN OF CUSTODY

14898

Company:
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834
Phone: (916) 928-3300 Fax: (916) 928-3341

Laboratory:
Sparger Technology
3050 Fite Circle, Suite 112, Sacramento, CA 95827
Phone: 916-362-8947
Fax: 916-362-0947

Send Results To:
Martha Adams
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834

Project:
Caltrans SR 12 Napa
Location: SR 12 Napa and Solano County
Project #:837393
Contract: 43A0078

Samplers:
I. Moorhead, D.Hart

	Sample ID:	Date	Time	Container	Total	Preservative Used	Matrix	ANALYSES: EPA 6010, Lead Only	ANALYSES: 9045A: pH	TAT
1	SR12-RT- 17 -0.15	07/ 03 /2002	1220	baggie	1	Ice	Soil	X		48 HR
2	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
3	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
4	SR12-RT- 18 -0.15	07/ /2002	1229	baggie	1	Ice	Soil	X		
5	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
6	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X	X	
7	SR12-RT- 19 -0.15	07/ /2002	1236	baggie	1	Ice	Soil	X		
8	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
9	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
10	SR12-RT- 20 -0.15	07/ /2002	1242	baggie	1	Ice	Soil	X		
11	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
12	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
13	SR12-RT- 21 -0.15	07/ /2002	1249	baggie	1	Ice	Soil	X		
14	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
15	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil	X		
16	SR12-RT- 22 -0.15	07/ /2002	1300	baggie	1	Ice	Soil	X		
17	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil	X		
18	SR12-RT- -0.45	07/ 03 /2002		baggie	1	Ice	Soil	X		48 HR
19	SR12-RT- -0.15	07/ /2002		baggie	1	Ice	Soil			
20	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil			
21	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil			
22	SR12-RT- -0.15	07/ /2002		baggie	1	Ice	Soil			
23	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil			
24	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil			
25	SR12-RT- -0.15	07/ /2002		baggie	1	Ice	Soil			
26	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil			
27	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil			
28	SR12-RT- -0.15	07/ /2002		baggie	1	Ice	Soil			
29	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil			
30	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil			
31	SR12-RT- -0.15	07/ /2002		baggie	1	Ice	Soil			
32	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil			
33	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil			
34	SR12-RT- -0.15	07/ /2002		baggie	1	Ice	Soil			
35	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil			
36	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil			
37	SR12-RT- -0.15	07/ /2002		baggie	1	Ice	Soil			
38	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil			
39	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil			
40	SR12-RT- -0.15	07/ /2002		baggie	1	Ice	Soil			
41	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil			
42	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil			
43	SR12-RT- -0.15	07/ /2002		baggie	1	Ice	Soil			
44	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil			
45	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil			
46	SR12-RT- -0.15	07/ /2002		baggie	1	Ice	Soil			
47	SR12-RT- -0.30	07/ /2002		baggie	1	Ice	Soil			
48	SR12-RT- -0.45	07/ /2002		baggie	1	Ice	Soil			

48 HOUR Rush!

Relinquished By: Martha Adams
Print Name: Martha Adams
Date: 7.5.02
Time: 10:41

Received By: [signature]
Print Name: Will Fleming
Date: 7/5/02
Time: 1042

Received By:
Print Name:
Date:
Time:

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Martha Adams
Shaw Environmental & Infrastructure
1326 N. Market Blvd.
Sacramento, CA 95834

Client	Shaw Environmental & Infrastructure
Workorder	14908 SR 12 NAPA
Received	07/09/02

The samples were received in EPA specified containers. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

Sparger Technology, Inc. ID Suffix Keys - These descriptors will follow the Sparger Technology, Inc. ID numbers and help identify the specific sample and clarify the report.

DUP - Matrix Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
LCS - Lab Control Sample
LCSD - Lab Control Sample Duplicate
RPD - Relative Percent Difference
QC - Additional Quality Control
DIL - Results from a diluted sample
ND - None Detected
RL - Reporting Limit

Note: In an effort to conserve paper, the results are printed on both sides of the paper.

Ray James
Laboratory Director

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14908 **Workorder ID** SR 12 NAPA

Parameter Lead
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14908001	SR 12-70-0.15	45.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908002	SR 12-70-0.30	33.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908003	SR 12-70-0.45	25.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908004	SR 12-71-0.15	57.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908005	SR 12-71-0.30	65.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908006	SR 12-71-0.45	27.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908007	SR 12-72-0.15	45.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908008	SR 12-72-0.30	67.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908009	SR 12-72-0.45	108	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908010	SR 12-73-0.15	17.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908011	SR 12-73-0.30	22.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908012	SR 12-73-0.45	21.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908013	SR 12-74-0.15	99.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908014	SR 12-74-0.30	64.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908015	SR 12-74-0.45	130	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908016	SR 12-75-0.15	31.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908017	SR 12-75-0.30	25.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908018	SR 12-75-0.45	33.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908019	SR 12-76-0.15	54.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908020	SR 12-76-0.30	57.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908021	SR 12-76-0.45	72.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908022	SR 12-77-0.15	129	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908023	SR 12-77-0.30	72.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908024	SR 12-77-0.45	117	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908025	SR 12-78-0.15	94.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908026	SR 12-78-0.30	300	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908027	SR 12-78-0.45	121	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908028	SR 12-79-0.15	145	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908029	SR 12-79-0.30	129	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908030	SR 12-79-0.45	138	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908031	SR 12-80-0.15	115	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908032	SR 12-80-0.30	166	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908033	SR 12-80-0.45	104	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908034	SR 12-81-0.15	73.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
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Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14908 **Workorder ID** SR 12 NAPA

Parameter Lead (continued)
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14908035	SR 12-81-0.30	68.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908036	SR 12-81-0.45	115	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908037	SR 12-82-0.15	76.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908038	SR 12-82-0.30	87.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908039	SR 12-82-0.45	82.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908040	SR 12-83-0.15	109	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908041	SR 12-83-0.30	152	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908042	SR 12-83-0.45	129	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908043	SR 12-84-0.15	186	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908044	SR 12-84-0.30	91.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908045	SR 12-84-0.45	162	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908046	SR 12-85-0.15	107	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908047	SR 12-85-0.30	56.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908048	SR 12-85-0.45	45.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908049	SR 12-86-0.15	14.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908050	SR 12-86-0.30	14.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908051	SR 12-86-0.45	12.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908052	SR 12-87-0.15	7.00	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908053	SR 12-87-0.30	8.00	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908054	SR 12-87-0.45	10.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908055	SR 12-88-0.15	17.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908056	SR 12-88-0.30	13.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908057	SR 12-88-0.45	14.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908058	SR 12-89-0.15	16.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908059	SR 12-89-0.30	17.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908060	SR 12-89-0.45	20.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908061	SR 12-90-0.15	15.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908062	SR 12-90-0.30	10.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908063	SR 12-90-0.45	8.00	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908064	SR 12-91-0.15	8.00	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908065	SR 12-91-0.30	7.00	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908066	SR 12-91-0.45	8.00	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908067	SR 12-92-0.15	18.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908068	SR 12-92-0.30	16.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14908 **Workorder ID** SR 12 NAPA

Parameter Lead (continued)
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14908069	SR 12-92-0.45	10.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908070	SR 12-93-0.15	30.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908071	SR 12-93-0.30	21.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908072	SR 12-93-0.45	16.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908073	SR 12-94-0.15	15.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908074	SR 12-94-0.30	21.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908075	SR 12-94-0.45	7.00	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908076	SR 12-95-0.15	25.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908077	SR 12-95-0.30	27.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908078	SR 12-95-0.45	18.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908079	SR 12-96-0.15	38.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908080	SR 12-96-0.30	7.00	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908081	SR 12-96-0.45	7.00	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908082	SR 12-97-0.15	18.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908083	SR 12-97-0.30	25.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908084	SR 12-97-0.45	9.00	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908085	SR 12-98-0.15	31.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908086	SR 12-98-0.30	6.00	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908087	SR 12-98-0.45	7.00	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908088	SR 12-99-0.15	ND	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908089	SR 12-99-0.30	51.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908090	SR 12-99-0.45	7.00	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908091	SR 12-100-0.15	18.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908092	SR 12-100-0.30	13.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908093	SR 12-100-0.45	9.00	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908094	SR 12-101-0.15	37.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908095	SR 12-101-0.30	28.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908096	SR 12-101-0.45	34.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908097	SR 12-102-0.15	34.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908098	SR 12-102-0.30	41.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908099	SR 12-102-0.45	31.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908100	SR 12-103-0.15	20.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908101	SR 12-103-0.30	16.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908102	SR 12-103-0.45	17.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14908 **Workorder ID** SR 12 NAPA

Parameter Lead (continued)
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14908103	SR 12-104-0.15	19.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908104	SR 12-104-0.30	9.00	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908105	SR 12-104-0.45	28.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908106	SR 12-105-0.15	30.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908107	SR 12-105-0.30	22.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908108	SR 12-105-0.45	17.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908109	SR 12-106-0.15	18.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908110	SR 12-106-0.30	13.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908111	SR 12-106-0.45	14.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908112	SR 12-107-0.15	23.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908113	SR 12-107-0.30	23.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908114	SR 12-107-0.45	29.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908115	SR 12-108-0.15	67.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908116	SR 12-108-0.30	87.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908117	SR 12-108-0.45	61.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908118	SR 12-109-0.15	26.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908119	SR 12-109-0.30	19.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908120	SR 12-109-0.45	24.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908121	SR 12-110-0.15	52.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908122	SR 12-110-0.30	71.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908123	SR 12-110-0.45	64.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908124	SR 12-111-0.15	110	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908125	SR 12-111-0.30	72.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908126	SR 12-111-0.45	117	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908127	SR 12-112-0.15	79.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908128	SR 12-112-0.30	45.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908129	SR 12-112-0.45	56.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908130	SR 12-113-0.15	87.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908131	SR 12-113-0.30	88.0	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908132	SR 12-113-0.45	125	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908133	SR 12-114-0.15	150	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908134	SR 12-114-0.30	140	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1
14908135	SR 12-114-0.45	135	1.0	mg/Kg	07/05/02	07/09/02	Soil	1:1

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14908 **Workorder ID** SR 12 NAPA

Parameter pH
Method 9045 PH

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14908003	SR 12-70-0.45	6.4	0.10	units	07/05/02	07/09/02	Soil	1:1
14908011	SR 12-73-0.30	6.4	0.10	units	07/05/02	07/09/02	Soil	1:1
14908021	SR 12-76-0.45	6.3	0.10	units	07/05/02	07/09/02	Soil	1:1
14908030	SR 12-79-0.45	6.3	0.10	units	07/05/02	07/09/02	Soil	1:1
14908039	SR 12-82-0.45	6.5	0.10	units	07/05/02	07/09/02	Soil	1:1
14908051	SR 12-86-0.45	6.5	0.10	units	07/05/02	07/09/02	Soil	1:1
14908056	SR 12-88-0.30	6.1	0.10	units	07/05/02	07/09/02	Soil	1:1
14908070	SR 12-93-0.15	6.1	0.10	units	07/05/02	07/09/02	Soil	1:1
14908078	SR 12-95-0.45	6.1	0.10	units	07/05/02	07/09/02	Soil	1:1
14908089	SR 12-99-0.30	6.4	0.10	units	07/05/02	07/09/02	Soil	1:1
14908098	SR 12-102-0.30	6.4	0.10	units	07/05/02	07/09/02	Soil	1:1
14908107	SR 12-105-0.30	6.6	0.10	units	07/05/02	07/09/02	Soil	1:1
14908118	SR 12-109-0.15	6.5	0.10	units	07/05/02	07/09/02	Soil	1:1
14908133	SR 12-114-0.15	6.4	0.10	units	07/05/02	07/09/02	Soil	1:1

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B Floor

CHAIN OF CUSTODY

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Phone: 916-362-8947
Fax: 916-362-0947

Send Results To:
Martha Adams
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834

Project:
Caltrans SR 12 Napa
Location: SR 12 Napa and Solano County
Project #:837393
Contract: 43A0078

Samplers:
I. Moorhead, D.Hart

	Sample ID:	Date	Time	Container	Total	Preservative Used	Matrix	ANALYSES: EPA 6010, Lead Only	ANALYSES: 9045A: pH	TAT
1	SR 12-70 -0.15	07/05/2002	0900	baggie	1	Ice	Soil	X		48 HR
2	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
3	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
4	SR 12-71 -0.15	07/05/2002	0908	baggie	1	Ice	Soil	X		48 HR
5	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
6	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
7	SR 12-72 -0.15	07/ /2002	0912	baggie	1	Ice	Soil	X		48 HR
8	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
9	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
10	SR 12-73 -0.15	07/ /2002	0917	baggie	1	Ice	Soil	X		48 HR
11	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
12	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
13	SR 12-74 -0.15	07/ /2002	0922	baggie	1	Ice	Soil	X		48 HR
14	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
15	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
16	SR 12-75 -0.15	07/ /2002	0928	baggie	1	Ice	Soil	X		48 HR
17	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
18	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
19	SR 12-76 -0.15	07/ /2002	0932	baggie	1	Ice	Soil	X		48 HR
20	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
21	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
22	SR 12-77 -0.15	07/ /2002	0940	baggie	1	Ice	Soil	X		48 HR
23	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
24	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
25	SR 12-78 -0.15	07/ /2002	0944	baggie	1	Ice	Soil	X		48 HR
26	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
27	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
28	SR 12-79 -0.15	07/ /2002	0951	baggie	1	Ice	Soil	X		48 HR
29	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
30	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
31	SR 12-80 -0.15	07/ /2002	0959	baggie	1	Ice	Soil	X		48 HR
32	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
33	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
34	SR 12-81 -0.15	07/ /2002	1006	baggie	1	Ice	Soil	X		48 HR
35	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
36	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
37	SR 12-82 -0.15	07/ /2002	1012	baggie	1	Ice	Soil	X		48 HR
38	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
39	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
40	SR 12-83 -0.15	07/ /2002	1018	baggie	1	Ice	Soil	X		48 HR
41	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
42	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
43	SR 12-84 -0.15	07/ /2002	1025	baggie	1	Ice	Soil	X		48 HR
44	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
45	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
46	SR 12-85 -0.15	07/ /2002	1031	baggie	1	Ice	Soil	X		48 HR
47	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
48	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR

48 HOUR Rush!

Relinquished By: Martha Adam
Print Name: Martha Adam
Date: 7-8-02
Time: 11:20

Received By: [illegible]
Print Name: Will Fleming
Date: 7/8/02
Time: 1121

Received By: [illegible]
Print Name: [illegible]
Date: 7-8-02
Time: 1:30

CHAIN OF CUSTODY

14908

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Project:
Caltrans SR 12 Napa
Location: SR 12 Napa and Solano County
Project #:837393
Contract: 43A0078

Samplers:
I. Moorhead, D.Hart

	Sample ID:	Date	Time	Container	Total	Preservative Used	Matrix	ANALYSES: EPA 6010, Lead Only	ANALYSES: 9045A: pH	TAT
1	SR 12- 86 -0.15	07/ 05 /2002	1036	baggie	1	Ice	Soil	X		48 HR
2	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
3	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
4	SR 12- 87 -0.15	07/ /2002	1043	baggie	1	Ice	Soil	X		48 HR
5	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
6	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
7	SR 12- 88 -0.15	07/ /2002	1052	baggie	1	Ice	Soil	X		48 HR
8	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
9	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
10	SR 12- 89 -0.15	07/ /2002	1059	baggie	1	Ice	Soil	X		48 HR
11	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
12	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
13	SR 12- 90 -0.15	07/ /2002	1103	baggie	1	Ice	Soil	X		48 HR
14	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
15	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
16	SR 12- 91 -0.15	07/ /2002	1107	baggie	1	Ice	Soil	X		48 HR
17	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
18	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
19	SR 12- 92 -0.15	07/ /2002	1112	baggie	1	Ice	Soil	X		48 HR
20	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
21	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
22	SR 12- 93 -0.15	07/ /2002	1117	baggie	1	Ice	Soil	X	X	48 HR
23	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
24	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
25	SR 12- 94 -0.15	07/ /2002	1121	baggie	1	Ice	Soil	X		48 HR
26	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
27	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
28	SR 12- 95 -0.15	07/ /2002	1126	baggie	1	Ice	Soil	X		48 HR
29	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
30	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
31	SR 12- 96 -0.15	07/ /2002	1133	baggie	1	Ice	Soil	X		48 HR
32	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
33	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
34	SR 12- 97 -0.15	07/ /2002	1140	baggie	1	Ice	Soil	X		48 HR
35	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
36	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
37	SR 12- 98 -0.15	07/ /2002	1149	baggie	1	Ice	Soil	X		48 HR
38	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
39	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
40	SR 12- 99 -0.15	07/ /2002	1157	baggie	1	Ice	Soil	X		48 HR
41	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
42	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
43	SR 12- 100 -0.15	07/ /2002	1204	baggie	1	Ice	Soil	X		48 HR
44	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
45	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
46	SR 12- 101 -0.15	07/ /2002	1209	baggie	1	Ice	Soil	X		48 HR
47	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
48	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR

48 Hour Rush!

Relinquished By: Martha Adams
Print Name: Martha Adams
Date: 7.8.02
Time: 11:20

Received By: [illegible]
Print Name: Will Fleury
Date: 7-8-02
Time: 11:21

Received By: [illegible]
Print Name: [illegible]
Date: 07-08-02
Time: 1:30

CHAIN OF CUSTODY

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Project:
Caltrans SR 12 Napa
Location: SR 12 Napa and Solano County
Project #:837393
Contract: 43A0078

Samplers:
I. Moorhead, D.Hart

	Sample ID:	Date	Time	Container	Total	Preservative Used	Matrix	ANALYSES: EPA 6010, Lead Only	ANALYSES: 9045A: pH	TAT
1	SR 12- 102 -0.15	07/ 05 /2002	1216	baggie	1	Ice	Soil	X		48 HR
2	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
3	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
4	SR 12- 103 -0.15	07/ /2002	1222	baggie	1	Ice	Soil	X		48 HR
5	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
6	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
7	SR 12- 104 -0.15	07/ /2002	1229	baggie	1	Ice	Soil	X		48 HR
8	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
9	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
10	SR 12- 105 -0.15	07/ /2002	1236	baggie	1	Ice	Soil	X		48 HR
11	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
12	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
13	SR 12- 106 -0.15	07/ /2002	1241	baggie	1	Ice	Soil	X		48 HR
14	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
15	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
16	SR 12- 107 -0.15	07/ /2002	1247	baggie	1	Ice	Soil	X		48 HR
17	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
18	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
19	SR 12- 108 -0.15	07/ /2002	1256	baggie	1	Ice	Soil	X		48 HR
20	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
21	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
22	SR 12- 109 -0.15	07/ /2002	1303	baggie	1	Ice	Soil	X	X	48 HR
23	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
24	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
25	SR 12- 110 -0.15	07/ /2002	1309	baggie	1	Ice	Soil	X		48 HR
26	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
27	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
28	SR 12- 111 -0.15	07/ /2002	1316	baggie	1	Ice	Soil	X		48 HR
29	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
30	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
31	SR 12- 112 -0.15	07/ /2002	1322	baggie	1	Ice	Soil	X		48 HR
32	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
33	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
34	SR 12- 113 -0.15	07/ /2002	1328	baggie	1	Ice	Soil	X		48 HR
35	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
36	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
37	SR 12- 114 -0.15	07/ /2002	1336	baggie	1	Ice	Soil	X	X	48 HR
38	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
39	SR 12- -0.45	07/ 05 /2002		baggie	1	Ice	Soil	X		48 HR
40	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
41	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
42	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
43	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
44	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
45	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
46	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
47	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
48	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR

48 Hour Rush!

Relinquished By: Martha Adams
Print Name: Martha Adams
Date: 7.8.02
Time: 11:20

Received By: [illegible]
Print Name: [illegible]
Date: 7-8-02
Time: 1121

Received By: [illegible]
Print Name: [illegible]
Date: 7-8-02
Time: 1:30

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Martha Adams
Shaw Environmental & Infrastructure
1326 N. Market Blvd.
Sacramento, CA 95834

Client	Shaw Environmental & Infrastructure
Workorder	14911 SR 12 NAPA
Received	07/10/02

The samples were received in EPA specified containers. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

Sparger Technology, Inc. ID Suffix Keys - These descriptors will follow the Sparger Technology, Inc. ID numbers and help identify the specific sample and clarify the report.

- DUP - Matrix Duplicate
- MS - Matrix Spike
- MSD - Matrix Spike Duplicate
- LCS - Lab Control Sample
- LCSD - Lab Control Sample Duplicate
- RPD - Relative Percent Difference
- QC - Additional Quality Control
- DIL - Results from a diluted sample
- ND - None Detected
- RL - Reporting Limit

Note: In an effort to conserve paper, the results are printed on both sides of the paper.

Ray James
Laboratory Director

)050 Fite Circle, Suite 112 • Sacramento, California 95827 • (916) 362-8947 • FAX (916) 362-0947

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14911 **Workorder ID** SR 12 NAPA

Parameter Lead
Method 6010B STLC Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14911001	SR12-1-0.15	26.6	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911002	SR12-1-0.30	3.17	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911003	SR12-2-0.15	8.81	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911004	SR12-2-0.30	1.71	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911005	SR12-2-0.45	5.54	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911006	SR12-3-0.15	5.02	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911007	SR12-3-0.30	5.70	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911008	SR12-3-0.45	9.47	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911009	SR12-4-0.15	5.64	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911010	SR12-4-0.30	8.92	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911011	SR12-4-0.45	2.45	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911012	SR12-5-0.15	11.6	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911013	SR12-5-0.30	18.0	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911014	SR12-5-0.45	14.1	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911015	SR12-6-0.15	27.4	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911016	SR12-6-0.30	16.4	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911017	SR12-6-0.45	25.9	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911018	SR12-7-0.15	6.19	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911019	SR12-7-0.30	4.75	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911020	SR12-7-0.45	6.02	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911021	SR12-8-0.15	3.08	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911022	SR12-8-0.30	2.13	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911023	SR12-9-0.15	9.91	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911024	SR12-9-0.30	7.34	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911025	SR12-9-0.45	6.03	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911026	SR12-10-0.30	2.87	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911027	SR12-10-0.45	2.51	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911028	SR12-11-0.30	8.56	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911029	SR12-11-0.45	2.54	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911030	SR12-12-0.30	1.58	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911031	SR12-12-0.45	5.91	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911032	SR12-13-0.15	36.6	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911033	SR12-13-0.30	14.0	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911034	SR12-13-0.45	8.33	0.050	mg/L	07/02/02	07/11/02	Soil	1:1

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14911 **Workorder ID** SR 12 NAPA

Parameter Lead (continued)
Method 6010B STLC Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14911035	SR12-15-0.15	3.55	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911036	SR12-15-0.30	4.97	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911037	SR12-15-0.45	3.60	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911038	SR12-22-0.30	1.33	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911039	SR12-24-0.45	2.17	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911040	SR12-25-0.30	2.71	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911041	SR12-25-0.45	3.22	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911042	SR12-27-0.15	2.38	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911043	SR12-27-0.30	4.58	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911044	SR12-27-0.45	5.80	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911045	SR12-28-0.15	3.57	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911046	SR12-28-0.30	9.26	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911047	SR12-28-0.45	3.32	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911048	SR12-29-0.45	3.26	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911049	SR12-30-0.30	1.27	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911050	SR12-30-0.45	1.26	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911051	SR12-31-0.15	0.640	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911052	SR12-31-0.30	1.22	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911053	SR12-32-0.15	2.70	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911054	SR12-32-0.30	2.08	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911055	SR12-33-0.15	3.27	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911056	SR12-33-0.30	3.75	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911057	SR12-33-0.45	2.95	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911058	SR12-34-0.45	1.76	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911059	SR12-35-0.15	6.29	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911060	SR12-35-0.30	5.84	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911061	SR12-35-0.45	32.3	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911062	SR12-37-0.30	1.33	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911063	SR12-41-0.30	1.98	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911064	SR12-41-0.45	4.95	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911065	SR12-42-0.45	3.59	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911066	SR12-44-0.30	1.48	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911067	SR12-44-0.45	3.05	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911068	SR12-48-0.15	4.97	0.050	mg/L	07/02/02	07/11/02	Soil	1:1

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14911 **Workorder ID** SR 12 NAPA

Parameter Lead (continued)
Method 6010B STLC Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14911069	SR12-48-0.30	2.83	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911070	SR12-49-0.15	1.95	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911071	SR12-49-0.30	3.30	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911072	SR12-49-0.45	2.97	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911073	SR12-50-0.30	5.24	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911074	SR12-50-0.45	3.41	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911075	SR12-51-0.15	4.83	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911076	SR12-51-0.30	5.50	0.050	mg/L	07/02/02	07/11/02	Soil	1:1
14911077	SR12-51-0.45	4.06	0.050	mg/L	07/02/02	07/11/02	Soil	1:1

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RECEIVING

Rush! 48 HOUR

7/9/02 11:30

Lab Request No. 1 for Caltrans
IT Corporation Project No. 837393
Caltrans SR 12 Napa
Contact: Martha Adams
7/9/02
Contract 43A0078

Sample Date: 07/02/02
Analyzed: 07/05/02

Please analyze the 77 samples listed below for soluble lead by the WET on a 48 hour turn around time.
These samples were submitted under ~~separate~~ C-O-C. (14892)
Please report the results on separate reports.

Work Order ID 837393, SR 12 Napa.

	Lab Id.		Sample Id.
1	14892	001	SR12 - 1 - 0.15
2	14892	002	SR12 - 1 - 0.30
3	14892	004	SR12 - 2 - 0.15
4	14892	005	SR12 - 2 - 0.30
5	14892	006	SR12 - 2 - 0.45
6	14892	007	SR12 - 3 - 0.15
7	14892	008	SR12 - 3 - 0.30
8	14892	009	SR12 - 3 - 0.45
9	14892	010	SR12 - 4 - 0.15
10	14892	011	SR12 - 4 - 0.30
11	14892	012	SR12 - 4 - 0.45
12	14892	013	SR12 - 5 - 0.15
13	14892	014	SR12 - 5 - 0.30
14	14892	015	SR12 - 5 - 0.45
15	14892	016	SR12 - 6 - 0.15
16	14892	017	SR12 - 6 - 0.30
17	14892	018	SR12 - 6 - 0.45
18	14892	019	SR12 - 7 - 0.15
19	14892	020	SR12 - 7 - 0.30
20	14892	021	SR12 - 7 - 0.45
21	14892	022	SR12 - 8 - 0.15
22	14892	023	SR12 - 8 - 0.30
23	14892	025	SR12 - 9 - 0.15
24	14892	026	SR12 - 9 - 0.30
25	14892	027	SR12 - 9 - 0.45
26	14892	029	SR12 - 10 - 0.30
27	14892	030	SR12 - 10 - 0.45
28	14892	032	SR12 - 11 - 0.30
29	14892	033	SR12 - 11 - 0.45
30	14892	035	SR12 - 12 - 0.30
31	14892	036	SR12 - 12 - 0.45
32	14892	037	SR12 - 13 - 0.15
33	14892	038	SR12 - 13 - 0.30
34	14892	039	SR12 - 13 - 0.45
35	14892	043	SR12 - 15 - 0.15
36	14892	044	SR12 - 15 - 0.30
37	14892	045	SR12 - 15 - 0.45
38	14892	065	SR12 - 22 - 0.30
39	14892	072	SR12 - 24 - 0.45
40	14892	074	SR12 - 25 - 0.30

	Lab Id.		Sample Id.
41	14892	075	SR12 - 25 - 0.45
42	14892	079	SR12 - 27 - 0.15
43	14892	080	SR12 - 27 - 0.30
44	14892	081	SR12 - 27 - 0.45
45	14892	082	SR12 - 28 - 0.15
46	14892	083	SR12 - 28 - 0.30
47	14892	084	SR12 - 28 - 0.45
48	14892	087	SR12 - 29 - 0.45
49	14892	089	SR12 - 30 - 0.30
50	14892	090	SR12 - 30 - 0.45
51	14892	091	SR12 - 31 - 0.15
52	14892	092	SR12 - 31 - 0.30
53	14892	094	SR12 - 32 - 0.15
54	14892	095	SR12 - 32 - 0.30
55	14892	097	SR12 - 33 - 0.15
56	14892	098	SR12 - 33 - 0.30
57	14892	099	SR12 - 33 - 0.45
58	14892	102	SR12 - 34 - 0.45
59	14892	103	SR12 - 35 - 0.15
60	14892	104	SR12 - 35 - 0.30
61	14892	105	SR12 - 35 - 0.45
62	14892	110	SR12 - 37 - 0.30
63	14892	122	SR12 - 41 - 0.30
64	14892	123	SR12 - 41 - 0.45
65	14892	126	SR12 - 42 - 0.45
66	14892	131	SR12 - 44 - 0.30
67	14892	132	SR12 - 44 - 0.45
68	14892	142	SR12 - 48 - 0.15
69	14892	143	SR12 - 48 - 0.30
70	14892	145	SR12 - 49 - 0.15
71	14892	146	SR12 - 49 - 0.30
72	14892	147	SR12 - 49 - 0.45
73	14892	149	SR12 - 50 - 0.30
74	14892	150	SR12 - 50 - 0.45
75	14892	151	SR12 - 51 - 0.15
76	14892	152	SR12 - 51 - 0.30
77	14892	153	SR12 - 51 - 0.45

48 Hour

Rush!

IT CORPORATION
A Member of The IT Group

1326 N. Market Boulevard
Sacramento, California 95834-1912

PHONE: 916/565-4352
FAX: 916/565-4356

TRANSMITTAL

TO:	Ray James	**DATE: JULY 9, 2002**	
	362-0947	**PROJECT NO.:**	837393
	Sparger Technology		
FROM:	Ian Moorhead	Pages: 2	
RE:	SR 12 Napa: WET Analyses		

QUANTITY:	DESCRIPTION:
77	Samples for soluble lead by the WET per the attached sheet.
	48 Hour Turn around time
	Samples collected 07/02/03 and submitted 07/03/02 under Chain of Custody 14892.

FOR YOUR:	SENT BY:
☐ USE	☐ REGULAR MAIL
☐ APPROVAL	☐ OVERNIGHT
☐ REVIEW/COMMENTS	☐ UPS
☐ INFORMATION	☐ COURIER
☐ OTHER	☒ OTHER FAX

Notes/Comments: Please call me with any questions.

Thanks!
IAN.

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Martha Adams
Shaw Environmental & Infrastructure
1326 N. Market Blvd.
Sacramento, CA 95834

Client	Shaw Environmental & Infrastructure
Workorder	14912 SR 12 NAPA
Received	07/10/02

The samples were received in EPA specified containers. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

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MS - Matrix Spike
MSD - Matrix Spike Duplicate
LCS - Lab Control Sample
LCSD - Lab Control Sample Duplicate
RPD - Relative Percent Difference
QC - Additional Quality Control
DIL - Results from a diluted sample
ND - None Detected
RL - Reporting Limit

Note: In an effort to conserve paper, the results are printed on both sides of the paper.

Ray James
Laboratory Director

050 Fite Circle, Suite 112 • Sacramento, California 95827 • (916) 362-8947 • FAX (916) 362-0947

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14912 **Workorder ID** SR 12 NAPA

Parameter Lead
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14912001	SR12-115-0.15	110	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912002	SR12-115-0.30	58.3	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912003	SR12-115-0.45	45.9	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912004	SR12-116-0.15	91.4	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912005	SR12-116-0.30	99.8	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912006	SR12-116-0.45	117	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912007	SR12-117-0.15	121	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912008	SR12-117-0.30	130	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912009	SR12-117-0.45	124	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912010	SR12-118-0.15	45.7	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912011	SR12-118-0.30	48.2	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912012	SR12-118-0.45	40.7	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912013	SR12-119-0.15	148	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912014	SR12-119-0.30	150	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912015	SR12-119-0.45	153	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912016	SR12-120-0.15	75.3	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912017	SR12-120-0.30	74.5	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912018	SR12-120-0.45	89.8	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912019	SR12-121-0.15	108	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912020	SR12-121-0.30	161	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912021	SR12-121-0.45	98.7	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912022	SR12-122-0.15	105	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912023	SR12-122-0.30	95.3	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912024	SR12-122-0.45	56.1	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912025	SR12-123-0.15	57.0	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912026	SR12-123-0.30	54.1	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912027	SR12-123-0.45	62.9	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912028	SR12-124-0.15	36.3	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912029	SR12-124-0.30	48.9	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912030	SR12-124-0.45	41.8	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912031	SR12-125-0.15	106	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912032	SR12-125-0.30	74.7	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912033	SR12-125-0.45	57.8	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912034	SR12-126-0.15	118	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1

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Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14912 **Workorder ID** SR 12 NAPA

Parameter Lead (continued)
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14912035	SR12-126-0.30	110	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912036	SR12-126-0.45	99.9	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912037	SR12-127-0.15	92.6	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912038	SR12-127-0.30	43.7	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912039	SR12-127-0.45	46.3	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912040	SR12-128-0.15	26.7	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912041	SR12-128-0.30	37.3	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912042	SR12-128-0.45	40.0	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912043	SR12-129-0.15	50.4	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912044	SR12-129-0.30	54.0	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912045	SR12-129-0.45	46.6	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912046	SR12-130-0.15	32.3	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912047	SR12-130-0.30	31.6	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912048	SR12-130-0.45	34.3	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912049	SR12-131-0.15	26.2	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912050	SR12-131-0.30	22.8	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912051	SR12-131-0.45	26.6	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912052	SR12-132-0.15	60.5	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912053	SR12-132-0.30	41.7	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912054	SR12-132-0.45	45.9	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912055	SR12-133-0.15	38.3	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912056	SR12-133-0.30	72.2	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912057	SR12-133-0.45	69.8	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912058	SR12-134-0.15	24.1	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912059	SR12-134-0.30	27.0	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912060	SR12-134-0.45	6.29	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912061	SR12-135-0.15	41.2	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912062	SR12-135-0.30	17.0	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912063	SR12-135-0.45	13.8	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912064	SR12-136-0.15	79.8	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912065	SR12-136-0.30	112	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912066	SR12-136-0.45	67.9	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912067	SR12-137-0.15	47.7	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912068	SR12-137-0.30	43.5	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1

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Client ID Shaw Environmental & Infrastructure
Workorder # 14912 **Workorder ID** SR 12 NAPA

Parameter Lead (continued)
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14912069	SR12-137-0.45	47.2	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912070	SR12-138-0.15	151	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912071	SR12-138-0.30	146	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912072	SR12-138-0.45	178	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912073	SR12-139-0.15	65.5	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912074	SR12-139-0.30	53.3	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912075	SR12-139-0.45	46.4	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912076	SR12-140-0.15	47.8	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912077	SR12-140-0.30	40.4	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912078	SR12-140-0.45	16.2	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912079	SR12-141-0.15	11.0	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912080	SR12-141-0.30	11.9	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912081	SR12-141-0.45	8.36	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912082	SR12-142-0.15	13.7	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912083	SR12-142-0.30	8.95	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912084	SR12-142-0.45	13.4	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912085	SR12-143-0.15	74.6	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912086	SR12-143-0.30	180	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912087	SR12-143-0.45	207	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912088	SR12-144-0.15	162	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912089	SR12-144-0.30	156	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912090	SR12-144-0.45	142	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912091	SR12-145-0.15	13.8	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912092	SR12-145-0.30	45.6	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912093	SR12-145-0.45	40.1	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912094	SR12-146-0.15	161	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912095	SR12-146-0.30	208	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912096	SR12-146-0.45	262	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912097	SR12-147-0.15	18.7	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912098	SR12-147-0.30	17.9	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912099	SR12-147-0.45	22.6	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912100	SR12-148-0.15	94.6	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912101	SR12-148-0.30	71.9	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912102	SR12-148-0.45	103	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1

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Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14912 **Workorder ID** SR 12 NAPA

Parameter Lead (continued)
Method 6010B Soil Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14912103	SR12-149-0.15	55.0	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912104	SR12-149-0.30	68.5	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912105	SR12-149-0.45	45.8	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912106	SR12-150-0.15	56.4	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912107	SR12-150-0.30	64.7	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912108	SR12-150-0.45	61.3	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912109	SR12-151-0.15	13.7	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912110	SR12-151-0.30	15.3	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912111	SR12-151-0.45	12.5	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912112	SR12-152-0.15	35.2	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912113	SR12-152-0.30	50.5	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912114	SR12-152-0.45	66.8	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912115	SR12-153-0.15	14.2	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912116	SR12-153-0.30	14.2	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912117	SR12-153-0.45	14.5	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912118	SR12-154-0.15	77.0	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912119	SR12-154-0.30	40.4	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912120	SR12-154-0.45	25.9	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912121	SR12-155-0.15	167	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912122	SR12-155-0.30	131	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912123	SR12-155-0.45	102	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912124	SR12-156-0.15	25.1	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912125	SR12-156-0.30	32.7	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912126	SR12-156-0.45	61.9	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912127	SR12-157-0.15	54.2	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912128	SR12-157-0.30	74.8	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912129	SR12-157-0.45	64.7	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912130	SR12-158-0.15	57.9	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912131	SR12-158-0.30	117	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912132	SR12-158-0.45	66.4	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912133	SR12-159-0.15	25.8	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912134	SR12-159-0.30	73.7	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1
14912135	SR12-159-0.45	27.3	1.0	mg/Kg	07/08/02	07/10/02	Soil	1:1

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Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14912 **Workorder ID** SR 12 NAPA

Parameter pH
Method 9045 PH

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14912002	SR12-115-0.30	6.2	0.10	units	07/08/02	07/10/02	Soil	1:1
14912010	SR12-118-0.15	6.0	0.10	units	07/08/02	07/10/02	Soil	1:1
14912020	SR12-121-0.30	6.2	0.10	units	07/08/02	07/10/02	Soil	1:1
14912029	SR12-124-0.30	6.3	0.10	units	07/08/02	07/10/02	Soil	1:1
14912037	SR12-127-0.15	6.2	0.10	units	07/08/02	07/10/02	Soil	1:1
14912049	SR12-131-0.15	6.3	0.10	units	07/08/02	07/10/02	Soil	1:1
14912054	SR12-132-0.45	6.6	0.10	units	07/08/02	07/10/02	Soil	1:1
14912064	SR12-136-0.15	6.5	0.10	units	07/08/02	07/10/02	Soil	1:1
14912072	SR12-138-0.45	6.6	0.10	units	07/08/02	07/10/02	Soil	1:1
14912082	SR12-142-0.15	6.5	0.10	units	07/08/02	07/10/02	Soil	1:1
14912091	SR12-145-0.15	6.9	0.10	units	07/08/02	07/10/02	Soil	1:1
14912100	SR12-148-0.15	6.5	0.10	units	07/08/02	07/10/02	Soil	1:1
14912108	SR12-150-0.45	7.2	0.10	units	07/08/02	07/10/02	Soil	1:1
14912118	SR12-154-0.15	6.7	0.10	units	07/08/02	07/10/02	Soil	1:1
14912128	SR12-157-0.30	7.1	0.10	units	07/08/02	07/10/02	Soil	1:1

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CHAIN OF CUSTODY

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Sparger Technology
3050 Fite Circle, Suite 112, Sacramento, CA 95827
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Send Results To:
Martha Adams
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834

Project:
Caltrans SR 12 Napa
Location: SR 12 Napa and Solano County
Project #:837393
Contract: 43A0078

Samplers:
I. Moorhead, D.Hart

	Sample ID:	Date	Time	Container	Total	Preservative Used	Matrix	ANALYSES: EPA 6010, Lead Only	ANALYSES: 9045A: pH	TAT
1	SR 12- 115 -0.15	07/08/2002	0855	baggie	1	Ice	Soil	X		48 HR
2	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
3	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
4	SR 12- 116 -0.15	07/ /2002	0858	baggie	1	Ice	Soil	X		48 HR
5	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
6	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
7	SR 12- 117 -0.15	07/ /2002	0901	baggie	1	Ice	Soil	X		48 HR
8	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
9	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
10	SR 12- 118 -0.15	07/ /2002	0906	baggie	1	Ice	Soil	X	X	48 HR
11	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
12	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
13	SR 12- 119 -0.15	07/ /2002	0911	baggie	1	Ice	Soil	X		48 HR
14	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
15	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
16	SR 12- 120 -0.15	07/ /2002	0914	baggie	1	Ice	Soil	X		48 HR
17	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
18	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
19	SR 12- 121 -0.15	07/ /2002	0918	baggie	1	Ice	Soil	X		48 HR
20	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
21	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
22	SR 12- 122 -0.15	07/ /2002	0923	baggie	1	Ice	Soil	X		48 HR
23	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
24	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
25	SR 12- 123 -0.15	07/ /2002	0929	baggie	1	Ice	Soil	X		48 HR
26	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
27	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
28	SR 12- 124 -0.15	07/ /2002	0934	baggie	1	Ice	Soil	X		48 HR
29	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
30	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
31	SR 12- 125 -0.15	07/ /2002	0939	baggie	1	Ice	Soil	X		48 HR
32	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
33	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
34	SR 12- 126 -0.15	07/ /2002	0946	baggie	1	Ice	Soil	X		48 HR
35	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
36	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
37	SR 12- 127 -0.15	07/ /2002	0949	baggie	1	Ice	Soil	X	X	48 HR
38	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
39	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
40	SR 12- 128 -0.15	07/ /2002	0953	baggie	1	Ice	Soil	X		48 HR
41	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
42	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
43	SR 12- 129 -0.15	07/ /2002	0957	baggie	1	Ice	Soil	X		48 HR
44	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
45	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
46	SR 12- 130 -0.15	07/ /2002	1001	baggie	1	Ice	Soil	X		48 HR
47	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
48	SR 12- -0.45	07/08/2002		baggie	1	Ice	Soil	X		48 HR

48 Hour Rush!

Relinquished By: [signature]
Print Name: IAN MOORHEAD
Date: 07/09/02
Time: 12:15

Received By: [signature]
Print Name: W.K. Fleming
Date: 7/9/02
Time: 1217

Received By: [signature]
Print Name: SOC
Date: 7-9-02
Time: 2:00

CHAIN OF CUSTODY

14912

Company:
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834
Phone: (916) 928-3300 Fax: (916) 928-3341

Laboratory:
Sparger Technology
3050 Fite Circle, Suite 112, Sacramento, CA 95827
Phone: 916-362-8947
Fax: 916-362-0947

Send Results To:
Martha Adams
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834

Project:
Caltrans SR 12 Napa
Location: SR 12 Napa and Solano County
Project #:837393
Contract: 43A0078

Samplers:
I. Moorhead, D.Hart

	Sample ID:	Date	Time	Container	Total	Preserv-ative Used	Matrix	ANALYSES: EPA 6010, Lead Only	ANALYSES: 9045A: pH	TAT
1	SR 12-131 -0.15	07/08/2002	1004	baggie	1	Ice	Soil	X	X	48 HR
2	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
3	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
4	SR 12-132 -0.15	07/ /2002	1008	baggie	1	Ice	Soil	X		48 HR
5	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
6	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X	X	48 HR
7	SR 12-133 -0.15	07/ /2002	1013	baggie	1	Ice	Soil	X		48 HR
8	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
9	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
10	SR 12-134 -0.15	07/ /2002	1019	baggie	1	Ice	Soil	X		48 HR
11	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
12	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
13	SR 12-135 -0.15	07/ /2002	1024	baggie	1	Ice	Soil	X		48 HR
14	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
15	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
16	SR 12-136 -0.15	07/ /2002	1031	baggie	1	Ice	Soil	X	X	48 HR
17	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
18	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
19	SR 12-137 -0.15	07/ /2002	1041	baggie	1	Ice	Soil	X		48 HR
20	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
21	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
22	SR 12-138 -0.15	07/08/2002	1050	baggie	1	Ice	Soil	X		48 HR
23	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
24	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X	X	48 HR
25	SR 12-139 -0.15	07/ /2002	1056	baggie	1	Ice	Soil	X		48 HR
26	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
27	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
28	SR 12-140 -0.15	07/ /2002	1101	baggie	1	Ice	Soil	X		48 HR
29	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
30	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
31	SR 12-141 -0.15	07/ /2002	1105	baggie	1	Ice	Soil	X		48 HR
32	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
33	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
34	SR 12-142 -0.15	07/ /2002	1110	baggie	1	Ice	Soil	X	X	48 HR
35	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
36	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
37	SR 12-143 -0.15	07/ /2002	1116	baggie	1	Ice	Soil	X		48 HR
38	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
39	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
40	SR 12-144 -0.15	07/ /2002	1123	baggie	1	Ice	Soil	X		48 HR
41	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
42	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
43	SR 12-145 -0.15	07/ /2002	1128	baggie	1	Ice	Soil	X	X	48 HR
44	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
45	SR 12- -0.45	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
46	SR 12-146 -0.15	07/ /2002	1133	baggie	1	Ice	Soil	X		48 HR
47	SR 12- -0.30	07/ /2002	↓	baggie	1	Ice	Soil	X		48 HR
48	SR 12- -0.45	07/08/2002	↓	baggie	1	Ice	Soil	X		48 HR

48 Rush!

Relinquished By: [signature]
Print Name: IAN MOORHEAD
Date: 07/09/02
Time: 12:15

Received By: [signature]
Print Name: WIL FLEMING
Date: 7/9/02
Time: 12:17

Received By:
Print Name:
Date:
Time:

CHAIN OF CUSTODY

14912

Company:
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834
Phone: (916) 928-3300 Fax: (916) 928-3341

Laboratory:
Sparger Technology
3050 Fite Circle, Suite 112, Sacramento, CA 95827
Phone: 916-362-8947
Fax: 916-362-0947

Send Results To:
Martha Adams
IT Corporation
1326 North Market Boulevard
Sacramento, CA 95834

Project:
Caltrans SR 12 Napa
Location: SR 12 Napa and Solano County
Project #:837393
Contract: 43A0078

Samplers:
I. Moorhead, D.Hart

	Sample ID:	Date	Time	Container	Total	Preserv-ative Used	Matrix	ANALYSES: EPA 6010, Lead Only	ANALYSES: 9045A: pH	TAT
1	SR 12- 147 -0.15	07/08/2002	1139	baggie	1	Ice	Soil	X		48 HR
2	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
3	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
4	SR 12- 148 -0.15	07/ /2002	1144	baggie	1	Ice	Soil	X	X	48 HR
5	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
6	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
7	SR 12- 149 -0.15	07/ /2002	1150	baggie	1	Ice	Soil	X		48 HR
8	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
9	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
10	SR 12- 150 -0.15	07/ /2002	1157	baggie	1	Ice	Soil	X		48 HR
11	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
12	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
13	SR 12- 151 -0.15	07/ /2002	1204	baggie	1	Ice	Soil	X		48 HR
14	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
15	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
16	SR 12- 152 -0.15	07/ /2002	1210	baggie	1	Ice	Soil	X		48 HR
17	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
18	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
19	SR 12- 153 -0.15	07/ /2002	1215	baggie	1	Ice	Soil	X		48 HR
20	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
21	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
22	SR 12- 154 -0.15	07/ /2002	1221	baggie	1	Ice	Soil	X	X	48 HR
23	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
24	SR 12- -0.45	07/08/2002		baggie	1	Ice	Soil	X		48 HR
25	SR 12- 155 -0.15	07/ /2002	1229	baggie	1	Ice	Soil	X		48 HR
26	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
27	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
28	SR 12- 156 -0.15	07/ /2002	1236	baggie	1	Ice	Soil	X		48 HR
29	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
30	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
31	SR 12- 157 -0.15	07/ /2002	1242	baggie	1	Ice	Soil	X		48 HR
32	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X	X	48 HR
33	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
34	SR 12- 158 -0.15	07/ /2002	1249	baggie	1	Ice	Soil	X		48 HR
35	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
36	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil	X		48 HR
37	SR 12- 159 -0.15	07/ /2002	1255	baggie	1	Ice	Soil	X		48 HR
38	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil	X		48 HR
39	SR 12- -0.45	07/08/2002		baggie	1	Ice	Soil	X		48 HR
40	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
41	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
42	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
43	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
44	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
45	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR
46	SR 12- -0.15	07/ /2002		baggie	1	Ice	Soil			48 HR
47	SR 12- -0.30	07/ /2002		baggie	1	Ice	Soil			48 HR
48	SR 12- -0.45	07/ /2002		baggie	1	Ice	Soil			48 HR

48 HOUR Rush!

Reliquished By: [signature]
Print Name: IAN MOORHEAD
Date:
Time: 07/09/02 12:15

Received By: [signature]
Print Name: WILFREDO
Date: 7/9/02
Time: 12:17

Received By:
Print Name:
Date:
Time:

RECEIVING

IT CORPORATION
A Member of The IT Group

1326 N. Market Boulevard
Sacramento, California 95834-1912

PHONE: 916/565-4352
FAX: 916/565-4356

TRANSMITTAL

TO:	Jennifer	*DATE: JULY 17, 2002*	
	Sparger Technology	*PROJECT No.:*	837393
	362-0947		
	Total Lead Results: SR 12 Napa		
FROM:	Ian Moorhead	Pages: 2	
RE:	SR 12 Napa: Sample Results		

QUANTITY:	*DESCRIPTION:*
1	We have received the STLC results but we are still missing the total lead results for COC 14911.
1	What is the status of the soil samples (SR12-115 to SR12-159) submitted on July 8, 2002(48 Hour).
	We are on a tight schedule for this project, please email the 14911 results and let me know when we can expect the remaining results

FOR YOUR:	*SENT BY:*
☐ USE	☐ REGULAR MAIL
☐ APPROVAL	☐ OVERNIGHT
☐ REVIEW/COMMENTS	☐ UPS
☐ INFORMATION	☐ COURIER
☐ OTHER	☐ OTHER

Notes/Comments: Please call me with any questions. 565-4352

Thanks! Ian.

SAC:\M:\Transmittal.doc-98\in1

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Martha Adams
Shaw Environmental & Infrastructure
1326 N. Market Blvd.
Sacramento, CA 95834

Client	Shaw Environmental & Infrastructure
Workorder	14914 837393 SR12 Napa
Received	07/10/02

The samples were received in EPA specified containers. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

Sparger Technology, Inc. ID Suffix Keys - These descriptors will follow the Sparger Technology, Inc. ID numbers and help identify the specific sample and clarify the report.

DUP - Matrix Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
LCS - Lab Control Sample
LCSD - Lab Control Sample Duplicate
RPD - Relative Percent Difference
QC - Additional Quality Control
DIL - Results from a diluted sample
ND - None Detected
RL - Reporting Limit

Note: In an effort to conserve paper, the results are printed on both sides of the paper.

Ray James
Laboratory Director

3050 Fite Circle, Suite 112 • Sacramento, California 95827 • (916) 362-8947 • FAX (916) 362-0947

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14914 **Workorder ID** 837393 SR12 Napa

Parameter Lead
Method 6010B STLC Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14914001	SR12-RT-1-0.15	1.93	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914002	SR12-RT-1-0.30	2.35	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914003	SR12-RT-1-0.45	3.57	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914004	SR12-RT-2-0.15	6.45	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914005	SR12-RT-2-0.30	22.5	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914006	SR12-RT-2-0.45	15.4	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914007	SR12-RT-3-0.15	2.32	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914008	SR12-RT-3-0.30	2.56	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914009	SR12-RT-3-0.45	2.41	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914010	SR12-RT-4-0.30	1.46	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914011	SR12-RT-6-0.15	9.24	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914012	SR12-RT-6-0.30	3.85	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914013	SR12-RT-7-0.15	17.7	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914014	SR12-RT-7-0.30	3.60	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914015	SR12-RT-7-0.45	19.8	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914016	SR12-RT-8-0.15	6.48	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914017	SR12-RT-8-0.30	5.27	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914018	SR12-RT-8-0.45	10.1	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914019	SR12-RT-9-0.15	9.97	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914020	SR12-RT-9-0.30	11.0	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914021	SR12-RT-9-0.45	11.9	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914022	SR12-RT-10-0.15	2.72	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914023	SR12-RT-10-0.30	9.12	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914024	SR12-RT-10-0.45	2.90	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914025	SR12-RT-11-0.30	4.52	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914026	SR12-RT-11-0.45	5.89	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914027	SR12-RT-12-0.15	9.79	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914028	SR12-RT-12-0.30	8.33	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914029	SR12-RT-12-0.45	18.0	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914030	SR12-RT-13-0.15	7.59	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914031	SR12-RT-13-0.30	3.27	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914032	SR12-RT-14-0.15	5.90	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914033	SR12-RT-14-0.30	13.8	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914034	SR12-RT-14-0.45	2.50	0.050	mg/L	07/03/02	07/12/02	Soil	1:1

3050 File Circle, Suite 112 • Sacramento, California 95827 • (916) 362-8947 • FAX (916) 362-0947

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14914 **Workorder ID** 837393 SR12 Napa

Parameter Lead (continued)
Method 6010B STLC Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
.4914035	SR12-RT-15-0.15	8.96	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914036	SR12-RT-15-0.30	12.7	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914037	SR12-RT-15-0.45	12.4	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
.4914038	SR12-RT-16-0.30	5.10	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
.4914039	SR12-RT-16-0.45	5.89	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914040	SR12-RT-18-0.45	8.05	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914041	SR12-RT-19-0.30	5.78	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914042	SR12-RT-19-0.45	5.29	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914043	SR12-RT-20-0.15	3.56	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914044	SR12-RT-20-0.30	5.17	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
.4914045	SR12-RT-20-0.45	5.68	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
.4914046	SR12-RT-21-0.15	1.05	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914047	SR12-RT-21-0.30	20.6	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
.4914048	SR12-RT-21-0.45	15.4	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
.4914049	SR12-RT-22-0.15	11.7	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914050	SR12-RT-22-0.30	10.4	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14914051	SR12-RT-22-0.45	5.87	0.050	mg/L	07/03/02	07/12/02	Soil	1:1

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Method Blank Report

Client ID Shaw Environmental & Infrastructure
Workorder ID 837393 SR12 Napa
Laboratory ID 46460
Sample ID MB for HBN 152650 [ICPV/3868]
Matrix STLC Leachate

Parameter	Method	Prep Date	Analyzed	Result	RL	Units	Dilution
Lead	6010B STLC Pb	07/10/02	07/12/02	ND	0.050	mg/L	1:1

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B-Floor

Lab Request No. 2 for Caltrans
IT Corporation Project No. 837393
Caltrans SR 12 Napa
Contact: Martha Adams
7/10/02
Contract 43A0078

RECEIVING
7/10/02 10:30 AM

48 Hour
Rush!

Please analyze the 51 samples listed below for soluble lead by the WET on a 48 hour turn around time. These samples were submitted under separate C-O-C. Please report the results on separate reports.

Work Order ID 837393, SR 12 Napa.

1	14898001	SR12-RT-1-0.15	7/3/02 0:00	60	Lead	mg/Kg	6010B Soil Pb
2	14898002	SR12-RT-1-0.30	7/3/02 0:00	51	Lead	mg/Kg	6010B Soil Pb
3	14898003	SR12-RT-1-0.45	7/3/02 0:00	189	Lead	mg/Kg	6010B Soil Pb
4	14898004	SR12-RT-2-0.15	7/3/02 0:00	131	Lead	mg/Kg	6010B Soil Pb
5	14898005	SR12-RT-2-0.30	7/3/02 0:00	288	Lead	mg/Kg	6010B Soil Pb
6	14898006	SR12-RT-2-0.45	7/3/02 0:00	339	Lead	mg/Kg	6010B Soil Pb
7	14898007	SR12-RT-3-0.15	7/3/02 0:00	95	Lead	mg/Kg	6010B Soil Pb
8	14898008	SR12-RT-3-0.30	7/3/02 0:00	77	Lead	mg/Kg	6010B Soil Pb
9	14898009	SR12-RT-3-0.45	7/3/02 0:00	62	Lead	mg/Kg	6010B Soil Pb
10	14898011	SR12-RT-4-0.30	7/3/02 0:00	183	Lead	mg/Kg	6010B Soil Pb
11	14898016	SR12-RT-6-0.15	7/3/02 0:00	412	Lead	mg/Kg	6010B Soil Pb
12	14898017	SR12-RT-6-0.30	7/3/02 0:00	93	Lead	mg/Kg	6010B Soil Pb
13	14898019	SR12-RT-7-0.15	7/3/02 0:00	431	Lead	mg/Kg	6010B Soil Pb
14	14898020	SR12-RT-7-0.30	7/3/02 0:00	192	Lead	mg/Kg	6010B Soil Pb
15	14898021	SR12-RT-7-0.45	7/3/02 0:00	417	Lead	mg/Kg	6010B Soil Pb
16	14898022	SR12-RT-8-0.15	7/3/02 0:00	190	Lead	mg/Kg	6010B Soil Pb
17	14898023	SR12-RT-8-0.30	7/3/02 0:00	218	Lead	mg/Kg	6010B Soil Pb
18	14898024	SR12-RT-8-0.45	7/3/02 0:00	218	Lead	mg/Kg	6010B Soil Pb
19	14898025	SR12-RT-9-0.15	7/3/02 0:00	196	Lead	mg/Kg	6010B Soil Pb
20	14898026	SR12-RT-9-0.30	7/3/02 0:00	315	Lead	mg/Kg	6010B Soil Pb
21	14898027	SR12-RT-9-0.45	7/3/02 0:00	269	Lead	mg/Kg	6010B Soil Pb
22	14898028	SR12-RT-10-0.15	7/3/02 0:00	92	Lead	mg/Kg	6010B Soil Pb
23	14898029	SR12-RT-10-0.30	7/3/02 0:00	180	Lead	mg/Kg	6010B Soil Pb
24	14898030	SR12-RT-10-0.45	7/3/02 0:00	77	Lead	mg/Kg	6010B Soil Pb
25	14898032	SR12-RT-11-0.30	7/3/02 0:00	109	Lead	mg/Kg	6010B Soil Pb
26	14898033	SR12-RT-11-0.45	7/3/02 0:00	85	Lead	mg/Kg	6010B Soil Pb
27	14898034	SR12-RT-12-0.15	7/3/02 0:00	65	Lead	mg/Kg	6010B Soil Pb
28	14898035	SR12-RT-12-0.30	7/3/02 0:00	195	Lead	mg/Kg	6010B Soil Pb
29	14898036	SR12-RT-12-0.45	7/3/02 0:00	153	Lead	mg/Kg	6010B Soil Pb
30	14898037	SR12-RT-13-0.15	7/3/02 0:00	228	Lead	mg/Kg	6010B Soil Pb
31	14898038	SR12-RT-13-0.30	7/3/02 0:00	63	Lead	mg/Kg	6010B Soil Pb
32	14898040	SR12-RT-14-0.15	7/3/02 0:00	83	Lead	mg/Kg	6010B Soil Pb
33	14898041	SR12-RT-14-0.30	7/3/02 0:00	293	Lead	mg/Kg	6010B Soil Pb
34	14898042	SR12-RT-14-0.45	7/3/02 0:00	76	Lead	mg/Kg	6010B Soil Pb
35	14898043	SR12-RT-15-0.15	7/3/02 0:00	112	Lead	mg/Kg	6010B Soil Pb

36	14898044	SR12-RT-15-0.30	7/3/02 0:00	232	Lead	mg/Kg	6010B Soil Pb
37	14898045	SR12-RT-15-0.45	7/3/02 0:00	170	Lead	mg/Kg	6010B Soil Pb
38	14898047	SR12-RT-16-0.30	7/3/02 0:00	135	Lead	mg/Kg	6010B Soil Pb
39	14898048	SR12-RT-16-0.45	7/3/02 0:00	103	Lead	mg/Kg	6010B Soil Pb
40	14898054	SR12-RT-18-0.45	7/3/02 0:00	64	Lead	mg/Kg	6010B Soil Pb
41	14898056	SR12-RT-19-0.30	7/3/02 0:00	87	Lead	mg/Kg	6010B Soil Pb
42	14898057	SR12-RT-19-0.45	7/3/02 0:00	86	Lead	mg/Kg	6010B Soil Pb
43	14898058	SR12-RT-20-0.15	7/3/02 0:00	73	Lead	mg/Kg	6010B Soil Pb
44	14898059	SR12-RT-20-0.30	7/3/02 0:00	103	Lead	mg/Kg	6010B Soil Pb
45	14898060	SR12-RT-20-0.45	7/3/02 0:00	112	Lead	mg/Kg	6010B Soil Pb
46	14898061	SR12-RT-21-0.15	7/3/02 0:00	63	Lead	mg/Kg	6010B Soil Pb
47	14898062	SR12-RT-21-0.30	7/3/02 0:00	258	Lead	mg/Kg	6010B Soil Pb
48	14898063	SR12-RT-21-0.45	7/3/02 0:00	451	Lead	mg/Kg	6010B Soil Pb
49	14898064	SR12-RT-22-0.15	7/3/02 0:00	188	Lead	mg/Kg	6010B Soil Pb
50	14898065	SR12-RT-22-0.30	7/3/02 0:00	244	Lead	mg/Kg	6010B Soil Pb
51	14898066	SR12-RT-22-0.45	7/3/02 0:00	148	Lead	mg/Kg	6010B Soil Pb

48 Hour
Rush!

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Martha Adams
Shaw Environmental & Infrastructure
1326 N. Market Blvd.
Sacramento, CA 95834

Client	Shaw Environmental & Infrastructure
Workorder	14915 837393 SR12 Napa
Received	07/10/02

The samples were received in EPA specified containers. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

Sparger Technology, Inc. ID Suffix Keys - These descriptors will follow the Sparger Technology, Inc. ID numbers and help identify the specific sample and clarify the report.

DUP - Matrix Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
LCS - Lab Control Sample
LCSD - Lab Control Sample Duplicate
RPD - Relative Percent Difference
QC - Additional Quality Control
DIL - Results from a diluted sample
ND - None Detected
RL - Reporting Limit

Note: In an effort to conserve paper, the results are printed on both sides of the paper.

Ray James
Laboratory Director

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14915 **Workorder ID** 837393 SR12 Napa

Parameter Lead
Method 6010B STLC Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14915001	SR12-52-0.45	2.20	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915002	SR 12-55-0.15	4.24	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915003	SR 12-55-0.30	4.03	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915004	SR 12-55-0.45	3.51	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915005	SR 12-62-0.45	0.600	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915006	SR 12-63-0.45	2.66	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915007	SR 12-64-0.15	3.56	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915008	SR 12-64-0.30	4.05	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915009	SR 12-64-0.45	2.88	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915010	SR 12-65-0.15	4.53	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915011	SR 12-66-0.30	1.01	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915012	SR 12-66-0.45	1.96	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915013	SR 12-67-0.15	2.79	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915014	SR 12-67-0.30	3.53	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915015	SR 12-67-0.45	3.02	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915016	SR 12-68-0.15	1.59	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915017	SR 12-68-0.30	3.32	0.050	mg/L	07/03/02	07/12/02	Soil	1:1
14915018	SR 12-68-0.45	5.11	0.050	mg/L	07/03/02	07/12/02	Soil	1:1

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Client's Name: Martha Adams **Company:** Shaw E & I

Work Order # 14897 **Date:** 7/10/02
IT Project # 837393 SR12 Napa

The following samples were analyzed for total lead and results were 50 ppm or greater. Please fax us a confirmation requesting to begin the STLC analysis. Thank you. Martha Adams : 48-hour TAT

Note: The units for the "Result" column are in ppm.

	LAB WORK ID	QUEUE	PROC CODE	PROC DESC	SAMPLE	Result	CUST SAMPLE ID
1	14897	ICP	6010 S Pb	Pb by ICP	14897012	65	SR 12-52-0.45
2	14897	ICP	6010 S Pb	Pb by ICP	14897019	110	SR 12-55-0.15
3	14897	ICP	6010 S Pb	Pb by ICP	14897020	80	SR 12-55-0.30
4	14897	ICP	6010 S Pb	Pb by ICP	14897021	99	SR 12-55-0.45
5	14897	ICP	6010 S Pb	Pb by ICP	14897042	51	SR 12-62-0.45
6	14897	ICP	6010 S Pb	Pb by ICP	14897045	53	SR 12-63-0.45
7	14897	ICP	6010 S Pb	Pb by ICP	14897046	83	SR 12-64-0.15
8	14897	ICP	6010 S Pb	Pb by ICP	14897047	81	SR 12-64-0.30
9	14897	ICP	6010 S Pb	Pb by ICP	14897048	70	SR 12-64-0.45
10	14897	ICP	6010 S Pb	Pb by ICP	14897049	59	SR 12-65-0.15
11	14897	ICP	6010 S Pb	Pb by ICP	14897053	51	SR 12-66-0.30
12	14897	ICP	6010 S Pb	Pb by ICP	14897054	64	SR 12-66-0.45
13	14897	ICP	6010 S Pb	Pb by ICP	14897055	85	SR 12-67-0.15
14	14897	ICP	6010 S Pb	Pb by ICP	14897056	96	SR 12-67-0.30
15	14897	ICP	6010 S Pb	Pb by ICP	14897057	92	SR 12-67-0.45
16	14897	ICP	6010 S Pb	Pb by ICP	14897058	61	SR 12-68-0.15
17	14897	ICP	6010 S Pb	Pb by ICP	14897059	105	SR 12-68-0.30
18	14897	ICP	6010 S Pb	Pb by ICP	14897060	120	SR 12-68-0.45

RECEIVING
7/10/02 11:40

48 HOUR
Rush!

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Martha Adams
Shaw Environmental & Infrastructure
1326 N. Market Blvd.
Sacramento, CA 95834

Client	Shaw Environmental & Infrastructure
Workorder	14919 837393 SR12 Napa
Received	07/11/02

The samples were received in EPA specified containers. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

Sparger Technology, Inc. ID Suffix Keys - These descriptors will follow the Sparger Technology, Inc. ID numbers and help identify the specific sample and clarify the report.

DUP - Matrix Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
LCS - Lab Control Sample
LCSD - Lab Control Sample Duplicate
RPD - Relative Percent Difference
QC - Additional Quality Control
DIL - Results from a diluted sample
ND - None Detected
RL - Reporting Limit

Note: In an effort to conserve paper, the results are printed on both sides of the paper.

Laboratory Director

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14919 **Workorder ID** 837393 SR12 Napa

Parameter Lead
Method 6010B STLC Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14919001	SR12-70-0.15	1.10	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919002	SR12-71-0.15	1.62	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919003	SR12-71-0.30	2.91	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919004	SR12-72-0.15	2.50	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919005	SR12-72-0.30	3.82	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919006	SR12-72-0.45	3.06	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919007	SR12-74-0.15	5.81	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919008	SR12-74-0.30	4.47	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919009	SR12-74-0.45	5.20	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919010	SR12-76-0.15	2.28	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919011	SR12-76-0.30	2.38	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919012	SR12-76-0.45	2.43	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919013	SR12-77-0.15	8.95	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919014	SR12-77-0.30	6.10	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919015	SR12-77-0.45	5.99	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919016	SR12-78-0.15	7.41	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919017	SR12-78-0.30	7.83	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919018	SR12-78-0.45	5.73	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919019	SR12-79-0.15	10.9	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919020	SR12-79-0.30	10.4	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919021	SR12-79-0.45	9.67	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919022	SR12-80-0.15	5.77	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919023	SR12-80-0.30	6.29	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919024	SR12-80-0.45	3.99	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919025	SR12-81-0.15	3.22	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919026	SR12-81-0.30	4.04	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919027	SR12-81-0.45	4.38	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919028	SR12-82-0.15	5.17	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919029	SR12-82-0.30	4.06	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919030	SR12-82-0.45	3.72	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919031	SR12-83-0.15	5.55	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919032	SR12-83-0.30	6.64	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919033	SR12-83-0.45	7.15	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919034	SR12-84-0.15	12.5	0.050	mg/L	07/05/02	07/15/02	Soil	1:1

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
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Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14919 **Workorder ID** 837393 SR12 Napa

Parameter Lead (continued)
Method 6010B STLC Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14919035	SR12-84-0.30	5.66	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919036	SR12-84-0.45	8.67	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919037	SR12-85-0.15	4.75	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919038	SR12-85-0.30	2.40	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919039	SR12-108-0.15	2.88	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919040	SR12-108-0.30	2.88	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919041	SR12-108-0.45	2.36	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919042	SR12-110-0.15	3.35	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919043	SR12-110-0.30	4.91	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919044	SR12-110-0.45	3.19	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919045	SR12-111-0.15	6.82	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919046	SR12-111-0.30	5.55	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919047	SR12-111-0.45	8.86	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919048	SR12-112-0.15	3.72	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919049	SR12-112-0.45	2.02	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919050	SR12-113-0.15	4.57	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919051	SR12-113-0.30	4.46	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919052	SR12-113-0.45	7.62	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919053	SR12-114-0.15	9.28	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919054	SR12-114-0.30	7.45	0.050	mg/L	07/05/02	07/15/02	Soil	1:1
14919055	SR12-114-0.45	4.67	0.050	mg/L	07/05/02	07/15/02	Soil	1:1

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Method Blank Report

Client ID	Shaw Environmental & Infrastructure
Workorder ID	837393 SR12 Napa
Laboratory ID	46527
Sample ID	MB for HBN 153148 [ICPV/3874]
Matrix	STLC Leachate

Parameter	Method	Prep Date	Analyzed	Result	RL	Units	Dilution
Lead	6010B STLC Pb	07/11/02	07/15/02	ND	0.050	mg/L	1:1

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B-Floor

Lab Request No. 3 for Caltrans
IT Corporation Project No. 837393
Caltrans SR 12 Napa
Contact: Martha Adams
7/10/02
Contract 43A0078

RECEIVING
7/10/02 16:30

Please analyze the 55 samples listed below for
soluble lead by the WET on a 48 hour turn around time.
These samples were submitted under separate C-O-C.
Please report the results on separate reports.

Work Order ID 837393, SR 12 Napa.

7/5/02

48 Hour
Rush!

14908001	SR 12-70-0.15	7/5/02 0:00	45	Lead	mg/Kg	6010B Soil Pb
14908004	SR 12-70-0.15	7/5/02 0:00	57	Lead	mg/Kg	6010B Soil Pb
14908005	SR 12-71-0.30	7/5/02 0:00	65	Lead	mg/Kg	6010B Soil Pb
14908007	SR 12-72-0.15	7/5/02 0:00	45	Lead	mg/Kg	6010B Soil Pb
14908008	SR 12-72-0.30	7/5/02 0:00	67	Lead	mg/Kg	6010B Soil Pb
14908009	SR 12-72-0.45	7/5/02 0:00	108	Lead	mg/Kg	6010B Soil Pb
14908013	SR 12-74-0.15	7/5/02 0:00	99	Lead	mg/Kg	6010B Soil Pb
14908014	SR 12-74-0.30	7/5/02 0:00	64	Lead	mg/Kg	6010B Soil Pb
14908015	SR 12-74-0.45	7/5/02 0:00	130	Lead	mg/Kg	6010B Soil Pb
14908019	SR 12-76-0.15	7/5/02 0:00	54	Lead	mg/Kg	6010B Soil Pb
14908020	SR 12-76-0.30	7/5/02 0:00	57	Lead	mg/Kg	6010B Soil Pb
14908021	SR 12-76-0.45	7/5/02 0:00	72	Lead	mg/Kg	6010B Soil Pb
14908022	SR 12-77-0.15	7/5/02 0:00	129	Lead	mg/Kg	6010B Soil Pb
14908023	SR 12-77-0.30	7/5/02 0:00	72	Lead	mg/Kg	6010B Soil Pb
14908024	SR 12-77-0.45	7/5/02 0:00	117	Lead	mg/Kg	6010B Soil Pb
14908025	SR 12-78-0.15	7/5/02 0:00	94	Lead	mg/Kg	6010B Soil Pb
14908026	SR 12-78-0.30	7/5/02 0:00	300	Lead	mg/Kg	6010B Soil Pb
14908027	SR 12-78-0.45	7/5/02 0:00	121	Lead	mg/Kg	6010B Soil Pb
14908028	SR 12-79-0.15	7/5/02 0:00	145	Lead	mg/Kg	6010B Soil Pb
14908029	SR 12-79-0.30	7/5/02 0:00	129	Lead	mg/Kg	6010B Soil Pb
14908030	SR 12-79-0.45	7/5/02 0:00	138	Lead	mg/Kg	6010B Soil Pb
14908031	SR 12-80-0.15	7/5/02 0:00	115	Lead	mg/Kg	6010B Soil Pb
14908032	SR 12-80-0.30	7/5/02 0:00	166	Lead	mg/Kg	6010B Soil Pb
14908033	SR 12-80-0.45	7/5/02 0:00	104	Lead	mg/Kg	6010B Soil Pb
14908034	SR 12-81-0.15	7/5/02 0:00	73	Lead	mg/Kg	6010B Soil Pb
14908035	SR 12-81-0.30	7/5/02 0:00	68	Lead	mg/Kg	6010B Soil Pb
14908036	SR 12-81-0.45	7/5/02 0:00	115	Lead	mg/Kg	6010B Soil Pb
14908037	SR 12-82-0.15	7/5/02 0:00	76	Lead	mg/Kg	6010B Soil Pb
14908038	SR 12-82-0.30	7/5/02 0:00	87	Lead	mg/Kg	6010B Soil Pb
14908039	SR 12-82-0.45	7/5/02 0:00	82	Lead	mg/Kg	6010B Soil Pb
14908040	SR 12-83-0.15	7/5/02 0:00	109	Lead	mg/Kg	6010B Soil Pb
14908041	SR 12-83-0.30	7/5/02 0:00	152	Lead	mg/Kg	6010B Soil Pb
14908042	SR 12-83-0.45	7/5/02 0:00	129	Lead	mg/Kg	6010B Soil Pb
14908043	SR 12-84-0.15	7/5/02 0:00	186	Lead	mg/Kg	6010B Soil Pb
14908044	SR 12-84-0.30	7/5/02 0:00	91	Lead	mg/Kg	6010B Soil Pb

74919

14908045	SR 12-84-0.45	7/5/02 0:00	162	Lead	mg/Kg	6010B Soil Pb
14908046	SR 12-85-0.15	7/5/02 0:00	107	Lead	mg/Kg	6010B Soil Pb
14908047	SR 12-85-0.30	7/5/02 0:00	56	Lead	mg/Kg	6010B Soil Pb
14908115	SR 12-108-0.15	7/5/02 0:00	67	Lead	mg/Kg	6010B Soil Pb
14908116	SR 12-108-0.30	7/5/02 0:00	87	Lead	mg/Kg	6010B Soil Pb
14908117	SR 12-108-0.45	7/5/02 0:00	61	Lead	mg/Kg	6010B Soil Pb
14908121	SR 12-110-0.15	7/5/02 0:00	52	Lead	mg/Kg	6010B Soil Pb
14908122	SR 12-110-0.30	7/5/02 0:00	71	Lead	mg/Kg	6010B Soil Pb
14908123	SR 12-110-0.45	7/5/02 0:00	64	Lead	mg/Kg	6010B Soil Pb
14908124	SR 12-111-0.15	7/5/02 0:00	110	Lead	mg/Kg	6010B Soil Pb
14908125	SR 12-111-0.30	7/5/02 0:00	72	Lead	mg/Kg	6010B Soil Pb
14908126	SR 12-111-0.45	7/5/02 0:00	117	Lead	mg/Kg	6010B Soil Pb
14908127	SR 12-112-0.15	7/5/02 0:00	79	Lead	mg/Kg	6010B Soil Pb
14908129	SR 12-112-0.45	7/5/02 0:00	56	Lead	mg/Kg	6010B Soil Pb
14908130	SR 12-113-0.15	7/5/02 0:00	87	Lead	mg/Kg	6010B Soil Pb
14908131	SR 12-113-0.30	7/5/02 0:00	88	Lead	mg/Kg	6010B Soil Pb
14908132	SR 12-113-0.45	7/5/02 0:00	125	Lead	mg/Kg	6010B Soil Pb
14908133	SR 12-114-0.15	7/5/02 0:00	150	Lead	mg/Kg	6010B Soil Pb
14908134	SR 12-114-0.30	7/5/02 0:00	140	Lead	mg/Kg	6010B Soil Pb
14908135	SR 12-114-0.45	7/5/02 0:00	135	Lead	mg/Kg	6010B Soil Pb

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Martha Adams
Shaw Environmental & Infrastructure
1326 N. Market Blvd.
Sacramento, CA 95834

Client	Shaw Environmental & Infrastructure
Workorder	14934 8337393 SR12 Napa
Received	07/15/02

The samples were received in EPA specified containers. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

Sparger Technology, Inc. ID Suffix Keys - These descriptors will follow the Sparger Technology, Inc. ID numbers and help identify the specific sample and clarify the report.

DUP - Matrix Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
LCS - Lab Control Sample
LCSD - Lab Control Sample Duplicate
RPD - Relative Percent Difference
QC - Additional Quality Control
DIL - Results from a diluted sample
ND - None Detected
RL - Reporting Limit

Note: In an effort to conserve paper, the results are printed on both sides of the paper.

Ray James
Laboratory Director

3050 Fite Circle, Suite 112 • Sacramento, California 95827 • (916) 362-8947 • FAX (916) 362-0947

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Martha Adams
Shaw Environmental & Infrastructure
1326 N. Market Blvd.
Sacramento, CA 95834

Client	Shaw Environmental & Infrastructure
Workorder	14940 837393 SR12 Napa
Received	07/16/02

The samples were received in EPA specified containers. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

Sparger Technology, Inc. ID Suffix Keys - These descriptors will follow the Sparger Technology, Inc. ID numbers and help identify the specific sample and clarify the report.

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Note: In an effort to conserve paper, the results are printed on both sides of the paper.

Ray James
Laboratory Director

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Page 1 of 3

Client's Name: Martha Adams **Company:** Shaw E & I

Work Order # 14912 **Date:** 7/17/02
IT Project # 837393 SR12 Napa

The following samples were analyzed for total lead and results were 50 ppm or greater. Please fax us a confirmation requesting to begin the STLC analysis. Thank you. Martha Adams July 17/02 48 hr TAT

Note: The units for the "Result" column are in ppm.

	LAB WORK	ORDER	PROC CODE	PROC DESC	LAB SN	Result	CUST SAMPLE ID	METHOD
1	14912	ICP	6010 S Pb	Pb by ICP	14912001	110	SR12-115-0.15	P3
2	14912	ICP	6010 S Pb	Pb by ICP	14912002	58.3	SR12-115-0.30	P3
3	14912	ICP	6010 S Pb	Pb by ICP	14912004	91.4	SR12-116-0.15	P3
4	14912	ICP	6010 S Pb	Pb by ICP	14912005	99.8	SR12-116-0.30	P3
5	14912	ICP	6010 S Pb	Pb by ICP	14912006	117	SR12-116-0.45	P3
6	14912	ICP	6010 S Pb	Pb by ICP	14912007	121	SR12-117-0.15	P3
7	14912	ICP	6010 S Pb	Pb by ICP	14912008	130	SR12-117-0.30	P3
8	14912	ICP	6010 S Pb	Pb by ICP	14912009	124	SR12-117-0.45	P3
9	14912	ICP	6010 S Pb	Pb by ICP	14912013	148	SR12-119-0.15	P3
10	14912	ICP	6010 S Pb	Pb by ICP	14912014	150	SR12-119-0.30	P3
11	14912	ICP	6010 S Pb	Pb by ICP	14912015	153	SR12-119-0.45	P3
12	14912	ICP	6010 S Pb	Pb by ICP	14912016	75.3	SR12-120-0.15	P3
13	14912	ICP	6010 S Pb	Pb by ICP	14912017	74.5	SR12-120-0.30	P3
14	14912	ICP	6010 S Pb	Pb by ICP	14912018	89.8	SR12-120-0.45	P3
15	14912	ICP	6010 S Pb	Pb by ICP	14912019	108	SR12-121-0.15	P3
16	14912	ICP	6010 S Pb	Pb by ICP	14912020	161	SR12-121-0.30	P3
17	14912	ICP	6010 S Pb	Pb by ICP	14912021	98.7	SR12-121-0.45	P3
18	14912	ICP	6010 S Pb	Pb by ICP	14912022	105	SR12-122-0.15	P3
19	14912	ICP	6010 S Pb	Pb by ICP	14912023	95.3	SR12-122-0.30	P3
20	14912	ICP	6010 S Pb	Pb by ICP	14912024	56.1	SR12-122-0.45	P3
21	14912	ICP	6010 S Pb	Pb by ICP	14912025	57	SR12-123-0.15	P3
22	14912	ICP	6010 S Pb	Pb by ICP	14912026	54.1	SR12-123-0.30	P3
23	14912	ICP	6010 S Pb	Pb by ICP	14912027	62.9	SR12-123-0.45	P3
24	14912	ICP	6010 S Pb	Pb by ICP	14912031	106	SR12-125-0.15	P3
25	14912	ICP	6010 S Pb	Pb by ICP	14912032	74.7	SR12-125-0.30	P3
26	14912	ICP	6010 S Pb	Pb by ICP	14912033	57.8	SR12-125-0.45	P3
27	14912	ICP	6010 S Pb	Pb by ICP	14912034	116	SR12-126-0.15	P3
28	14912	ICP	6010 S Pb	Pb by ICP	14912035	110	SR12-126-0.30	P3
29	14912	ICP	6010 S Pb	Pb by ICP	14912036	99.9	SR12-126-0.45	P3
30	14912	ICP	6010 S Pb	Pb by ICP	14912037	92.6	SR12-127-0.15	P3

Page 2 of 7

	LAB_WO_ID	QUEUE	PROC_CODE	PROC_DESC	LSN	RESULT	CUST_SAMPLE_ID	METHOD
31	14912	ICP	6010 S Pb	Pb by ICP	14912043	50.4	SR12-129-0.15	P3
32	14912	ICP	6010 S Pb	Pb by ICP	14912044	54	SR12-129-0.30	P3
33	14912	ICP	6010 S Pb	Pb by ICP	14912052	60.5	SR12-132-0.15	P3
34	14912	ICP	6010 S Pb	Pb by ICP	14912056	72.2	SR12-133-0.30	P3
35	14912	ICP	6010 S Pb	Pb by ICP	14912057	69.8	SR12-133-0.45	P3
36	14912	ICP	6010 S Pb	Pb by ICP	14912064	79.8	SR12-136-0.15	P3
37	14912	ICP	6010 S Pb	Pb by ICP	14912065	112	SR12-136-0.30	P3
38	14912	ICP	6010 S Pb	Pb by ICP	14912066	67.9	SR12-136-0.45	P3
39	14912	ICP	6010 S Pb	Pb by ICP	14912070	151	SR12-138-0.15	P3
40	14912	ICP	6010 S Pb	Pb by ICP	14912071	146	SR12-138-0.30	P3
41	14912	ICP	6010 S Pb	Pb by ICP	14912072	178	SR12-138-0.46	P3
42	14912	ICP	6010 S Pb	Pb by ICP	14912073	65.5	SR12-139-0.15	P3
43	14912	ICP	6010 S Pb	Pb by ICP	14912074	53.3	SR12-139-0.30	P3
44	14912	ICP	6010 S Pb	Pb by ICP	14912085	74.6	SR12-143-0.15	P3
45	14912	ICP	6010 S Pb	Pb by ICP	14912086	180	SR12-143-0.30	P3
46	14912	ICP	6010 S Pb	Pb by ICP	14912087	207	SR12-143-0.45	P3
47	14912	ICP	6010 S Pb	Pb by ICP	14912088	162	SR12-144-0.15	P3
48	14912	ICP	6010 S Pb	Pb by ICP	14912089	156	SR12-144-0.30	P3
49	14912	ICP	6010 S Pb	Pb by ICP	14912090	142	SR12-144-0.45	P3
50	14912	ICP	6010 S Pb	Pb by ICP	14912094	161	SR12-146-0.15	P3
51	14912	ICP	6010 S Pb	Pb by ICP	14912095	208	SR12-146-0.30	P3
52	14912	ICP	6010 S Pb	Pb by ICP	14912096	262	SR12-146-0.45	P3
53	14912	ICP	6010 S Pb	Pb by ICP	14912100	94.6	SR12-148-0.15	P3
54	14912	ICP	6010 S Pb	Pb by ICP	14912101	71.9	SR12-148-0.30	P3
55	14912	ICP	6010 S Pb	Pb by ICP	14912102	103	SR12-148-0.45	P3
56	14912	ICP	6010 S Pb	Pb by ICP	14912103	55	SR12-149-0.15	P3
57	14912	ICP	6010 S Pb	Pb by ICP	14912104	68.5	SR12-149-0.30	P3
58	14912	ICP	6010 S Pb	Pb by ICP	14912106	56.4	SR12-150-0.15	P3
59	14912	ICP	6010 S Pb	Pb by ICP	14912107	64.7	SR12-150-0.30	P3
60	14912	ICP	6010 S Pb	Pb by ICP	14912108	61.3	SR12-150-0.45	P3
61	14912	ICP	6010 S Pb	Pb by ICP	14912113	50.5	SR12-152-0.30	P3
62	14912	ICP	6010 S Pb	Pb by ICP	14912114	66.8	SR12-152-0.45	P3
63	14912	ICP	6010 S Pb	Pb by ICP	14912118	77	SR12-154-0.15	P3
64	14912	ICP	6010 S Pb	Pb by ICP	14912121	167	SR12-155-0.15	P3
65	14912	ICP	6010 S Pb	Pb by ICP	14912122	131	SR12-155-0.30	P3
66	14912	ICP	6010 S Pb	Pb by ICP	14912123	102	SR12-155-0.45	P3
67	14912	ICP	6010 S Pb	Pb by ICP	14912126	61.9	SR12-156-0.45	P3
68	14912	ICP	6010 S Pb	Pb by ICP	14912127	54.2	SR12-157-0.15	P3
69	14912	ICP	6010 S Pb	Pb by ICP	14912128	74.8	SR12-157-0.30	P3
70	14912	ICP	6010 S Pb	Pb by ICP	14912129	64.7	SR12-157-0.45	P3
71	14912	ICP	6010 S Pb	Pb by ICP	14912130	57.9	SR12-158-0.15	P3
72	14912	ICP	6010 S Pb	Pb by ICP	14912131	117	SR12-158-0.30	P3
73	14912	ICP	6010 S Pb	Pb by ICP	14912132	66.4	SR12-158-0.45	P3

Page 3 of 3

[illegible]	LAB WORK ID	QUEUE	PROC CODE	PROC DESC	HSN	RESULT	CDS SAMPLE ID	METHOD
74	14912	ICP	6010 S Pb	Pb by ICP	14912134	73.7	SR12-159-0.30	P3

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Martha Adams
Shaw Environmental & Infrastructure
1326 N. Market Blvd.
Sacramento, CA 95834

Client	Shaw Environmental & Infrastructure
Workorder	14965 837393 SR12 Napa
Received	07/25/02

The samples were received in EPA specified containers. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

Sparger Technology, Inc. ID Suffix Keys - These descriptors will follow the Sparger Technology, Inc. ID numbers and help identify the specific sample and clarify the report.

- DUP - Matrix Duplicate
- MS - Matrix Spike
- MSD - Matrix Spike Duplicate
- LCS - Lab Control Sample
- LCSD - Lab Control Sample Duplicate
- RPD - Relative Percent Difference
- QC - Additional Quality Control
- DIL - Results from a diluted sample
- ND - None Detected
- RL - Reporting Limit

Note: In an effort to conserve paper, the results are printed on both sides of the paper.

Ray James
Laboratory Director

050 Fite Circle, Suite 112 • Sacramento, California 95827 • (916) 362-8947 • FAX (916) 362-0947

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14965 **Workorder ID** 837393 SR12 Napa

Parameter Lead
Method 6010B STLC Pb

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14965001	SR12-52-0.15	1.18	0.050	mg/L	07/03/02	07/29/02	Soil	1:1
14965002	SR12-54-0.15	1.28	0.050	mg/L	07/03/02	07/29/02	Soil	1:1
14965003	SR12-99-0.30	2.02	0.050	mg/L	07/05/02	07/29/02	Soil	1:1

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48 Hour
Rush!

Lab Request No. 4 for Caltrans
IT Corporation Project No. 837393
Caltrans SR 12 Napa
Contact: Martha Adams
7/25/02
Contract 43A0078

Please analyze the 3 samples listed below for soluble lead by the WET on a 48 hour turn around time. These samples were submitted under separate C-O-C. Please report the results on separate reports.

Work Order ID 837393, SR 12 Napa.

	Lab Id.			Sample Id.		
1	14897	010		SR 12 -	52	-0.15
2	14897	016		SR 12 -	64	-0.15
3	14908	089		SR 12 -	99	-0.30

Post-it® Fax Note 7671	Date 7/25	# of pages ▶ 1
To JENNIFER	From IAN MOLCHERS	
Co./Dept.	Co. SHAW	
Phone #	Phone # 565. 4352	
Fax # 362. 0947	Fax #	

RECEIVING
7/25/02 1:20

Jennifer:

Please check the results for the following samples which we received via email. SR12-82-0.15 is listed twice.
The samples that were requested for DI-WET were:
SR12 - 80 - 0.15
SR12 - 80 - 0.30
SR12 - 82 - 0.15

14943012	SR 12-80-0.30.	7/5/02 0:00	1.2	Lead	mg/L	6010B STLC-DI
14943013	SR 12-82-0.15.	7/5/02 0:00	1.08	Lead	mg/L	6010B STLC-DI
14943014	SR 12-82-0.15.	7/5/02 0:00	1.41	Lead	mg/L	6010B STLC-DI

Lab Request No. 4 for Caltrans
IT Corporation Project No. 837393
Caltrans SR 12 Napa
Contact: Martha Adams
7/25/02
Contract 43A0078

Please analyze the 3 samples listed below for soluble lead by the WET on a 48 hour turn around time. These samples were submitted under separate C-O-C. Please report the results on separate reports.

Work Order ID 837393, SR 12 Napa.

	Lab Id.			Sample Id.		
1	14897	010		SR 12 -	52	-0.15
2	14897	016		SR 12 -	64	-0.15
3	14908	089		SR 12 -	99	-0.30

Post-it® Fax Note 7671	Date 7/25	# of pages ▶ 1
To Jennifer	From Ian Mackenzie	
Co./Dept.	Co. SHAW	
Phone #	Phone # 565-4352	
Fax # 362-0947	Fax #	

RECEIVING
7/25/02 11:20

Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Martha Adams
Shaw Environmental & Infrastructure
1326 N. Market Blvd.
Sacramento, CA 95834

Client	Shaw Environmental & Infrastructure
Workorder	14966 837393 SR12 Napa
Received	07/25/02

The samples were received in EPA specified containers. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

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MSD - Matrix Spike Duplicate
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LCSD - Lab Control Sample Duplicate
RPD - Relative Percent Difference
QC - Additional Quality Control
DIL - Results from a diluted sample
ND - None Detected
RL - Reporting Limit

Note: In an effort to conserve paper, the results are printed on both sides of the paper.

Ray James
Laboratory Director

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Sparger Technology, Inc.
Environmental Laboratories

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Test Certificate of Analysis

Client ID Shaw Environmental & Infrastructure
Workorder # 14966 **Workorder ID** 837393 SR12 Napa

Parameter Lead
Method 6010B STLC-DI

Lab ID	Sample ID	Result	RL	Units	Collected	Analyzed	Matrix	Dilution
14966001	SR12-115-0.15	1.10	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966002	SR12-116-0.15	1.29	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966003	SR12-116-0.45	0.453	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966004	SR12-117-0.15	1.58	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966005	SR12-117-0.30	1.56	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966006	SR12-117-0.45	1.41	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966007	SR12-119-0.15	2.74	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966008	SR12-119-0.30	2.00	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966009	SR12-119-0.45	1.59	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966010	SR12-120-0.45	0.640	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966011	SR12-121-0.15	0.801	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966012	SR12-121-0.30	0.770	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966013	SR12-122-0.15	1.16	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966014	SR12-125-0.15	1.81	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966015	SR12-126-0.15	1.23	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966016	SR12-138-0.15	3.23	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966017	SR12-138-0.30	3.15	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966018	SR12-138-0.45	2.49	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966019	SR12-143-0.45	4.43	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966020	SR12-144-0.15	3.01	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966021	SR12-144-0.30	2.72	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966022	SR12-144-0.45	3.02	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966023	SR12-146-0.15	2.47	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966024	SR12-146-0.30	1.92	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966025	SR12-146-0.45	7.63	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966026	SR12-148-0.45	1.88	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966027	SR12-149-0.15	1.58	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966028	SR12-149-0.30	3.28	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966029	SR12-150-0.15	1.20	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966030	SR12-150-0.30	1.11	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966031	SR12-150-0.45	2.03	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966032	SR12-158-0.30	2.51	0.010	mg/L	07/08/02	07/29/02	Soil	1:1
14966033	SR12-159-0.30	1.08	0.010	mg/L	07/08/02	07/29/02	Soil	1:1

3050 Fite Circle, Suite 112 • Sacramento, California 95827 • (916) 362-8947 • FAX (916) 362-0947

Client's Name: Martha Adams **Company:** Shaw E & I

Work Order # 14949
IT Project # 837393 SR12 Napa **Date:** 7/25/02

The following samples were analyzed for STLC and results were 5 ppm or greater. Please fax us a confirmation requesting to begin the STLC-DI analysis. Thank you. Martha Adams 48-hr TAT

Note: The units for the "Result" column are in ppm.

	LAB WO ID	QUEUE	PROC CODE	PROC DESC	HSN	Result	CLIENT SAMPLE ID
1	14949	ICP	6010 C Pb	Pb by ICP	14949001	7.57	SR 12-115-0.15.
2	14949	ICP	6010 C Pb	Pb by ICP	14949003	6.48	SR 12-116-0.15.
3	14949	ICP	6010 C Pb	Pb by ICP	14949005	5.1	SR 12-116-0.45.
4	14949	ICP	6010 C Pb	Pb by ICP	14949006	8.96	SR 12-117-0.15.
5	14949	ICP	6010 C Pb	Pb by ICP	14949007	7.91	SR 12-117-0.30.
6	14949	ICP	6010 C Pb	Pb by ICP	14949008	6.84	SR 12-117-0.45.
7	14949	ICP	6010 C Pb	Pb by ICP	14949009	9.92	SR 12-119-0.15.
8	14949	ICP	6010 C Pb	Pb by ICP	14949010	8.06	SR 12-119-0.30.
9	14949	ICP	6010 C Pb	Pb by ICP	14949011	7.83	SR 12-119-0.45.
10	14949	ICP	6010 C Pb	Pb by ICP	14949014	8.71	SR 12-120-0.45.
11	14949	ICP	6010 C Pb	Pb by ICP	14949015	7.33	SR 12-121-0.15.
12	14949	ICP	6010 C Pb	Pb by ICP	14949016	6.08	SR 12-121-0.30.
13	14949	ICP	6010 C Pb	Pb by ICP	14949018	6.57	SR 12-122-0.15.
14	14949	ICP	6010 C Pb	Pb by ICP	14949024	5.45	SR 12-125-0.15.
15	14949	ICP	6010 C Pb	Pb by ICP	14949027	5.74	SR 12-126-0.15.
16	14949	ICP	6010 C Pb	Pb by ICP	14949039	6.11	SR 12-138-0.15.
17	14949	ICP	6010 C Pb	Pb by ICP	14949040	7.9	SR 12-138-0.30.
18	14949	ICP	6010 C Pb	Pb by ICP	14949041	8.42	SR 12-138-0.45.
19	14949	ICP	6010 C Pb	Pb by ICP	14949046	6.6	SR 12-143-0.45.
20	14949	ICP	6010 C Pb	Pb by ICP	14949047	6.15	SR 12-144-0.15.
21	14949	ICP	6010 C Pb	Pb by ICP	14949048	6.87	SR 12-144-0.30.
22	14949	ICP	6010 C Pb	Pb by ICP	14949049	5.76	SR 12-144-0.45.
23	14949	ICP	6010 C Pb	Pb by ICP	14949050	7.45	SR 12-146-0.15.
24	14949	ICP	6010 C Pb	Pb by ICP	14949051	7.6	SR 12-146-0.30.
25	14949	ICP	6010 C Pb	Pb by ICP	14949052	14.1	SR 12-146-0.45.
26	14949	ICP	6010 C Pb	Pb by ICP	14949055	6.83	SR 12-148-0.45.

RECEIVING
7/25/02 11:15

48 Hour
Rush!

14966

	LAB WO ID	QUEUE	PROC CODE	PROC DESC	LSHSN	Result	CUST SAMPLE ID
27	14949	ICP	6010 C Pb	Pb by ICP	14949056	13	SR 12-149-0.15.
28	14949	ICP	6010 C Pb	Pb by ICP	14949057	17.5	SR 12-149-0.30.
29	14949	ICP	6010 C Pb	Pb by ICP	14949058	9.78	SR 12-150-0.15.
30	14949	ICP	6010 C Pb	Pb by ICP	14949059	11.2	SR 12-150-0.30.
31	14949	ICP	6010 C Pb	Pb by ICP	14949060	17.2	SR 12-150-0.45.
32	14949	ICP	6010 C Pb	Pb by ICP	14949072	10.4	SR 12-158-0.30.
33	14949	ICP	6010 C Pb	Pb by ICP	14949074	5.05	SR 12-159-0.30.

APPENDIX G
STATISTICAL ANALYSIS SPREADSHEETS, STATE ROUTE 12

STATS, SR 12 WIDENING, NAPA AND SOLANO COUNTY, CALIFORNIA

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	PH
N	477	227	91	49
LO 80% CI	64.479	5.1323	2.2015	6.5525
MEAN	69.264	5.5463	2.5648	6.6163
UP 80% CI	74.049	5.9604	2.9282	6.6801
SD	81.432	4.8532	2.6848	0.3436
VARIANCE	6631.1	23.554	7.2081	0.1181
SE MEAN	3.7285	0.3221	0.2814	0.0491
MINIMUM	1.0000	0.6000	0.3580	6.0000
MAXIMUM	966.00	36.600	21.100	7.2000

CORRELATIONS (PEARSON)
ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL
WET	**0.8862**

CASES INCLUDED 227 MISSING CASES 250

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.04286	0.00149	28.76	0.0000

R-SQUARED	0.7854	RESID. MEAN SQUARE (MSE)	11.6835
ADJUSTED R-SQUARED	0.7845	STANDARD DEVIATION	3.41811

SOURCE	DF	SS	MS	F	P
REGRESSION	1	9665.67	9665.67	827.29	0.0000
RESIDUAL	226	2640.47	11.6835		
TOTAL	227	12306.1			

CASES INCLUDED 227 MISSING CASES 250

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	-1.2217	LOWER FITTED BOUND	3.0321
PREDICTED VALUE	**3.1739**	FITTED VALUE	3.1739
UPPER PREDICTED BOUND	7.5695	UPPER FITTED BOUND	3.3157
SE (PREDICTED VALUE)	3.4199	SE (FITTED VALUE)	0.1103

UNUSUALNESS (LEVERAGE)	0.0010
PERCENT COVERAGE	80.0
CORRESPONDING T	1.29

PREDICTOR VALUES: TOTAL = 74.049

CORRELATIONS (PEARSON)
ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL
DIWET	**0.8976**

CASES INCLUDED 91 MISSING CASES 386

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.01605	8.309E-04	19.32	0.0000

R-SQUARED	0.8056	RESID. MEAN SQUARE (MSE)	2.69364
ADJUSTED R-SQUARED	0.8035	STANDARD DEVIATION	1.64123

SOURCE	DF	SS	MS	F	P
REGRESSION	1	1004.93	1004.93	373.08	0.0000
RESIDUAL	90	242.428	2.69364		
TOTAL	91	1247.36			

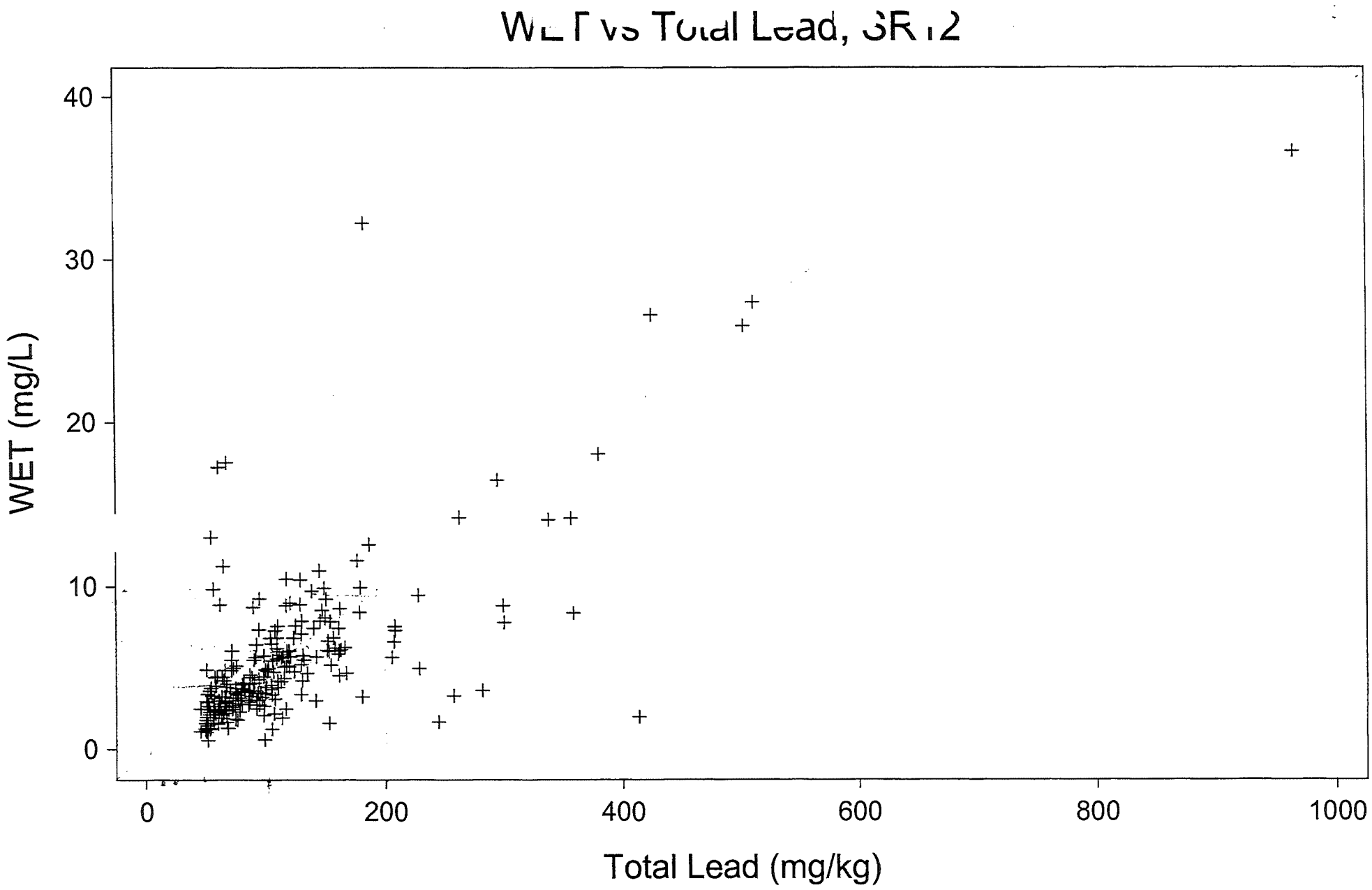
CASES INCLUDED 91 MISSING CASES 386

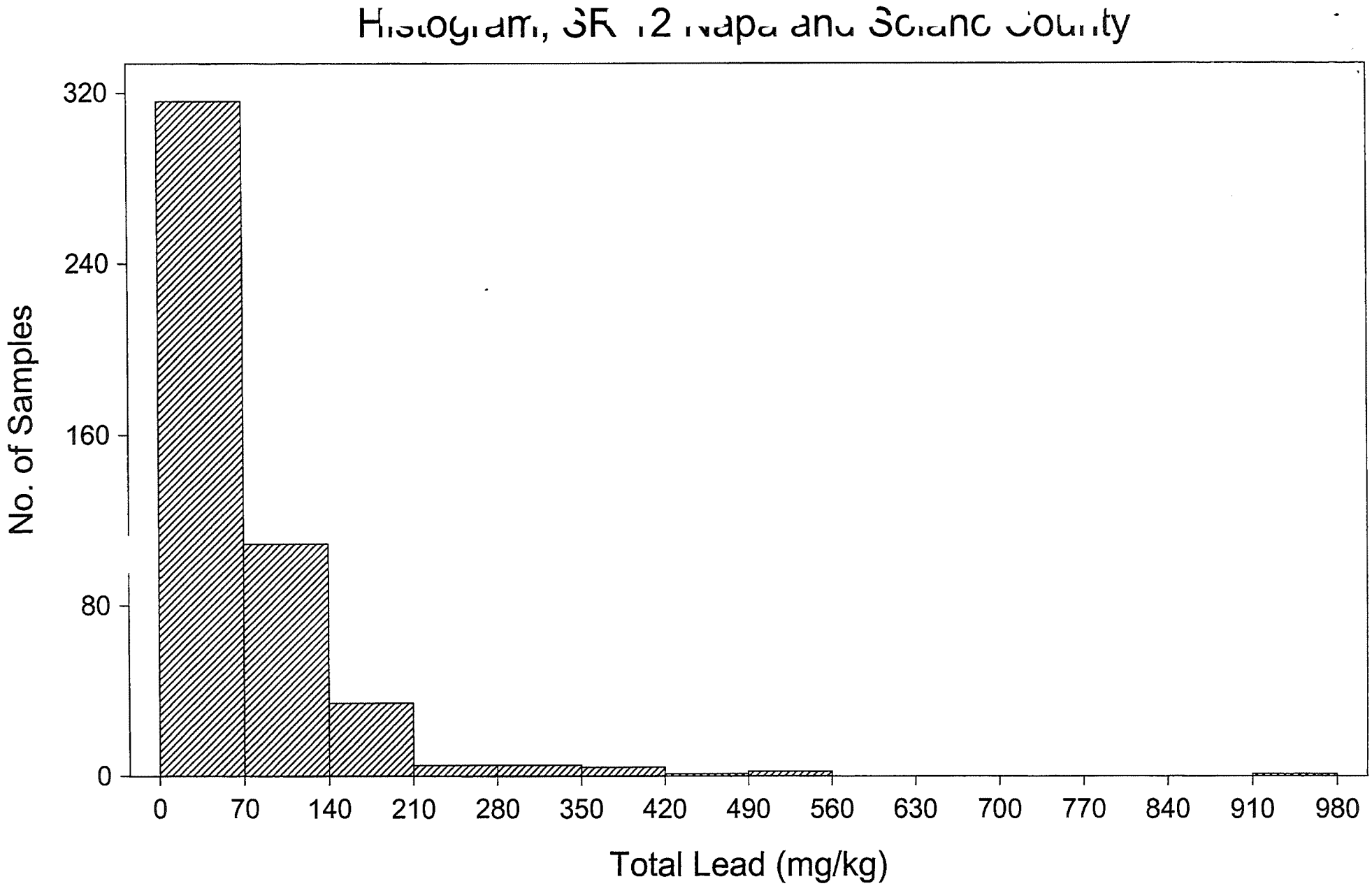
PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	-0.9320	LOWER FITTED BOUND	1.1089
PREDICTED VALUE	**1.1883**	FITTED VALUE	1.1883
UPPER PREDICTED BOUND	3.3087	UPPER FITTED BOUND	1.2678
SE (PREDICTED VALUE)	1.6424	SE (FITTED VALUE)	0.0615

UNUSUALNESS (LEVERAGE)	0.0014
PERCENT COVERAGE	80.0
CORRESPONDING T	1.29

PREDICTOR VALUES: TOTAL = 74.049


WET vs Total Lead, 3R12
WET (mg/L)
40
30
20
10
0
0
200
400
600
800
1000
Total Lead (mg/kg)


Histogram, SR 12 Napa and Solano County
No. of Samples
320
240
160
80
0
0
70
140
210
280
350
420
490
560
630
700
770
840
910
980
Total Lead (mg/kg)

APPENDIX H
STATISTICAL ANALYSIS SPREADSHEETS, EA NO. 0A0400

STATS, SR 12, EA No. 0A0400

DESCRIPTIVE STATISTICS

	TOTAL	WET	DIWET	PH
N	66	51	35	7
LO 80% CI	121.99	7.0140	3.4698	6.8206
MEAN	139.70	7.9959	4.1161	7.0714
UP 80% CI	157.40	8.9778	4.7625	7.3222
SD	111.09	5.3994	2.9260	0.4608
VARIANCE	12342	29.154	8.5613	0.2124
SE MEAN	13.675	0.7561	0.4946	0.1742
MINIMUM	6.0000	1.0500	0.2950	6.5000
MAXIMUM	451.00	22.500	12.300	8.0000

CORRELATIONS (PEARSON)
ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL
WET	**0.9220**

CASES INCLUDED 51 MISSING CASES 15

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF WET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.04398	0.00261	16.84	0.0000

R-SQUARED	0.8501	RESID. MEAN SQUARE (MSE)	14.1414
ADJUSTED R-SQUARED	0.8471	STANDARD DEVIATION	3.76050

SOURCE	DF	SS	MS	F	P
REGRESSION	1	4011.25	4011.25	283.65	0.0000
RESIDUAL	50	707.070	14.1414		
TOTAL	51	4718.32			

CASES INCLUDED 51 MISSING CASES 15

PREDICTED/FITTED VALUES OF WET

LOWER PREDICTED BOUND	2.0883	LOWER FITTED BOUND	6.4619
PREDICTED VALUE	**7.0018**	FITTED VALUE	7.0018
UPPER PREDICTED BOUND	11.915	UPPER FITTED BOUND	7.5418
SE (PREDICTED VALUE)	3.7834	SE (FITTED VALUE)	0.4157

UNUSUALNESS (LEVERAGE)	0.0122
PERCENT COVERAGE	80.0
CORRESPONDING T	1.30

PREDICTOR VALUES: TOTAL = 159.20

CORRELATIONS (PEARSON)
ZERO INTERCEPT OPTION SELECTED: CORRELATIONS = COSINES

	TOTAL
DIWET	**0.9196**

CASES INCLUDED 35 MISSING CASES 31

UNWEIGHTED LEAST SQUARES LINEAR REGRESSION OF DIWET

NOTE: MODEL FORCED THROUGH ORIGIN

PREDICTOR VARIABLES	COEFFICIENT	STD ERROR	STUDENT'S T	P
TOTAL	0.01990	0.00146	13.65	0.0000

R-SQUARED	0.8456	RESID. MEAN SQUARE (MSE)	4.01443
ADJUSTED R-SQUARED	0.8411	STANDARD DEVIATION	2.00360

SOURCE	DF	SS	MS	F	P
REGRESSION	1	747.587	747.587	186.23	0.0000
RESIDUAL	34	136.491	4.01443		
TOTAL	35	884.077			

CASES INCLUDED 35 MISSING CASES 31

PREDICTED/FITTED VALUES OF DIWET

LOWER PREDICTED BOUND	0.5312	LOWER FITTED BOUND	2.8640
PREDICTED VALUE	**3.1674**	FITTED VALUE	3.1674
UPPER PREDICTED BOUND	5.8035	UPPER FITTED BOUND	3.4707
SE (PREDICTED VALUE)	2.0170	SE (FITTED VALUE)	0.2321

UNUSUALNESS (LEVERAGE)	0.0134
PERCENT COVERAGE	80.0
CORRESPONDING T	1.31

PREDICTOR VALUES: TOTAL = 159.20

BOOTSTRAP
SR 12, EA NO 0A0400
NAPA COUNTY, CA

SR 12, EA No. 0A0400

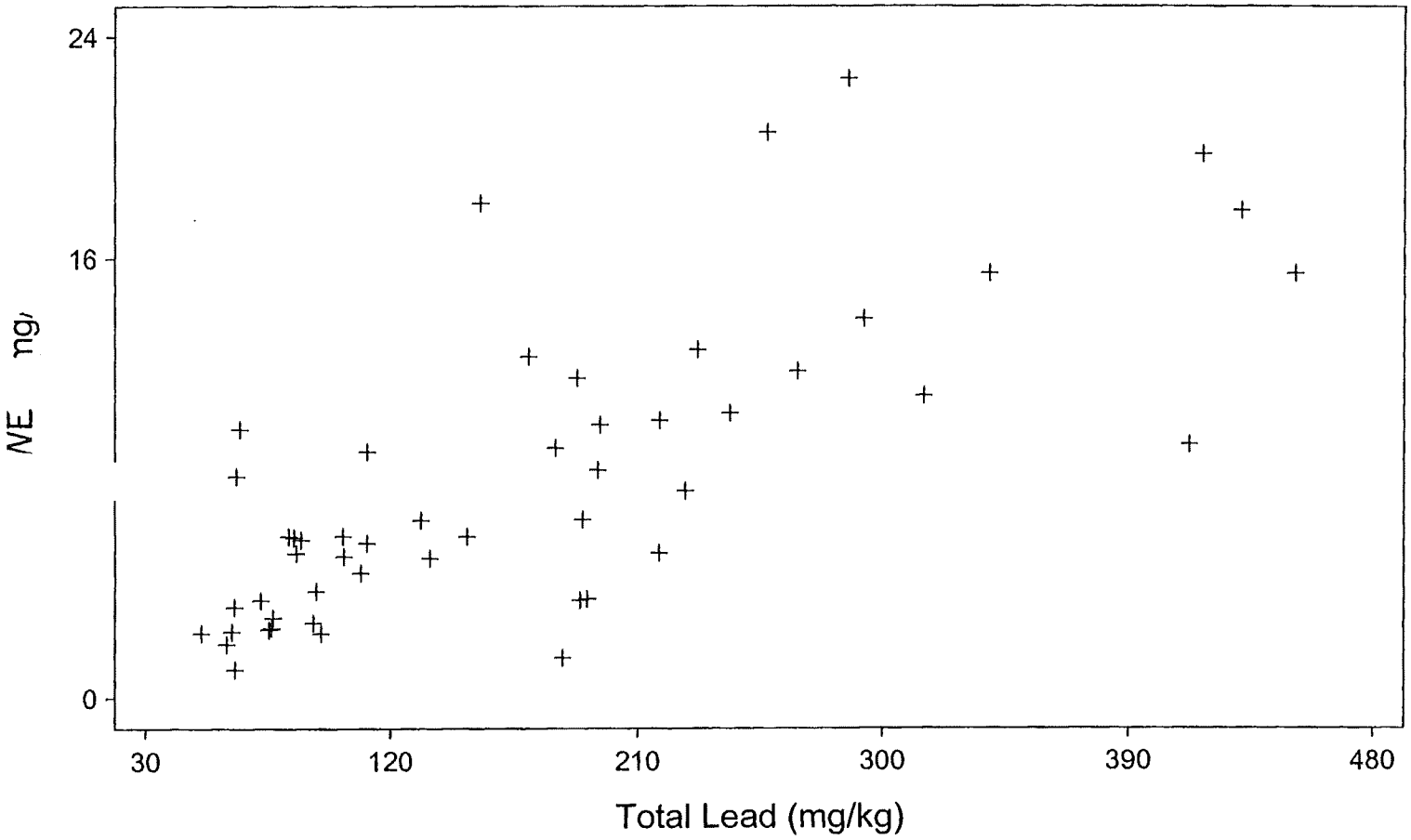
Analyte	LOD	Concentration	Sample Designation (site #boring #-depth)			Depth	Result	Qualifier	Weight	
Lead (mg/kg)	1	60.00	SR12-RT-	1	-0.15	0.15	60.00	=	1	**ME Avg**
Lead (mg/kg)	1	51.00	SR12-RT-	1	-0.30	0.30	51.00	=	1	**139.697**
Lead (mg/kg)	1	189.00	SR12-RT-	1	-0.45	0.45	189.00	=	1	
Lead (mg/kg)	1	131.00	SR12-RT-	2	-0.15	0.15	131.00	=	1	
Lead (mg/kg)	1	288.00	SR12-RT-	2	-0.30	0.30	288.00	=	1	
Lead (mg/kg)	1	339.00	SR12-RT-	2	-0.45	0.45	339.00	=	1	
Lead (mg/kg)	1	95.00	SR12-RT-	3	-0.15	0.15	95.00	=	1	
Lead (mg/kg)	1	77.00	SR12-RT-	3	-0.30	0.30	77.00	=	1	
Lead (mg/kg)	1	62.00	SR12-RT-	3	-0.45	0.45	62.00	=	1	
Lead (mg/kg)	1	39.00	SR12-RT-	4	-0.15	0.15	39.00	=	1	
Lead (mg/kg)	1	183.00	SR12-RT-	4	-0.30	0.30	183.00	=	1	
Lead (mg/kg)	1	18.00	SR12-RT-	4	-0.45	0.45	18.00	=	1	
Lead (mg/kg)	1	36.00	SR12-RT-	5	-0.15	0.15	36.00	=	1	
Lead (mg/kg)	1	29.00	SR12-RT-	5	-0.30	0.30	29.00	=	1	
Lead (mg/kg)	1	31.00	SR12-RT-	5	-0.45	0.45	31.00	=	1	
Lead (mg/kg)	1	412.00	SR12-RT-	6	-0.15	0.15	412.00	=	1	
Lead (mg/kg)	1	93.00	SR12-RT-	6	-0.30	0.30	93.00	=	1	
Lead (mg/kg)	1	48.00	SR12-RT-	6	-0.45	0.45	48.00	=	1	
Lead (mg/kg)	1	431.00	SR12-RT-	7	-0.15	0.15	431.00	=	1	
Lead (mg/kg)	1	192.00	SR12-RT-	7	-0.30	0.30	192.00	=	1	
Lead (mg/kg)	1	417.00	SR12-RT-	7	-0.45	0.45	417.00	=	1	
Lead (mg/kg)	1	190.00	SR12-RT-	8	-0.15	0.15	190.00	=	1	
Lead (mg/kg)	1	218.00	SR12-RT-	8	-0.30	0.30	218.00	=	1	
Lead (mg/kg)	1	218.00	SR12-RT-	8	-0.45	0.45	218.00	=	1	
Lead (mg/kg)	1	196.00	SR12-RT-	9	-0.15	0.15	196.00	=	1	
Lead (mg/kg)	1	315.00	SR12-RT-	9	-0.30	0.30	315.00	=	1	
Lead (mg/kg)	1	269.00	SR12-RT-	9	-0.45	0.45	269.00	=	1	
Lead (mg/kg)	1	92.00	SR12-RT-	10	-0.15	0.15	92.00	=	1	
Lead (mg/kg)	1	180.00	SR12-RT-	10	-0.30	0.30	180.00	=	1	
Lead (mg/kg)	1	77.00	SR12-RT-	10	-0.45	0.45	77.00	=	1	
Lead (mg/kg)	1	48.00	SR12-RT-	11	-0.15	0.15	48.00	=	1	
Lead (mg/kg)	1	109.00	SR12-RT-	11	-0.30	0.30	109.00	=	1	

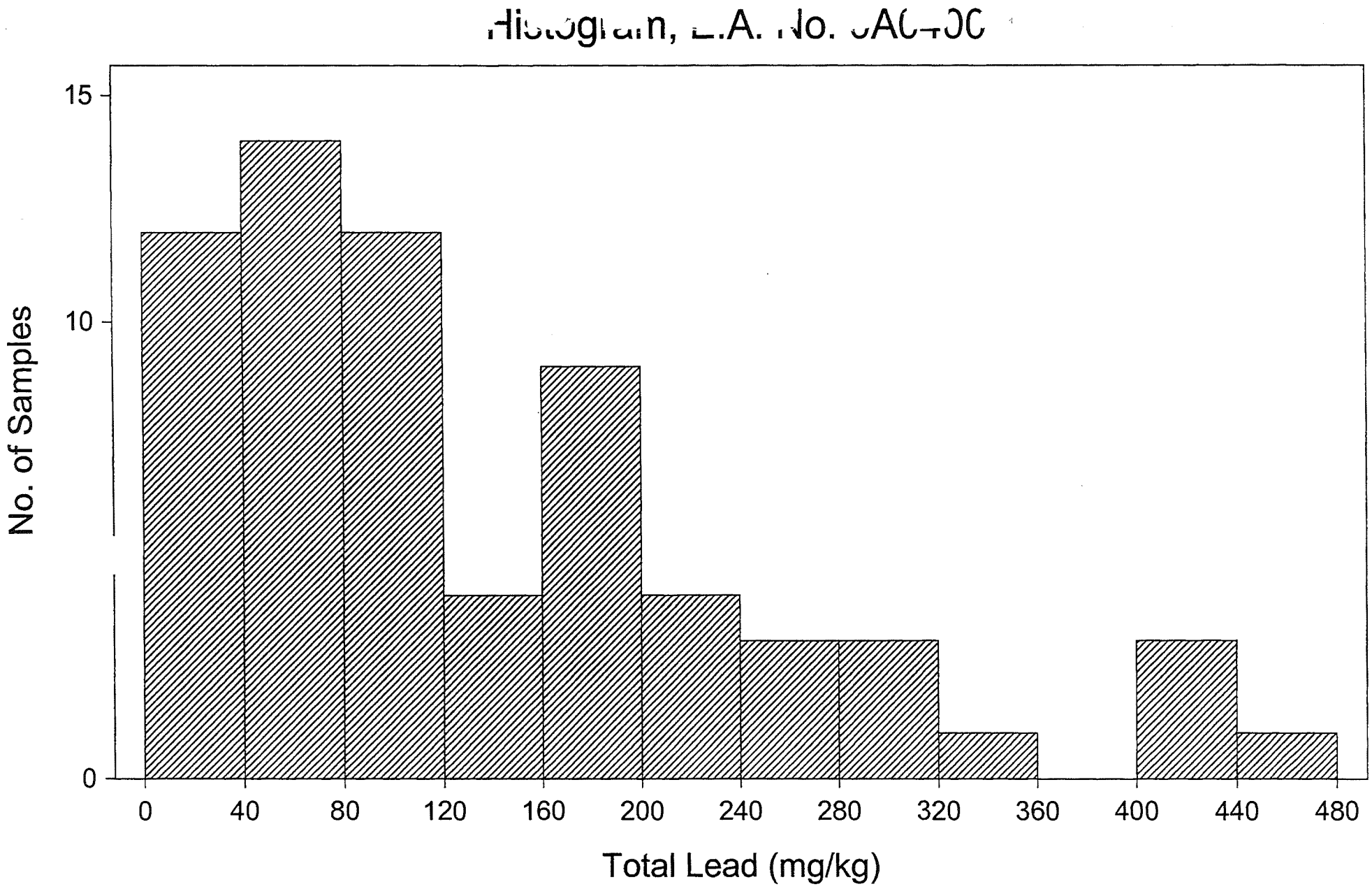
NP Bootstrap 90% UCLs
Site Mean
159.20

BOOTSTRAP
SR 12, EA NO 0A0400
NAPA COUNTY, CA

Analyte	LOD	Concentration	(site #boring #-depth)			Depth	Result	Qualifier	Weight
Lead (mg/kg)	1	85.00	SR12-RT-	11	-0.45	0.45	85.00	=	1
Lead (mg/kg)	1	65.00	SR12-RT-	12	-0.15	0.15	65.00	=	1
Lead (mg/kg)	1	195.00	SR12-RT-	12	-0.30	0.30	195.00	=	1
Lead (mg/kg)	1	153.00	SR12-RT-	12	-0.45	0.45	153.00	=	1
Lead (mg/kg)	1	228.00	SR12-RT-	13	-0.15	0.15	228.00	=	1
Lead (mg/kg)	1	63.00	SR12-RT-	13	-0.30	0.30	63.00	=	1
Lead (mg/kg)	1	6.00	SR12-RT-	13	-0.45	0.45	6.00	=	1
Lead (mg/kg)	1	83.00	SR12-RT-	14	-0.15	0.15	83.00	=	1
Lead (mg/kg)	1	293.00	SR12-RT-	14	-0.30	0.30	293.00	=	1
Lead (mg/kg)	1	76.00	SR12-RT-	14	-0.45	0.45	76.00	=	1
Lead (mg/kg)	1	112.00	SR12-RT-	15	-0.15	0.15	112.00	=	1
Lead (mg/kg)	1	232.00	SR12-RT-	15	-0.30	0.30	232.00	=	1
Lead (mg/kg)	1	170.00	SR12-RT-	15	-0.45	0.45	170.00	=	1
Lead (mg/kg)	1	48.00	SR12-RT-	16	-0.15	0.15	48.00	=	1
Lead (mg/kg)	1	135.00	SR12-RT-	16	-0.30	0.30	135.00	=	1
Lead (mg/kg)	1	103.00	SR12-RT-	16	-0.45	0.45	103.00	=	1
Lead (mg/kg)	1	23.00	SR12-RT-	17	-0.15	0.15	23.00	=	1
Lead (mg/kg)	1	22.00	SR12-RT-	17	-0.30	0.30	22.00	=	1
Lead (mg/kg)	1	31.00	SR12-RT-	17	-0.45	0.45	31.00	=	1
Lead (mg/kg)	1	26.00	SR12-RT-	18	-0.15	0.15	26.00	=	1
Lead (mg/kg)	1	22.00	SR12-RT-	18	-0.30	0.30	22.00	=	1
Lead (mg/kg)	1	64.00	SR12-RT-	18	-0.45	0.45	64.00	=	1
Lead (mg/kg)	1	39.00	SR12-RT-	19	-0.15	0.15	39.00	=	1
Lead (mg/kg)	1	87.00	SR12-RT-	19	-0.30	0.30	87.00	=	1
Lead (mg/kg)	1	86.00	SR12-RT-	19	-0.45	0.45	86.00	=	1
Lead (mg/kg)	1	73.00	SR12-RT-	20	-0.15	0.15	73.00	=	1
Lead (mg/kg)	1	103.00	SR12-RT-	20	-0.30	0.30	103.00	=	1
Lead (mg/kg)	1	112.00	SR12-RT-	20	-0.45	0.45	112.00	=	1
Lead (mg/kg)	1	63.00	SR12-RT-	21	-0.15	0.15	63.00	=	1
Lead (mg/kg)	1	258.00	SR12-RT-	21	-0.30	0.30	258.00	=	1
Lead (mg/kg)	1	451.00	SR12-RT-	21	-0.45	0.45	451.00	=	1
Lead (mg/kg)	1	188.00	SR12-RT-	22	-0.15	0.15	188.00	=	1
Lead (mg/kg)	1	244.00	SR12-RT-	22	-0.30	0.30	244.00	=	1
Lead (mg/kg)	1	148.00	SR12-RT-	22	-0.45	0.45	148.00	=	1

E.A. No. 0A0400, WET vs TOTAL




Histogram, E.A. No. 3A0-40
No. of Samples
15
10
0
0
40
80
120
160
200
240
280
320
360
400
440
480
Total Lead (mg/kg)

PREPARED FOR:
MARK THOMAS & COMPANY
1960 ZANKER ROAD
SAN JOSE, CALIFORNIA

PREPARED BY:
GEOCON CONSULTANTS, INC.
6671 BRISA STREET
LIVERMORE, CALIFORNIA

GEOCON

GEOCON PROJECT No. E8481-06-01

AUGUST 2009

GEOCON
CONSULTANTS, INC.
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. E8481-06-01
August 18, 2009

Mr. John Kenyon
Mark Thomas & Company, Inc.
1960 Zanker Road
San Jose, California 95112

Subject: JAMESON CANYON ROAD IMPROVEMENT PROJECT
NAPA AND SOLANO COUNTIES, CALIFORNIA
LIMITED SITE INVESTIGATION REPORT

Dear Mr. Kenyon:

Geocon has performed environmental engineering services at the subject site in general accordance with the scope of work outlined in our Workplan dated March 31, 2009. The subject site consists of properties proposed for partial land acquisition along an approximate 6-mile segment of Jameson Canyon Road. The project area extends from Red Top Road in Solano County to approximately 700 feet east of Kelly Road in Napa County.

The accompanying report summarizes the services performed including limited soil sample collection from soil borings advanced using hand-auger and direct-push drilling equipment, and laboratory testing.

The contents of this report reflect the views of Geocon Consultants, Inc., who is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the State of California or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

If there are any questions concerning the contents of this report, or if Geocon may be of further service, please contact the undersigned at your convenience.

Sincerely,

GEOCON CONSULTANTS, INC.

Lauren Vigliotti
Senior Staff Geologist

Richard Day, CEG, CHG
Vice President

PROFESSIONAL GEOLOGIST
RICHARD W. DAY
No. 5479
Exp. 09-30-09
STATE OF CALIFORNIA

LJV:RWD

(6+pdf) Addressee

TABLE OF CONTENTS

Page

1.0 INTRODUCTION 1
- 1.1 Purpose 1
- 1.2 Proposed Improvements 1

2.0 BACKGROUND 2
- 2.1 Hazardous Waste Determination Criteria 2
- 2.2 Environmental Screening Levels 3

3.0 SCOPE OF SERVICES 3
- 3.1 Pre-field Activities 3
- 3.2 Field Activities 3

4.0 INVESTIGATIVE METHODS 4
- 4.1 Sampling Procedures 4
- 4.2 Laboratory Analyses 4
- 4.3 Quality Assurance/Quality Control Procedures 5

5.0 INVESTIGATIVE RESULTS 5
- 5.1 Soil Analytical Results 5
- 5.2 Laboratory Quality Assurance/Quality Control 6

6.0 CONCLUSIONS AND RECOMMENDATIONS 7
- 6.1 CAM17 Metals 7
- 6.2 Petroleum Hydrocarbon Compounds 8
- 6.3 Pesticides and Herbicides 8
- 6.4 Worker Protection 9

7.0 REPORT LIMITATIONS 10

FIGURES
1. Vicinity Map
2a-e. Site Plans

TABLES
1. Boring Coordinates
2. Summary of CAM17 Metals Results
3. Summary of Organics Results
4. Summary of pH Results

APPENDICES
A. Laboratory Analytical Reports and Chain-of-custody Documentation
B. Arsenic, Vanadium and TPH Statistics

LIMITED SITE INVESTIGATION REPORT

1.0 INTRODUCTION

This *Limited Site Investigation Report* was prepared for the Jameson Canyon Road Improvement Project in Napa and Solano Counties, California. The project site consists of properties proposed for partial land acquisition along an approximate 6-mile segment of Jameson Canyon Road. The project area extends from Red Top Road in Solano County to approximately 700 feet east of Kelly Road in Napa County (the Site). Partial land acquisition is proposed for 27 parcels located adjacent to existing California Department of Transportation (Caltrans) right-of-way (ROW) within the project area. Proposed partial acquisition parcels include vineyards, residential properties, a golf course, agricultural land, and California Department of Water Resources ROW.

This report documents the limited site investigation for metals, petroleum hydrocarbons, organochlorine pesticides, and herbicides in shallow soil within the limits of Jameson Canyon Road Improvement Project site, as depicted on the Vicinity Map, Figure 1. The soil boring locations advanced during the site investigation are depicted on the Site Plans, Figures 2a through 2e.

1.1 Purpose

The purpose of the scope of services was to evaluate whether impacts due to petroleum hydrocarbons, metals, pesticides, or herbicides exist in the surface and near-surface soil on portions of private property parcels proposed for acquisition within the project area. The investigation results will be used to evaluate waste classification, soil reuse/disposal options, soil handling practices, and worker health and safety precautions.

1.2 Proposed Improvements

The Jameson Canyon Road Improvement Project is proposed to include the following:

- Constructing an additional lane in each direction to create a four-lane roadway, and
- Widening entrance and exit lanes to rural surface streets within the project area.

Soil borings were advanced at private properties proposed for acquisition adjacent to existing Caltrans ROW using hand-auger techniques. Soil samples were collected from two depth intervals from each boring for the purpose of evaluating potential vertical impacts to soil. Selected soil samples were analyzed for metals, petroleum hydrocarbon compounds, pesticides, herbicides, and pH.

2.0 BACKGROUND

2.1 Hazardous Waste Determination Criteria

Regulatory criteria to classify a waste as California hazardous for handling and disposal purposes are contained in the CCR, Title 22, Division 4.5, Chapter 11, Article 3, §66261.24. Criteria to classify a waste as Resource, Conservation, and Recovery Act (RCRA) hazardous are contained in Chapter 40 of the Code of Federal Regulations (40 CFR), Section 261.

For waste containing metals, the waste is classified as California hazardous when: 1) the total metal content exceeds the respective Total Threshold Limit Concentration (TTLC); or 2) the soluble metal content exceeds the respective Soluble Threshold Limit Concentration (STLC) based on the standard Waste Extraction Test (WET). A waste has the potential of exceeding the STLC when the waste's total metal content is greater than or equal to ten times the respective STLC value since the WET uses a 1:10 dilution ratio. Hence, when a total metal is detected at a concentration greater than or equal to ten times the respective STLC, and assuming that 100 percent of the total metals are soluble, soluble metal analysis is required. A material is classified as RCRA hazardous, or Federal hazardous, when the soluble metal content exceeds the Federal regulatory level based on the Toxicity Characteristic Leaching Procedure (TCLP).

The above regulatory criteria are based on chemical concentrations. Wastes may also be classified as hazardous based on other criteria such as ignitability and corrosivity; however, for the purposes of this investigation, toxicity (i.e., lead concentrations) is the primary factor considered for waste classification since waste generated during the construction activities would not likely warrant testing for ignitability or other criteria. Waste that is classified as either California hazardous or RCRA hazardous requires management as a hazardous waste.

The Department of Toxic Substances Control (DTSC) regulates and interprets hazardous waste laws in California. The DTSC generally considers excavated or transported materials that exhibit "hazardous waste" characteristics to be a "waste" requiring proper management, treatment and disposal. Soil that contains lead above hazardous waste thresholds and is left in-place would not be necessarily classified by DTSC as a "waste." The DTSC has provided site-specific determinations that "movement of wastes within an area of contamination does not constitute "land disposal" and, thus, does not trigger hazardous waste disposal requirements. Therefore, lead-impacted soil that is scarified in-place, moisture-conditioned, and re-compacted during landscaping improvement activities might not be considered a "waste"; DTSC should be consulted to confirm waste classification. It is noted that in addition to DTSC regulations, health and safety requirements and other local agency requirements may also apply to the handling and disposal of lead-impacted soil. Waste that is classified as either

"California hazardous" or "RCRA hazardous," requires management as a hazardous waste and disposal at an appropriately permitted disposal facility.

2.2 Environmental Screening Levels

The San Francisco Bay Regional Water Quality Control Board (SFRWQCB) has prepared a technical report entitled *Screening For Environmental Concerns At Sites With Contaminated Soil and Groundwater, Interim Final - November 2007 (Revised May 2008)*, which presents Environmental Screening Levels (ESLs) for soil, groundwater, soil gas, and surface water, to assist in evaluating sites impacted by releases of hazardous chemicals. The ESLs are conservative values for more than 100 commonly detected contaminants, which may be used to compare with environmental data collected at a site. ESLs are strictly risk assessment tools and "not regulatory clean up standards." The presence of a chemical at concentrations in excess of an ESL does not necessarily indicate that adverse impacts to human health or the environment are occurring; this simply indicates that a potential for adverse risk may exist and that additional evaluation is or may be warranted (SFRWQCB, 2008).

This report includes comparisons to ESL Tables A and K-3 (Table A – Shallow Soil [≤3 meters below ground surface; bgs] - Groundwater is a Current or Potential Source of Drinking Water; Table K-3 – Direct Exposure Screening Levels – Construction/Trench Worker Scenario. The respective ESLs are listed at the end of Tables 2 and 3.

3.0 SCOPE OF SERVICES

The following sections present the scope of services performed by Geocon.

3.1 Pre-field Activities

- Prepared the *Limited Soil Investigation Workplan, Jameson Canyon Road, Napa and Solano Counties, California,* dated March 31, 2009.
- Prepared a health and safety plan (HSP) for the project that provided guidelines on the use of personal protective equipment and the health and safety procedures to be implemented during the investigation activities.
- Retained the services of Advanced Technology Laboratories (ATL) to perform the analyses of the soil samples.
- Notified Underground Service Alert (USA) at least 48 hours prior to fieldwork involving drilling or direct push sampling activities.

3.2 Field Activities

The field activities were conducted between May 12 and 15, 2009, and consisted of advancing soil borings at private properties adjacent to the eastbound and westbound shoulders of Jameson Canyon Road using hand methods. We collected a total of 116 soil samples from 58 borings at depth intervals

of 0 to 0.5 foot and 1.0 to 1.5 feet. Groundwater was not encountered the advancement of the soil borings.

Soil boring coordinates were obtained using global positioning system (GPS) equipment. The GPS coordinates are presented in Table 1 and boring locations are depicted on the Site Plans (Figures 2a through 2e).

4.0 INVESTIGATIVE METHODS

4.1 Sampling Procedures

The soil samples were retrieved using hand-auger methods. Soil samples were collected in stainless steel tubes secured with Teflon tape and plastic end caps, labeled, and placed in a chilled cooler for transport to the analytical laboratory. Completed soil borings were backfilled to surface grade with soil cuttings.

Sampling equipment was cleansed by washing the equipment with a Liquinox solution followed by two successive rinses with distilled water. The decontamination water was returned to the site surface away from storm drains and inlets in a manner not to create runoff.

The soil samples were transported to ATL for analysis, under standard chain-of-custody documentation.

4.2 Laboratory Analyses

Laboratory analyses were performed under a standard turn-around-time (TAT). Reproductions of the laboratory reports and chain-of-custody documentation are presented as Appendix A. The laboratory analyses performed are summarized below:

- A total of 29 soil samples were analyzed CAM17 metals following Environmental Protection Agency (EPA) Test Methods 6010/7471A.
- The 58 surface soil samples were initially analyzed for the following:
  - TPH as gasoline (TPHg), as diesel (TPHd), and as motor oil (TPHmo) using EPA Method 8015M
  - Benzene, toluene, ethylbenzene, total xylenes (BTEX) and methyl tert-butyl ether (MTBE) using EPA Test Method 8021
  - Organochlorine pesticides using EPA Test Method 8081
- Based on the surface sample results, six soil samples collected from the 1.0 to 1.5-foot depth interval were subsequently analyzed for TPHd and TPHmo using EPA Method 8015M
- A total of 13 soil samples were analyzed for soil pH following EPA Test Method 9045

4.3 Quality Assurance/Quality Control Procedures

Quality assurance/quality control (QA/QC) procedures were performed for each method of analysis with specificity for each analyte listed in the test method's QA/QC. The laboratory QA/QC procedures included the following:

- One method blank for every ten samples, batch of samples or type of matrix, whichever was more frequent.
- One sample analyzed in duplicate for every ten samples, batch of samples or type of matrix, whichever was more frequent.
- One spiked sample for every ten samples, batch of samples or type of matrix, whichever was more frequent, with spike made at ten times the detection limit or at the analyte level.

Prior to submitting the soil samples to the laboratory, the chain-of-custody documentation was reviewed for accuracy and completeness.

5.0 INVESTIGATIVE RESULTS

5.1 Soil Analytical Results

Analytical results of the soil samples are summarized in Tables 2 through 4.

- Arsenic, barium, cadmium, cobalt, copper, nickel, vanadium, zinc, and mercury were reported in the soil samples at concentrations below ten times their respective STLC values. Antimony, beryllium, cadmium, molybdenum, selenium, silver, and thallium were not detected above their respective laboratory reporting limits in the soil samples.
- TPHg was not detected above the laboratory reporting limit of 1.0 milligrams per kilogram (mg/kg) in the soil samples.
- TPHd was reported at concentrations ranging from less than (<) the reporting limit of 1.0 to 190 mg/kg.
- TPHmo was reported at concentrations between 1.2 and 1,700 mg/kg.
- Pesticides were reported in the soil samples as follows:
  - Chlordane in sample B53-0 at a concentration of 0.011 mg/kg
  - 4,4'-DDT in three samples at concentrations between 0.0026 and 0.005 mg/kg
  - Dieldrin in sample B30-0 at a concentration of 0.0075 mg/kg
- Herbicides were not detected above their respective laboratory reporting limits in the samples.
- Reported soil pH values in the soil samples ranged from 5.6 to 7.5.

5.2 Laboratory Quality Assurance/Quality Control

We reviewed the laboratory QA/QC provided with the laboratory report. The data show non-detect results for the method blanks. The relative percent differences (RPDs) of the duplicate samples for three metals and one of the TPH analyses were outside criteria. Matrix spike (MS) and/or matrix spike duplicate (MSD) were outside recovery criteria for several analyses. The Case Narratives in the laboratory reports state that each analytical batch was validated by the laboratory control sample (LCS). The data showed acceptable recoveries and RPDs for the remainder of the duplicates and matrix spikes.

Several samples required dilution due to sample matrix. Surrogate recoveries for several samples were diluted out. However, acceptable reporting limits were achieved and other laboratory QA/QC samples were within criteria.

Based on surface sample results, TPHd and TPHmo analysis was requested for six deeper soil samples; however, the analysis request was submitted beyond sample holding time for four of the soil samples (B9-1.5, B17-1.5, B55-1.5, and B58-1.5).

Based on this limited data review, no additional qualifications of the soil data are necessary, and the data are of sufficient quality for the purposes of this report.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 CAM17 Metals

Based on a comparison of the total CAM17 metals concentrations to their respective STLCs and TTLCs, soil excavated from the Site should not be considered a hazardous waste based on metal content.

The mean and maximum CAM17 metals concentrations in soil were compared to ESLs (SFRWQCB, May 2008, Tables A and K-3) and with published background levels typically present in California soils as presented in *Background Concentrations of Trace and Major Elements in California Soils* (Kearney Foundation of Soil Science, Division of Agriculture and Natural Resources, University of California, March 1996). For those samples in which non-detect results were reported, a value equal to one-half of the laboratory reporting limit was used in the calculation. The statistical results are included in Appendix B.

Reported arsenic concentrations were between 3.7 and 10 mg/kg, which exceed the residential and commercial/industrial land use ESLs for shallow soil of 0.39 mg/kg and 1.6 mg/kg, respectively. However, reported arsenic concentrations are below the worker direct exposure ESL of 15 mg/kg. Reported vanadium concentrations were between 25 and 59 mg/kg in the soil samples, exceeding the residential land use ESL for shallow soil of 16 mg/kg. Reported vanadium concentrations are less than the ESLs for commercial land use and worker direct exposure of 200 mg/kg and 770 mg/kg, respectively. The reported means and maximums, ESLs and published background concentrations for arsenic and vanadium are summarized in the table below:

Metal	Mean	Maximum	Shallow Soil Residential ESL	Shallow Soil Commercial/ Industrial ESL	Worker Direct Exposure ESL	PUBLISHED BACKGROUND MEAN[1]	PUBLISHED BACKGROUND RANGE [1]
Arsenic	5.7	10	0.39	1.6	15	3.5	0.6 to 11.0
Vanadium	36.3	59	16	200	770	112	39 to 288

Concentrations reported in milligrams per kilogram (mg/kg); [1] Kearney Foundation of Soil Science, March 1996

The reported arsenic concentrations in the soil samples collected at the Site exceed the shallow soil ESLs; however, they are within the published background concentration range. The SFRWQCB *Update to Environmental Screening Levels (ESLs) Technical Document (November 2007, Revised May 2008)* states that ambient background concentrations of arsenic typically exceed risk-based screening levels. In such instances, it may be more appropriate to compare site data to regionally-specific established background levels. The reported vanadium concentrations for the soil samples collected at the Site are greater than the residential ESL and are less than the

Commercial/Industrial land use ESL, Direct Exposure – Construction/Trench Worker ESL, and the published background mean concentration (Kearney Foundation of Soil Science, 1996).

Based on the reported results for arsenic and vanadium, and comparisons to ESLs and published background concentrations, offsite reuse or disposal of soil may be restricted based on metals content, depending on proposed use.

6.2 Petroleum Hydrocarbon Compounds

TPHd was reported in six surface samples at concentrations exceeding its residential and commercial/industrial land use ESL of 83 mg/kg for shallow soil. TPHmo was reported in the same six surface samples and in one deeper soil sample at concentrations exceeding its residential ESL of 370 mg/kg. The reported TPHmo concentrations did not exceed its commercial ESL of 2,500 mg/kg.

Mean concentrations were calculated for the full set of TPHd and TPHmo results for soil samples collected at the Site. For those samples in which non-detect results were reported, a value equal to one-half of the laboratory reporting limit was used in the calculation. The statistical results are included in Appendix B.

The means, maximums, and ESLs for TPHd and TPHmo are summarized in the following table:

Compound	Mean	Maximum	Shallow Soil Residential ESL	Shallow Soil Commercial/ Industrial ESL	Worker Direct Exposure ESL
TPHd	20.6	190	83	83	4,200
TPHmo	128.6	1,700	370	2,500	12,000

Concentrations reported in milligrams per kilogram (mg/kg)

The mean concentrations for TPHd and TPHmo for soil samples collected at the Site are less than their respective residential ESLs; however, some reported TPHd concentrations exceed the residential and commercial/industrial land use ESL and some TPHmo concentrations exceed the residential ESL. Accordingly, offsite disposal or reuse of soil excavated from those areas with elevated TPHd and TPHmo concentrations may be restricted based on petroleum hydrocarbon content.

6.3 Pesticides and Herbicides

The pesticides 4,4'-DDT (in three samples), dieldrin (in one sample) and chlordane (in one sample) were the only pesticides detected in the 58 surface samples. The reported 4,4'-DDT and chlordane concentrations are less than their respective residential land use ESLs. The reported dieldrin concentration (0.0075 mg/kg) in sample B30-0 exceeds its residential and commercial land use ESLs

of 0.0023 mg/kg for shallow soil and is less than the worker direct exposure ESL of 21 mg/kg. Herbicides were not detected above laboratory reporting limits in the samples analyzed.

Based on the single detection of dieldrin exceeding its residential land use ESL out of 58 samples, offsite disposal or reuse of excavated soil should not be restricted based on pesticide content.

6.4 Worker Protection

Per Caltrans' requirements, the contractor(s) should prepare a project-specific health and safety plan (CCR Title 8, Section 1532.1) to minimize worker exposure to impacted soil. The plan should include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other health and safety protocols and procedures for the handling of lead-impacted soil.

7.0 REPORT LIMITATIONS

This report has been prepared exclusively for Mark Thomas and Company, Inc. The information contained herein is only valid as of the date of the field sampling and will require an update to reflect additional information obtained.

This report is not a comprehensive site characterization and should not be construed as such. The findings as presented in this report are predicated on the results of the limited sampling and laboratory testing performed. In addition, the information obtained is not intended to address potential impacts related to sources other than those specified herein. Therefore, the report should be deemed conclusive with respect to only the information obtained. We make no warranty, express or implied, with respect to the content of this report or any subsequent reports, correspondence or consultation. Geocon strived to perform the services summarized herein in accordance with the local standard of care in the geographic region at the time the services were rendered.

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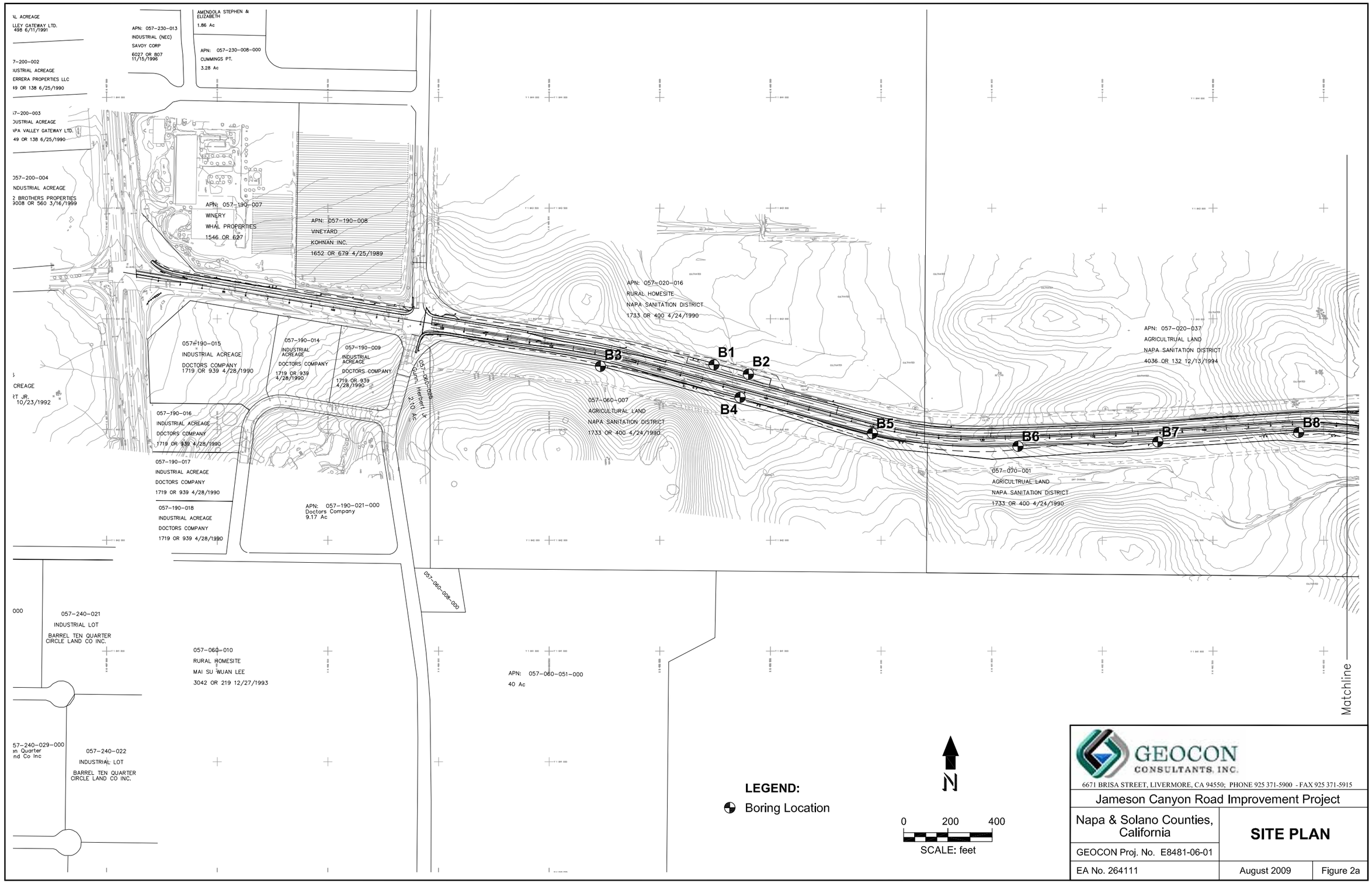
Highway 12W Improvement Project

Solano and Napa Counties, California

VICINITY MAP

E8481-06-04	August 2009	Figure 1



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Jameson Canyon Road Improvement Project

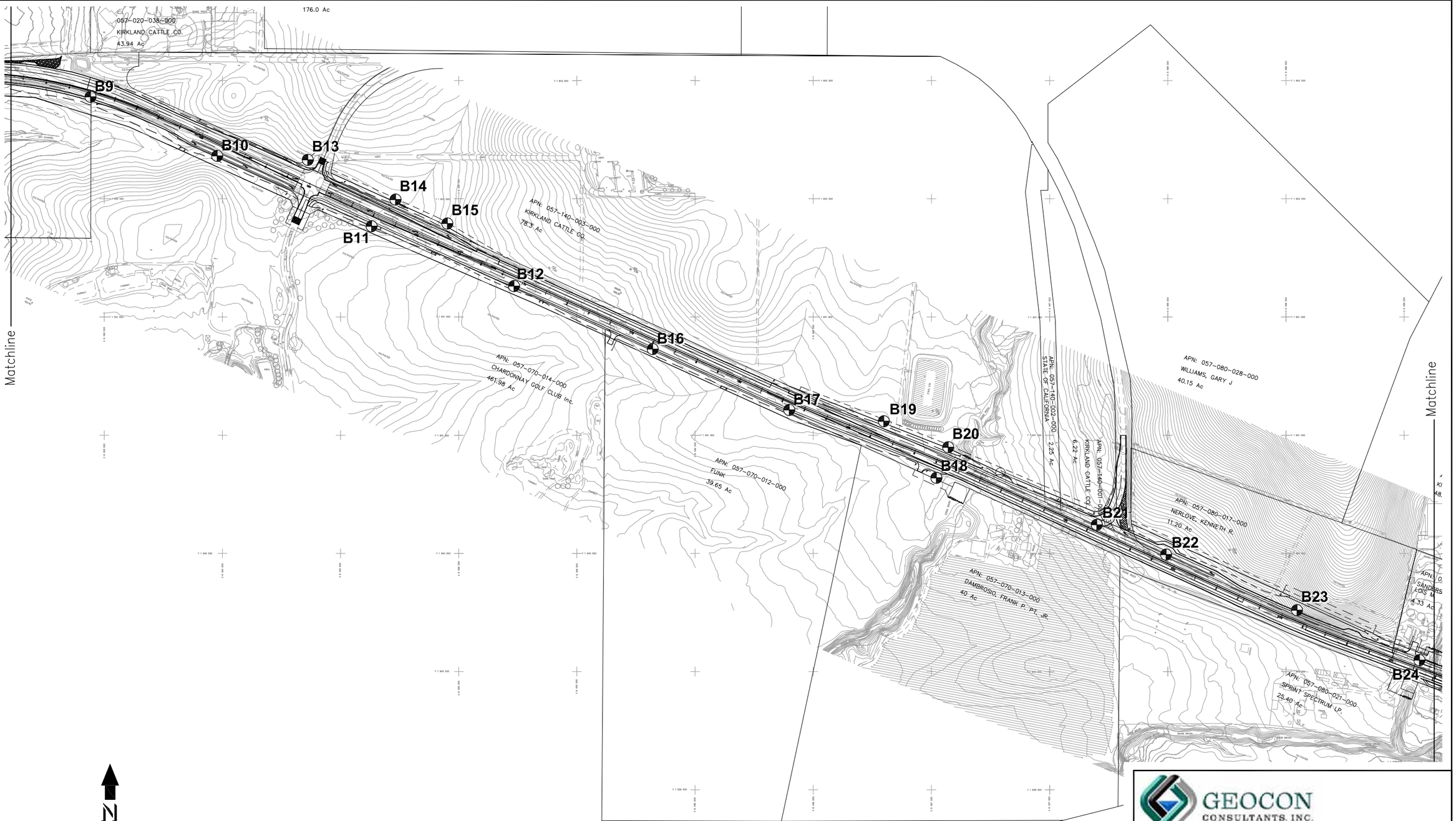
Napa & Solano Counties, California

SITE PLAN

GEOCON Proj. No. E8481-06-01

EA No. 264111 | August 2009 | Figure 2a

SITE0609.DWG



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Jameson Canyon Road Improvement Project

Napa & Solano Counties, California

SITE PLAN

GEOCON Proj. No. E8481-06-01

EA No. 264111

August 2009

Figure 2b

SITE0609.DWG

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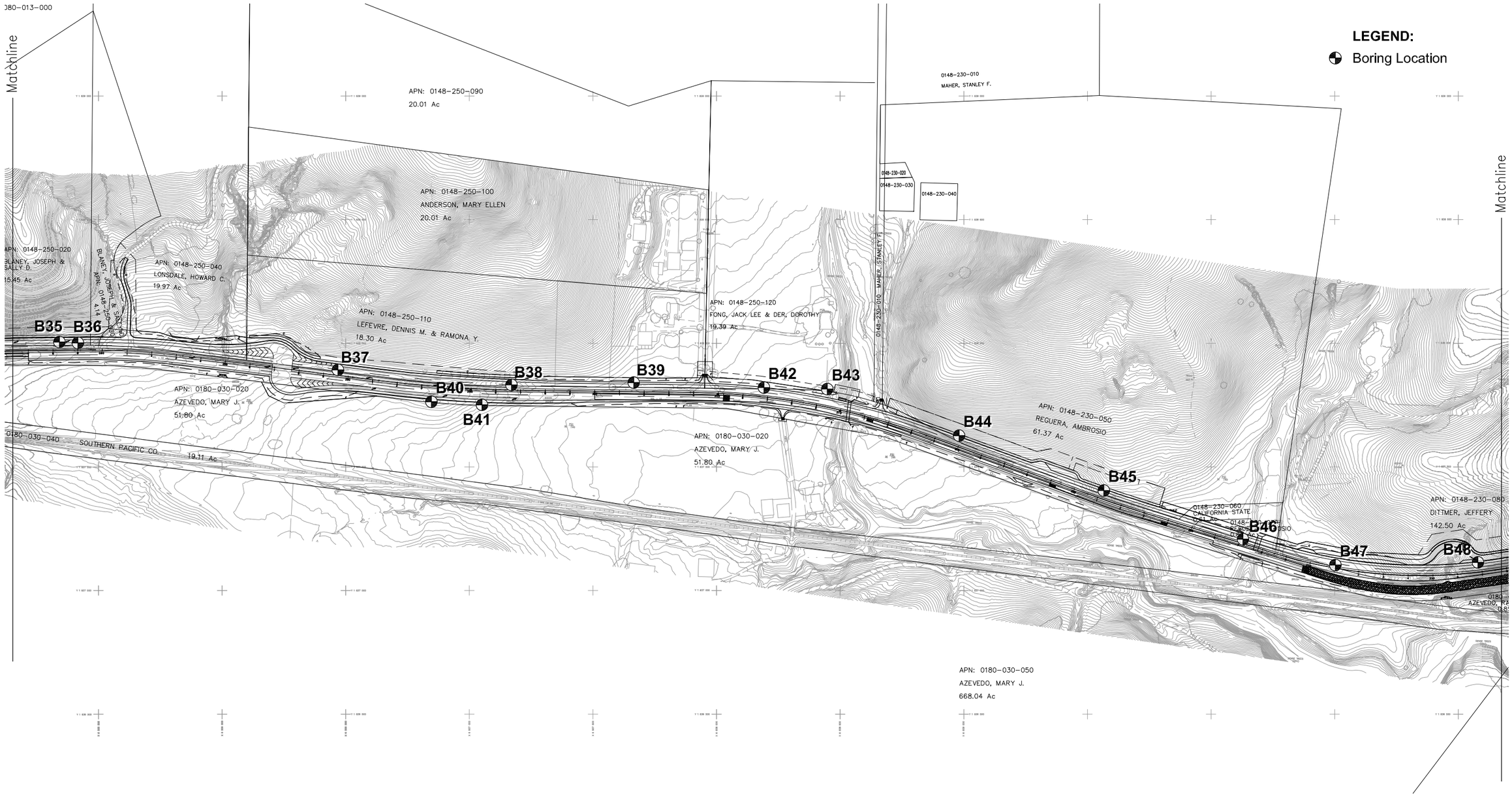
Jameson Canyon Road Improvement Project		
Napa & Solano Counties, California	SITE PLAN	
GEOCON Proj. No. E8481-06-01		
EA No. 264111	August 2009	Figure 2c

SITE0609.DWG



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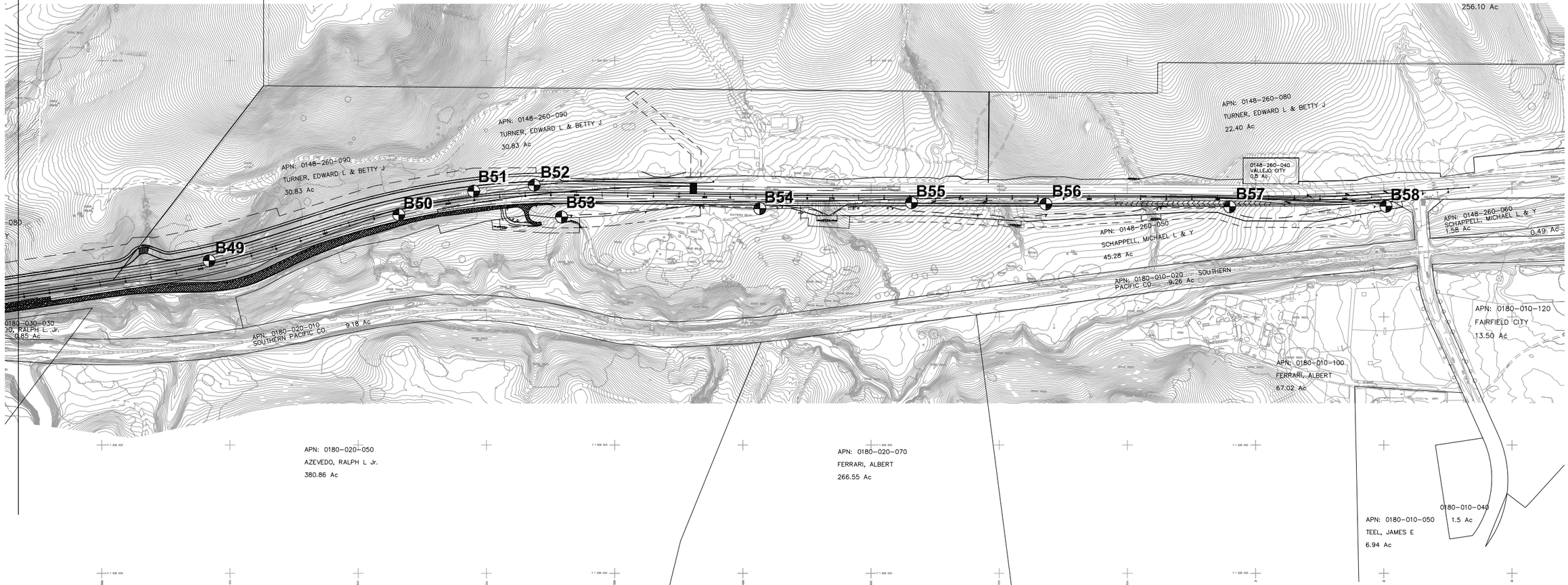
Jameson Canyon Road Improvement Project	
Napa & Solano Counties, California	**SITE PLAN**
GEOCON Proj. No. E8481-06-01	
EA No. 264111	August 2009 / Figure 2d

SITE0609.DWG



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Jameson Canyon Road Improvement Project	
Napa & Solano Counties, California	**SITE PLAN**
GEOCON Proj. No. E8481-06-01	
EA No. 264111	August 2009 — Figure 2e

SITE0609.DWG

TABLE 1
Boring Coordinates
Jameson Canyon Road Improvement Project
Napa and Solano Counties, California

Boring ID	Easting	Northing
B1	1,842,792.454	6,490,244.585
B2	1,842,750.047	6,490,400.394
B3	1,842,786.004	6,489,731.712
B4	1,842,645.659	6,490,362.629
B5	1,842,482.757	6,490,960.526
B6	1,842,424.580	6,491,618.560
B7	1,842,445.105	6,492,250.231
B8	1,842,487.116	6,492,887.190
B9	1,842,431.370	6,493,441.844
B10	1,842,181.608	6,493,978.117
B11	1,841,884.323	6,494,631.504
B12	1,841,630.980	6,495,233.984
B13	1,842,164.679	6,494,361.506
B14	1,841,997.084	6,494,732.587
B15	1,841,895.649	6,494,951.644
B16	1,841,364.490	6,495,820.732
B17	1,841,106.986	6,496,398.392
B18	1,840,820.004	6,497,021.166
B19	1,841,059.149	6,496,798.636
B20	1,840,949.355	6,497,070.792
B21	1,840,621.005	6,497,699.703
B22	1,840,495.258	6,497,993.039
B23	1,840,260.118	6,498,546.545
B24	1,840,048.686	6,499,064.921
B25	1,839,807.870	6,499,699.528
B26	1,839,547.713	6,500,401.490
B27	1,839,256.795	6,501,009.304
B28	1,839,030.784	6,501,629.498
B29	1,838,780.236	6,502,234.648
B30	1,838,621.940	6,502,487.786
B31	1,838,403.938	6,502,823.904
B32	1,838,175.009	6,503,427.630
B33	1,838,079.872	6,503,850.142
B34	1,838,034.168	6,504,068.796

TABLE 1
Boring Coordinates
Jameson Canyon Road Improvement Project
Napa and Solano Counties, California

Boring ID	Easting	Northing
B35	1,838,005.369	6,505,341.841
B36	1,837,972.838	6,505,405.901
B37	1,837,892.602	6,506,468.692
B38	1,837,831.695	6,507,170.302
B39	1,837,841.171	6,507,664.793
B40	1,837,763.531	6,506,846.534
B41	1,837,751.412	6,507,051.010
B42	1,837,820.826	6,508,191.545
B43	1,837,814.801	6,508,447.926
B44	1,837,626.640	6,508,980.723
B45	1,837,404.721	6,509,566.370
B46	1,837,207.965	6,510,129.165
B47	1,837,103.074	6,510,502.975
B48	1,837,114.172	6,511,079.653
B49	1,837,219.170	6,511,918.566
B50	1,837,399.018	6,512,658.080
B51	1,837,490.706	6,512,950.204
B52	1,837,514.113	6,513,186.549
B53	1,837,390.044	6,513,292.882
B54	1,837,422.592	6,514,066.101
B55	1,837,445.857	6,514,658.066
B56	1,837,440.383	6,515,182.184
B57	1,837,429.768	6,515,898.928
B58	1,837,431.829	6,516,508.478

Coordinates are shown in feet (NAD 83, Zone 2).

TABLE 2
Summary of CAM17 Metals Results
Jameson Canyon Road Improvement Project
Napa and Solano Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
B1-0	0	<2.0	10	110	<1.0	<1.0	8.5	5.9	18	25	<1.0	14	<1.0	<1.0	<1.0	41	57	<0.10
B3-1.5	1.5	<2.0	5.6	140	<1.0	<1.0	8.2	4.9	15	19	<1.0	8.0	<1.0	<1.0	<1.0	25	28	<0.10
B5-0	0	<2.0	8.2	300	<1.0	<1.0	16	8.4	18	14	<1.0	18	<1.0	<1.0	<1.0	42	50	<0.10
B7-1.5	1.5	<2.0	4.3	74	<1.0	<1.0	9.0	1.2	12	6.8	<1.0	6.2	<1.0	<1.0	<1.0	26	25	<0.10
B9-0	0	<2.0	5.8	130	<1.0	<1.0	11	6.1	20	30	<1.0	15	<1.0	<1.0	<1.0	30	98	<0.10
B11-1.5	1.5	<2.0	6.7	63	<1.0	<1.0	11	7.9	13	6.8	<1.0	12	<1.0	<1.0	<1.0	32	22	<0.10
B13-0	0	<2.0	6.2	150	<1.0	<1.0	12	10	21	28	<1.0	14	<1.0	<1.0	<1.0	33	42	<0.10
B15-1.5	1.5	<2.0	7.3	170	<1.0	<1.0	15	6.1	24	15	<1.0	15	<1.0	<1.0	<1.0	59	33	<0.10
B17-0	0	<2.0	4.0	62	<1.0	<1.0	13	3.6	13	12	<1.0	7.1	<1.0	<1.0	<1.0	47	45	<0.10
B19-1.5	1.5	<2.0	5.4	150	<1.0	<1.0	15	7.9	21	11	<1.0	16	<1.0	<1.0	<1.0	36	48	<0.10
B21-0	0	<2.0	6.0	100	<1.0	<1.0	16	7.7	22	38	<1.0	15	<1.0	<1.0	<1.0	37	61	<0.10
B23-1.5	1.5	<2.0	5.3	88	<1.0	<1.0	16	7.0	18	6.0	<1.0	9.7	<1.0	<1.0	<1.0	40	33	<0.10
B25-0	0	<2.0	4.1	120	<1.0	<1.0	14	6.8	10	4.2	<1.0	15	<1.0	<1.0	<1.0	28	35	<0.10
B27-1.5	1.5	<2.0	8.2	400	<1.0	<1.0	20	6.7	31	13	<1.0	24	<1.0	<1.0	<1.0	56	58	<0.10
B29-0	0	<2.0	4.5	120	<1.0	<1.0	14	8.6	22	45	<1.0	14	<1.0	<1.0	<1.0	31	140	<0.10
B31-1.5	1.5	<2.0	3.7	180	<1.0	<1.0	10	8.7	15	8.3	<1.0	11	<1.0	<1.0	<1.0	26	32	<0.10
B33-0	0	<2.0	6.3	120	<1.0	1.0	13	9.2	17	19	<1.0	19	<1.0	<1.0	<1.0	48	59	<0.10
B35-1.5	1.5	<2.0	4.8	130	<1.0	<1.0	16	8.0	23	18	<1.0	15	<1.0	<1.0	<1.0	35	120	<0.10

TABLE 2
Summary of CAM17 Metals Results
Jameson Canyon Road Improvement Project
Napa and Solano Counties, California

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Mercury
B37-0	0	<2.0	4.5	150	<1.0	<1.0	14	7.5	22	20	<1.0	13	<1.0	<1.0	<1.0	30	73	0.10
B39-1.5	1.5	<2.0	6.2	310	<1.0	<1.0	13	9.2	31	17	<1.0	17	<1.0	<1.0	<1.0	39	51	<0.10
B41-0	0	<2.0	5.9	180	<1.0	<1.0	14	19	17	43	<1.0	16	<1.0	<1.0	<1.0	33	67	<0.10
B43-1.5	1.5	<2.0	4.0	160	<1.0	<1.0	14	5.9	19	5.7	<1.0	13	<1.0	<1.0	<1.0	31	44	<0.10
B45-0	0	<2.0	4.4	140	<1.0	<1.0	15	9.2	16	8.9	<1.0	14	<1.0	<1.0	<1.0	32	45	<0.10
B47-1.5	1.5	<2.0	5.0	240	<1.0	<1.0	13	7.5	22	7.3	<1.0	15	<1.0	<1.0	<1.0	29	44	<0.10
B49-0	0	<2.0	6.7	120	<1.0	<1.0	20	10	27	9.0	<1.0	19	<1.0	<1.0	<1.0	44	55	<0.10
B51-1.5	1.5	<2.0	5.5	260	<1.0	<1.0	17	9.0	18	5.8	<1.0	16	<1.0	<1.0	<1.0	41	46	<0.10
B53-0	0	<2.0	4.2	160	<1.0	<1.0	15	7.4	17	8.9	<1.0	14	<1.0	<1.0	<1.0	34	43	<0.10
B55-1.5	1.5	<2.0	5.0	130	<1.0	<1.0	14	6.9	14	12	<1.0	11	<1.0	<1.0	<1.0	33	37	<0.10
B57-0	0	<2.0	6.6	130	<1.0	<1.0	14	8.1	25	8.2	<1.0	14	<1.0	<1.0	<1.0	35	89	<0.10
ESLs																		
Residential Land Use		6.3	0.39	750	4.0	1.7	750	40	230	200	40	150	10	20	1.3	16	600	1.3
Commercial Land Use		40	1.6	1,500	8.0	7.4	750	80	230	750	40	150	10	40	1.6	200	600	10
Worker Direct Exposure		310	15	2,600	98	39	1,200,000	94	310,000	750	78	260	3,900	3,900	62	770	230,000	58

Notes:

Results are shown in units of milligrams per kilogram (mg/kg) < = Analyte was not detected above the laboratory reporting limit

ESLs = Environmental Screening Levels Tables A and K-3, SFRWQCB, May 2008. ESLs for chromium are for Chromium III, no standard for total chromium.

TABLE 3
Summary of Organics Results
Jameson Canyon Road Improvement Project
Napa and Solano Counties, California

Sample ID	Sample Depth (ft)	TPHg	TPHd	TPHmo	BTEX	MTBE	Pesticides	Herbicides
B1-0	0	<1.0	<1.0	3.2	ND	<0.005	ND	ND
B2-0	0	<1.0	3.5	29	ND	<0.005	ND	---
B3-0	0	<1.0	33	150	ND	<0.005	ND	---
B4-0	0	<1.0	4.7	30	ND	<0.005	ND	---
B5-0	0	<1.0	3.3	14	ND	<0.005	ND	---
B6-0	0	<1.0	7.7	45	ND	<0.005	ND	---
B7-0	0	<1.0	1.8	5.8	ND	<0.005	ND	---
B8-0	0	<1.0	7.5	41	ND	<0.005	ND	---
B9-0	0	<1.0	130	610	ND	<0.005	ND	ND
B9-1.5	1.5	---	<20	180	---	---	---	---
B10-0	0	<1.0	9.2	60	ND	<0.005	ND	---
B11-0	0	<1.0	7.4	61	ND	<0.005	ND	---
B12-0	0	<1.0	<1.0	1.2	ND	<0.005	ND	---
B13-0	0	<1.0	2.6	16	ND	<0.005	ND	ND
B14-0	0	<1.0	19	140	ND	<0.005	ND	---
B15-0	0	<1.0	4.4	22	ND	<0.005	ND	---
B16-0	0	<1.0	6.9	44	ND	<0.005	ND	---
B17-0	0	<1.0	150	1,700	ND	<0.005	ND	ND
B17-1.5	1.5	---	53	470	---	---	---	---

TABLE 3
Summary of Organics Results
Jameson Canyon Road Improvement Project
Napa and Solano Counties, California

Sample ID	Sample Depth (ft)	TPHg	TPHd	TPHmo	BTEX	MTBE	Pesticides	Herbicides
B18-0	0	<1.0	1.9	3.6	ND	<0.005	ND	---
B19-0	0	<1.0	5.8	40	ND	<0.005	ND	---
B20-0	0	<1.0	9.7	59	ND	<0.005	ND	---
B21-0	0	<1.0	120	890	ND	<0.005	ND	ND
B21-1.5	1.5	---	1.5	6.8	---	---	---	---
B22-0	0	<1.0	110	590	ND	<0.005	4,4'-DDT = 0.003	---
B22-1.5	1.5	---	3.5	13	---	---	---	---
B23-0	0	<1.0	2.2	10	ND	<0.005	ND	---
B24-0	0	<1.0	9.1	59	ND	<0.005	ND	---
B25-0	0	<1.0	1.2	3.8	ND	<0.005	ND	ND
B26-0	0	<1.0	4.1	28	ND	<0.005	ND	---
B27-0	0	<1.0	2.4	16	ND	<0.005	ND	---
B28-0	0	<1.0	12	57	ND	<0.005	ND	---
B29-0	0	<1.0	9.9	52	ND	<0.005	ND	ND
B30-0	0	<1.0	8.4	44	ND	<0.005	Dieldrin = 0.0075	---
B31-0	0	<1.0	18	120	ND	<0.005	ND	---
B32-0	0	<1.0	2.5	17	ND	<0.005	ND	---
B33-0	0	<1.0	5.3	29	ND	<0.005	ND	ND
B34-0	0	<1.0	6.7	52	ND	<0.005	ND	---

TABLE 3
Summary of Organics Results
Jameson Canyon Road Improvement Project
Napa and Solano Counties, California

Sample ID	Sample Depth (ft)	TPHg	TPHd	TPHmo	BTEX	MTBE	Pesticides	Herbicides
B35-0	0	<1.0	11	62	ND	<0.005	ND	---
B36-0	0	<1.0	1.2	5.3	ND	<0.005	ND	---
B37-0	0	<1.0	16	94	ND	<0.005	ND	ND
B38-0	0	<1.0	2.3	18	ND	<0.005	ND	---
B39-0	0	<1.0	20	93	ND	<0.005	4,4'-DDT = 0.0026	---
B40-0	0	<1.0	6.7	43	ND	<0.005	ND	---
B41-0	0	<1.0	9.0	63	ND	<0.005	ND	ND
B42-0	0	<1.0	31	130	ND	<0.005	4,4'-DDT = 0.005	---
B43-0	0	<1.0	3.2	10	ND	<0.005	ND	---
B44-0	0	<1.0	<1.0	3.4	ND	<0.005	ND	---
B45-0	0	<1.0	<1.0	4.5	ND	<0.005	ND	ND
B46-0	0	<1.0	8.8	51	ND	<0.005	ND	---
B47-0	0	<1.0	8.7	53	ND	<0.005	ND	---
B48-0	0	<1.0	1.3	7.1	ND	<0.005	ND	---
B49-0	0	<1.0	2.4	13	ND	<0.005	ND	ND
B50-0	0	<1.0	4.8	39	ND	<0.005	ND	---
B51-0	0	<1.0	2.3	27	ND	<0.005	ND	---
B52-0	0	<1.0	15	83	ND	<0.005	ND	---

TABLE 3
Summary of Organics Results
Jameson Canyon Road Improvement Project
Napa and Solano Counties, California

Sample ID	Sample Depth (ft)	TPHg	TPHd	TPHmo	BTEX	MTBE	Pesticides	Herbicides
B53-0	0	<1.0	12	48	ND	<0.005	Chlordane = 0.011	ND
B54-0	0	<1.0	31	140	ND	<0.005	ND	---
B55-0	0	<1.0	100	420	ND	<0.005	ND	---
B55-1.5	1.5	---	2.2	16	---	---	---	---
B56-0	0	<1.0	20	93	ND	<0.005	ND	---
B57-0	0	<1.0	18	71	ND	<0.005	ND	ND
B58-0	0	<1.0	190	750	ND	<0.005	ND	---
B58-1.5	1.5	---	<20	180	---	---	---	---
ESLs								
Residential Land Use		83	83	370	---	0.023	Chlordane = 0.44 4,4'-DDT = 1.7 Dieldrin = 0.0023	---
Commercial Land Use		83	83	2,500	---	0.023	Chlordane = 1.7 4,4'-DDT = 4.0 Dieldrin = 0.0023	---
Worker Direct Exposure		4,200	4,200	12,000	---	2,800	Chlordane = 21 4,4'-DDT = 87 Dieldrin = 1.6	---

Notes:
Results are shown in units of milligrams per kilogram (mg/kg).
TPHg = Total Petroleum Hydrocarbons as gasoline
TPHd = Total Petroleum Hydrocarbons as diesel
TPHmo = Total Petroleum Hydrocarbons as motor oil
BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes
MTBE = Methyl-tert-butyl ether
ND = Not Detected above laboratory reporting limit
--- = Not Analyzed or Not Applicable
< = Not detected above the stated laboratory reporting limit
ESLs = Environmental Screening Levels Tables A and K-3, SFRWQCB, May 2008.

TABLE 4
Summary of pH Results
Jameson Canyon Road Improvement Project
Napa and Solano Counties, California

Sample ID	Sample Depth (ft)	pH
B1-0	0	6.6
B5-1.5	1.5	5.6
B10-0	0	5.9
B14-1.5	1.5	6.7
B19-0	0	5.7
B23-1.5	1.5	6.9
B28-0	0	7.4
B32-1.5	1.5	7.2
B37-0	0	6.2
B41-1.5	1.5	7.1
B46-0	0	5.7
B50-1.5	1.5	7.2
B55-0	0	7.5

APPENDIX A

May 21, 2009

ELAP No.: 1838
NELAP No.: 02107CA
NEVADA.: CA-401
CSDLAC No.: 10196

Workorder No.: 105494

Chris Merritt
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

TEL: (925) 371-5900
FAX: (925) 371-5915

RE: Jameson Canyon, E8481-06-01

Attention: Chris Merritt

Enclosed are the results for sample(s) received on May 14, 2009 by Advanced Technology Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (562)989-4045 if I can be of further assistance to your company.

Sincerely,

Eddie F. Rodriguez
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories.

Advanced Technology Laboratories
3275 Walnut Avenue Signal Hill, CA 90755 Tel: 562 989-4045 Fax: 562 989-4040

CASE NARRATIVE

Samples for Herbicides (8151) were subcontracted to Sierra Analytical Laboratories, Inc. with ELAP Cert.#2320.

Analytical Comments for Method 6010

Matrix Spike (MS) and /or Matrix Spike Duplicate (MSD) are/is outside recovery criteria for sample 105522-002AMSD; however, the analytical batch was validated by the Laboratory Control Sample (LCS).

RPD for Duplicate (DUP) is outside criteria for sample 105494-040ADUP; however, the Laboratory Control Sample (LCS) validated the analytical batch.

Analytical Comments for Method 8015 (DRO/ORO)

Dilution was necessary for samples 105494-009A, 105494-021A, 105494-025A, 105494-029A, 105494-031A, 105494-033A, 105494-037A, 105494-039A and 105494-041A, due to sample matrix.

Surrogate recovery was diluted out for samples 105494-009A, 105494-031A, 105494-033A, 105494-037A, 105494-039A, 105494-039AMS, 105494-039AMSD, 105494-041A, 105494-041AMS and 105494-041AMSD.

Matrix Spike (MS) and /or Matrix Spike Duplicate (MSD) are/is outside recovery criteria for samples 105494-039AMS, 105494-039AMSD and 105494-041AMS; however, the analytical batch was validated by the Laboratory Control Sample (LCS).

RPD for Matrix Spike (MS)/Matrix Spike Duplicate (MSD) is outside criteria for samples 105494-039AMSD and 105494-041AMSD; however, the analytical batch was validated by the Laboratory Control Sample (LCS).

Analytical Comments for Method 8015/8021

Matrix Spike (MS) and /or Matrix Spike Duplicate (MSD) are/is outside recovery criteria for sample 105494-019AMS; however, the analytical batch was validated by the Laboratory Control Sample (LCS).

RPD for Matrix Spike (MS)/Matrix Spike Duplicate (MSD) is outside criteria for sample 105494-019AMSD; however, the analytical batch was validated by the Laboratory Control Sample (LCS).

Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B10 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 7:57:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-001A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520C	QC Batch: 55383			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	9.2	1.0		mg/Kg	1	5/20/2009 06:38 PM
ORO	60	1.0		mg/Kg	1	5/20/2009 06:38 PM
Surr: p-Terphenyl	65.0	30-130		%REC	1	5/20/2009 06:38 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 02:44 PM
Surr: Bromofluorobenzene (FID)	76.3	59-145		%REC	1	5/14/2009 02:44 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 02:44 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 02:44 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 02:44 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 02:44 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 02:44 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 02:44 PM
Surr: Bromofluorobenzene (PID)	68.3	65-140		%REC	1	5/14/2009 02:44 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517A	QC Batch: 55375			PrepDate: 5/15/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/17/2009 09:19 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/17/2009 09:19 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/17/2009 09:19 PM
Aldrin	ND	1.0		µg/Kg	1	5/17/2009 09:19 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:19 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 09:19 PM
beta-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:19 PM
Chlordane	ND	8.5		µg/Kg	1	5/17/2009 09:19 PM
delta-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:19 PM
Dieldrin	ND	2.0		µg/Kg	1	5/17/2009 09:19 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/17/2009 09:19 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/17/2009 09:19 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B10 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 7:57:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-001A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517A	QC Batch: 55375			PrepDate: 5/15/2009		Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/17/2009 09:19 PM
Endrin	ND	2.0		µg/Kg	1	5/17/2009 09:19 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/17/2009 09:19 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/17/2009 09:19 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:19 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 09:19 PM
Heptachlor	ND	1.0		µg/Kg	1	5/17/2009 09:19 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/17/2009 09:19 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/17/2009 09:19 PM
Toxaphene	ND	50		µg/Kg	1	5/17/2009 09:19 PM
Surr: Decachlorobiphenyl	77.2	20-142		%REC	1	5/17/2009 09:19 PM
Surr: Tetrachloro-m-xylene	82.0	25-115		%REC	1	5/17/2009 09:19 PM
PH						
				EPA 9045C		
RunID: WETCHEM_090515A	QC Batch: R109066			PrepDate:		Analyst: **DDL**
pH	5.9	0.10		pH Units	1	5/15/2009

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B11 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 7:50:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-003A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520C	QC Batch: 55383			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	7.4	1.0		mg/Kg	1	5/20/2009 06:47 PM
ORO	61	1.0		mg/Kg	1	5/20/2009 06:47 PM
Surr: p-Terphenyl	67.3	30-130		%REC	1	5/20/2009 06:47 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 03:00 PM
Surr: Bromofluorobenzene (FID)	96.4	59-145		%REC	1	5/14/2009 03:00 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 03:00 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 03:00 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 03:00 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 03:00 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 03:00 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 03:00 PM
Surr: Bromofluorobenzene (PID)	86.2	65-140		%REC	1	5/14/2009 03:00 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517A	QC Batch: 55375			PrepDate: 5/15/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/17/2009 09:33 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/17/2009 09:33 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/17/2009 09:33 PM
Aldrin	ND	1.0		µg/Kg	1	5/17/2009 09:33 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:33 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 09:33 PM
beta-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:33 PM
Chlordane	ND	8.5		µg/Kg	1	5/17/2009 09:33 PM
delta-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:33 PM
Dieldrin	ND	2.0		µg/Kg	1	5/17/2009 09:33 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/17/2009 09:33 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/17/2009 09:33 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B11 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 7:50:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-003A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517A	QC Batch: 55375				PrepDate: 5/15/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/17/2009 09:33 PM
Endrin	ND	2.0		µg/Kg	1	5/17/2009 09:33 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/17/2009 09:33 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/17/2009 09:33 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:33 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 09:33 PM
Heptachlor	ND	1.0		µg/Kg	1	5/17/2009 09:33 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/17/2009 09:33 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/17/2009 09:33 PM
Toxaphene	ND	50		µg/Kg	1	5/17/2009 09:33 PM
Surr: Decachlorobiphenyl	75.9	20-142		%REC	1	5/17/2009 09:33 PM
Surr: Tetrachloro-m-xylene	77.5	25-115		%REC	1	5/17/2009 09:33 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B11 - 1.5
Lab Order:	105494	**Collection Date:**	5/12/2009 8:00:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-004A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519C	QC Batch: 55395			PrepDate:	5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 01:50 PM
Arsenic	6.7	1.0		mg/Kg	1	5/19/2009 01:50 PM
Barium	63	1.0		mg/Kg	1	5/19/2009 01:50 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 01:50 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 01:50 PM
Chromium	11	1.0		mg/Kg	1	5/19/2009 01:50 PM
Cobalt	7.9	1.0		mg/Kg	1	5/19/2009 01:50 PM
Copper	13	2.0		mg/Kg	1	5/19/2009 01:50 PM
Lead	6.8	1.0		mg/Kg	1	5/19/2009 01:50 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 01:50 PM
Nickel	12	1.0		mg/Kg	1	5/19/2009 01:50 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 01:50 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 01:50 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 01:50 PM
Vanadium	32	1.0		mg/Kg	1	5/19/2009 01:50 PM
Zinc	22	1.0		mg/Kg	1	5/19/2009 01:50 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519C	QC Batch: 55365			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 12:16 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B12 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 8:15:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-005A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520C	QC Batch: 55383			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	ND	1.0		mg/Kg	1	5/20/2009 05:27 PM
ORO	1.2	1.0		mg/Kg	1	5/20/2009 05:27 PM
Surr: p-Terphenyl	83.8	30-130		%REC	1	5/20/2009 05:27 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 03:32 PM
Surr: Bromofluorobenzene (FID)	95.6	59-145		%REC	1	5/14/2009 03:32 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 03:32 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 03:32 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 03:32 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 03:32 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 03:32 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 03:32 PM
Surr: Bromofluorobenzene (PID)	85.7	65-140		%REC	1	5/14/2009 03:32 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517A	QC Batch: 55375			PrepDate: 5/15/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/17/2009 08:08 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/17/2009 08:08 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/17/2009 08:08 PM
Aldrin	ND	1.0		µg/Kg	1	5/17/2009 08:08 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/17/2009 08:08 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 08:08 PM
beta-BHC	ND	1.0		µg/Kg	1	5/17/2009 08:08 PM
Chlordane	ND	8.5		µg/Kg	1	5/17/2009 08:08 PM
delta-BHC	ND	1.0		µg/Kg	1	5/17/2009 08:08 PM
Dieldrin	ND	2.0		µg/Kg	1	5/17/2009 08:08 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/17/2009 08:08 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/17/2009 08:08 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B12 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 8:15:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-005A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517A	QC Batch: 55375				PrepDate: 5/15/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/17/2009 08:08 PM
Endrin	ND	2.0		µg/Kg	1	5/17/2009 08:08 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/17/2009 08:08 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/17/2009 08:08 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/17/2009 08:08 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 08:08 PM
Heptachlor	ND	1.0		µg/Kg	1	5/17/2009 08:08 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/17/2009 08:08 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/17/2009 08:08 PM
Toxaphene	ND	50		µg/Kg	1	5/17/2009 08:08 PM
Surr: Decachlorobiphenyl	85.5	20-142		%REC	1	5/17/2009 08:08 PM
Surr: Tetrachloro-m-xylene	83.3	25-115		%REC	1	5/17/2009 08:08 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B16 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 8:28:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-007A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520C	QC Batch: 55383			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	6.9	1.0		mg/Kg	1	5/20/2009 06:20 PM
ORO	44	1.0		mg/Kg	1	5/20/2009 06:20 PM
Surr: p-Terphenyl	62.3	30-130		%REC	1	5/20/2009 06:20 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 03:47 PM
Surr: Bromofluorobenzene (FID)	85.7	59-145		%REC	1	5/14/2009 03:47 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 03:47 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 03:47 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 03:47 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 03:47 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 03:47 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 03:47 PM
Surr: Bromofluorobenzene (PID)	77.1	65-140		%REC	1	5/14/2009 03:47 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517A	QC Batch: 55375			PrepDate: 5/15/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/17/2009 09:48 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/17/2009 09:48 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/17/2009 09:48 PM
Aldrin	ND	1.0		µg/Kg	1	5/17/2009 09:48 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:48 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 09:48 PM
beta-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:48 PM
Chlordane	ND	8.5		µg/Kg	1	5/17/2009 09:48 PM
delta-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:48 PM
Dieldrin	ND	2.0		µg/Kg	1	5/17/2009 09:48 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/17/2009 09:48 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/17/2009 09:48 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B16 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 8:28:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-007A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517A	QC Batch: 55375				PrepDate: 5/15/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/17/2009 09:48 PM
Endrin	ND	2.0		µg/Kg	1	5/17/2009 09:48 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/17/2009 09:48 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/17/2009 09:48 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:48 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 09:48 PM
Heptachlor	ND	1.0		µg/Kg	1	5/17/2009 09:48 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/17/2009 09:48 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/17/2009 09:48 PM
Toxaphene	ND	50		µg/Kg	1	5/17/2009 09:48 PM
Surr: Decachlorobiphenyl	68.4	20-142		%REC	1	5/17/2009 09:48 PM
Surr: Tetrachloro-m-xylene	69.1	25-115		%REC	1	5/17/2009 09:48 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B17 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 8:57:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-009A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519C	QC Batch: 55395			PrepDate: 5/18/2009		Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 01:53 PM
Arsenic	4.0	1.0		mg/Kg	1	5/19/2009 01:53 PM
Barium	62	1.0		mg/Kg	1	5/19/2009 01:53 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 01:53 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 01:53 PM
Chromium	13	1.0		mg/Kg	1	5/19/2009 01:53 PM
Cobalt	3.6	1.0		mg/Kg	1	5/19/2009 01:53 PM
Copper	13	2.0		mg/Kg	1	5/19/2009 01:53 PM
Lead	12	1.0		mg/Kg	1	5/19/2009 01:53 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 01:53 PM
Nickel	7.1	1.0		mg/Kg	1	5/19/2009 01:53 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 01:53 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 01:53 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 01:53 PM
Vanadium	47	1.0		mg/Kg	1	5/19/2009 01:53 PM
Zinc	45	1.0		mg/Kg	1	5/19/2009 01:53 PM
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
	EPA 3550B			**EPA 8015B(M)**		
RunID: GC16_090520C	QC Batch: 55383			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	150	50		mg/Kg	25	5/20/2009 06:56 PM
ORO	1700	50		mg/Kg	25	5/20/2009 06:56 PM
Surr: p-Terphenyl	0	30-130	SDO	%REC	25	5/20/2009 06:56 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 04:09 PM
Surr: Bromofluorobenzene (FID)	81.0	59-145		%REC	1	5/14/2009 04:09 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 04:09 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 04:09 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 04:09 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B17 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 8:57:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-009A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514A	QC Batch:	E09VS129			PrepDate:	Analyst: **KHN**
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 04:09 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 04:09 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 04:09 PM
Surr: Bromofluorobenzene (PID)	73.6	65-140		%REC	1	5/14/2009 04:09 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517A	QC Batch:	55375			PrepDate:	5/15/2009 Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/17/2009 10:02 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/17/2009 10:02 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/17/2009 10:02 PM
Aldrin	ND	1.0		µg/Kg	1	5/17/2009 10:02 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:02 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 10:02 PM
beta-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:02 PM
Chlordane	ND	8.5		µg/Kg	1	5/17/2009 10:02 PM
delta-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:02 PM
Dieldrin	ND	2.0		µg/Kg	1	5/17/2009 10:02 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/17/2009 10:02 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/17/2009 10:02 PM
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/17/2009 10:02 PM
Endrin	ND	2.0		µg/Kg	1	5/17/2009 10:02 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/17/2009 10:02 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/17/2009 10:02 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:02 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 10:02 PM
Heptachlor	ND	1.0		µg/Kg	1	5/17/2009 10:02 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/17/2009 10:02 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/17/2009 10:02 PM
Toxaphene	ND	50		µg/Kg	1	5/17/2009 10:02 PM
Surr: Decachlorobiphenyl	65.5	20-142		%REC	1	5/17/2009 10:02 PM
Surr: Tetrachloro-m-xylene	52.8	25-115		%REC	1	5/17/2009 10:02 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519B	QC Batch:	55364			PrepDate:	5/18/2009 Analyst: **RQ**

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B17 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 8:57:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-009A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY BY COLD VAPOR TECHNIQUE						
			EPA 7471A			
RunID: AA5_090519B	QC Batch: 55364			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 11:31 AM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B40 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 9:54:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-011A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520C	QC Batch: 55383			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	6.7	1.0		mg/Kg	1	5/20/2009 06:29 PM
ORO	43	1.0		mg/Kg	1	5/20/2009 06:29 PM
Surr: p-Terphenyl	56.6	30-130		%REC	1	5/20/2009 06:29 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 04:25 PM
Surr: Bromofluorobenzene (FID)	95.8	59-145		%REC	1	5/14/2009 04:25 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 04:25 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 04:25 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 04:25 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 04:25 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 04:25 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 04:25 PM
Surr: Bromofluorobenzene (PID)	85.3	65-140		%REC	1	5/14/2009 04:25 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517A	QC Batch: 55375			PrepDate: 5/15/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/17/2009 10:16 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/17/2009 10:16 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/17/2009 10:16 PM
Aldrin	ND	1.0		µg/Kg	1	5/17/2009 10:16 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:16 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 10:16 PM
beta-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:16 PM
Chlordane	ND	8.5		µg/Kg	1	5/17/2009 10:16 PM
delta-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:16 PM
Dieldrin	ND	2.0		µg/Kg	1	5/17/2009 10:16 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/17/2009 10:16 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/17/2009 10:16 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B40 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 9:54:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-011A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517A	QC Batch: 55375				PrepDate: 5/15/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/17/2009 10:16 PM
Endrin	ND	2.0		µg/Kg	1	5/17/2009 10:16 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/17/2009 10:16 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/17/2009 10:16 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:16 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 10:16 PM
Heptachlor	ND	1.0		µg/Kg	1	5/17/2009 10:16 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/17/2009 10:16 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/17/2009 10:16 PM
Toxaphene	ND	50		µg/Kg	1	5/17/2009 10:16 PM
Surr: Decachlorobiphenyl	85.4	20-142		%REC	1	5/17/2009 10:16 PM
Surr: Tetrachloro-m-xylene	71.3	25-115		%REC	1	5/17/2009 10:16 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B41 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 9:55:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-013A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519C	QC Batch: 55395			PrepDate: 5/18/2009		Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 01:56 PM
Arsenic	5.9	1.0		mg/Kg	1	5/19/2009 01:56 PM
Barium	180	1.0		mg/Kg	1	5/19/2009 01:56 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 01:56 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 01:56 PM
Chromium	14	1.0		mg/Kg	1	5/19/2009 01:56 PM
Cobalt	19	1.0		mg/Kg	1	5/19/2009 01:56 PM
Copper	17	2.0		mg/Kg	1	5/19/2009 01:56 PM
Lead	43	1.0		mg/Kg	1	5/19/2009 01:56 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 01:56 PM
Nickel	16	1.0		mg/Kg	1	5/19/2009 01:56 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 01:56 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 01:56 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 01:56 PM
Vanadium	33	1.0		mg/Kg	1	5/19/2009 01:56 PM
Zinc	67	1.0		mg/Kg	1	5/19/2009 01:56 PM
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
	EPA 3550B			**EPA 8015B(M)**		
RunID: GC16_090520C	QC Batch: 55383			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	9.0	1.0		mg/Kg	1	5/20/2009 07:06 PM
ORO	63	1.0		mg/Kg	1	5/20/2009 07:06 PM
Surr: p-Terphenyl	46.4	30-130		%REC	1	5/20/2009 07:06 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 04:40 PM
Surr: Bromofluorobenzene (FID)	95.2	59-145		%REC	1	5/14/2009 04:40 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 04:40 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 04:40 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 04:40 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B41 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 9:55:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-013A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514A	QC Batch:	E09VS129			PrepDate:	Analyst: **KHN**
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 04:40 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 04:40 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 04:40 PM
Surr: Bromofluorobenzene (PID)	85.5	65-140		%REC	1	5/14/2009 04:40 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517A	QC Batch:	55375			PrepDate:	5/15/2009 Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/17/2009 10:30 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/17/2009 10:30 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/17/2009 10:30 PM
Aldrin	ND	1.0		µg/Kg	1	5/17/2009 10:30 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:30 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 10:30 PM
beta-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:30 PM
Chlordane	ND	8.5		µg/Kg	1	5/17/2009 10:30 PM
delta-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:30 PM
Dieldrin	ND	2.0		µg/Kg	1	5/17/2009 10:30 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/17/2009 10:30 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/17/2009 10:30 PM
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/17/2009 10:30 PM
Endrin	ND	2.0		µg/Kg	1	5/17/2009 10:30 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/17/2009 10:30 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/17/2009 10:30 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:30 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 10:30 PM
Heptachlor	ND	1.0		µg/Kg	1	5/17/2009 10:30 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/17/2009 10:30 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/17/2009 10:30 PM
Toxaphene	ND	50		µg/Kg	1	5/17/2009 10:30 PM
Surr: Decachlorobiphenyl	64.0	20-142		%REC	1	5/17/2009 10:30 PM
Surr: Tetrachloro-m-xylene	63.2	25-115		%REC	1	5/17/2009 10:30 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519B	QC Batch:	55364			PrepDate:	5/18/2009 Analyst: **RQ**

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B41 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 9:55:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-013A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY BY COLD VAPOR TECHNIQUE						
			EPA 7471A			
RunID: AA5_090519B	QC Batch: 55364			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 11:33 AM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B41 - 1.5
Lab Order:	105494	**Collection Date:**	5/12/2009 10:00:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-014A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
PH						
			EPA 9045C			
RunID: WETCHEM_090515A	QC Batch: R109066			PrepDate:		Analyst: **DDL**
pH	7.1	0.10		pH Units	1	5/15/2009

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B1 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 11:00:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-015A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519C	QC Batch: 55395			PrepDate:	5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 01:59 PM
Arsenic	10	1.0		mg/Kg	1	5/19/2009 01:59 PM
Barium	110	1.0		mg/Kg	1	5/19/2009 01:59 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 01:59 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 01:59 PM
Chromium	8.5	1.0		mg/Kg	1	5/19/2009 01:59 PM
Cobalt	5.9	1.0		mg/Kg	1	5/19/2009 01:59 PM
Copper	18	2.0		mg/Kg	1	5/19/2009 01:59 PM
Lead	25	1.0		mg/Kg	1	5/19/2009 01:59 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 01:59 PM
Nickel	14	1.0		mg/Kg	1	5/19/2009 01:59 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 01:59 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 01:59 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 01:59 PM
Vanadium	41	1.0		mg/Kg	1	5/19/2009 01:59 PM
Zinc	57	1.0		mg/Kg	1	5/19/2009 01:59 PM
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
	EPA 3550B			**EPA 8015B(M)**		
RunID: GC16_090520C	QC Batch: 55383			PrepDate:	5/18/2009	Analyst: **CBR**
DRO	ND	1.0		mg/Kg	1	5/20/2009 05:36 PM
ORO	3.2	1.0		mg/Kg	1	5/20/2009 05:36 PM
Surr: p-Terphenyl	69.6	30-130		%REC	1	5/20/2009 05:36 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 04:56 PM
Surr: Bromofluorobenzene (FID)	106	59-145		%REC	1	5/14/2009 04:56 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 04:56 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 04:56 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 04:56 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B1 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 11:00:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-015A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514A	QC Batch:	E09VS129			PrepDate:	Analyst: **KHN**
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 04:56 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 04:56 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 04:56 PM
Surr: Bromofluorobenzene (PID)	94.5	65-140		%REC	1	5/14/2009 04:56 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517A	QC Batch:	55375			PrepDate: 5/15/2009	Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/17/2009 10:44 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/17/2009 10:44 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/17/2009 10:44 PM
Aldrin	ND	1.0		µg/Kg	1	5/17/2009 10:44 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:44 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 10:44 PM
beta-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:44 PM
Chlordane	ND	8.5		µg/Kg	1	5/17/2009 10:44 PM
delta-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:44 PM
Dieldrin	ND	2.0		µg/Kg	1	5/17/2009 10:44 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/17/2009 10:44 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/17/2009 10:44 PM
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/17/2009 10:44 PM
Endrin	ND	2.0		µg/Kg	1	5/17/2009 10:44 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/17/2009 10:44 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/17/2009 10:44 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:44 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 10:44 PM
Heptachlor	ND	1.0		µg/Kg	1	5/17/2009 10:44 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/17/2009 10:44 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/17/2009 10:44 PM
Toxaphene	ND	50		µg/Kg	1	5/17/2009 10:44 PM
Surr: Decachlorobiphenyl	71.6	20-142		%REC	1	5/17/2009 10:44 PM
Surr: Tetrachloro-m-xylene	72.4	25-115		%REC	1	5/17/2009 10:44 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519B	QC Batch:	55364			PrepDate: 5/18/2009	Analyst: **RQ**

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B1 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 11:00:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-015A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519B	QC Batch: 55364			PrepDate: 5/18/2009		Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 11:35 AM
PH						
				EPA 9045C		
RunID: WETCHEM_090515A	QC Batch: R109066			PrepDate:		Analyst: **DDL**
pH	6.6	0.10		pH Units	1	5/15/2009

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B2 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 10:56:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-017A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520C	QC Batch: 55383			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	3.5	1.0		mg/Kg	1	5/20/2009 05:44 PM
ORO	29	1.0		mg/Kg	1	5/20/2009 05:44 PM
Surr: p-Terphenyl	55.2	30-130		%REC	1	5/20/2009 05:44 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 05:12 PM
Surr: Bromofluorobenzene (FID)	88.4	59-145		%REC	1	5/14/2009 05:12 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 05:12 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 05:12 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 05:12 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 05:12 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 05:12 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 05:12 PM
Surr: Bromofluorobenzene (PID)	78.8	65-140		%REC	1	5/14/2009 05:12 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517A	QC Batch: 55375			PrepDate: 5/15/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/17/2009 10:58 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/17/2009 10:58 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/17/2009 10:58 PM
Aldrin	ND	1.0		µg/Kg	1	5/17/2009 10:58 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:58 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 10:58 PM
beta-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:58 PM
Chlordane	ND	8.5		µg/Kg	1	5/17/2009 10:58 PM
delta-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:58 PM
Dieldrin	ND	2.0		µg/Kg	1	5/17/2009 10:58 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/17/2009 10:58 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/17/2009 10:58 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B2 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 10:56:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-017A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517A	QC Batch: 55375				PrepDate: 5/15/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/17/2009 10:58 PM
Endrin	ND	2.0		µg/Kg	1	5/17/2009 10:58 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/17/2009 10:58 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/17/2009 10:58 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/17/2009 10:58 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 10:58 PM
Heptachlor	ND	1.0		µg/Kg	1	5/17/2009 10:58 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/17/2009 10:58 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/17/2009 10:58 PM
Toxaphene	ND	50		µg/Kg	1	5/17/2009 10:58 PM
Surr: Decachlorobiphenyl	70.1	20-142		%REC	1	5/17/2009 10:58 PM
Surr: Tetrachloro-m-xylene	68.4	25-115		%REC	1	5/17/2009 10:58 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B4 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 11:21:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-019A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520C	QC Batch: 55383			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	4.7	1.0		mg/Kg	1	5/20/2009 05:53 PM
ORO	30	1.0		mg/Kg	1	5/20/2009 05:53 PM
Surr: p-Terphenyl	60.9	30-130		%REC	1	5/20/2009 05:53 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 05:43 PM
Surr: Bromofluorobenzene (FID)	92.9	59-145		%REC	1	5/14/2009 05:43 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514A	QC Batch: E09VS129			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 05:43 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 05:43 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 05:43 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 05:43 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 05:43 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 05:43 PM
Surr: Bromofluorobenzene (PID)	83.5	65-140		%REC	1	5/14/2009 05:43 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517A	QC Batch: 55375			PrepDate: 5/15/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/17/2009 11:13 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/17/2009 11:13 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/17/2009 11:13 PM
Aldrin	ND	1.0		µg/Kg	1	5/17/2009 11:13 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:13 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 11:13 PM
beta-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:13 PM
Chlordane	ND	8.5		µg/Kg	1	5/17/2009 11:13 PM
delta-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:13 PM
Dieldrin	ND	2.0		µg/Kg	1	5/17/2009 11:13 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/17/2009 11:13 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/17/2009 11:13 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B4 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 11:21:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-019A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517A	QC Batch: 55375				PrepDate: 5/15/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/17/2009 11:13 PM
Endrin	ND	2.0		µg/Kg	1	5/17/2009 11:13 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/17/2009 11:13 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/17/2009 11:13 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:13 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 11:13 PM
Heptachlor	ND	1.0		µg/Kg	1	5/17/2009 11:13 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/17/2009 11:13 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/17/2009 11:13 PM
Toxaphene	ND	50		µg/Kg	1	5/17/2009 11:13 PM
Surr: Decachlorobiphenyl	91.4	20-142		%REC	1	5/17/2009 11:13 PM
Surr: Tetrachloro-m-xylene	84.2	25-115		%REC	1	5/17/2009 11:13 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B3 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 11:25:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-021A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC8_090518B	QC Batch: 55402			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	33	5.0		mg/Kg	5	5/19/2009 06:12 AM
ORO	150	5.0		mg/Kg	5	5/19/2009 06:12 AM
Surr: p-Terphenyl	85.8	30-130		%REC	5	5/19/2009 06:12 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 08:35 PM
Surr: Bromofluorobenzene (FID)	92.4	59-145		%REC	1	5/14/2009 08:35 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 08:35 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 08:35 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 08:35 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 08:35 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 08:35 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 08:35 PM
Surr: Bromofluorobenzene (PID)	83.3	65-140		%REC	1	5/14/2009 08:35 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517B	QC Batch: 55376			PrepDate: 5/15/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/17/2009 11:27 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/17/2009 11:27 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/17/2009 11:27 PM
Aldrin	ND	1.0		µg/Kg	1	5/17/2009 11:27 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:27 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 11:27 PM
beta-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:27 PM
Chlordane	ND	8.5		µg/Kg	1	5/17/2009 11:27 PM
delta-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:27 PM
Dieldrin	ND	2.0		µg/Kg	1	5/17/2009 11:27 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/17/2009 11:27 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/17/2009 11:27 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B3 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 11:25:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-021A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517B	QC Batch: 55376				PrepDate: 5/15/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/17/2009 11:27 PM
Endrin	ND	2.0		µg/Kg	1	5/17/2009 11:27 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/17/2009 11:27 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/17/2009 11:27 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:27 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 11:27 PM
Heptachlor	ND	1.0		µg/Kg	1	5/17/2009 11:27 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/17/2009 11:27 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/17/2009 11:27 PM
Toxaphene	ND	50		µg/Kg	1	5/17/2009 11:27 PM
Surr: Decachlorobiphenyl	77.0	20-142		%REC	1	5/17/2009 11:27 PM
Surr: Tetrachloro-m-xylene	82.7	25-115		%REC	1	5/17/2009 11:27 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B3 - 1.5
Lab Order:	105494	**Collection Date:**	5/12/2009 11:30:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-022A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519C	QC Batch: 55395			PrepDate:	5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 02:01 PM
Arsenic	5.6	1.0		mg/Kg	1	5/19/2009 02:01 PM
Barium	140	1.0		mg/Kg	1	5/19/2009 02:01 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 02:01 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 02:01 PM
Chromium	8.2	1.0		mg/Kg	1	5/19/2009 02:01 PM
Cobalt	4.9	1.0		mg/Kg	1	5/19/2009 02:01 PM
Copper	15	2.0		mg/Kg	1	5/19/2009 02:01 PM
Lead	19	1.0		mg/Kg	1	5/19/2009 02:01 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 02:01 PM
Nickel	8.0	1.0		mg/Kg	1	5/19/2009 02:01 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 02:01 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 02:01 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 02:01 PM
Vanadium	25	1.0		mg/Kg	1	5/19/2009 02:01 PM
Zinc	28	1.0		mg/Kg	1	5/19/2009 02:01 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519B	QC Batch: 55364			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 11:41 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B5 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 11:41:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-023A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519C	QC Batch: 55395			PrepDate:	5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 02:04 PM
Arsenic	8.2	1.0		mg/Kg	1	5/19/2009 02:04 PM
Barium	300	1.0		mg/Kg	1	5/19/2009 02:04 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 02:04 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 02:04 PM
Chromium	16	1.0		mg/Kg	1	5/19/2009 02:04 PM
Cobalt	8.4	1.0		mg/Kg	1	5/19/2009 02:04 PM
Copper	18	2.0		mg/Kg	1	5/19/2009 02:04 PM
Lead	14	1.0		mg/Kg	1	5/19/2009 02:04 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 02:04 PM
Nickel	18	1.0		mg/Kg	1	5/19/2009 02:04 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 02:04 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 02:04 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 02:04 PM
Vanadium	42	1.0		mg/Kg	1	5/19/2009 02:04 PM
Zinc	50	1.0		mg/Kg	1	5/19/2009 02:04 PM
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
	EPA 3550B			**EPA 8015B(M)**		
RunID: GC8_090518B	QC Batch: 55402			PrepDate:	5/18/2009	Analyst: **CBR**
DRO	3.3	1.0		mg/Kg	1	5/19/2009 02:38 AM
ORO	14	1.0		mg/Kg	1	5/19/2009 02:38 AM
Surr: p-Terphenyl	81.2	30-130		%REC	1	5/19/2009 02:38 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 08:50 PM
Surr: Bromofluorobenzene (FID)	93.2	59-145		%REC	1	5/14/2009 08:50 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 08:50 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 08:50 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 08:50 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B5 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 11:41:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-023A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514B	QC Batch:	E09VS130			PrepDate:	Analyst: **KHN**
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 08:50 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 08:50 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 08:50 PM
Surr: Bromofluorobenzene (PID)	84.0	65-140		%REC	1	5/14/2009 08:50 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517B	QC Batch:	55376			PrepDate:	5/15/2009 Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/17/2009 11:41 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/17/2009 11:41 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/17/2009 11:41 PM
Aldrin	ND	1.0		µg/Kg	1	5/17/2009 11:41 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:41 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 11:41 PM
beta-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:41 PM
Chlordane	ND	8.5		µg/Kg	1	5/17/2009 11:41 PM
delta-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:41 PM
Dieldrin	ND	2.0		µg/Kg	1	5/17/2009 11:41 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/17/2009 11:41 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/17/2009 11:41 PM
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/17/2009 11:41 PM
Endrin	ND	2.0		µg/Kg	1	5/17/2009 11:41 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/17/2009 11:41 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/17/2009 11:41 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:41 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 11:41 PM
Heptachlor	ND	1.0		µg/Kg	1	5/17/2009 11:41 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/17/2009 11:41 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/17/2009 11:41 PM
Toxaphene	ND	50		µg/Kg	1	5/17/2009 11:41 PM
Surr: Decachlorobiphenyl	71.0	20-142		%REC	1	5/17/2009 11:41 PM
Surr: Tetrachloro-m-xylene	71.3	25-115		%REC	1	5/17/2009 11:41 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519B	QC Batch:	55364			PrepDate:	5/18/2009 Analyst: **RQ**

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B5 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 11:41:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-023A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY BY COLD VAPOR TECHNIQUE						
			EPA 7471A			
RunID: AA5_090519B	QC Batch: 55364			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 11:43 AM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B5 - 1.5
Lab Order:	105494	**Collection Date:**	5/12/2009 11:44:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-024A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
PH						
				EPA 9045C		
RunID: WETCHEM_090515A	QC Batch: R109066			PrepDate:		Analyst: **DDL**
pH	5.6	0.10		pH Units	1	5/15/2009

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B6 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 11:57:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-025A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC8_090518B	QC Batch: 55402			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	7.7	5.0		mg/Kg	5	5/19/2009 06:39 AM
ORO	45	5.0		mg/Kg	5	5/19/2009 06:39 AM
Surr: p-Terphenyl	83.9	30-130		%REC	5	5/19/2009 06:39 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 09:06 PM
Surr: Bromofluorobenzene (FID)	92.9	59-145		%REC	1	5/14/2009 09:06 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 09:06 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 09:06 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 09:06 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 09:06 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 09:06 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 09:06 PM
Surr: Bromofluorobenzene (PID)	83.2	65-140		%REC	1	5/14/2009 09:06 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517B	QC Batch: 55376			PrepDate: 5/15/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/17/2009 11:55 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/17/2009 11:55 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/17/2009 11:55 PM
Aldrin	ND	1.0		µg/Kg	1	5/17/2009 11:55 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:55 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 11:55 PM
beta-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:55 PM
Chlordane	ND	8.5		µg/Kg	1	5/17/2009 11:55 PM
delta-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:55 PM
Dieldrin	ND	2.0		µg/Kg	1	5/17/2009 11:55 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/17/2009 11:55 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/17/2009 11:55 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B6 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 11:57:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-025A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517B	QC Batch: 55376				PrepDate: 5/15/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/17/2009 11:55 PM
Endrin	ND	2.0		µg/Kg	1	5/17/2009 11:55 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/17/2009 11:55 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/17/2009 11:55 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/17/2009 11:55 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 11:55 PM
Heptachlor	ND	1.0		µg/Kg	1	5/17/2009 11:55 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/17/2009 11:55 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/17/2009 11:55 PM
Toxaphene	ND	50		µg/Kg	1	5/17/2009 11:55 PM
Surr: Decachlorobiphenyl	77.3	20-142		%REC	1	5/17/2009 11:55 PM
Surr: Tetrachloro-m-xylene	70.4	25-115		%REC	1	5/17/2009 11:55 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B7 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 12:05:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-027A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC8_090518B	QC Batch: 55402			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	1.8	1.0		mg/Kg	1	5/19/2009 01:44 AM
ORO	5.8	1.0		mg/Kg	1	5/19/2009 01:44 AM
Surr: p-Terphenyl	90.2	30-130		%REC	1	5/19/2009 01:44 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 09:22 PM
Surr: Bromofluorobenzene (FID)	100	59-145		%REC	1	5/14/2009 09:22 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 09:22 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 09:22 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 09:22 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 09:22 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 09:22 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 09:22 PM
Surr: Bromofluorobenzene (PID)	90.0	65-140		%REC	1	5/14/2009 09:22 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517B	QC Batch: 55376			PrepDate: 5/15/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/17/2009 09:05 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/17/2009 09:05 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/17/2009 09:05 PM
Aldrin	ND	1.0		µg/Kg	1	5/17/2009 09:05 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:05 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 09:05 PM
beta-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:05 PM
Chlordane	ND	8.5		µg/Kg	1	5/17/2009 09:05 PM
delta-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:05 PM
Dieldrin	ND	2.0		µg/Kg	1	5/17/2009 09:05 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/17/2009 09:05 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/17/2009 09:05 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B7 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 12:05:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-027A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517B	QC Batch: 55376				PrepDate: 5/15/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/17/2009 09:05 PM
Endrin	ND	2.0		µg/Kg	1	5/17/2009 09:05 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/17/2009 09:05 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/17/2009 09:05 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/17/2009 09:05 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/17/2009 09:05 PM
Heptachlor	ND	1.0		µg/Kg	1	5/17/2009 09:05 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/17/2009 09:05 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/17/2009 09:05 PM
Toxaphene	ND	50		µg/Kg	1	5/17/2009 09:05 PM
Surr: Decachlorobiphenyl	82.5	20-142		%REC	1	5/17/2009 09:05 PM
Surr: Tetrachloro-m-xylene	80.7	25-115		%REC	1	5/17/2009 09:05 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B7 - 1.5
Lab Order:	105494	**Collection Date:**	5/12/2009 12:10:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-028A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519C	QC Batch: 55395			PrepDate:	5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 02:07 PM
Arsenic	4.3	1.0		mg/Kg	1	5/19/2009 02:07 PM
Barium	74	1.0		mg/Kg	1	5/19/2009 02:07 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 02:07 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 02:07 PM
Chromium	9.0	1.0		mg/Kg	1	5/19/2009 02:07 PM
Cobalt	1.2	1.0		mg/Kg	1	5/19/2009 02:07 PM
Copper	12	2.0		mg/Kg	1	5/19/2009 02:07 PM
Lead	6.8	1.0		mg/Kg	1	5/19/2009 02:07 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 02:07 PM
Nickel	6.2	1.0		mg/Kg	1	5/19/2009 02:07 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 02:07 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 02:07 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 02:07 PM
Vanadium	26	1.0		mg/Kg	1	5/19/2009 02:07 PM
Zinc	25	1.0		mg/Kg	1	5/19/2009 02:07 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519B	QC Batch: 55364			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 11:45 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B8 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 12:12:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-029A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC8_090518B	QC Batch: 55402			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	7.5	5.0		mg/Kg	5	5/19/2009 07:06 AM
ORO	41	5.0		mg/Kg	5	5/19/2009 07:06 AM
Surr: p-Terphenyl	88.0	30-130		%REC	5	5/19/2009 07:06 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 09:37 PM
Surr: Bromofluorobenzene (FID)	97.0	59-145		%REC	1	5/14/2009 09:37 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 09:37 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 09:37 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 09:37 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 09:37 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 09:37 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 09:37 PM
Surr: Bromofluorobenzene (PID)	87.0	65-140		%REC	1	5/14/2009 09:37 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517B	QC Batch: 55376			PrepDate: 5/15/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 12:09 AM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 12:09 AM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 12:09 AM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 12:09 AM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:09 AM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 12:09 AM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:09 AM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 12:09 AM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:09 AM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 12:09 AM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 12:09 AM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 12:09 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B8 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 12:12:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-029A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517B	QC Batch: 55376				PrepDate: 5/15/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 12:09 AM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 12:09 AM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 12:09 AM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 12:09 AM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:09 AM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 12:09 AM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 12:09 AM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 12:09 AM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 12:09 AM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 12:09 AM
Surr: Decachlorobiphenyl	67.2	20-142		%REC	1	5/18/2009 12:09 AM
Surr: Tetrachloro-m-xylene	65.1	25-115		%REC	1	5/18/2009 12:09 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B9 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 12:26:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-031A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519C	QC Batch: 55395			PrepDate:	5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 02:11 PM
Arsenic	5.8	1.0		mg/Kg	1	5/19/2009 02:11 PM
Barium	130	1.0		mg/Kg	1	5/19/2009 02:11 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 02:11 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 02:11 PM
Chromium	11	1.0		mg/Kg	1	5/19/2009 02:11 PM
Cobalt	6.1	1.0		mg/Kg	1	5/19/2009 02:11 PM
Copper	20	2.0		mg/Kg	1	5/19/2009 02:11 PM
Lead	30	1.0		mg/Kg	1	5/19/2009 02:11 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 02:11 PM
Nickel	15	1.0		mg/Kg	1	5/19/2009 02:11 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 02:11 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 02:11 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 02:11 PM
Vanadium	30	1.0		mg/Kg	1	5/19/2009 02:11 PM
Zinc	98	1.0		mg/Kg	1	5/19/2009 02:11 PM
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
	EPA 3550B			**EPA 8015B(M)**		
RunID: GC8_090518B	QC Batch: 55402			PrepDate:	5/18/2009	Analyst: **CBR**
DRO	130	20		mg/Kg	20	5/19/2009 05:45 AM
ORO	610	20		mg/Kg	20	5/19/2009 05:45 AM
Surr: p-Terphenyl	0	30-130	SDO	%REC	20	5/19/2009 05:45 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 09:53 PM
Surr: Bromofluorobenzene (FID)	96.5	59-145		%REC	1	5/14/2009 09:53 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 09:53 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 09:53 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 09:53 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B9 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 12:26:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-031A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514B	QC Batch:	E09VS130			PrepDate:	Analyst: **KHN**
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 09:53 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 09:53 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 09:53 PM
Surr: Bromofluorobenzene (PID)	87.0	65-140		%REC	1	5/14/2009 09:53 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517B	QC Batch:	55376			PrepDate:	5/15/2009 Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 12:24 AM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 12:24 AM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 12:24 AM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 12:24 AM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:24 AM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 12:24 AM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:24 AM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 12:24 AM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:24 AM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 12:24 AM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 12:24 AM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 12:24 AM
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 12:24 AM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 12:24 AM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 12:24 AM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 12:24 AM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:24 AM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 12:24 AM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 12:24 AM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 12:24 AM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 12:24 AM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 12:24 AM
Surr: Decachlorobiphenyl	46.5	20-142		%REC	1	5/18/2009 12:24 AM
Surr: Tetrachloro-m-xylene	50.7	25-115		%REC	1	5/18/2009 12:24 AM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519B	QC Batch:	55364			PrepDate:	5/18/2009 Analyst: **RQ**

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B9 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 12:26:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-031A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY BY COLD VAPOR TECHNIQUE						
			EPA 7471A			
RunID: AA5_090519B	QC Batch: 55364			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 11:47 AM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B58 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 2:10:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-033A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC8_090518B	QC Batch: 55402			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	190	20		mg/Kg	10	5/19/2009 04:52 AM
ORO	750	20		mg/Kg	10	5/19/2009 04:52 AM
Surr: p-Terphenyl	0	30-130	SDO	%REC	10	5/19/2009 04:52 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 10:08 PM
Surr: Bromofluorobenzene (FID)	96.0	59-145		%REC	1	5/14/2009 10:08 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 10:08 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 10:08 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 10:08 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 10:08 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 10:08 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 10:08 PM
Surr: Bromofluorobenzene (PID)	86.9	65-140		%REC	1	5/14/2009 10:08 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517B	QC Batch: 55376			PrepDate: 5/15/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 12:38 AM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 12:38 AM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 12:38 AM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 12:38 AM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:38 AM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 12:38 AM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:38 AM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 12:38 AM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:38 AM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 12:38 AM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 12:38 AM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 12:38 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B58 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 2:10:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-033A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517B	QC Batch: 55376				PrepDate: 5/15/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 12:38 AM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 12:38 AM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 12:38 AM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 12:38 AM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:38 AM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 12:38 AM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 12:38 AM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 12:38 AM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 12:38 AM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 12:38 AM
Surr: Decachlorobiphenyl	65.8	20-142		%REC	1	5/18/2009 12:38 AM
Surr: Tetrachloro-m-xylene	65.8	25-115		%REC	1	5/18/2009 12:38 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B57 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 2:07:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-035A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519C	QC Batch: 55395			PrepDate: 5/18/2009		Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 02:14 PM
Arsenic	6.6	1.0		mg/Kg	1	5/19/2009 02:14 PM
Barium	130	1.0		mg/Kg	1	5/19/2009 02:14 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 02:14 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 02:14 PM
Chromium	14	1.0		mg/Kg	1	5/19/2009 02:14 PM
Cobalt	8.1	1.0		mg/Kg	1	5/19/2009 02:14 PM
Copper	25	2.0		mg/Kg	1	5/19/2009 02:14 PM
Lead	8.2	1.0		mg/Kg	1	5/19/2009 02:14 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 02:14 PM
Nickel	14	1.0		mg/Kg	1	5/19/2009 02:14 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 02:14 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 02:14 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 02:14 PM
Vanadium	35	1.0		mg/Kg	1	5/19/2009 02:14 PM
Zinc	89	1.0		mg/Kg	1	5/19/2009 02:14 PM
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
	EPA 3550B			**EPA 8015B(M)**		
RunID: GC8_090518B	QC Batch: 55402			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	18	2.0		mg/Kg	1	5/19/2009 03:05 AM
ORO	71	2.0		mg/Kg	1	5/19/2009 03:05 AM
Surr: p-Terphenyl	78.3	30-130		%REC	1	5/19/2009 03:05 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 10:24 PM
Surr: Bromofluorobenzene (FID)	94.4	59-145		%REC	1	5/14/2009 10:24 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 10:24 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 10:24 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 10:24 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B57 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 2:07:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-035A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514B	QC Batch:	E09VS130			PrepDate:	Analyst: **KHN**
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 10:24 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 10:24 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 10:24 PM
Surr: Bromofluorobenzene (PID)	84.8	65-140		%REC	1	5/14/2009 10:24 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517B	QC Batch:	55376			PrepDate: 5/15/2009	Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 12:52 AM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 12:52 AM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 12:52 AM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 12:52 AM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:52 AM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 12:52 AM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:52 AM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 12:52 AM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:52 AM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 12:52 AM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 12:52 AM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 12:52 AM
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 12:52 AM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 12:52 AM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 12:52 AM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 12:52 AM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 12:52 AM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 12:52 AM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 12:52 AM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 12:52 AM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 12:52 AM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 12:52 AM
Surr: Decachlorobiphenyl	69.2	20-142		%REC	1	5/18/2009 12:52 AM
Surr: Tetrachloro-m-xylene	74.9	25-115		%REC	1	5/18/2009 12:52 AM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519B	QC Batch:	55364			PrepDate: 5/18/2009	Analyst: **RQ**

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B57 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 2:07:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-035A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY BY COLD VAPOR TECHNIQUE						
			EPA 7471A			
RunID: AA5_090519B	QC Batch: 55364			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 11:49 AM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B56 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 2:30:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-037A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC8_090518B QC Batch: 55402				PrepDate: 5/18/2009		Analyst: **CBR**
DRO	20	20		mg/Kg	10	5/19/2009 05:19 AM
ORO	93	20		mg/Kg	10	5/19/2009 05:19 AM
Surr: p-Terphenyl	0	30-130	SDO	%REC	10	5/19/2009 05:19 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514B QC Batch: E09VS130				PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 10:39 PM
Surr: Bromofluorobenzene (FID)	100	59-145		%REC	1	5/14/2009 10:39 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514B QC Batch: E09VS130				PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 10:39 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 10:39 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 10:39 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 10:39 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 10:39 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 10:39 PM
Surr: Bromofluorobenzene (PID)	90.5	65-140		%REC	1	5/14/2009 10:39 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517B QC Batch: 55376				PrepDate: 5/15/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 01:06 AM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 01:06 AM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 01:06 AM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 01:06 AM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 01:06 AM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 01:06 AM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 01:06 AM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 01:06 AM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 01:06 AM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 01:06 AM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 01:06 AM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 01:06 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B56 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 2:30:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-037A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517B	QC Batch: 55376				PrepDate: 5/15/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 01:06 AM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 01:06 AM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 01:06 AM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 01:06 AM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 01:06 AM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 01:06 AM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 01:06 AM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 01:06 AM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 01:06 AM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 01:06 AM
Surr: Decachlorobiphenyl	65.9	20-142		%REC	1	5/18/2009 01:06 AM
Surr: Tetrachloro-m-xylene	74.7	25-115		%REC	1	5/18/2009 01:06 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B55 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 2:31:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-039A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC8_090518B	QC Batch: 55402			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	100	20		mg/Kg	10	5/19/2009 03:32 AM
ORO	420	20		mg/Kg	10	5/19/2009 03:32 AM
Surr: p-Terphenyl	0	30-130	SDO	%REC	10	5/19/2009 03:32 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/14/2009 10:55 PM
Surr: Bromofluorobenzene (FID)	92.0	59-145		%REC	1	5/14/2009 10:55 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514B	QC Batch: E09VS130			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/14/2009 10:55 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/14/2009 10:55 PM
m,p-Xylene	ND	10		µg/Kg	1	5/14/2009 10:55 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/14/2009 10:55 PM
o-Xylene	ND	5.0		µg/Kg	1	5/14/2009 10:55 PM
Toluene	ND	5.0		µg/Kg	1	5/14/2009 10:55 PM
Surr: Bromofluorobenzene (PID)	83.0	65-140		%REC	1	5/14/2009 10:55 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090517B	QC Batch: 55376			PrepDate: 5/15/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 01:20 AM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 01:20 AM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 01:20 AM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 01:20 AM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 01:20 AM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 01:20 AM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 01:20 AM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 01:20 AM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 01:20 AM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 01:20 AM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 01:20 AM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 01:20 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B55 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 2:31:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-039A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090517B	QC Batch: 55376			PrepDate: 5/15/2009		Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 01:20 AM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 01:20 AM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 01:20 AM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 01:20 AM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 01:20 AM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 01:20 AM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 01:20 AM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 01:20 AM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 01:20 AM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 01:20 AM
Surr: Decachlorobiphenyl	34.7	20-142		%REC	1	5/18/2009 01:20 AM
Surr: Tetrachloro-m-xylene	41.8	25-115		%REC	1	5/18/2009 01:20 AM
PH						
				EPA 9045C		
RunID: WETCHEM_090515A	QC Batch: R109066			PrepDate:		Analyst: **DDL**
pH	7.5	0.10		pH Units	1	5/15/2009

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B55 - 1.5
Lab Order:	105494	**Collection Date:**	5/12/2009 2:39:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-040A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519C	QC Batch: 55395			PrepDate:	5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 02:17 PM
Arsenic	5.0	1.0		mg/Kg	1	5/19/2009 02:17 PM
Barium	130	1.0		mg/Kg	1	5/19/2009 02:17 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 02:17 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 02:17 PM
Chromium	14	1.0		mg/Kg	1	5/19/2009 02:17 PM
Cobalt	6.9	1.0		mg/Kg	1	5/19/2009 02:17 PM
Copper	14	2.0		mg/Kg	1	5/19/2009 02:17 PM
Lead	12	1.0		mg/Kg	1	5/19/2009 02:17 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 02:17 PM
Nickel	11	1.0		mg/Kg	1	5/19/2009 02:17 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 02:17 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 02:17 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 02:17 PM
Vanadium	33	1.0		mg/Kg	1	5/19/2009 02:17 PM
Zinc	37	1.0		mg/Kg	1	5/19/2009 02:17 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519B	QC Batch: 55364			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 11:51 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B54 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 2:42:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-041A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC8_090518C	QC Batch: 55404			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	31	10		mg/Kg	10	5/19/2009 11:07 AM
ORO	140	10		mg/Kg	10	5/19/2009 11:07 AM
Surr: p-Terphenyl	0	30-130	SDO	%REC	10	5/19/2009 11:07 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/15/2009 01:48 AM
Surr: Bromofluorobenzene (FID)	105	59-145		%REC	1	5/15/2009 01:48 AM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/15/2009 01:48 AM
Ethylbenzene	ND	5.0		µg/Kg	1	5/15/2009 01:48 AM
m,p-Xylene	ND	10		µg/Kg	1	5/15/2009 01:48 AM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/15/2009 01:48 AM
o-Xylene	ND	5.0		µg/Kg	1	5/15/2009 01:48 AM
Toluene	ND	5.0		µg/Kg	1	5/15/2009 01:48 AM
Surr: Bromofluorobenzene (PID)	93.7	65-140		%REC	1	5/15/2009 01:48 AM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377			PrepDate: 5/15/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 08:30 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 08:30 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 08:30 PM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 08:30 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:30 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 08:30 PM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:30 PM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 08:30 PM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:30 PM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 08:30 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 08:30 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 08:30 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B54 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 2:42:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-041A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377				PrepDate: 5/15/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 08:30 PM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 08:30 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 08:30 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 08:30 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:30 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 08:30 PM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 08:30 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 08:30 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 08:30 PM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 08:30 PM
Surr: Decachlorobiphenyl	52.2	20-142		%REC	1	5/18/2009 08:30 PM
Surr: Tetrachloro-m-xylene	53.5	25-115		%REC	1	5/18/2009 08:30 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B53 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 2:55:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-043A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519A	QC Batch: 55396			PrepDate: 5/18/2009		Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 12:10 PM
Arsenic	4.2	1.0		mg/Kg	1	5/19/2009 12:10 PM
Barium	160	1.0		mg/Kg	1	5/19/2009 12:10 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 12:10 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 12:10 PM
Chromium	15	1.0		mg/Kg	1	5/19/2009 12:10 PM
Cobalt	7.4	1.0		mg/Kg	1	5/19/2009 12:10 PM
Copper	17	2.0		mg/Kg	1	5/19/2009 12:10 PM
Lead	8.9	1.0		mg/Kg	1	5/19/2009 12:10 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 12:10 PM
Nickel	14	1.0		mg/Kg	1	5/19/2009 12:10 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 12:10 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 12:10 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 12:10 PM
Vanadium	34	1.0		mg/Kg	1	5/19/2009 12:10 PM
Zinc	43	1.0		mg/Kg	1	5/19/2009 12:10 PM
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
	EPA 3550B			**EPA 8015B(M)**		
RunID: GC8_090518C	QC Batch: 55404			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	12	1.0		mg/Kg	1	5/19/2009 10:40 AM
ORO	48	1.0		mg/Kg	1	5/19/2009 10:40 AM
Surr: p-Terphenyl	90.8	30-130		%REC	1	5/19/2009 10:40 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/15/2009 02:03 AM
Surr: Bromofluorobenzene (FID)	97.8	59-145		%REC	1	5/15/2009 02:03 AM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/15/2009 02:03 AM
Ethylbenzene	ND	5.0		µg/Kg	1	5/15/2009 02:03 AM
m,p-Xylene	ND	10		µg/Kg	1	5/15/2009 02:03 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B53 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 2:55:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-043A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514C	QC Batch:	E09VS131			PrepDate:	Analyst: **KHN**
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/15/2009 02:03 AM
o-Xylene	ND	5.0		µg/Kg	1	5/15/2009 02:03 AM
Toluene	ND	5.0		µg/Kg	1	5/15/2009 02:03 AM
Surr: Bromofluorobenzene (PID)	87.5	65-140		%REC	1	5/15/2009 02:03 AM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC10_090518A	QC Batch:	55377			PrepDate: 5/15/2009	Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 08:44 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 08:44 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 08:44 PM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 08:44 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:44 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 08:44 PM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:44 PM
Chlordane	11	8.5		µg/Kg	1	5/18/2009 08:44 PM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:44 PM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 08:44 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 08:44 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 08:44 PM
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 08:44 PM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 08:44 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 08:44 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 08:44 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:44 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 08:44 PM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 08:44 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 08:44 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 08:44 PM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 08:44 PM
Surr: Decachlorobiphenyl	70.1	20-142		%REC	1	5/18/2009 08:44 PM
Surr: Tetrachloro-m-xylene	72.2	25-115		%REC	1	5/18/2009 08:44 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519B	QC Batch:	55364			PrepDate: 5/18/2009	Analyst: **RQ**

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B53 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 2:55:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-043A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY BY COLD VAPOR TECHNIQUE						
			EPA 7471A			
RunID: AA5_090519B	QC Batch: 55364			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 11:29 AM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B18 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 8:55:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-045A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC8_090518C	QC Batch: 55404			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	1.9	1.0		mg/Kg	1	5/19/2009 09:46 AM
ORO	3.6	1.0		mg/Kg	1	5/19/2009 09:46 AM
Surr: p-Terphenyl	81.1	30-130		%REC	1	5/19/2009 09:46 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/15/2009 02:19 AM
Surr: Bromofluorobenzene (FID)	99.5	59-145		%REC	1	5/15/2009 02:19 AM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/15/2009 02:19 AM
Ethylbenzene	ND	5.0		µg/Kg	1	5/15/2009 02:19 AM
m,p-Xylene	ND	10		µg/Kg	1	5/15/2009 02:19 AM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/15/2009 02:19 AM
o-Xylene	ND	5.0		µg/Kg	1	5/15/2009 02:19 AM
Toluene	ND	5.0		µg/Kg	1	5/15/2009 02:19 AM
Surr: Bromofluorobenzene (PID)	88.8	65-140		%REC	1	5/15/2009 02:19 AM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377			PrepDate: 5/15/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 07:08 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 07:08 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 07:08 PM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 07:08 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 07:08 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 07:08 PM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 07:08 PM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 07:08 PM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 07:08 PM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 07:08 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 07:08 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 07:08 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B18 - 0
Lab Order:	105494	**Collection Date:**	5/12/2009 8:55:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105494-045A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377				PrepDate: 5/15/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 07:08 PM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 07:08 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 07:08 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 07:08 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 07:08 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 07:08 PM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 07:08 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 07:08 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 07:08 PM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 07:08 PM
Surr: Decachlorobiphenyl	65.8	20-142		%REC	1	5/18/2009 07:08 PM
Surr: Tetrachloro-m-xylene	65.2	25-115		%REC	1	5/18/2009 07:08 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **MB-55395** SampType: **MBLK** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109141**
Client ID: **PBS** Batch ID: **55395** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713685**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	2.0									
Arsenic	ND	1.0									
Barium	0.238	1.0									
Beryllium	ND	1.0									
Cadmium	0.019	1.0									
Chromium	0.154	1.0									
Cobalt	ND	1.0									
Copper	ND	2.0									
Lead	0.222	1.0									
Molybdenum	ND	1.0									
Nickel	0.039	1.0									
Selenium	ND	1.0									
Silver	0.035	1.0									
Thallium	ND	1.0									
Vanadium	0.058	1.0									
Zinc	0.378	1.0									

Sample ID: **LCS-55395** SampType: **LCS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109141**
Client ID: **LCSS** Batch ID: **55395** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713686**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	49.672	2.0	50.00	0	99.3	80	120				
Arsenic	49.107	1.0	50.00	0	98.2	80	120				
Barium	52.644	1.0	50.00	0.2383	105	80	120				
Beryllium	50.755	1.0	50.00	0	102	80	120				
Cadmium	50.179	1.0	50.00	0.01944	100	80	120				
Chromium	48.428	1.0	50.00	0.1537	96.5	80	120				
Cobalt	52.079	1.0	50.00	0	104	80	120				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **LCS-55395** SampType: **LCS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109141**
Client ID: **LCSS** Batch ID: **55395** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713686**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	52.833	2.0	50.00	0	106	80	120				
Lead	51.772	1.0	50.00	0.2220	103	80	120				
Molybdenum	52.860	1.0	50.00	0	106	80	120				
Nickel	49.968	1.0	50.00	0.03919	99.9	80	120				
Selenium	47.512	1.0	50.00	0	95.0	80	120				
Silver	51.299	1.0	50.00	0.03508	103	80	120				
Thallium	45.200	1.0	50.00	0	90.4	80	120				
Vanadium	52.892	1.0	50.00	0.05757	106	80	120				
Zinc	49.699	1.0	50.00	0.3779	98.6	80	120				

Sample ID: **105494-040ADUP** SampType: **DUP** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109141**
Client ID: **B55 - 1.5** Batch ID: **55395** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713697**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	0.286	2.0						0.5709	0	20	
Arsenic	4.596	1.0						4.998	8.38	20	
Barium	123.967	1.0						130.7	5.32	20	
Beryllium	0.215	1.0						0.2087	0	20	
Cadmium	0.425	1.0						0.4492	0	20	
Chromium	12.486	1.0						13.68	9.16	20	
Cobalt	5.580	1.0						6.892	21.0	20	R
Copper	12.437	2.0						14.07	12.3	20	
Lead	7.255	1.0						11.83	48.0	20	R
Molybdenum	ND	1.0						0	0	20	
Nickel	9.547	1.0						11.46	18.2	20	
Selenium	ND	1.0						0	0	20	
Silver	ND	1.0						0	0	20	
Thallium	ND	1.0						0	0	20	
Vanadium	30.687	1.0						33.32	8.23	20	
Zinc	33.785	1.0						37.45	10.3	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **105494-040AMS** SampType: **MS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109141**
Client ID: **B55 - 1.5** Batch ID: **55395** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713698**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	82.253	2.0	125.0	0.5709	65.3	25	106				
Arsenic	105.562	1.0	125.0	4.998	80.5	42	113				
Barium	225.874	1.0	125.0	130.7	76.1	19	140				
Beryllium	106.750	1.0	125.0	0.2087	85.2	50	109				
Cadmium	102.602	1.0	125.0	0.4492	81.7	48	106				
Chromium	114.307	1.0	125.0	13.68	80.5	44	116				
Cobalt	111.631	1.0	125.0	6.892	83.8	47	107				
Copper	128.276	2.0	125.0	14.07	91.4	49	124				
Lead	113.036	1.0	125.0	11.83	81.0	33	120				
Molybdenum	106.444	1.0	125.0	0	85.2	46	111				
Nickel	114.885	1.0	125.0	11.46	82.7	43	111				
Selenium	100.640	1.0	125.0	0	80.5	43	104				
Silver	109.303	1.0	125.0	0	87.4	53	114				
Thallium	93.540	1.0	125.0	0	74.8	41	107				
Vanadium	137.367	1.0	125.0	33.32	83.2	48	116				
Zinc	136.776	1.0	125.0	37.45	79.5	24	129				

Sample ID: **105494-040AMSD** SampType: **MSD** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109141**
Client ID: **B55 - 1.5** Batch ID: **55395** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713699**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	75.720	2.0	125.0	0.5709	60.1	25	106	82.25	8.27	20	
Arsenic	102.610	1.0	125.0	4.998	78.1	42	113	105.6	2.84	20	
Barium	239.750	1.0	125.0	130.7	87.2	19	140	225.9	5.96	20	
Beryllium	100.881	1.0	125.0	0.2087	80.5	50	109	106.8	5.65	20	
Cadmium	97.310	1.0	125.0	0.4492	77.5	48	106	102.6	5.29	20	
Chromium	109.703	1.0	125.0	13.68	76.8	44	116	114.3	4.11	20	
Cobalt	106.886	1.0	125.0	6.892	80.0	47	107	111.6	4.34	20	
Copper	123.485	2.0	125.0	14.07	87.5	49	124	128.3	3.81	20	
Lead	111.164	1.0	125.0	11.83	79.5	33	120	113.0	1.67	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **105494-040AMSD** SampType: **MSD** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109141**
Client ID: **B55 - 1.5** Batch ID: **55395** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713699**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	102.050	1.0	125.0	0	81.6	46	111	106.4	4.21	20	
Nickel	111.028	1.0	125.0	11.46	79.7	43	111	114.9	3.41	20	
Selenium	97.347	1.0	125.0	0	77.9	43	104	100.6	3.33	20	
Silver	103.170	1.0	125.0	0	82.5	53	114	109.3	5.77	20	
Thallium	89.728	1.0	125.0	0	71.8	41	107	93.54	4.16	20	
Vanadium	135.558	1.0	125.0	33.32	81.8	48	116	137.4	1.33	20	
Zinc	133.753	1.0	125.0	37.45	77.0	24	129	136.8	2.23	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **MB-55396** SampType: **MBLK** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109135**
Client ID: **PBS** Batch ID: **55396** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713553**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	2.0									
Arsenic	ND	1.0									
Barium	ND	1.0									
Beryllium	ND	1.0									
Cadmium	0.011	1.0									
Chromium	0.172	1.0									
Cobalt	ND	1.0									
Copper	0.336	2.0									
Lead	ND	1.0									
Molybdenum	ND	1.0									
Nickel	ND	1.0									
Selenium	ND	1.0									
Silver	0.021	1.0									
Thallium	ND	1.0									
Vanadium	ND	1.0									
Zinc	0.223	1.0									

Sample ID: **LCS-55396** SampType: **LCS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109135**
Client ID: **LCSS** Batch ID: **55396** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713554**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	46.981	2.0	50.00	0	94.0	80	120				
Arsenic	46.540	1.0	50.00	0	93.1	80	120				
Barium	49.822	1.0	50.00	0	99.6	80	120				
Beryllium	48.278	1.0	50.00	0	96.6	80	120				
Cadmium	47.419	1.0	50.00	0.01062	94.8	80	120				
Chromium	45.767	1.0	50.00	0.1722	91.2	80	120				
Cobalt	49.355	1.0	50.00	0	98.7	80	120				
Copper	50.674	2.0	50.00	0.3361	101	80	120				
Lead	49.391	1.0	50.00	0	98.8	80	120				

Qualifiers:

B Analyte detected in the associated Method Blank
ND Not Detected at the Reporting Limit
DO Surrogate Diluted Out
E Value above quantitation range
R RPD outside accepted recovery limits
Calculations are based on raw values
H Holding times for preparation or analysis exceeded
S Spike/Surrogate outside of limits due to matrix interference

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Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **LCS-55396** SampType: **LCS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109135**
Client ID: **LCSS** Batch ID: **55396** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713554**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	50.058	1.0	50.00	0	100	80	120				
Nickel	47.319	1.0	50.00	0	94.6	80	120				
Selenium	45.577	1.0	50.00	0	91.2	80	120				
Silver	48.723	1.0	50.00	0.02147	97.4	80	120				
Thallium	42.901	1.0	50.00	0	85.8	80	120				
Vanadium	49.980	1.0	50.00	0	100	80	120				
Zinc	46.908	1.0	50.00	0.2230	93.4	80	120				

Sample ID: **105522-002ADUP** SampType: **DUP** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109135**
Client ID: **ZZZZZZ** Batch ID: **55396** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713557**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	1.050	2.0						0.9843	0	20	
Arsenic	4.344	1.0						4.194	3.52	20	
Barium	89.447	1.0						99.52	10.7	20	
Beryllium	ND	1.0						0	0	20	
Cadmium	0.898	1.0						0.6990	0	20	
Chromium	6.661	1.0						6.559	1.54	20	
Cobalt	3.619	1.0						3.943	8.58	20	
Copper	70.134	2.0						68.57	2.25	20	
Lead	21.323	1.0						18.41	14.7	20	
Molybdenum	0.211	1.0						0.2677	0	20	
Nickel	7.068	1.0						6.179	13.4	20	
Selenium	ND	1.0						0	0	20	
Silver	0.078	1.0						0	0	20	
Thallium	ND	1.0						0	0	20	
Vanadium	15.420	1.0						16.08	4.22	20	
Zinc	1071.343	1.0						946.4	12.4	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **105522-002AMS** SampType: **MS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109135**
Client ID: **ZZZZZZ** Batch ID: **55396** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713558**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	92.215	2.0	125.0	0.9843	73.0	25	106				
Arsenic	118.760	1.0	125.0	4.194	91.7	42	113				
Barium	197.772	1.0	125.0	99.52	78.6	19	140				
Beryllium	116.111	1.0	125.0	0	92.9	50	109				
Cadmium	105.372	1.0	125.0	0.6990	83.7	48	106				
Chromium	114.384	1.0	125.0	6.559	86.3	44	116				
Cobalt	110.102	1.0	125.0	3.943	84.9	47	107				
Copper	221.113	2.0	125.0	68.57	122	49	124				
Lead	125.850	1.0	125.0	18.41	86.0	33	120				
Molybdenum	117.200	1.0	125.0	0.2677	93.5	46	111				
Nickel	112.871	1.0	125.0	6.179	85.4	43	111				
Selenium	115.077	1.0	125.0	0	92.1	43	104				
Silver	123.647	1.0	125.0	0	98.9	53	114				
Thallium	96.705	1.0	125.0	0	77.4	41	107				
Vanadium	133.864	1.0	125.0	16.08	94.2	48	116				
Zinc	997.882	1.0	125.0	946.4	41.2	24	129				

Sample ID: **105522-002AMSD** SampType: **MSD** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109135**
Client ID: **ZZZZZZ** Batch ID: **55396** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713559**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	89.248	2.0	125.0	0.9843	70.6	25	106	92.22	3.27	20	
Arsenic	121.321	1.0	125.0	4.194	93.7	42	113	118.8	2.13	20	
Barium	193.945	1.0	125.0	99.52	75.5	19	140	197.8	1.95	20	
Beryllium	116.274	1.0	125.0	0	93.0	50	109	116.1	0.141	20	
Cadmium	104.822	1.0	125.0	0.6990	83.3	48	106	105.4	0.524	20	
Chromium	112.352	1.0	125.0	6.559	84.6	44	116	114.4	1.79	20	
Cobalt	108.912	1.0	125.0	3.943	84.0	47	107	110.1	1.09	20	
Copper	195.935	2.0	125.0	68.57	102	49	124	221.1	12.1	20	
Lead	124.060	1.0	125.0	18.41	84.5	33	120	125.9	1.43	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **105522-002AMSD** SampType: **MSD** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109135**
Client ID: **ZZZZZZ** Batch ID: **55396** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713559**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	117.804	1.0	125.0	0.2677	94.0	46	111	117.2	0.514	20	
Nickel	111.055	1.0	125.0	6.179	83.9	43	111	112.9	1.62	20	
Selenium	115.811	1.0	125.0	0	92.6	43	104	115.1	0.635	20	
Silver	122.842	1.0	125.0	0	98.3	53	114	123.6	0.653	20	
Thallium	96.500	1.0	125.0	0	77.2	41	107	96.71	0.213	20	
Vanadium	131.700	1.0	125.0	16.08	92.5	48	116	133.9	1.63	20	
Zinc	910.929	1.0	125.0	946.4	-28.4	24	129	997.9	9.11	20	S

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
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ANALYTICAL QC SUMMARY REPORT

TestCode: 7471_S

Sample ID: **MB-55364** SampType: **MBLK** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109133**
Client ID: **PBS** Batch ID: **55364** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713532**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.10									

Sample ID: **LCS-55364** SampType: **LCS** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109133**
Client ID: **LCSS** Batch ID: **55364** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713533**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.893	0.10	0.8300	0	108	80	120				

Sample ID: **105494-043A-MS** SampType: **MS** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109133**
Client ID: **B53 - 0** Batch ID: **55364** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713534**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.994	0.10	0.8300	0.05115	114	70	130				

Sample ID: **105494-043A-MSD** SampType: **MSD** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109133**
Client ID: **B53 - 0** Batch ID: **55364** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713535**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	1.001	0.10	0.8300	0.05115	114	70	130	0.9941	0.710	20	

Sample ID: **105494-043A-DUP** SampType: **DUP** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109133**
Client ID: **B53 - 0** Batch ID: **55364** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713536**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.051	0.10						0.05115	0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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Work Order: 105494
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ANALYTICAL QC SUMMARY REPORT

TestCode: 7471_S

Sample ID: **MB-55365** SampType: **MBLK** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109134**
Client ID: **PBS** Batch ID: **55365** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713562**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.10									

Sample ID: **LCS-55365** SampType: **LCS** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109134**
Client ID: **LCSS** Batch ID: **55365** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713563**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.947	0.10	0.8300	0	114	80	120				

Sample ID: **105495-024A-MS** SampType: **MS** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109134**
Client ID: **ZZZZZZ** Batch ID: **55365** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713564**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	1.064	0.10	0.8300	0.02447	125	70	130				

Sample ID: **105495-024A-DUP** SampType: **DUP** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109134**
Client ID: **ZZZZZZ** Batch ID: **55365** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713565**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.024	0.10						0.02447	0	20	

Sample ID: **105495-024A-MSD** SampType: **MSD** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109134**
Client ID: **ZZZZZZ** Batch ID: **55365** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713567**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.949	0.10	0.8300	0.02447	111	70	130	1.064	11.5	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **MB-55383** SampType: **MBLK** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109194**
Client ID: **PBS** Batch ID: **55383** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/20/2009** SeqNo: **1714637**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0									
ORO	ND	1.0									
Surr: p-Terphenyl	2.102		2.670		78.7	30	130				

Sample ID: **LCS-55383** SampType: **LCS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109194**
Client ID: **LCSS** Batch ID: **55383** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/20/2009** SeqNo: **1714638**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	23.264	1.0	33.00	0	70.5	35	124				
Surr: p-Terphenyl	2.286		2.670		85.6	30	130				

Sample ID: **105494-005ADUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109194**
Client ID: **B12 - 0** Batch ID: **55383** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/20/2009** SeqNo: **1714639**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0						0	0	20	
ORO	1.363	1.0						1.180	14.4	20	
Surr: p-Terphenyl	1.760		2.670		65.9	30	130		0	0	

Sample ID: **105494-007AMS** SampType: **MS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109194**
Client ID: **B16 - 0** Batch ID: **55383** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/20/2009** SeqNo: **1714644**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	32.425	1.0	33.00	6.937	77.2	12	125				
Surr: p-Terphenyl	2.139		2.670		80.1	30	130				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **105494-007AMSD** SampType: **MSD** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109194**
Client ID: **B16 - 0** Batch ID: **55383** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/20/2009** SeqNo: **1714645**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	28.496	1.0	33.00	6.937	65.3	12	125	32.43	12.9	20	
Surr: p-Terphenyl	2.056		2.670		77.0	30	130		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **LCS-55402** SampType: **LCS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109166**
Client ID: **LCSS** Batch ID: **55402** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/19/2009** SeqNo: **1714192**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	25.852	1.0	33.00	0	78.3	35	124				
Surr: p-Terphenyl	2.504		2.670		93.8	30	130				

Sample ID: **MB-55402** SampType: **MBLK** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109166**
Client ID: **PBS** Batch ID: **55402** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/19/2009** SeqNo: **1714193**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0									
ORO	ND	1.0									
Surr: p-Terphenyl	2.532		2.670		94.8	30	130				

Sample ID: **105494-027ADUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109166**
Client ID: **B7 - 0** Batch ID: **55402** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/19/2009** SeqNo: **1714195**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	1.605	1.0						1.815	12.3	20	
ORO	5.337	1.0						5.847	9.11	20	
Surr: p-Terphenyl	1.884		2.670		70.5	30	130		0	0	

Sample ID: **105494-039AMS** SampType: **MS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109166**
Client ID: **B55 - 0** Batch ID: **55402** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/19/2009** SeqNo: **1714199**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	186.769	20	33.00	100.8	260	12	125				S
Surr: p-Terphenyl	0		2.670		0	30	130				SDO

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **105494-039AMSD** SampType: **MSD** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109166**
Client ID: **B55 - 0** Batch ID: **55402** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/19/2009** SeqNo: **1714200**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	243.425	20	33.00	100.8	432	12	125	186.8	26.3	20	SR
Surr: p-Terphenyl	0		2.670		0	30	130		0	0	SDO

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **LCS-55404** SampType: **LCS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109173**
Client ID: **LCSS** Batch ID: **55404** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/19/2009** SeqNo: **1714282**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	31.746	1.0	33.00	0	96.2	35	124				
Surr: p-Terphenyl	3.349		2.670		125	30	130				

Sample ID: **MB-55404** SampType: **MBLK** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109173**
Client ID: **PBS** Batch ID: **55404** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/19/2009** SeqNo: **1714283**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0									
ORO	ND	1.0									
Surr: p-Terphenyl	2.355		2.670		88.2	30	130				

Sample ID: **105494-045ADUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109173**
Client ID: **B18 - 0** Batch ID: **55404** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/19/2009** SeqNo: **1714284**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	1.886	1.0						1.874	0.683	20	
ORO	3.873	1.0						3.631	6.46	20	
Surr: p-Terphenyl	2.039		2.670		76.4	30	130		0	0	

Sample ID: **105494-041AMS** SampType: **MS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109173**
Client ID: **B54 - 0** Batch ID: **55404** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/19/2009** SeqNo: **1714289**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	24.731	10	33.00	30.74	-18.2	12	125				S
Surr: p-Terphenyl	0		2.670		0	30	130				SDO

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **105494-041AMSD** SampType: **MSD** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109173**
Client ID: **B54 - 0** Batch ID: **55404** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/19/2009** SeqNo: **1714290**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	40.539	10	33.00	30.74	29.7	12	125	24.73	48.4	20	R
Surr: p-Terphenyl	0		2.670		0	30	130		0	0	SDO

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **E090514LCS1** SampType: **LCS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109040**
Client ID: **LCSS** Batch ID: **E09VS129** TestNo: **EPA 8015B(M** Analysis Date: **5/14/2009** SeqNo: **1711743**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	4.643	1.0	5.000	0	92.9	73	120				
Surr: Bromofluorobenzene (FID)	96.189		100.0		96.2	59	145				

Sample ID: **E090514MB1** SampType: **MBLK** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109040**
Client ID: **PBS** Batch ID: **E09VS129** TestNo: **EPA 8015B(M** Analysis Date: **5/14/2009** SeqNo: **1711744**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0									
Surr: Bromofluorobenzene (FID)	97.178		100.0		97.2	59	145				

Sample ID: **105494-019ADUP** SampType: **DUP** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109040**
Client ID: **B4 - 0** Batch ID: **E09VS129** TestNo: **EPA 8015B(M** Analysis Date: **5/14/2009** SeqNo: **1711755**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0						0	0	20	
Surr: Bromofluorobenzene (FID)	92.671		100.0		92.7	59	145		0	0	

Sample ID: **105494-019AMS** SampType: **MS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109040**
Client ID: **B4 - 0** Batch ID: **E09VS129** TestNo: **EPA 8015B(M** Analysis Date: **5/14/2009** SeqNo: **1711756**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	1.917	1.0	5.000	0	38.3	39	135				S
Surr: Bromofluorobenzene (FID)	102.294		100.0		102	59	145				

Sample ID: **105494-019AMSD** SampType: **MSD** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109040**
Client ID: **B4 - 0** Batch ID: **E09VS129** TestNo: **EPA 8015B(M** Analysis Date: **5/14/2009** SeqNo: **1711757**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	3.323	1.0	5.000	0	66.5	39	135	1.917	53.7	20	R

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **105494-019AMSD** SampType: **MSD** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109040**
Client ID: **B4 - 0** Batch ID: **E09VS129** TestNo: **EPA 8015B(M** Analysis Date: **5/14/2009** SeqNo: **1711757**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Bromofluorobenzene (FID)	93.159		100.0		93.2	59	145		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **E090514LCS3** SampType: **LCS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109044**
Client ID: **LCSS** Batch ID: **E09VS130** TestNo: **EPA 8015B(M** Analysis Date: **5/14/2009** SeqNo: **1711826**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	4.505	1.0	5.000	0	90.1	73	120				
Surr: Bromofluorobenzene (FID)	99.645		100.0		99.6	59	145				

Sample ID: **E090514MB2** SampType: **MBLK** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109044**
Client ID: **PBS** Batch ID: **E09VS130** TestNo: **EPA 8015B(M** Analysis Date: **5/14/2009** SeqNo: **1711827**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0									
Surr: Bromofluorobenzene (FID)	98.781		100.0		98.8	59	145				

Sample ID: **105494-039ADUP** SampType: **DUP** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109044**
Client ID: **B55 - 0** Batch ID: **E09VS130** TestNo: **EPA 8015B(M** Analysis Date: **5/14/2009** SeqNo: **1711838**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0						0	0	20	
Surr: Bromofluorobenzene (FID)	90.381		100.0		90.4	59	145		0	0	

Sample ID: **105494-039AMS** SampType: **MS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109044**
Client ID: **B55 - 0** Batch ID: **E09VS130** TestNo: **EPA 8015B(M** Analysis Date: **5/14/2009** SeqNo: **1711839**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	2.657	1.0	5.000	0	53.1	39	135				
Surr: Bromofluorobenzene (FID)	92.935		100.0		92.9	59	145				

Sample ID: **105494-039AMSD** SampType: **MSD** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109044**
Client ID: **B55 - 0** Batch ID: **E09VS130** TestNo: **EPA 8015B(M** Analysis Date: **5/14/2009** SeqNo: **1711840**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	2.776	1.0	5.000	0	55.5	39	135	2.657	4.38	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **105494-039AMSD** SampType: **MSD** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109044**
Client ID: **B55 - 0** Batch ID: **E09VS130** TestNo: **EPA 8015B(M** Analysis Date: **5/14/2009** SeqNo: **1711840**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Bromofluorobenzene (FID)	96.426		100.0		96.4	59	145		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **E090514MB3** SampType: **MBLK** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109048**
Client ID: **PBS** Batch ID: **E09VS131** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1711923**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0									
Surr: Bromofluorobenzene (FID)	99.780		100.0		99.8	59	145				

Sample ID: **105495-013ADUP** SampType: **DUP** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109048**
Client ID: **ZZZZZZ** Batch ID: **E09VS131** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1711933**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0						0	0	20	
Surr: Bromofluorobenzene (FID)	93.480		100.0		93.5	59	145		0	0	

Sample ID: **105495-013AMS** SampType: **MS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109048**
Client ID: **ZZZZZZ** Batch ID: **E09VS131** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1711934**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	3.368	1.0	5.000	0	67.4	39	135				
Surr: Bromofluorobenzene (FID)	98.921		100.0		98.9	59	145				

Sample ID: **105495-013AMSD** SampType: **MSD** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109048**
Client ID: **ZZZZZZ** Batch ID: **E09VS131** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1711935**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	3.290	1.0	5.000	0	65.8	39	135	3.368	2.34	20	
Surr: Bromofluorobenzene (FID)	99.322		100.0		99.3	59	145		0	0	

Sample ID: **E090514LCS5** SampType: **LCS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109048**
Client ID: **LCSS** Batch ID: **E09VS131** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1711936**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	4.255	1.0	5.000	0	85.1	73	120				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **E090514LCS5** SampType: **LCS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109048**
Client ID: **LCSS** Batch ID: **E09VS131** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1711936**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Bromofluorobenzene (FID)	98.927		100.0		98.9	59	145				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
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ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **E090514LCS2** SampType: **LCS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109040**
Client ID: **LCSS** Batch ID: **E09VS129** TestNo: **EPA 8021B** Analysis Date: **5/14/2009** SeqNo: **1711758**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	92.871	5.0	100.0	0	92.9	80	121				
Ethylbenzene	94.638	5.0	100.0	0	94.6	84	120				
m,p-Xylene	193.262	10	200.0	0	96.6	84	122				
Methyl tert-butyl ether	86.736	5.0	100.0	0	86.7	66	128				
o-Xylene	96.089	5.0	100.0	0	96.1	84	123				
Toluene	94.753	5.0	100.0	0	94.8	84	120				
Surr: Bromofluorobenzene (PID)	89.006		100.0		89.0	65	140				

Sample ID: **E090514MB1** SampType: **MBLK** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109040**
Client ID: **PBS** Batch ID: **E09VS129** TestNo: **EPA 8021B** Analysis Date: **5/14/2009** SeqNo: **1711759**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0									
Ethylbenzene	ND	5.0									
m,p-Xylene	ND	10									
Methyl tert-butyl ether	ND	5.0									
o-Xylene	ND	5.0									
Toluene	ND	5.0									
Surr: Bromofluorobenzene (PID)	87.553		100.0		87.6	65	140				

Sample ID: **105494-019ADUP** SampType: **DUP** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109040**
Client ID: **B4 - 0** Batch ID: **E09VS129** TestNo: **EPA 8021B** Analysis Date: **5/14/2009** SeqNo: **1711770**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0						0	0	20	
Ethylbenzene	ND	5.0						0	0	20	
m,p-Xylene	ND	10						0	0	20	
Methyl tert-butyl ether	ND	5.0						0	0	20	
o-Xylene	ND	5.0						0	0	20	
Toluene	ND	5.0						0	0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **105494-019ADUP** SampType: **DUP** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109040**
Client ID: **B4 - 0** Batch ID: **E09VS129** TestNo: **EPA 8021B** Analysis Date: **5/14/2009** SeqNo: **1711770**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Xylenes, Total	ND	15						0	0	20	
Surr: Bromofluorobenzene (PID)	83.132		100.0		83.1	65	140		0	0	

Sample ID: **105494-019AMS** SampType: **MS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109040**
Client ID: **B4 - 0** Batch ID: **E09VS129** TestNo: **EPA 8021B** Analysis Date: **5/14/2009** SeqNo: **1711771**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	14.817	5.0	35.75	0	41.4	22	132				
Ethylbenzene	15.359	5.0	49.65	0	30.9	15	133				
m,p-Xylene	63.702	10	199.6	0	31.9	30	118				
Methyl tert-butyl ether	308.665	5.0	578.9	0	53.3	38	136				
o-Xylene	22.897	5.0	78.40	0	29.2	21	119				
Toluene	66.674	5.0	172.2	0	38.7	36	129				
Surr: Bromofluorobenzene (PID)	89.220		100.0		89.2	65	140				

Sample ID: **105494-019AMSD** SampType: **MSD** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109040**
Client ID: **B4 - 0** Batch ID: **E09VS129** TestNo: **EPA 8021B** Analysis Date: **5/14/2009** SeqNo: **1711772**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	23.125	5.0	35.75	0	64.7	22	132	14.82	43.8	20	R
Ethylbenzene	25.886	5.0	49.65	0	52.1	15	133	15.36	51.0	20	R
m,p-Xylene	102.601	10	199.6	0	51.4	30	118	63.70	46.8	20	R
Methyl tert-butyl ether	432.361	5.0	578.9	0	74.7	38	136	308.7	33.4	20	R
o-Xylene	37.633	5.0	78.40	0	48.0	21	119	22.90	48.7	20	R
Toluene	104.231	5.0	172.2	0	60.5	36	129	66.67	44.0	20	R
Surr: Bromofluorobenzene (PID)	87.929		100.0		87.9	65	140		0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **E090514LCS4** SampType: **LCS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109044**
Client ID: **LCSS** Batch ID: **E09VS130** TestNo: **EPA 8021B** Analysis Date: **5/14/2009** SeqNo: **1711895**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	93.048	5.0	100.0	0	93.0	80	121				
Ethylbenzene	92.054	5.0	100.0	0	92.1	84	120				
m,p-Xylene	187.775	10	200.0	0	93.9	84	122				
Methyl tert-butyl ether	87.129	5.0	100.0	0	87.1	66	128				
o-Xylene	95.030	5.0	100.0	0	95.0	84	123				
Toluene	93.642	5.0	100.0	0	93.6	84	120				
Surr: Bromofluorobenzene (PID)	89.772		100.0		89.8	65	140				

Sample ID: **E090514MB2** SampType: **MBLK** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109044**
Client ID: **PBS** Batch ID: **E09VS130** TestNo: **EPA 8021B** Analysis Date: **5/14/2009** SeqNo: **1711896**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0									
Ethylbenzene	ND	5.0									
m,p-Xylene	ND	10									
Methyl tert-butyl ether	ND	5.0									
o-Xylene	ND	5.0									
Toluene	ND	5.0									
Surr: Bromofluorobenzene (PID)	88.113		100.0		88.1	65	140				

Sample ID: **105494-039ADUP** SampType: **DUP** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109044**
Client ID: **B55 - 0** Batch ID: **E09VS130** TestNo: **EPA 8021B** Analysis Date: **5/14/2009** SeqNo: **1711907**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0						0	0	20	
Ethylbenzene	ND	5.0						0	0	20	
m,p-Xylene	ND	10						0	0	20	
Methyl tert-butyl ether	ND	5.0						0	0	20	
o-Xylene	ND	5.0						0	0	20	
Toluene	ND	5.0						0	0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **105494-039ADUP** SampType: **DUP** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109044**
Client ID: **B55 - 0** Batch ID: **E09VS130** TestNo: **EPA 8021B** Analysis Date: **5/14/2009** SeqNo: **1711907**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Xylenes, Total	ND	15						0	0	20	
Surr: Bromofluorobenzene (PID)	81.485		100.0		81.5	65	140		0	0	

Sample ID: **105494-039AMS** SampType: **MS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109044**
Client ID: **B55 - 0** Batch ID: **E09VS130** TestNo: **EPA 8021B** Analysis Date: **5/14/2009** SeqNo: **1711908**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	21.068	5.0	35.75	0	58.9	22	132				
Ethylbenzene	22.131	5.0	49.65	0	44.6	15	133				
m,p-Xylene	92.622	10	199.6	0	46.4	30	118				
Methyl tert-butyl ether	416.787	5.0	578.9	0	72.0	38	136				
o-Xylene	32.061	5.0	78.40	0	40.9	21	119				
Toluene	95.010	5.0	172.2	0	55.2	36	129				
Surr: Bromofluorobenzene (PID)	85.585		100.0		85.6	65	140				

Sample ID: **105494-039AMSD** SampType: **MSD** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109044**
Client ID: **B55 - 0** Batch ID: **E09VS130** TestNo: **EPA 8021B** Analysis Date: **5/14/2009** SeqNo: **1711909**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	21.519	5.0	35.75	0	60.2	22	132	21.07	2.12	20	
Ethylbenzene	22.231	5.0	49.65	0	44.8	15	133	22.13	0.451	20	
m,p-Xylene	92.561	10	199.6	0	46.4	30	118	92.62	0.0659	20	
Methyl tert-butyl ether	423.497	5.0	578.9	0	73.2	38	136	416.8	1.60	20	
o-Xylene	33.121	5.0	78.40	0	42.2	21	119	32.06	3.25	20	
Toluene	95.748	5.0	172.2	0	55.6	36	129	95.01	0.774	20	
Surr: Bromofluorobenzene (PID)	89.504		100.0		89.5	65	140		0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **E090514LCS6** SampType: **LCS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109048**
Client ID: **LCSS** Batch ID: **E09VS131** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1711938**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	91.586	5.0	100.0	0	91.6	80	121				
Ethylbenzene	90.224	5.0	100.0	0	90.2	84	120				
m,p-Xylene	183.840	10	200.0	0	91.9	84	122				
Methyl tert-butyl ether	87.047	5.0	100.0	0	87.0	66	128				
o-Xylene	93.242	5.0	100.0	0	93.2	84	123				
Toluene	91.949	5.0	100.0	0	91.9	84	120				
Surr: Bromofluorobenzene (PID)	88.708		100.0		88.7	65	140				

Sample ID: **E090514MB3** SampType: **MBLK** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109048**
Client ID: **PBS** Batch ID: **E09VS131** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1711939**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0									
Ethylbenzene	ND	5.0									
m,p-Xylene	ND	10									
Methyl tert-butyl ether	ND	5.0									
o-Xylene	ND	5.0									
Toluene	ND	5.0									
Surr: Bromofluorobenzene (PID)	89.404		100.0		89.4	65	140				

Sample ID: **105495-013ADUP** SampType: **DUP** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109048**
Client ID: **ZZZZZZ** Batch ID: **E09VS131** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1711950**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0						0	0	20	
Ethylbenzene	ND	5.0						0	0	20	
m,p-Xylene	ND	10						0	0	20	
Methyl tert-butyl ether	ND	5.0						0	0	20	
o-Xylene	ND	5.0						0	0	20	
Toluene	ND	5.0						0	0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **105495-013ADUP** SampType: **DUP** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109048**
Client ID: **ZZZZZZ** Batch ID: **E09VS131** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1711950**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Bromofluorobenzene (PID)	83.686		100.0		83.7	65	140		0	0	

Sample ID: **105495-013AMS** SampType: **MS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109048**
Client ID: **ZZZZZZ** Batch ID: **E09VS131** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1711951**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	21.425	5.0	35.75	0	59.9	22	132				
Ethylbenzene	19.973	5.0	49.65	0	40.2	15	133				
m,p-Xylene	91.922	10	199.6	0	46.1	30	118				
Methyl tert-butyl ether	406.699	5.0	578.9	0	70.3	38	136				
o-Xylene	36.772	5.0	78.40	0	46.9	21	119				
Toluene	90.885	5.0	172.2	0	52.8	36	129				
Surr: Bromofluorobenzene (PID)	93.793		100.0		93.8	65	140				

Sample ID: **105495-013AMSD** SampType: **MSD** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109048**
Client ID: **ZZZZZZ** Batch ID: **E09VS131** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1711952**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	20.705	5.0	35.75	0	57.9	22	132	21.42	3.42	20	
Ethylbenzene	19.792	5.0	49.65	0	39.9	15	133	19.97	0.910	20	
m,p-Xylene	90.761	10	199.6	0	45.5	30	118	91.92	1.27	20	
Methyl tert-butyl ether	392.516	5.0	578.9	0	67.8	38	136	406.7	3.55	20	
o-Xylene	35.993	5.0	78.40	0	45.9	21	119	36.77	2.14	20	
Toluene	90.646	5.0	172.2	0	52.6	36	129	90.88	0.263	20	
Surr: Bromofluorobenzene (PID)	93.725		100.0		93.7	65	140		0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
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ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **MB-55375** SampType: **MBLK** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109123**
Client ID: **PBS** Batch ID: **55375** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/17/2009** SeqNo: **1713412**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0									
4,4´-DDE	ND	2.0									
4,4´-DDT	ND	2.0									
Aldrin	ND	1.0									
alpha-BHC	ND	1.0									
alpha-Chlordane	ND	1.0									
beta-BHC	ND	1.0									
Chlordane	ND	8.5									
delta-BHC	ND	1.0									
Dieldrin	ND	2.0									
Endosulfan I	ND	1.0									
Endosulfan II	ND	2.0									
Endosulfan sulfate	ND	2.0									
Endrin	ND	2.0									
Endrin aldehyde	ND	2.0									
Endrin ketone	ND	2.0									
gamma-BHC	ND	1.0									
gamma-Chlordane	ND	1.0									
Heptachlor	ND	1.0									
Heptachlor epoxide	ND	1.0									
Methoxychlor	ND	5.0									
Toxaphene	ND	50									
Surr: Tetrachloro-m-xylene	12.980		16.67		77.9	25	115				
Surr: Decachlorobiphenyl	12.429		16.67		74.6	20	142				

Sample ID: **LCS-55375** SampType: **LCS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109123**
Client ID: **LCSS** Batch ID: **55375** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/17/2009** SeqNo: **1713413**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aldrin	13.346	1.0	16.67	0	80.1	59	113				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
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Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **LCS-55375** SampType: **LCS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109123**
Client ID: **LCSS** Batch ID: **55375** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/17/2009** SeqNo: **1713413**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dieldrin	13.165	2.0	16.67	0	79.0	59	108				
Endrin	13.488	2.0	16.67	0	80.9	41	132				
gamma-BHC	13.277	1.0	16.67	0	79.6	60	111				
Heptachlor	13.460	1.0	16.67	0	80.7	62	108				
Surr: Tetrachloro-m-xylene	11.933		16.67		71.6	25	115				
Surr: Decachlorobiphenyl	11.704		16.67		70.2	20	142				

Sample ID: **105494-005AMS** SampType: **MS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109123**
Client ID: **B12 - 0** Batch ID: **55375** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/17/2009** SeqNo: **1713414**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	14.680	2.0	16.67	0	88.1	29	143				
Aldrin	14.620	1.0	16.67	0	87.7	44	131				
Dieldrin	14.826	2.0	16.67	0	88.9	40	136				
Endrin	15.322	2.0	16.67	0	91.9	41	146				
gamma-BHC	14.697	1.0	16.67	0	88.2	45	129				
Heptachlor	14.797	1.0	16.67	0	88.8	48	126				
Surr: Tetrachloro-m-xylene	12.933		16.67		77.6	25	115				
Surr: Decachlorobiphenyl	13.899		16.67		83.4	20	142				

Sample ID: **105494-005AMSD** SampType: **MSD** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109123**
Client ID: **B12 - 0** Batch ID: **55375** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/17/2009** SeqNo: **1713415**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	14.543	2.0	16.67	0	87.2	29	143	14.68	0.940	20	
Aldrin	14.953	1.0	16.67	0	89.7	44	131	14.62	2.25	20	
Dieldrin	14.614	2.0	16.67	0	87.7	40	136	14.83	1.44	20	
Endrin	15.289	2.0	16.67	0	91.7	41	146	15.32	0.218	20	
gamma-BHC	15.056	1.0	16.67	0	90.3	45	129	14.70	2.41	20	
Heptachlor	15.136	1.0	16.67	0	90.8	48	126	14.80	2.27	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
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Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **105494-005AMSD** SampType: **MSD** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109123**
Client ID: **B12 - 0** Batch ID: **55375** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/17/2009** SeqNo: **1713415**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Tetrachloro-m-xylene	13.232		16.67		79.4	25	115		0	0	
Surr: Decachlorobiphenyl	13.729		16.67		82.4	20	142		0	0	

Sample ID: **105494-005ADUP** SampType: **DUP** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109123**
Client ID: **B12 - 0** Batch ID: **55375** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/17/2009** SeqNo: **1713416**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0						0	0	20	
4,4´-DDE	ND	2.0						0	0	20	
4,4´-DDT	ND	2.0						0	0	20	
Aldrin	ND	1.0						0	0	20	
alpha-BHC	ND	1.0						0	0	20	
alpha-Chlordane	ND	1.0						0	0	20	
beta-BHC	ND	1.0						0	0	20	
Chlordane	ND	8.5						0	0	20	
delta-BHC	ND	1.0						0	0	20	
Dieldrin	ND	2.0						0	0	20	
Endosulfan I	ND	1.0						0	0	20	
Endosulfan II	ND	2.0						0	0	20	
Endosulfan sulfate	ND	2.0						0	0	20	
Endrin	ND	2.0						0	0	20	
Endrin aldehyde	ND	2.0						0	0	20	
Endrin ketone	ND	2.0						0	0	20	
gamma-BHC	ND	1.0						0	0	20	
gamma-Chlordane	ND	1.0						0	0	20	
Heptachlor	ND	1.0						0	0	20	
Heptachlor epoxide	ND	1.0						0	0	20	
Methoxychlor	ND	5.0						0	0	20	
Toxaphene	ND	50						0	0	20	
Surr: Tetrachloro-m-xylene	12.283		16.67		73.7	25	115		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID:	**105494-005ADUP**	SampType:	**DUP**	TestCode:	**8081_S**	Units:	**µg/Kg**	Prep Date:	**5/15/2009**	RunNo:	**109123**		
Client ID:	**B12 - 0**	Batch ID:	**55375**	TestNo:	**EPA 8081A**	**EPA 3550B**		Analysis Date:	**5/17/2009**	SeqNo:	**1713416**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl	13.150		16.67		78.9	20	142		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **MB-55376**	SampType: **MBLK**	TestCode: **8081_S**	Units: **µg/Kg**	Prep Date: **5/15/2009**	RunNo: **109124**
Client ID: **PBS**	Batch ID: **55376**	TestNo: **EPA 8081A**	**EPA 3550B**	Analysis Date: **5/17/2009**	SeqNo: **1713427**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0									
4,4´-DDE	ND	2.0									
4,4´-DDT	ND	2.0									
Aldrin	ND	1.0									
alpha-BHC	ND	1.0									
alpha-Chlordane	ND	1.0									
beta-BHC	ND	1.0									
Chlordane	ND	8.5									
delta-BHC	ND	1.0									
Dieldrin	ND	2.0									
Endosulfan I	ND	1.0									
Endosulfan II	ND	2.0									
Endosulfan sulfate	ND	2.0									
Endrin	ND	2.0									
Endrin aldehyde	ND	2.0									
Endrin ketone	ND	2.0									
gamma-BHC	ND	1.0									
gamma-Chlordane	ND	1.0									
Heptachlor	ND	1.0									
Heptachlor epoxide	ND	1.0									
Methoxychlor	ND	5.0									
Toxaphene	ND	50									
Surr: Tetrachloro-m-xylene	12.878		16.67		77.3	25	115				
Surr: Decachlorobiphenyl	12.321		16.67		73.9	20	142				

Sample ID: **LCS-55376**	SampType: **LCS**	TestCode: **8081_S**	Units: **µg/Kg**	Prep Date: **5/15/2009**	RunNo: **109124**
Client ID: **LCSS**	Batch ID: **55376**	TestNo: **EPA 8081A**	**EPA 3550B**	Analysis Date: **5/17/2009**	SeqNo: **1713428**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aldrin	13.051	1.0	16.67	0	78.3	59	113				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **LCS-55376** SampType: **LCS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109124**
Client ID: **LCSS** Batch ID: **55376** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/17/2009** SeqNo: **1713428**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dieldrin	13.350	2.0	16.67	0	80.1	59	108				
Endrin	13.356	2.0	16.67	0	80.1	41	132				
gamma-BHC	13.172	1.0	16.67	0	79.0	60	111				
Heptachlor	13.347	1.0	16.67	0	80.1	62	108				
Surr: Tetrachloro-m-xylene	12.087		16.67		72.5	25	115				
Surr: Decachlorobiphenyl	11.957		16.67		71.7	20	142				

Sample ID: **105494-027AMS** SampType: **MS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109124**
Client ID: **B7 - 0** Batch ID: **55376** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/17/2009** SeqNo: **1713429**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	12.480	2.0	16.67	0	74.9	29	143				
Aldrin	12.768	1.0	16.67	0	76.6	44	131				
Dieldrin	12.570	2.0	16.67	0	75.4	40	136				
Endrin	13.692	2.0	16.67	0	82.1	41	146				
gamma-BHC	12.709	1.0	16.67	0	76.2	45	129				
Heptachlor	12.952	1.0	16.67	0	77.7	48	126				
Surr: Tetrachloro-m-xylene	11.291		16.67		67.7	25	115				
Surr: Decachlorobiphenyl	11.836		16.67		71.0	20	142				

Sample ID: **105494-027AMSD** SampType: **MSD** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109124**
Client ID: **B7 - 0** Batch ID: **55376** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/17/2009** SeqNo: **1713430**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	12.571	2.0	16.67	0	75.4	29	143	12.48	0.727	20	
Aldrin	12.868	1.0	16.67	0	77.2	44	131	12.77	0.778	20	
Dieldrin	12.520	2.0	16.67	0	75.1	40	136	12.57	0.395	20	
Endrin	13.152	2.0	16.67	0	78.9	41	146	13.69	4.03	20	
gamma-BHC	12.712	1.0	16.67	0	76.3	45	129	12.71	0.0236	20	
Heptachlor	13.047	1.0	16.67	0	78.3	48	126	12.95	0.737	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **105494-027AMSD** SampType: **MSD** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109124**
Client ID: **B7 - 0** Batch ID: **55376** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/17/2009** SeqNo: **1713430**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Tetrachloro-m-xylene	11.317		16.67		67.9	25	115		0	0	
Surr: Decachlorobiphenyl	12.225		16.67		73.3	20	142		0	0	

Sample ID: **105494-027ADUP** SampType: **DUP** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109124**
Client ID: **B7 - 0** Batch ID: **55376** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/17/2009** SeqNo: **1713431**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0						0	0	20	
4,4´-DDE	ND	2.0						0	0	20	
4,4´-DDT	ND	2.0						0	0	20	
Aldrin	ND	1.0						0	0	20	
alpha-BHC	ND	1.0						0	0	20	
alpha-Chlordane	ND	1.0						0	0	20	
beta-BHC	ND	1.0						0	0	20	
Chlordane	ND	8.5						0	0	20	
delta-BHC	ND	1.0						0	0	20	
Dieldrin	ND	2.0						0	0	20	
Endosulfan I	ND	1.0						0	0	20	
Endosulfan II	ND	2.0						0	0	20	
Endosulfan sulfate	ND	2.0						0	0	20	
Endrin	ND	2.0						0	0	20	
Endrin aldehyde	ND	2.0						0	0	20	
Endrin ketone	ND	2.0						0	0	20	
gamma-BHC	ND	1.0						0	0	20	
gamma-Chlordane	ND	1.0						0	0	20	
Heptachlor	ND	1.0						0	0	20	
Heptachlor epoxide	ND	1.0						0	0	20	
Methoxychlor	ND	5.0						0	0	20	
Toxaphene	ND	50						0	0	20	
Surr: Tetrachloro-m-xylene	11.453		16.67		68.7	25	115		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID:	**105494-027ADUP**	SampType:	**DUP**	TestCode:	**8081_S**	Units:	**µg/Kg**		Prep Date:	**5/15/2009**		RunNo:	**109124**	
Client ID:	**B7 - 0**	Batch ID:	**55376**	TestNo:	**EPA 8081A**		**EPA 3550B**		Analysis Date:	**5/17/2009**		SeqNo:	**1713431**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl	11.322		16.67		67.9	20	142		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **MB-55377** SampType: **MBLK** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109130**
Client ID: **PBS** Batch ID: **55377** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713499**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0									
4,4´-DDE	ND	2.0									
4,4´-DDT	ND	2.0									
Aldrin	ND	1.0									
alpha-BHC	ND	1.0									
alpha-Chlordane	ND	1.0									
beta-BHC	ND	1.0									
Chlordane	ND	8.5									
delta-BHC	ND	1.0									
Dieldrin	ND	2.0									
Endosulfan I	ND	1.0									
Endosulfan II	ND	2.0									
Endosulfan sulfate	ND	2.0									
Endrin	ND	2.0									
Endrin aldehyde	ND	2.0									
Endrin ketone	ND	2.0									
gamma-BHC	ND	1.0									
gamma-Chlordane	ND	1.0									
Heptachlor	ND	1.0									
Heptachlor epoxide	ND	1.0									
Methoxychlor	ND	5.0									
Toxaphene	ND	50									
Surr: Tetrachloro-m-xylene	12.219		16.67		73.3	25	115				
Surr: Decachlorobiphenyl	10.222		16.67		61.3	20	142				

Sample ID: **LCS-55377** SampType: **LCS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109130**
Client ID: **LCSS** Batch ID: **55377** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713500**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aldrin	11.921	1.0	16.67	0	71.5	59	113				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **LCS-55377** SampType: **LCS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109130**
Client ID: **LCSS** Batch ID: **55377** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713500**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dieldrin	12.212	2.0	16.67	0	73.3	59	108				
Endrin	11.400	2.0	16.67	0	68.4	41	132				
gamma-BHC	11.668	1.0	16.67	0	70.0	60	111				
Heptachlor	12.767	1.0	16.67	0	76.6	62	108				
Surr: Tetrachloro-m-xylene	11.378		16.67		68.3	25	115				
Surr: Decachlorobiphenyl	9.393		16.67		56.3	20	142				

Sample ID: **105494-045AMS** SampType: **MS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109130**
Client ID: **B18 - 0** Batch ID: **55377** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713501**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	13.898	2.0	16.67	0	83.4	29	143				
Aldrin	13.310	1.0	16.67	0	79.8	44	131				
Dieldrin	14.314	2.0	16.67	0	85.9	40	136				
Endrin	14.460	2.0	16.67	0	86.7	41	146				
gamma-BHC	12.909	1.0	16.67	0	77.4	45	129				
Heptachlor	14.266	1.0	16.67	0	85.6	48	126				
Surr: Tetrachloro-m-xylene	10.844		16.67		65.0	25	115				
Surr: Decachlorobiphenyl	11.627		16.67		69.7	20	142				

Sample ID: **105494-045AMSD** SampType: **MSD** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109130**
Client ID: **B18 - 0** Batch ID: **55377** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713502**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	12.521	2.0	16.67	0	75.1	29	143	13.90	10.4	20	
Aldrin	12.285	1.0	16.67	0	73.7	44	131	13.31	8.01	20	
Dieldrin	12.977	2.0	16.67	0	77.8	40	136	14.31	9.80	20	
Endrin	12.988	2.0	16.67	0	77.9	41	146	14.46	10.7	20	
gamma-BHC	12.109	1.0	16.67	0	72.6	45	129	12.91	6.39	20	
Heptachlor	13.216	1.0	16.67	0	79.3	48	126	14.27	7.64	20	

Qualifiers:

B Analyte detected in the associated Method Blank
ND Not Detected at the Reporting Limit
DO Surrogate Diluted Out
E Value above quantitation range
R RPD outside accepted recovery limits
Calculations are based on raw values
H Holding times for preparation or analysis exceeded
S Spike/Surrogate outside of limits due to matrix interference

CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **105494-045AMSD** SampType: **MSD** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109130**
Client ID: **B18 - 0** Batch ID: **55377** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713502**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Tetrachloro-m-xylene	10.388		16.67		62.3	25	115		0	0	
Surr: Decachlorobiphenyl	10.318		16.67		61.9	20	142		0	0	

Sample ID: **105494-045ADUP** SampType: **DUP** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109130**
Client ID: **B18 - 0** Batch ID: **55377** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713504**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0						0	0	20	
4,4´-DDE	ND	2.0						0	0	20	
4,4´-DDT	ND	2.0						0	0	20	
Aldrin	ND	1.0						0	0	20	
alpha-BHC	ND	1.0						0	0	20	
alpha-Chlordane	ND	1.0						0	0	20	
beta-BHC	ND	1.0						0	0	20	
Chlordane	ND	8.5						0	0	20	
delta-BHC	ND	1.0						0	0	20	
Dieldrin	ND	2.0						0	0	20	
Endosulfan I	ND	1.0						0	0	20	
Endosulfan II	ND	2.0						0	0	20	
Endosulfan sulfate	ND	2.0						0	0	20	
Endrin	ND	2.0						0	0	20	
Endrin aldehyde	ND	2.0						0	0	20	
Endrin ketone	ND	2.0						0	0	20	
gamma-BHC	ND	1.0						0	0	20	
gamma-Chlordane	ND	1.0						0	0	20	
Heptachlor	ND	1.0						0	0	20	
Heptachlor epoxide	ND	1.0						0	0	20	
Methoxychlor	ND	5.0						0	0	20	
Toxaphene	ND	50						0	0	20	
Surr: Tetrachloro-m-xylene	11.078		16.67		66.5	25	115		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID:	**105494-045ADUP**	SampType:	**DUP**	TestCode:	**8081_S**	Units:	**µg/Kg**		Prep Date:	**5/15/2009**		RunNo:	**109130**	
Client ID:	**B18 - 0**	Batch ID:	**55377**	TestNo:	**EPA 8081A**	**EPA 3550B**			Analysis Date:	**5/18/2009**		SeqNo:	**1713504**	
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl		11.165			16.67			67.0	20	142		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

Advanced Technology Laboratories
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CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 9045_S

Sample ID: **105407-013ADUP** SampType: **DUP** TestCode: **9045_S** Units: **pH Units** Prep Date: RunNo: **109066**
Client ID: **ZZZZZZ** Batch ID: **R109066** TestNo: **EPA 9045C** Analysis Date: **5/15/2009** SeqNo: **1712294**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	7.960	0.10						8.000	0.501	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

19 May 2009

Diane Galvan
Advanced Technology Labs
3275 Walnut Avenue
Signal Hill, CA 90755

RE:NA

Work Order No.: 0905228

Attached are the results of the analyses for samples received by the laboratory on 05/15/09 13:35.

The samples were received by Sierra Analytical Labs, Inc. with a chain of custody record attached or completed at the submittal of the samples.

The analyses were performed according to the prescribed method as outlined by EPA, Standard Methods, and A.S.T.M.

The remaining portions of the samples will be disposed of within 30 days from the date of this report.
If you require any additional retaining time, please advise us.

Sincerely,

Richard K. Forsyth

Richard K. Forsyth

Laboratory Director

Sierra Analytical Labs, Inc. is certified by the California Department of Health Services (DOHS), Environmental Laboratory Accredidation Program (ELAP) No. 2320.

Advanced Technology Labs 3275 Walnut Avenue Signal Hill CA, 90755	Project: NA Project Number: PO#SC04581 Project Manager: Diane Galvan	**Reported:** 05/19/09 09:45

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
105494-009B / B17-0	0905228-01	Soil	05/12/09 08:57	05/15/09 13:35
105494-013B / B41-0	0905228-02	Soil	05/12/09 09:55	05/15/09 13:35
105494-015B / B1-0	0905228-03	Soil	05/12/09 11:00	05/15/09 13:35
105494-023B / B5-0	0905228-04	Soil	05/12/09 11:41	05/15/09 13:35
105494-031B / B9-0	0905228-05	Soil	05/12/09 12:26	05/15/09 13:35
105494-035B / 57-0	0905228-06	Soil	05/12/09 14:07	05/15/09 13:35
105494-043B / 53-0	0905228-07	Soil	05/12/09 14:55	05/15/09 13:35

CASE NARRATIVE

SAMPLE RECEIPT: Samples were received intact, at 4°C, and accompanied by chain of custody documentation.
PRESERVATION: Samples requiring preservation were verified prior to sample preparation and analysis.
HOLDING TIMES: All holding times were met, unless otherwises noted in the report with data qualifiers.
QA/QC CRITERIA: All quality objective criteria were met, except as noted in the report with data qualifiers.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

26052 Merit Circle Suite 105, Laguna Hills, California 92653
Telephone: (949) 348-9389 Fax: (949) 348-9115
E-Mail: sierralabs @ sierralabs.net

Advanced Technology Labs 3275 Walnut Avenue Signal Hill CA, 90755	Project: NA Project Number: PO#SC04581 Project Manager: Diane Galvan	**Reported:** 05/19/09 09:45

Chlorinated Herbicides by EPA Method 8151A

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
105494-009B / B17-0 (0905228-01) Soil Sampled: 05/12/09 08:57 Received: 05/15/09 13:35									
2,4,5-T	ND	1.6	µg/kg	1	B9E1832	05/18/09	05/18/09 22:22	EPA 8151A	
2,4,5-TP (Silvex)	ND	1.6	"	"	"	"	"	"	
2,4-D	ND	1.6	"	"	"	"	"	"	
2,4-DB	ND	4.0	"	"	"	"	"	"	
3,5-Dichlorobenzoic acid	ND	2.0	"	"	"	"	"	"	
4-Nitrophenol	ND	2.0	"	"	"	"	"	"	
Acifluorfen	ND	1.6	"	"	"	"	"	"	
Bentazon	ND	1.6	"	"	"	"	"	"	
Chloramben	ND	1.6	"	"	"	"	"	"	
Dalapon	ND	20	"	"	"	"	"	"	
DCPA diacid	ND	1.6	"	"	"	"	"	"	
Dicamba	ND	1.6	"	"	"	"	"	"	
Dichlorprop	ND	1.6	"	"	"	"	"	"	
Dinoseb	ND	1.6	"	"	"	"	"	"	
Pentachlorophenol	ND	1.6	"	"	"	"	"	"	
Picloram	ND	1.6	"	"	"	"	"	"	
Surrogate: 2,4-Dichlorophenylacetic Acid		*43.5 %*	*35-150*		"	"	"	"	
105494-013B / B41-0 (0905228-02) Soil Sampled: 05/12/09 09:55 Received: 05/15/09 13:35									
2,4,5-T	ND	1.6	µg/kg	1	B9E1832	05/18/09	05/18/09 23:08	EPA 8151A	
2,4,5-TP (Silvex)	ND	1.6	"	"	"	"	"	"	
2,4-D	ND	1.6	"	"	"	"	"	"	
2,4-DB	ND	4.0	"	"	"	"	"	"	
3,5-Dichlorobenzoic acid	ND	2.0	"	"	"	"	"	"	
4-Nitrophenol	ND	2.0	"	"	"	"	"	"	
Acifluorfen	ND	1.6	"	"	"	"	"	"	
Bentazon	ND	1.6	"	"	"	"	"	"	
Chloramben	ND	1.6	"	"	"	"	"	"	
Dalapon	ND	20	"	"	"	"	"	"	
DCPA diacid	ND	1.6	"	"	"	"	"	"	
Dicamba	ND	1.6	"	"	"	"	"	"	
Dichlorprop	ND	1.6	"	"	"	"	"	"	
Dinoseb	ND	1.6	"	"	"	"	"	"	
Pentachlorophenol	ND	1.6	"	"	"	"	"	"	
Picloram	ND	1.6	"	"	"	"	"	"	
Surrogate: 2,4-Dichlorophenylacetic Acid		*67.2 %*	*35-150*		"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Advanced Technology Labs 3275 Walnut Avenue Signal Hill CA, 90755	Project: NA Project Number: PO#SC04581 Project Manager: Diane Galvan	**Reported:** 05/19/09 09:45

Chlorinated Herbicides by EPA Method 8151A

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
105494-015B / B1-0 (0905228-03) Soil Sampled: 05/12/09 11:00 Received: 05/15/09 13:35									
2,4,5-T	ND	1.6	µg/kg	1	B9E1832	05/18/09	05/18/09 23:55	EPA 8151A	
2,4,5-TP (Silvex)	ND	1.6	"	"	"	"	"	"	
2,4-D	ND	1.6	"	"	"	"	"	"	
2,4-DB	ND	4.0	"	"	"	"	"	"	
3,5-Dichlorobenzoic acid	ND	2.0	"	"	"	"	"	"	
4-Nitrophenol	ND	2.0	"	"	"	"	"	"	
Acifluorfen	ND	1.6	"	"	"	"	"	"	
Bentazon	ND	1.6	"	"	"	"	"	"	
Chloramben	ND	1.6	"	"	"	"	"	"	
Dalapon	ND	20	"	"	"	"	"	"	
DCPA diacid	ND	1.6	"	"	"	"	"	"	
Dicamba	ND	1.6	"	"	"	"	"	"	
Dichlorprop	ND	1.6	"	"	"	"	"	"	
Dinoseb	ND	1.6	"	"	"	"	"	"	
Pentachlorophenol	ND	1.6	"	"	"	"	"	"	
Picloram	ND	1.6	"	"	"	"	"	"	
Surrogate: 2,4-Dichlorophenylacetic Acid		*66.8 %*	*35-150*		"	"	"	"	
105494-023B / B5-0 (0905228-04) Soil Sampled: 05/12/09 11:41 Received: 05/15/09 13:35									
2,4,5-T	ND	1.6	µg/kg	1	B9E1832	05/18/09	05/19/09 00:41	EPA 8151A	
2,4,5-TP (Silvex)	ND	1.6	"	"	"	"	"	"	
2,4-D	ND	1.6	"	"	"	"	"	"	
2,4-DB	ND	4.0	"	"	"	"	"	"	
3,5-Dichlorobenzoic acid	ND	2.0	"	"	"	"	"	"	
4-Nitrophenol	ND	2.0	"	"	"	"	"	"	
Acifluorfen	ND	1.6	"	"	"	"	"	"	
Bentazon	ND	1.6	"	"	"	"	"	"	
Chloramben	ND	1.6	"	"	"	"	"	"	
Dalapon	ND	20	"	"	"	"	"	"	
DCPA diacid	ND	1.6	"	"	"	"	"	"	
Dicamba	ND	1.6	"	"	"	"	"	"	
Dichlorprop	ND	1.6	"	"	"	"	"	"	
Dinoseb	ND	1.6	"	"	"	"	"	"	
Pentachlorophenol	ND	1.6	"	"	"	"	"	"	
Picloram	ND	1.6	"	"	"	"	"	"	
Surrogate: 2,4-Dichlorophenylacetic Acid		*48.7 %*	*35-150*		"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Advanced Technology Labs 3275 Walnut Avenue Signal Hill CA, 90755	Project: NA Project Number: PO#SC04581 Project Manager: Diane Galvan	**Reported:** 05/19/09 09:45

Chlorinated Herbicides by EPA Method 8151A

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
105494-031B / B9-0 (0905228-05) Soil Sampled: 05/12/09 12:26 Received: 05/15/09 13:35									
2,4,5-T	ND	1.6	µg/kg	1	B9E1832	05/18/09	05/19/09 01:28	EPA 8151A	
2,4,5-TP (Silvex)	ND	1.6	"	"	"	"	"	"	
2,4-D	ND	1.6	"	"	"	"	"	"	
2,4-DB	ND	4.0	"	"	"	"	"	"	
3,5-Dichlorobenzoic acid	ND	2.0	"	"	"	"	"	"	
4-Nitrophenol	ND	2.0	"	"	"	"	"	"	
Acifluorfen	ND	1.6	"	"	"	"	"	"	
Bentazon	ND	1.6	"	"	"	"	"	"	
Chloramben	ND	1.6	"	"	"	"	"	"	
Dalapon	ND	20	"	"	"	"	"	"	
DCPA diacid	ND	1.6	"	"	"	"	"	"	
Dicamba	ND	1.6	"	"	"	"	"	"	
Dichlorprop	ND	1.6	"	"	"	"	"	"	
Dinoseb	ND	1.6	"	"	"	"	"	"	
Pentachlorophenol	ND	1.6	"	"	"	"	"	"	
Picloram	ND	1.6	"	"	"	"	"	"	
Surrogate: 2,4-Dichlorophenylacetic Acid		*52.9 %*	*35-150*		"	"	"	"	
105494-035B / 57-0 (0905228-06) Soil Sampled: 05/12/09 14:07 Received: 05/15/09 13:35									
2,4,5-T	ND	1.6	µg/kg	1	B9E1832	05/18/09	05/19/09 02:14	EPA 8151A	
2,4,5-TP (Silvex)	ND	1.6	"	"	"	"	"	"	
2,4-D	ND	1.6	"	"	"	"	"	"	
2,4-DB	ND	4.0	"	"	"	"	"	"	
3,5-Dichlorobenzoic acid	ND	2.0	"	"	"	"	"	"	
4-Nitrophenol	ND	2.0	"	"	"	"	"	"	
Acifluorfen	ND	1.6	"	"	"	"	"	"	
Bentazon	ND	1.6	"	"	"	"	"	"	
Chloramben	ND	1.6	"	"	"	"	"	"	
Dalapon	ND	20	"	"	"	"	"	"	
DCPA diacid	ND	1.6	"	"	"	"	"	"	
Dicamba	ND	1.6	"	"	"	"	"	"	
Dichlorprop	ND	1.6	"	"	"	"	"	"	
Dinoseb	ND	1.6	"	"	"	"	"	"	
Pentachlorophenol	ND	1.6	"	"	"	"	"	"	
Picloram	ND	1.6	"	"	"	"	"	"	
Surrogate: 2,4-Dichlorophenylacetic Acid		*51.4 %*	*35-150*		"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Advanced Technology Labs	Project: NA	
3275 Walnut Avenue	Project Number: PO#SC04581	**Reported:**
Signal Hill CA, 90755	Project Manager: Diane Galvan	05/19/09 09:45

Chlorinated Herbicides by EPA Method 8151A

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
105494-043B / 53-0 (0905228-07) Soil Sampled: 05/12/09 14:55 Received: 05/15/09 13:35									
2,4,5-T	ND	1.6	µg/kg	1	B9E1832	05/18/09	05/19/09 03:01	EPA 8151A	
2,4,5-TP (Silvex)	ND	1.6	"	"	"	"	"	"	
2,4-D	ND	1.6	"	"	"	"	"	"	
2,4-DB	ND	4.0	"	"	"	"	"	"	
3,5-Dichlorobenzoic acid	ND	2.0	"	"	"	"	"	"	
4-Nitrophenol	ND	2.0	"	"	"	"	"	"	
Acifluorfen	ND	1.6	"	"	"	"	"	"	
Bentazon	ND	1.6	"	"	"	"	"	"	
Chloramben	ND	1.6	"	"	"	"	"	"	
Dalapon	ND	20	"	"	"	"	"	"	
DCPA diacid	ND	1.6	"	"	"	"	"	"	
Dicamba	ND	1.6	"	"	"	"	"	"	
Dichlorprop	ND	1.6	"	"	"	"	"	"	
Dinoseb	ND	1.6	"	"	"	"	"	"	
Pentachlorophenol	ND	1.6	"	"	"	"	"	"	
Picloram	ND	1.6	"	"	"	"	"	"	
Surrogate: 2,4-Dichlorophenylacetic Acid		*51.8 %*	*35-150*		"	"	"	"	

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26052 Merit Circle Suite 105, Laguna Hills, California 92653
Telephone: (949) 348-9389 Fax: (949) 348-9115
E-Mail: sierralabs @ sierralabs.net

Advanced Technology Labs 3275 Walnut Avenue Signal Hill CA, 90755	Project: NA Project Number: PO#SC04581 Project Manager: Diane Galvan	**Reported:** 05/19/09 09:45

Chlorinated Herbicides by EPA Method 8151A - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9E1832 - EPA 8151A Herbicides										
Blank (B9E1832-BLK1)				Prepared & Analyzed: 05/18/09						
2,4,5-T	ND	1.6	µg/kg							
2,4,5-TP (Silvex)	ND	1.6	"							
2,4-D	ND	1.6	"							
2,4-DB	ND	4.0	"							
3,5-Dichlorobenzoic acid	ND	2.0	"							
4-Nitrophenol	ND	2.0	"							
Acifluorfen	ND	1.6	"							
Bentazon	ND	1.6	"							
Chloramben	ND	1.6	"							
Dalapon	ND	20	"							
DCPA diacid	ND	1.6	"							
Dicamba	ND	1.6	"							
Dichlorprop	ND	1.6	"							
Dinoseb	ND	1.6	"							
Pentachlorophenol	ND	1.6	"							
Picloram	ND	1.6	"							
Surrogate: 2,4-Dichlorophenylacetic Acid	*57.9*		*"*	*100*		*57.9*	*35-150*			
LCS (B9E1832-BS1)				Prepared & Analyzed: 05/18/09						
2,4,5-T	5.41	1.6	µg/kg	10.0		54.1	20-150			
2,4,5-TP (Silvex)	9.17	1.6	"	10.0		91.7	20-150			
Dichlorprop	3.40	1.6	"	10.0		34.0	20-150			
Dinoseb	9.64	1.6	"	10.0		96.4	20-150			
Matrix Spike (B9E1832-MS1)		**Source: 0905228-07**		Prepared & Analyzed: 05/18/09						
2,4,5-T	5.55	1.6	µg/kg	10.0	ND	55.5	20-150			
2,4,5-TP (Silvex)	5.50	1.6	"	10.0	ND	55.0	20-150			
Dichlorprop	2.73	1.6	"	10.0	ND	27.3	20-150			
Dinoseb	10.0	1.6	"	10.0	ND	100	20-150			

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Advanced Technology Labs	Project: NA	
3275 Walnut Avenue	Project Number: PO#SC04581	**Reported:**
Signal Hill CA, 90755	Project Manager: Diane Galvan	05/19/09 09:45

Chlorinated Herbicides by EPA Method 8151A - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9E1832 - EPA 8151A Herbicides										
Matrix Spike Dup (B9E1832-MSD1)		**Source: 0905228-07**		Prepared & Analyzed: 05/18/09						
2,4,5-T	4.47	1.6	µg/kg	10.0	ND	44.7	20-150	21.6	30	
2,4,5-TP (Silvex)	5.69	1.6	"	10.0	ND	56.9	20-150	3.40	30	
Dichlorprop	2.31	1.6	"	10.0	ND	23.1	20-150	16.7	30	
Dinoseb	8.82	1.6	"	10.0	ND	88.2	20-150	12.5	30	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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26052 MERIT CIRCLE SUITE 105, LAGUNA HILLS, CALIFORNIA 92653
TELEPHONE: (949) 348-9389 FAX: (949) 348-9115
E-MAIL: SIERRALABS @ SIERRALABS.NET

0905228

Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755-5225
www.atlglobal.com
TEL: (562) 989-4045 *FAX: (562) 989-4040*

CHAIN-OF-CUSTODY RECORD

QC Level: CT

Subcontractor:
Sierra Laboratories
26052 Merit Circle Suite 105
Laguna Hills, CA 92653

TEL: (949) 348-9389
FAX: (949) 348-9115
Acct #:

Field Sampler: D. Watts

14-May-09

	Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests: EPA 8151		
01	105494-009B / B17 - 0	Soil	5/12/2009 8:57:00 AM	4OZG	1		
02	105494-013B / B41 - 0	Soil	5/12/2009 9:55:00 AM	4OZG	1		
03	105494-015B / B1 - 0	Soil	5/12/2009 11:00:00 AM	4OZG	1		
04	105494-023B / B5 - 0	Soil	5/12/2009 11:41:00 AM	4OZG	1		
05	105494-031B / B9 - 0	Soil	5/12/2009 12:26:00 PM	4OZG	1		
06	105494-035B / B57 - 0	Soil	5/12/2009 2:07:00 PM	4OZG	1		
07	105494-043B / B53 - 0	Soil	5/12/2009 2:55:00 PM	4OZG	1		

General Comments: Please email sample receipt acknowledgement to the PM.
Please use PO#: SC04581 Please fax results by: NORMAL TAT
PLEASE SEND REPORT TO DIANE GALVAN

		Date/Time			Date/Time
Relinquished by:		5/14/09	**Received by:**		5/15/09 940
Relinquished by:		5/15/09 1334	**Received by:**		5.15.09 13:35

B-9 SOCL

CHAIN OF CL RODY RECORD

Advanced Technology Laboratories
3275 Walnut Avenue
Signal Hill, CA 90755
(562) 989-4045 • Fax (562) 989-4040

FOR LABORATORY USE ONLY:

P.O.#:

Logged By: Date: 5/14/09

Method of Transport: Client ☐ ATL ☐ CA OverN ☐ FEDEX ☐ Other: UPS

Sample Condition Upon Receipt: 6.0

1. CHILLED Y☑ N☐
2. HEADSPACE (VOA) Y☐ N☐ n/a
3. CONTAINER INTACT Y☑ N☐
4. SEALED Y☐ N☑
5. # OF SPLS MATCH COC Y☐ N☐
6. PRESERVED Y☑ N☐

Client: GEOCON
Attn: C. MERRITT
Address: 6671 BRISA ST
City LIVERMORE State CA Zip Code 94550
TEL: (925) 371-5900
FAX: (") " 5915

Project Name: JAMESON CANYON Project #: E8481-06-01 Sampler: (Printed Name) D. WATTS (Signature) WATTS

Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
WATTS	5/13/09	0900	UPS	5/13/09	0800
			Marg Chi	5/14/09	9:30

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: D. WATTS 5/12/09
Print Name Date
Signature WATTS

Send Report To:
Attn:
Co: SEE "CLIENT"
Address
City State Zip

Bill To:
Attn:
Co:
Address
City State Zip

Special Instructions/Comments: SEE ATTACHED INSTRUCTIONS

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample : $2.00 / sample / mo (after 45 days)
- Records : $1.00 / ATL workorder / mo (after 1 year)

Circle or Add Analysis(es) Requested: 8081A (Pesticides), 8082 (PCB), 8260B (Volatiles), 8270C (BNA), 6010B (Total Metal), 8015B (GRO) / 8020 (BTEX), 8015B (DRO), 8021 (BTEX), TITLE 22 / CAM 17 (6010 / 7000)

SPECIFY APPROPRIATE MATRIX: SOIL, WATER, GROUND WATER, WASTEWATER

QA/QC: RTNE ☐ CT ☒ SWRCB ☐ Logcode ____ OTHER ____

ITEM	LAB USE ONLY: Batch #: Lab No.	Sample Description: Sample I.D. / Location	Date	Time	SOIL	TAT	Container(s) #	Container(s) Type	PRESERVATION	REMARKS
	105494-01	B10-0	5/12/09	0757	X	E	1	T M	C	
	-2	B10-1.5		0804						
	-3	B11-0		0750						
	-4	B11-1.5		0800						
	-5	B12-0		0815						
	-6	B12-1.5		0816						
	-7	B16-0		0828						
	-8	B16-1.5		0834						
	-9	B17-0		0857						
	-10	B17-1.5		0905						

• TAT starts 8 a.m. following day if samples received after 3 p.m.

TAT: A= Overnight ≤ 24 hr B= Emergency Next workday C= Critical 2 Workdays D= Urgent 3 Workdays E= Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=HCl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

DISTRIBUTION: White with report, Yellow to folder, Pink to submitter.

CHAIN OF CUSTODY RECORD

Advanced Technology Laboratories
3275 Walnut Avenue
Signal Hill, CA 90755
(562) 989-4045 • Fax (562) 989-4040

FOR LABORATORY USE ONLY:

P.O.#:

Logged By: f Date: 5/14/09

Method of Transport: Client ☐ ATL ☐ CA OverN ☐ FEDEX ☐ Other:

Sample Condition Upon Receipt:
1. CHILLED Y☐ N☐ 4. SEALED Y☐ N☐
2. HEADSPACE (VOA) Y☐ N☐ 5. # OF SPLS MATCH COC Y☐ N☐
3. CONTAINER INTACT Y☐ N☐ 6. PRESERVED Y☐ N☐

Client:
Attn: See Pg 1
Address:
City State Zip Code
TEL: ( )
FAX: ( )
Project Name: See Pg 1
Project #:
Sampler: (Printed Name) (Signature)

Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
[illegible]	5/13/09	0900	UPS	5/13/09	0900
			Maria [illegible]	5/14/09	9:30

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: See Pg 1
Print Name Date
Signature

Send Report To:
Attn:
Co:
Address
City State Zip

Bill To:
Attn:
Co:
Address
City State Zip

Special Instructions/Comments:

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- Sample : $2.00 / sample / mo (after 45 days)
- Records : $1.00 / ATL workorder / mo (after 1 year)

Circle or Add Analysis(es) Requested: 8081A (Pesticides), 8082 (PCB), 8260B (Volatiles), 8270C (BNA), 6010B (Total Metal), 8015B (GRO) / 8020 (BTEX), 8015B (DRO), 8021 (BTEX), TITLE 22 / CAM 17 (6010 / 7000)

SPECIFY APPROPRIATE MATRIX: SOIL, WATER, GROUND WATER, WASTEWATER

QA/QC: RTNE ☐ CT ☒ SWRCB ☐ Logcode ____ OTHER ____

ITEM	LAB USE ONLY: Batch #: / Lab No.	Sample Description: Sample I.D. / Location	Date	Time	SOIL	TAT	Container(s) #	Container(s) Type	PRESERVATION	REMARKS
	105494-11	B40 - 0	5/12/09	0954	X	E	1	T m	C	
	-12	B40 - 1.5		0959						
	-13	B41 - 0		0955						
	-14	B41 - 1.5		1000						
	-15	B1 - 0		1100						
	-16	B1 - 1.5		1105						
	-17	B2 - 0		1056						
	-18	B2 - 1.5		1059						
	-19	B4 - 0		1121						
	-20	B4 - 1.5		1127						

• TAT starts 8 a.m. following day if samples received after 3 p.m.

TAT: A= Overnight ≤ 24 hr; B= Emergency Next workday; C= Critical 2 Workdays; D= Urgent 3 Workdays; E= Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=Hcl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

DISTRIBUTION: **White** with report, **Yellow** to folder, **Pink** to submitter.

CHAIN OF CU TODY RECORD

Advanced Technology Laboratories
3275 Walnut Avenue
Signal Hill, CA 90755
(562) 989-4045 • Fax (562) 989-4040

FOR LABORATORY USE ONLY:

P.O.#:

Logged By: f Date: 5/14/09

Method of Transport: Client ☐ ATL ☐ CA OverN ☐ FEDEX ☐ Other:

Sample Condition Upon Receipt:
1. CHILLED Y☐ N☐ 4. SEALED Y☐ N☐
2. HEADSPACE (VOA) Y☐ N☐ 5. # OF SPLS MATCH COC Y☐ N☐
3. CONTAINER INTACT Y☐ N☐ 6. PRESERVED Y☐ N☐

Client:
Attn: SEE Pg 1
Address:
City State Zip Code
TEL: ( )
FAX: ( )
Project Name: SEE Pg 1
Project #:
Sampler: (Printed Name) (Signature)

Relinquished by: (Signature and Printed Name)	Date: 5/13/09	Time: 0900	Received by: (Signature and Printed Name) UPS	Date: 5/13/09	Time: 0900
Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name) Mike Ship	Date: 5/14/09	Time: 930
Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: SEE Pg 1
Print Name Date
Signature

Send Report To:
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SPECIFY APPROPRIATE MATRIX: SOIL, WATER, GROUND WATER, WASTEWATER

QA/QC: RTNE ☐ CT ☒ SWRCB ☐ Logcode ____ OTHER ____

ITEM	LAB USE ONLY: Batch #: / Lab No.	Sample Description: Sample I.D. / Location	Date	Time	SOIL	TAT	Container(s) #	Container(s) Type	PRESERVATION	REMARKS
	B054944-21	B3-0	5/12/09	1125	X	E	1	T	m	c
	-22	B3-1.5		1130						
	-23	B5-0		1141						
	-24	B5-1.5		1144						
	-25	B6-0		1157						
	-26	B6-1.5		1159						
	-27	B7-0		1205						
	-28	B7-1.5		1210						
	-29	B8-0		1212						
	-30	B8-1.5		1214						

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Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=HCl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

DISTRIBUTION: White with report, Yellow to folder, Pink to submitter.

CHAIN OF CUSTODY RECORD

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Signal Hill, CA 90755
(562) 989-4045 • Fax (562) 989-4040

FOR LABORATORY USE ONLY:

P.O.#:
Logged By: f Date: 5/14/09

Method of Transport: Client ☐ ATL ☐ CA OverN ☐ FEDEX ☐ Other:

Sample Condition Upon Receipt: 1. CHILLED Y☐ N☐ 2. HEADSPACE (VOA) Y☐ N☐ 3. CONTAINER INTACT Y☐ N☐ 4. SEALED Y☐ N☐ 5. # OF SPLS MATCH COC Y☐ N☐ 6. PRESERVED Y☐ N☐

Client:
Attn: See Pg 1
Address:
City State Zip Code
TEL: ( )
FAX: ( )
Project Name: See Pg 1
Project #:
Sampler: (Printed Name) (Signature)

Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
[illegible]	5/13/09	0900	UPS	5/13/09	0900
	5/13/09		Marge Mg	5/14/09	930

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: See Pg 1
Print Name Date
Signature

Send Report To: Attn: Co: Address City State Zip

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SPECIFY APPROPRIATE MATRIX: SOIL, WATER, GROUND WATER, WASTEWATER

QA/QC: RTNE ☐ CT ☑ SWRCB ☐ Logcode ___ OTHER ___

ITEM	LAB USE ONLY: Batch #: Lab No.	Sample Description: Sample I.D. / Location	Date	Time	TAT	Container(s) #	Container(s) Type	PRESERVATION	REMARKS
	105494-31	B9-0	5/12/09	1226	E	1	Tm	C	
	-32	B9-1.5		1229					
	-33	B58-0		1410					
	-34	B58-1.5		1415					
	-35	B57-0		1407					
	-36	B57-1.5		1414					
	-37	B56-0		1430					
	-38	B56-1.5		1435					
	-39	B55-0		1431					
	-40	B55-1.5		1439					

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Preservatives: H=HCl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

DISTRIBUTION: White with report, Yellow to folder, Pink to submitter.

CHAIN OF CL TODY RECORD

Advanced Technology Laboratories
3275 Walnut Avenue
Signal Hill, CA 90755
(562) 989-4045 • Fax (562) 989-4040

FOR LABORATORY USE ONLY:

P.O.#:

Logged By: Date: 5/14/09

Method of Transport: Client ☐ ATL ☐ CA OverN ☐ FEDEX ☐ Other:

Sample Condition Upon Receipt: 1. CHILLED Y☐ N☐ 2. HEADSPACE (VOA) Y☐ N☐ 3. CONTAINER INTACT Y☐ N☐ 4. SEALED Y☐ N☐ 5. # OF SPLS MATCH COC Y☐ N☐ 6. PRESERVED Y☐ N☐

Client:
Attn:
Address:
City State Zip Code
TEL: ( )
FAX: ( )

Project Name: SEE Pg 1 Project #: Sampler: (Printed Name) (Signature)

Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
[illegible]	5/13/09	0900	[illegible]	5/13/09	0900
			[illegible]	5/14/09	9:30

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: SEE Pg 1
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Signature

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SPECIFY APPROPRIATE MATRIX: SOIL, WATER, GROUND WATER, WASTEWATER

QA/QC: RTNE ☐ CT ☒ SWRCB ☐ Logcode ____ OTHER ____

ITEM	LAB USE ONLY: Batch #: Lab No.	Sample Description: Sample I.D. / Location	Date	Time	SOIL	TAT	Container(s) #	Type	PRESERVATION	REMARKS
	105494-41	B54-0	5/12/09	1442	X	E	1	T/m	C	
	-42	B54-1.5	↓	1449	↓	↓	↓	↓	↓	
	-43	B53-0	↓	1455	↓	↓	↓	↓	↓	
	-44	B53-1.5	↓	1500	↓	↓	↓	↓	↓	
	-45	B18-0	5/12/09	0855	↓	↓	↓	↓	↓	
	-46	B18-1.5	↓	0900	↓	↓	↓	↓	↓	

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Preservatives: H=Hcl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

DISTRIBUTION: **White** with report, **Yellow** to folder, **Pink** to submitter.

E8481-06-01

Soil Sample Laboratory Analyses

The laboratory will be instructed to analyze the samples as outlined below and in Table 1, Soil Sample Analysis Matrix.

- The upper (~0') soil samples ~~collected from shallow soil borings~~ will be analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPHg), TPH as diesel (TPHd), and TPH as motor oil (TPHmo) using Environmental Protection Agency (EPA) Test Method 8015; benzene, toluene, ethylbenzene, and total xylenes (BTEX) and methyl tert-butyl ether (MTBE) using EPA Test Method 8021, and organochlorine pesticides using EPA Test Method 8081. Approximately 25 percent of the upper soil samples will be analyzed for herbicides using EPA Test Method 8151A, and for total California Assessment Manual (CAM) 17 metals using EPA Test Method 6010/7471.
- Based on the results of the upper soil samples, up to 50 percent of the deeper (~1.5') soil samples ~~collected from the shallow soil borings~~ may be analyzed for TPHg, TPHd, and TPHmo using EPA Test Method 8015; and BTEX and MTBE using EPA Test Method 8021.
- Approximately 25 percent of the deeper soil samples ~~collected from the shallow soil borings~~ will be analyzed for total CAM 17 metals using EPA Test Method 6010/7471.
- Soil samples with total metal concentrations greater than ten times their respective STLC concentrations will be further analyzed for soluble metals using the California Waste Extraction Test (WET) method and EPA Test Method 7420.
- Ten percent of all shallow soil samples (randomly selected ~~by the laboratory~~) will be analyzed for pH using EPA Test Method 9045.

Quality assurance/quality control (QA/QC) procedures will be performed for each method of analysis with specificity for each analyte listed in the test method's QA/QC. QA/QC measures will include the following:

- One method blank for every ten samples, batch of samples or type of matrix, whichever is more frequent.
- One sample analyzed in duplicate for every ten samples, batch of samples or type of matrix, whichever is more frequent.
- One spiked sample for every ten samples, batch of samples or type of matrix, whichever is more frequent, with spike made at ten times the detection limit or at the analyte level.

TABLE 1
Soil Sample Analysis Matix
Jameson Canyon (E8481-06-01)
Napa and Solano Counties, California

Sample Location	Sample No.	TPHg/BTEX/MTBE (EPA 8015/8021)	TPHd/mo (EPA 8015)	CAM 17 Metals (EPA 6010/7471)	Soluble Metals (WET/EPA 7420)	Pesticides (EPA 8081)	Herbicides (EPA 8151A)	pH (EPA 9045)
B1	0	1	1	1	as needed	1	1	1
B1	1.5	as needed	as needed	---	---	---	---	---
B2	0	1	1	---	---	1	---	---
B2	1.5	as needed	as needed	---	---	---	---	---
B3	0	1	1	---	---	1	---	---
B3	1.5	as needed	as needed	1	as needed	---	---	---
B4	0	1	1	---	---	1	---	---
B4	1.5	as needed	as needed	---	---	---	---	---
B5	0	1	1	1	as needed	1	1	---
B5	1.5	as needed	as needed	---	---	---	---	1
B6	0	1	1	---	---	1	---	---
B6	1.5	as needed	as needed	---	---	---	---	---
B7	0	1	1	---	---	1	---	---
B7	1.5	as needed	as needed	1	as needed	---	---	---
B8	0	1	1	---	---	1	---	---
B8	1.5	as needed	as needed	---	---	---	---	---
B9	0	1	1	1	as needed	1	1	---
B9	1.5	as needed	as needed	---	---	---	---	---
B10	0	1	1	---	---	1	---	1
B10	1.5	as needed	as needed	---	---	---	---	---
B11	0	1	1	---	---	1	---	---
B11	1.5	as needed	as needed	1	as needed	---	---	---
B12	0	1	1	---	---	1	---	---
B12	1.5	as needed	as needed	---	---	---	---	---
B13	0	1	1	1	as needed	1	1	---
B13	1.5	as needed	as needed	---	---	---	---	---

TABLE 1
Soil Sample Analysis Matix
Jameson Canyon (E8481-06-01)
Napa and Solano Counties, California

Sample Location	Sample No.	TPHg/BTEX/MTBE (EPA 8015/8021)	TPHd/mo (EPA 8015)	CAM 17 Metals (EPA 6010/7471)	Soluble Metals (WET/EPA 7420)	Pesticides (EPA 8081)	Herbicides (EPA 8151A)	pH (EPA 9045)
B14	0	1	1	---	---	1	---	---
B14	1.5	as needed	as needed	---	---	---	---	1
B15	0	1	1	---	---	1	---	---
B15	1.5	as needed	as needed	1	as needed	---	---	---
B16	0	1	1	---	---	1	---	---
B16	1.5	as needed	as needed	---	---	---	---	---
B17	0	1	1	1	as needed	1	1	---
B17	1.5	as needed	as needed	---	---	---	---	---
B18	0	1	1	---	---	1	---	---
B18	1.5	as needed	as needed	---	---	---	---	---
B19	0	1	1	---	---	1	---	1
B19	1.5	as needed	as needed	1	as needed	---	---	---
B20	0	1	1	---	---	1	---	---
B20	1.5	as needed	as needed	---	---	---	---	---
B21	0	1	1	1	as needed	1	1	---
B21	1.5	as needed	as needed	---	---	---	---	---
B22	0	1	1	---	---	1	---	---
B22	1.5	as needed	as needed	---	---	---	---	---
B23	0	1	1	---	---	1	---	---
B23	1.5	as needed	as needed	1	as needed	---	---	1
B24	0	1	1	---	---	1	---	---
B24	1.5	as needed	as needed	---	---	---	---	---
B25	0	1	1	1	as needed	1	1	---
B25	1.5	as needed	as needed	---	---	---	---	---
B26	0	1	1	---	---	1	---	---
B26	1.5	as needed	as needed	---	---	---	---	---

TABLE 1
Soil Sample Analysis Matix
Jameson Canyon (E8481-06-01)
Napa and Solano Counties, California

Sample Location	Sample No.	TPHg/BTEX/MTBE (EPA 8015/8021)	TPHd/mo (EPA 8015)	CAM 17 Metals (EPA 6010/7471)	Soluble Metals (WET/EPA 7420)	Pesticides (EPA 8081)	Herbicides (EPA 8151A)	pH (EPA 9045)
B27	0	1	1	---	---	1	---	---
B27	1.5	as needed	as needed	1	as needed	---	---	---
B28	0	1	1	---	---	1	---	1
B28	1.5	as needed	as needed	---	---	---	---	---
B29	0	1	1	1	as needed	1	1	---
B29	1.5	as needed	as needed	---	---	---	---	---
B30	0	1	1	---	---	1	---	---
B30	1.5	as needed	as needed	---	---	---	---	---
B31	0	1	1	---	---	1	---	---
B31	1.5	as needed	as needed	1	as needed	---	---	---
B32	0	1	1	---	---	1	---	---
B32	1.5	as needed	as needed	---	---	---	---	1
B33	0	1	1	1	as needed	1	1	---
B33	1.5	as needed	as needed	---	---	---	---	---
B34	0	1	1	---	---	1	---	---
B34	1.5	as needed	as needed	---	---	---	---	---
B35	0	1	1	---	---	1	---	---
B35	1.5	as needed	as needed	1	as needed	---	---	---
B36	0	1	1	---	---	1	---	---
B36	1.5	as needed	as needed	---	---	---	---	---
B37	0	1	1	1	as needed	1	1	1
B37	1.5	as needed	as needed	---	---	---	---	---
B38	0	1	1	---	---	1	---	---
B38	1.5	as needed	as needed	---	---	---	---	---
B39	0	1	1	---	---	1	---	---
B39	1.5	as needed	as needed	1	as needed	---	---	---

TABLE 1
Soil Sample Analysis Matix
Jameson Canyon (E8481-06-01)
Napa and Solano Counties, California

Sample Location	Sample No.	TPHg/BTEX/MTBE (EPA 8015/8021)	TPHd/mo (EPA 8015)	CAM 17 Metals (EPA 6010/7471)	Soluble Metals (WET/EPA 7420)	Pesticides (EPA 8081)	Herbicides (EPA 8151A)	pH (EPA 9045)
B40	0	1	1	---	---	1	---	---
B40	1.5	as needed	as needed	---	---	---	---	---
B41	0	1	1	1	as needed	1	1	---
B41	1.5	as needed	as needed	---	---	---	---	1
B42	0	1	1	---	---	1	---	---
B42	1.5	as needed	as needed	---	---	---	---	---
B43	0	1	1	---	---	1	---	---
B43	1.5	as needed	as needed	1	as needed	---	---	---
B44	0	1	1	---	---	1	---	---
B44	1.5	as needed	as needed	---	---	---	---	---
B45	0	1	1	1	as needed	1	1	---
B45	1.5	as needed	as needed	---	---	---	---	---
B46	0	1	1	---	---	1	---	1
B46	1.5	as needed	as needed	---	---	---	---	---
B47	0	1	1	---	---	1	---	---
B47	1.5	as needed	as needed	1	as needed	---	---	---
B48	0	1	1	---	---	1	---	---
B48	1.5	as needed	as needed	---	---	---	---	---
B49	0	1	1	1	as needed	1	1	---
B49	1.5	as needed	as needed	---	---	---	---	---
B50	0	1	1	---	---	1	---	---
B50	1.5	as needed	as needed	---	---	---	---	1
B51	0	1	1	---	---	1	---	---
B51	1.5	as needed	as needed	1	as needed	---	---	---
B52	0	1	1	---	---	1	---	---
B52	1.5	as needed	as needed	---	---	---	---	---

TABLE 1
Soil Sample Analysis Matix
Jameson Canyon (E8481-06-01)
Napa and Solano Counties, California

Sample Location	Sample No.	TPHg/BTEX/MTBE (EPA 8015/8021)	TPHd/mo (EPA 8015)	CAM 17 Metals (EPA 6010/7471)	Soluble Metals (WET/EPA 7420)	Pesticides (EPA 8081)	Herbicides (EPA 8151A)	pH (EPA 9045)
B53	0	1	1	1	as needed	1	1	---
B53	1.5	as needed	as needed	---	---	---	---	---
B54	0	1	1	---	---	1	---	---
B54	1.5	as needed	as needed	---	---	---	---	---
B55	0	1	1	---	---	1	---	1
B55	1.5	as needed	as needed	1	as needed	---	---	---
B56	0	1	1	---	---	1	---	---
B56	1.5	as needed	as needed	---	---	---	---	---
B57	0	1	1	1	as needed	1	1	---
B57	1.5	as needed	as needed	---	---	---	---	---
B58	0	1	1	---	---	1	---	---
B58	1.5	as needed	as needed	---	---	---	---	---
	TOTAL	**58**	**58**	**29**	**0**	**58**	**15**	**13**

May 29, 2009

ELAP No.: 1838
NELAP No.: 02107CA
NEVADA.: CA-401
CSDLAC No.: 10196

Workorder No.: 105494

Chris Merritt
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

TEL: (925) 371-5900
FAX: (925) 371-5915

RE: Jameson Canyon, E8481-06-01

Attention: Chris Merritt

Enclosed are the results for sample(s) received on May 14, 2009 by Advanced Technology Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

This is an addendum report. Please incorporate with documentation previously submitted.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (562)989-4045 if I can be of further assistance to your company.

Sincerely,

for Eddie F. Rodriguez
Laboratory Director

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories.

Advanced Technology Laboratories
3275 Walnut Avenue Signal Hill, CA 90755 Tel: 562 989-4045 Fax: 562 989-4040

CLIENT: Geocon Consultants, Inc.
Project: Jameson Canyon, E8481-06-01
Lab Order: 105494

CASE NARRATIVE

Sample Receiving / General Comments

Additional analysis was requested for TPHD/MO beyond holding time. Results are flagged with an "H" qualifier.

Analytical Comments for Method 8015 (DRO/ORO)

Dilution was necessary for samples 105494-010A, 105494-032A and 105494-034A, due to sample matrix.

Surrogate recovery was diluted out for samples 105494-010A, 105494-032A and 105494-034A.

Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *29-May-09*

CLIENT: Geocon Consultants, Inc.
Project: Jameson Canyon, E8481-06-01
Lab Order: 105494

Lab ID: 105494-010 **Collection Date:** 5/12/2009 9:05:00 AM
Client Sample ID: B17 - 1.5 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B			**EPA 8015B(M)**			
RunID: GC16_090528A QC Batch: 55573					PrepDate: 5/28/2009	Analyst: **CBR**
DRO	53	20	H	mg/Kg	10	5/29/2009 01:33 AM
ORO	470	20	H	mg/Kg	10	5/29/2009 01:33 AM
Surr: p-Terphenyl	0	30-130	SDOH	%REC	10	5/29/2009 01:33 AM

Lab ID: 105494-032 **Collection Date:** 5/12/2009 12:29:00 PM
Client Sample ID: B9 - 1.5 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B			**EPA 8015B(M)**			
RunID: GC16_090528A QC Batch: 55573					PrepDate: 5/28/2009	Analyst: **CBR**
DRO	ND	20	H	mg/Kg	10	5/29/2009 01:42 AM
ORO	180	20	H	mg/Kg	10	5/29/2009 01:42 AM
Surr: p-Terphenyl	0	30-130	SDOH	%REC	10	5/29/2009 01:42 AM

Lab ID: 105494-034 **Collection Date:** 5/12/2009 2:15:00 PM
Client Sample ID: B58 - 1.5 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B			**EPA 8015B(M)**			
RunID: GC16_090528A QC Batch: 55573					PrepDate: 5/28/2009	Analyst: **CBR**
DRO	ND	20	H	mg/Kg	10	5/29/2009 01:51 AM
ORO	180	20	H	mg/Kg	10	5/29/2009 01:51 AM
Surr: p-Terphenyl	0	30-130	SDOH	%REC	10	5/29/2009 01:51 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories
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Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *29-May-09*

CLIENT: Geocon Consultants, Inc.
Project: Jameson Canyon, E8481-06-01

Lab Order: 105494

Lab ID: 105494-040
Collection Date: 5/12/2009 2:39:00 PM
Client Sample ID: B55 - 1.5
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B			**EPA 8015B(M)**			
RunID: GC16_090528A	QC Batch: 55573				PrepDate: 5/28/2009	Analyst: **CBR**
DRO	2.2	1.0	H	mg/Kg	1	5/29/2009 01:15 AM
ORO	16	1.0	H	mg/Kg	1	5/29/2009 01:15 AM
Surr: p-Terphenyl	66.7	30-130	H	%REC	1	5/29/2009 01:15 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **MB-55573** SampType: **MBLK** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/28/2009** RunNo: **109395**
Client ID: **PBS** Batch ID: **55573** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/28/2009** SeqNo: **1718140**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0									
ORO	ND	1.0									
Surr: p-Terphenyl	2.366		2.670		88.6	30	130				

Sample ID: **LCS-55573** SampType: **LCS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/28/2009** RunNo: **109395**
Client ID: **LCSS** Batch ID: **55573** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/28/2009** SeqNo: **1718141**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	23.676	1.0	33.00	0	71.7	35	124				
Surr: p-Terphenyl	2.425		2.670		90.8	30	130				

Sample ID: **105634-040AMS** SampType: **MS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/28/2009** RunNo: **109395**
Client ID: **ZZZZZZ** Batch ID: **55573** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/28/2009** SeqNo: **1718142**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	22.035	1.0	33.00	0	66.8	12	125				
Surr: p-Terphenyl	2.481		2.670		92.9	30	130				

Sample ID: **105634-040AMSD** SampType: **MSD** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/28/2009** RunNo: **109395**
Client ID: **ZZZZZZ** Batch ID: **55573** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/28/2009** SeqNo: **1718143**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	22.022	1.0	33.00	0	66.7	12	125	22.04	0.0590	20	
Surr: p-Terphenyl	2.257		2.670		84.5	30	130		0	0	

Sample ID: **105634-039ADUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/28/2009** RunNo: **109395**
Client ID: **ZZZZZZ** Batch ID: **55573** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/28/2009** SeqNo: **1718144**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: 105494
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **105634-039ADUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/28/2009** RunNo: **109395**
Client ID: **ZZZZZZ** Batch ID: **55573** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/28/2009** SeqNo: **1718144**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0						0	0	20	
ORO	ND	1.0						0	0	20	
Surr: p-Terphenyl	1.923		2.670		72.0	30	130		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

Diane Galvan

From: Chris Merritt [merritt@geoconinc.com]
Sent: Wednesday, May 27, 2009 11:58 AM
To: Diane Galvan
Subject: RE: Results/EDD's - Jameson Canyon (105533)

Yes, please run them...

-----Original Message-----
From: Diane Galvan [mailto:Diane@atlglobal.com]
Sent: Wednesday, May 27, 2009 11:16 AM
To: Chris Merritt
Cc: livermore@geoconinc.com
Subject: RE: Results/EDD's - Jameson Canyon (105533)

Hi Chris,

The holding time expired yesterday for samples B9-1.5, B17-1.5, B55-1.5 and B58-1.5. Would you like us to proceed? Please advise.

Diane

From: Chris Merritt [mailto:merritt@geoconinc.com]
Sent: Tuesday, May 26, 2009 8:31 PM
To: Diane Galvan
Cc: livermore@geoconinc.com
Subject: RE: Results/EDD's - Jameson Canyon (105533)

For B9, B17, B21, B22, B55, B58

I'd like to get the 1.5-foot samples analyzed for TPHd/mo.

Thanks!

May 21, 2009

ELAP No.: 1838
NELAP No.: 02107CA
NEVADA.: CA-401
CSDLAC No.: 10196

Workorder No.: 105495

Chris Merritt
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

TEL: (925) 371-5900
FAX: (925) 371-5915

RE: Jameson Canyon, E8481-06-01

Attention: Chris Merritt

Enclosed are the results for sample(s) received on May 14, 2009 by Advanced Technology Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (562)989-4045 if I can be of further assistance to your company.

Sincerely,

Eddie F. Rodriguez
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories.

Advanced Technology Laboratories
3275 Walnut Avenue Signal Hill, CA 90755 Tel: 562 989-4045 Fax: 562 989-4040

CLIENT: Geocon Consultants, Inc.
Project: Jameson Canyon, E8481-06-01
Lab Order: 105495

CASE NARRATIVE

Samples for Herbicides (8151) were subcontracted to Sierra Analytical Laboratories, Inc. with ELAP Cert.#2320.

Analytical Comments for Method 6010

Matrix Spike (MS) and /or Matrix Spike Duplicate (MSD) are/is outside recovery criteria for sample 105522-002AMSD; however, the analytical batch was validated by the Laboratory Control Sample (LCS).

Analytical Comments for Method 8015 (DRO/ORO)

Dilution was necessary for samples 105495-003A and 105495-021A, due to sample matrix.

Surrogate recovery was diluted out for samples 105494-021A, 105494-041AMS and 105494-041AMSD.

Matrix Spike (MS) and /or Matrix Spike Duplicate (MSD) are/is outside recovery criteria for sample 105494-041AMS; however, the analytical batch was validated by the Laboratory Control Sample (LCS).

RPD for Matrix Spike (MS)/Matrix Spike Duplicate (MSD) is outside criteria for sample 105494-041AMSD; however, the analytical batch was validated by the Laboratory Control Sample (LCS).

Analytical Comments for Method 8015/8021

RPD for Matrix Spike (MS)/Matrix Spike Duplicate (MSD) is outside criteria for sample 105495-015AMSD; however, the analytical batch was validated by the Laboratory Control Sample (LCS).

Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B15 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 11:21:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-001A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520B	QC Batch: 55403			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	4.4	1.0		mg/Kg	1	5/20/2009 02:15 PM
ORO	22	1.0		mg/Kg	1	5/20/2009 02:15 PM
Surr: p-Terphenyl	76.3	30-130		%REC	1	5/20/2009 02:15 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/15/2009 02:34 AM
Surr: Bromofluorobenzene (FID)	100	59-145		%REC	1	5/15/2009 02:34 AM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/15/2009 02:34 AM
Ethylbenzene	ND	5.0		µg/Kg	1	5/15/2009 02:34 AM
m,p-Xylene	ND	10		µg/Kg	1	5/15/2009 02:34 AM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/15/2009 02:34 AM
o-Xylene	ND	5.0		µg/Kg	1	5/15/2009 02:34 AM
Toluene	ND	5.0		µg/Kg	1	5/15/2009 02:34 AM
Surr: Bromofluorobenzene (PID)	89.9	65-140		%REC	1	5/15/2009 02:34 AM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377			PrepDate: 5/15/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 08:58 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 08:58 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 08:58 PM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 08:58 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:58 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 08:58 PM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:58 PM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 08:58 PM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:58 PM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 08:58 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 08:58 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 08:58 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

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Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B15 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 11:21:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-001A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377				PrepDate: 5/15/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 08:58 PM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 08:58 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 08:58 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 08:58 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:58 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 08:58 PM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 08:58 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 08:58 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 08:58 PM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 08:58 PM
Surr: Decachlorobiphenyl	61.3	20-142		%REC	1	5/18/2009 08:58 PM
Surr: Tetrachloro-m-xylene	58.9	25-115		%REC	1	5/18/2009 08:58 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B15 - 1.5
Lab Order:	105495	**Collection Date:**	5/13/2009 11:27:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-002A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519A	QC Batch: 55396			PrepDate:	5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 12:13 PM
Arsenic	7.3	1.0		mg/Kg	1	5/19/2009 12:13 PM
Barium	170	1.0		mg/Kg	1	5/19/2009 12:13 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 12:13 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 12:13 PM
Chromium	15	1.0		mg/Kg	1	5/19/2009 12:13 PM
Cobalt	6.1	1.0		mg/Kg	1	5/19/2009 12:13 PM
Copper	24	2.0		mg/Kg	1	5/19/2009 12:13 PM
Lead	15	1.0		mg/Kg	1	5/19/2009 12:13 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 12:13 PM
Nickel	15	1.0		mg/Kg	1	5/19/2009 12:13 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 12:13 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 12:13 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 12:13 PM
Vanadium	59	1.0		mg/Kg	1	5/19/2009 12:13 PM
Zinc	33	1.0		mg/Kg	1	5/19/2009 12:13 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519C	QC Batch: 55365			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 12:18 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B14 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 11:25:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-003A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520B	QC Batch: 55403			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	19	2.0		mg/Kg	2	5/20/2009 03:22 PM
ORO	140	2.0		mg/Kg	2	5/20/2009 03:22 PM
Surr: p-Terphenyl	58.7	30-130		%REC	2	5/20/2009 03:22 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/15/2009 02:50 AM
Surr: Bromofluorobenzene (FID)	105	59-145		%REC	1	5/15/2009 02:50 AM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/15/2009 02:50 AM
Ethylbenzene	ND	5.0		µg/Kg	1	5/15/2009 02:50 AM
m,p-Xylene	ND	10		µg/Kg	1	5/15/2009 02:50 AM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/15/2009 02:50 AM
o-Xylene	ND	5.0		µg/Kg	1	5/15/2009 02:50 AM
Toluene	ND	5.0		µg/Kg	1	5/15/2009 02:50 AM
Surr: Bromofluorobenzene (PID)	93.8	65-140		%REC	1	5/15/2009 02:50 AM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377			PrepDate: 5/15/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 09:11 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 09:11 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 09:11 PM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 09:11 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:11 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 09:11 PM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:11 PM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 09:11 PM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:11 PM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 09:11 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 09:11 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 09:11 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B14 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 11:25:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-003A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377				PrepDate: 5/15/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 09:11 PM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 09:11 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 09:11 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 09:11 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:11 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 09:11 PM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 09:11 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 09:11 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 09:11 PM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 09:11 PM
Surr: Decachlorobiphenyl	66.6	20-142		%REC	1	5/18/2009 09:11 PM
Surr: Tetrachloro-m-xylene	68.5	25-115		%REC	1	5/18/2009 09:11 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B14 - 1.5
Lab Order:	105495	**Collection Date:**	5/13/2009 11:30:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-004A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
PH						
			EPA 9045C			
RunID: WETCHEM_090515D	QC Batch: R109069			PrepDate:		Analyst: **DDL**
pH	6.7	0.10		pH Units	1	5/15/2009

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B13 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 11:35:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-005A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519A	QC Batch: 55396			PrepDate: 5/18/2009		Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 12:30 PM
Arsenic	6.2	1.0		mg/Kg	1	5/19/2009 12:30 PM
Barium	150	1.0		mg/Kg	1	5/19/2009 12:30 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 12:30 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 12:30 PM
Chromium	12	1.0		mg/Kg	1	5/19/2009 12:30 PM
Cobalt	10	1.0		mg/Kg	1	5/19/2009 12:30 PM
Copper	21	2.0		mg/Kg	1	5/19/2009 12:30 PM
Lead	28	1.0		mg/Kg	1	5/19/2009 12:30 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 12:30 PM
Nickel	14	1.0		mg/Kg	1	5/19/2009 12:30 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 12:30 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 12:30 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 12:30 PM
Vanadium	33	1.0		mg/Kg	1	5/19/2009 12:30 PM
Zinc	42	1.0		mg/Kg	1	5/19/2009 12:30 PM
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
	EPA 3550B			**EPA 8015B(M)**		
RunID: GC16_090520B	QC Batch: 55403			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	2.6	1.0		mg/Kg	1	5/20/2009 02:24 PM
ORO	16	1.0		mg/Kg	1	5/20/2009 02:24 PM
Surr: p-Terphenyl	69.0	30-130		%REC	1	5/20/2009 02:24 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/15/2009 03:05 AM
Surr: Bromofluorobenzene (FID)	101	59-145		%REC	1	5/15/2009 03:05 AM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/15/2009 03:05 AM
Ethylbenzene	ND	5.0		µg/Kg	1	5/15/2009 03:05 AM
m,p-Xylene	ND	10		µg/Kg	1	5/15/2009 03:05 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B13 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 11:35:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-005A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514C	QC Batch:	E09VS131			PrepDate:	Analyst: **KHN**
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/15/2009 03:05 AM
o-Xylene	ND	5.0		µg/Kg	1	5/15/2009 03:05 AM
Toluene	ND	5.0		µg/Kg	1	5/15/2009 03:05 AM
Surr: Bromofluorobenzene (PID)	90.3	65-140		%REC	1	5/15/2009 03:05 AM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC10_090518A	QC Batch:	55377			PrepDate:	5/15/2009 Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 09:25 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 09:25 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 09:25 PM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 09:25 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:25 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 09:25 PM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:25 PM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 09:25 PM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:25 PM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 09:25 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 09:25 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 09:25 PM
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 09:25 PM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 09:25 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 09:25 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 09:25 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:25 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 09:25 PM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 09:25 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 09:25 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 09:25 PM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 09:25 PM
Surr: Decachlorobiphenyl	66.2	20-142		%REC	1	5/18/2009 09:25 PM
Surr: Tetrachloro-m-xylene	62.6	25-115		%REC	1	5/18/2009 09:25 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519C	QC Batch:	55365			PrepDate:	5/18/2009 Analyst: **RQ**

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B13 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 11:35:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-005A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY BY COLD VAPOR TECHNIQUE						
			EPA 7471A			
RunID: AA5_090519C	QC Batch: 55365			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 12:20 PM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B20 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 11:51:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-007A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520B	QC Batch: 55403			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	9.7	1.0		mg/Kg	1	5/20/2009 02:34 PM
ORO	59	1.0		mg/Kg	1	5/20/2009 02:34 PM
Surr: p-Terphenyl	79.8	30-130		%REC	1	5/20/2009 02:34 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/15/2009 03:21 AM
Surr: Bromofluorobenzene (FID)	98.7	59-145		%REC	1	5/15/2009 03:21 AM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/15/2009 03:21 AM
Ethylbenzene	ND	5.0		µg/Kg	1	5/15/2009 03:21 AM
m,p-Xylene	ND	10		µg/Kg	1	5/15/2009 03:21 AM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/15/2009 03:21 AM
o-Xylene	ND	5.0		µg/Kg	1	5/15/2009 03:21 AM
Toluene	ND	5.0		µg/Kg	1	5/15/2009 03:21 AM
Surr: Bromofluorobenzene (PID)	88.6	65-140		%REC	1	5/15/2009 03:21 AM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377			PrepDate: 5/15/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 09:39 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 09:39 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 09:39 PM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 09:39 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:39 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 09:39 PM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:39 PM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 09:39 PM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:39 PM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 09:39 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 09:39 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 09:39 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B20 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 11:51:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-007A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377				PrepDate: 5/15/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 09:39 PM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 09:39 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 09:39 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 09:39 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:39 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 09:39 PM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 09:39 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 09:39 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 09:39 PM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 09:39 PM
Surr: Decachlorobiphenyl	76.8	20-142		%REC	1	5/18/2009 09:39 PM
Surr: Tetrachloro-m-xylene	74.8	25-115		%REC	1	5/18/2009 09:39 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B19 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 12:00:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-009A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520B	QC Batch: 55403			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	5.8	1.0		mg/Kg	1	5/20/2009 02:44 PM
ORO	40	1.0		mg/Kg	1	5/20/2009 02:44 PM
Surr: p-Terphenyl	66.9	30-130		%REC	1	5/20/2009 02:44 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/15/2009 03:37 AM
Surr: Bromofluorobenzene (FID)	93.0	59-145		%REC	1	5/15/2009 03:37 AM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/15/2009 03:37 AM
Ethylbenzene	ND	5.0		µg/Kg	1	5/15/2009 03:37 AM
m,p-Xylene	ND	10		µg/Kg	1	5/15/2009 03:37 AM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/15/2009 03:37 AM
o-Xylene	ND	5.0		µg/Kg	1	5/15/2009 03:37 AM
Toluene	ND	5.0		µg/Kg	1	5/15/2009 03:37 AM
Surr: Bromofluorobenzene (PID)	83.3	65-140		%REC	1	5/15/2009 03:37 AM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377			PrepDate: 5/15/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 09:53 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 09:53 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 09:53 PM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 09:53 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:53 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 09:53 PM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:53 PM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 09:53 PM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:53 PM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 09:53 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 09:53 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 09:53 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B19 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 12:00:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-009A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377			PrepDate: 5/15/2009		Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 09:53 PM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 09:53 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 09:53 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 09:53 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 09:53 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 09:53 PM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 09:53 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 09:53 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 09:53 PM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 09:53 PM
Surr: Decachlorobiphenyl	62.6	20-142		%REC	1	5/18/2009 09:53 PM
Surr: Tetrachloro-m-xylene	64.7	25-115		%REC	1	5/18/2009 09:53 PM
PH						
				EPA 9045C		
RunID: WETCHEM_090515D	QC Batch: R109069			PrepDate:		Analyst: **DDL**
pH	5.7	0.10		pH Units	1	5/15/2009

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B19 - 1.5
Lab Order:	105495	**Collection Date:**	5/13/2009 12:05:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-010A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519A	QC Batch: 55396			PrepDate:	5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 12:33 PM
Arsenic	5.4	1.0		mg/Kg	1	5/19/2009 12:33 PM
Barium	150	1.0		mg/Kg	1	5/19/2009 12:33 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 12:33 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 12:33 PM
Chromium	15	1.0		mg/Kg	1	5/19/2009 12:33 PM
Cobalt	7.9	1.0		mg/Kg	1	5/19/2009 12:33 PM
Copper	21	2.0		mg/Kg	1	5/19/2009 12:33 PM
Lead	11	1.0		mg/Kg	1	5/19/2009 12:33 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 12:33 PM
Nickel	16	1.0		mg/Kg	1	5/19/2009 12:33 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 12:33 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 12:33 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 12:33 PM
Vanadium	36	1.0		mg/Kg	1	5/19/2009 12:33 PM
Zinc	48	1.0		mg/Kg	1	5/19/2009 12:33 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519C	QC Batch: 55365			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 12:22 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B51 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 12:36:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-011A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520B	QC Batch: 55403			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	2.3	1.0		mg/Kg	1	5/20/2009 01:43 PM
ORO	27	1.0		mg/Kg	1	5/20/2009 01:43 PM
Surr: p-Terphenyl	59.0	30-130		%REC	1	5/20/2009 01:43 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/15/2009 03:53 AM
Surr: Bromofluorobenzene (FID)	96.2	59-145		%REC	1	5/15/2009 03:53 AM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/15/2009 03:53 AM
Ethylbenzene	ND	5.0		µg/Kg	1	5/15/2009 03:53 AM
m,p-Xylene	ND	10		µg/Kg	1	5/15/2009 03:53 AM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/15/2009 03:53 AM
o-Xylene	ND	5.0		µg/Kg	1	5/15/2009 03:53 AM
Toluene	ND	5.0		µg/Kg	1	5/15/2009 03:53 AM
Surr: Bromofluorobenzene (PID)	85.6	65-140		%REC	1	5/15/2009 03:53 AM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377			PrepDate: 5/15/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 10:06 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 10:06 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 10:06 PM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 10:06 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:06 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 10:06 PM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:06 PM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 10:06 PM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:06 PM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 10:06 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 10:06 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 10:06 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B51 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 12:36:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-011A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377				PrepDate: 5/15/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 10:06 PM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 10:06 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 10:06 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 10:06 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:06 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 10:06 PM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 10:06 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 10:06 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 10:06 PM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 10:06 PM
Surr: Decachlorobiphenyl	65.6	20-142		%REC	1	5/18/2009 10:06 PM
Surr: Tetrachloro-m-xylene	59.1	25-115		%REC	1	5/18/2009 10:06 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B51 - 1.5
Lab Order:	105495	**Collection Date:**	5/13/2009 12:39:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-012A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519A	QC Batch: 55396			PrepDate:	5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 12:35 PM
Arsenic	5.5	1.0		mg/Kg	1	5/19/2009 12:35 PM
Barium	260	1.0		mg/Kg	1	5/19/2009 12:35 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 12:35 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 12:35 PM
Chromium	17	1.0		mg/Kg	1	5/19/2009 12:35 PM
Cobalt	9.0	1.0		mg/Kg	1	5/19/2009 12:35 PM
Copper	18	2.0		mg/Kg	1	5/19/2009 12:35 PM
Lead	5.8	1.0		mg/Kg	1	5/19/2009 12:35 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 12:35 PM
Nickel	16	1.0		mg/Kg	1	5/19/2009 12:35 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 12:35 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 12:35 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 12:35 PM
Vanadium	41	1.0		mg/Kg	1	5/19/2009 12:35 PM
Zinc	46	1.0		mg/Kg	1	5/19/2009 12:35 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519C	QC Batch: 55365			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 12:24 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B52 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 12:35:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-013A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520B	QC Batch: 55403			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	15	1.0		mg/Kg	1	5/20/2009 03:02 PM
ORO	83	1.0		mg/Kg	1	5/20/2009 03:02 PM
Surr: p-Terphenyl	76.2	30-130		%REC	1	5/20/2009 03:02 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/15/2009 04:08 AM
Surr: Bromofluorobenzene (FID)	94.5	59-145		%REC	1	5/15/2009 04:08 AM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090514C	QC Batch: E09VS131			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/15/2009 04:08 AM
Ethylbenzene	ND	5.0		µg/Kg	1	5/15/2009 04:08 AM
m,p-Xylene	ND	10		µg/Kg	1	5/15/2009 04:08 AM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/15/2009 04:08 AM
o-Xylene	ND	5.0		µg/Kg	1	5/15/2009 04:08 AM
Toluene	ND	5.0		µg/Kg	1	5/15/2009 04:08 AM
Surr: Bromofluorobenzene (PID)	85.1	65-140		%REC	1	5/15/2009 04:08 AM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377			PrepDate: 5/15/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 10:20 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 10:20 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 10:20 PM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 10:20 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:20 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 10:20 PM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:20 PM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 10:20 PM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:20 PM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 10:20 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 10:20 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 10:20 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B52 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 12:35:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-013A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC10_090518A	QC Batch: 55377				PrepDate: 5/15/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 10:20 PM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 10:20 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 10:20 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 10:20 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:20 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 10:20 PM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 10:20 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 10:20 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 10:20 PM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 10:20 PM
Surr: Decachlorobiphenyl	61.4	20-142		%REC	1	5/18/2009 10:20 PM
Surr: Tetrachloro-m-xylene	60.1	25-115		%REC	1	5/18/2009 10:20 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B44 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 1:35:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-015A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520B	QC Batch: 55403			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	ND	1.0		mg/Kg	1	5/20/2009 01:24 PM
ORO	3.4	1.0		mg/Kg	1	5/20/2009 01:24 PM
Surr: p-Terphenyl	80.3	30-130		%REC	1	5/20/2009 01:24 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090515A	QC Batch: E09VS132			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/15/2009 11:31 AM
Surr: Bromofluorobenzene (FID)	97.6	59-145		%REC	1	5/15/2009 11:31 AM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090515A	QC Batch: E09VS132			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/15/2009 11:31 AM
Ethylbenzene	ND	5.0		µg/Kg	1	5/15/2009 11:31 AM
m,p-Xylene	ND	10		µg/Kg	1	5/15/2009 11:31 AM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/15/2009 11:31 AM
o-Xylene	ND	5.0		µg/Kg	1	5/15/2009 11:31 AM
Toluene	ND	5.0		µg/Kg	1	5/15/2009 11:31 AM
Surr: Bromofluorobenzene (PID)	86.2	65-140		%REC	1	5/15/2009 11:31 AM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518B	QC Batch: 55378			PrepDate: 5/15/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 08:03 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 08:03 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 08:03 PM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 08:03 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:03 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 08:03 PM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:03 PM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 08:03 PM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:03 PM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 08:03 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 08:03 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 08:03 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B44 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 1:35:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-015A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC10_090518B	QC Batch: 55378				PrepDate: 5/15/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 08:03 PM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 08:03 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 08:03 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 08:03 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 08:03 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 08:03 PM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 08:03 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 08:03 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 08:03 PM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 08:03 PM
Surr: Decachlorobiphenyl	75.1	20-142		%REC	1	5/18/2009 08:03 PM
Surr: Tetrachloro-m-xylene	64.2	25-115		%REC	1	5/18/2009 08:03 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B45 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 1:20:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-017A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
EPA 3050B				**EPA 6010B**		
RunID: ICP8_090519A	QC Batch: 55396			PrepDate: 5/18/2009		Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 12:38 PM
Arsenic	4.4	1.0		mg/Kg	1	5/19/2009 12:38 PM
Barium	140	1.0		mg/Kg	1	5/19/2009 12:38 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 12:38 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 12:38 PM
Chromium	15	1.0		mg/Kg	1	5/19/2009 12:38 PM
Cobalt	9.2	1.0		mg/Kg	1	5/19/2009 12:38 PM
Copper	16	2.0		mg/Kg	1	5/19/2009 12:38 PM
Lead	8.9	1.0		mg/Kg	1	5/19/2009 12:38 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 12:38 PM
Nickel	14	1.0		mg/Kg	1	5/19/2009 12:38 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 12:38 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 12:38 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 12:38 PM
Vanadium	32	1.0		mg/Kg	1	5/19/2009 12:38 PM
Zinc	45	1.0		mg/Kg	1	5/19/2009 12:38 PM
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520B	QC Batch: 55403			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	ND	1.0		mg/Kg	1	5/20/2009 01:33 PM
ORO	4.5	1.0		mg/Kg	1	5/20/2009 01:33 PM
Surr: p-Terphenyl	74.8	30-130		%REC	1	5/20/2009 01:33 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090515A	QC Batch: E09VS132			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/15/2009 12:02 PM
Surr: Bromofluorobenzene (FID)	99.7	59-145		%REC	1	5/15/2009 12:02 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090515A	QC Batch: E09VS132			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/15/2009 12:02 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/15/2009 12:02 PM
m,p-Xylene	ND	10		µg/Kg	1	5/15/2009 12:02 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B45 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 1:20:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-017A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090515A	QC Batch:	E09VS132			PrepDate:	Analyst: **KHN**
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/15/2009 12:02 PM
o-Xylene	ND	5.0		µg/Kg	1	5/15/2009 12:02 PM
Toluene	ND	5.0		µg/Kg	1	5/15/2009 12:02 PM
Surr: Bromofluorobenzene (PID)	88.2	65-140		%REC	1	5/15/2009 12:02 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC10_090518B	QC Batch:	55378			PrepDate:	5/15/2009 Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 10:34 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 10:34 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 10:34 PM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 10:34 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:34 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 10:34 PM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:34 PM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 10:34 PM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:34 PM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 10:34 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 10:34 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 10:34 PM
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 10:34 PM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 10:34 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 10:34 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 10:34 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:34 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 10:34 PM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 10:34 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 10:34 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 10:34 PM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 10:34 PM
Surr: Decachlorobiphenyl	57.9	20-142		%REC	1	5/18/2009 10:34 PM
Surr: Tetrachloro-m-xylene	60.7	25-115		%REC	1	5/18/2009 10:34 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519C	QC Batch:	55365			PrepDate:	5/18/2009 Analyst: **RQ**

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B45 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 1:20:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-017A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY BY COLD VAPOR TECHNIQUE						
			EPA 7471A			
RunID: AA5_090519C	QC Batch: 55365			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 12:26 PM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B46 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 1:26:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-019A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520B	QC Batch: 55403			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	8.8	1.0		mg/Kg	1	5/20/2009 02:53 PM
ORO	51	1.0		mg/Kg	1	5/20/2009 02:53 PM
Surr: p-Terphenyl	69.9	30-130		%REC	1	5/20/2009 02:53 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090515A	QC Batch: E09VS132			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/15/2009 12:18 PM
Surr: Bromofluorobenzene (FID)	87.7	59-145		%REC	1	5/15/2009 12:18 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090515A	QC Batch: E09VS132			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/15/2009 12:18 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/15/2009 12:18 PM
m,p-Xylene	ND	10		µg/Kg	1	5/15/2009 12:18 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/15/2009 12:18 PM
o-Xylene	ND	5.0		µg/Kg	1	5/15/2009 12:18 PM
Toluene	ND	5.0		µg/Kg	1	5/15/2009 12:18 PM
Surr: Bromofluorobenzene (PID)	78.3	65-140		%REC	1	5/15/2009 12:18 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518B	QC Batch: 55378			PrepDate: 5/15/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 10:47 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 10:47 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 10:47 PM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 10:47 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:47 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 10:47 PM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:47 PM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 10:47 PM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:47 PM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 10:47 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 10:47 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 10:47 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B46 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 1:26:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-019A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518B	QC Batch: 55378			PrepDate: 5/15/2009		Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 10:47 PM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 10:47 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 10:47 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 10:47 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 10:47 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 10:47 PM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 10:47 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 10:47 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 10:47 PM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 10:47 PM
Surr: Decachlorobiphenyl	79.9	20-142		%REC	1	5/18/2009 10:47 PM
Surr: Tetrachloro-m-xylene	70.8	25-115		%REC	1	5/18/2009 10:47 PM
PH						
				EPA 9045C		
RunID: WETCHEM_090515D	QC Batch: R109069			PrepDate:		Analyst: **DDL**
pH	5.7	0.10		pH Units	1	5/15/2009

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B42 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 2:04:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-021A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC8_090518C	QC Batch: 55404			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	31	10		mg/Kg	10	5/19/2009 12:27 PM
ORO	130	10		mg/Kg	10	5/19/2009 12:27 PM
Surr: p-Terphenyl	0	30-130	SDO	%REC	10	5/19/2009 12:27 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090515A	QC Batch: E09VS132			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/15/2009 12:34 PM
Surr: Bromofluorobenzene (FID)	84.8	59-145		%REC	1	5/15/2009 12:34 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090515A	QC Batch: E09VS132			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/15/2009 12:34 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/15/2009 12:34 PM
m,p-Xylene	ND	10		µg/Kg	1	5/15/2009 12:34 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/15/2009 12:34 PM
o-Xylene	ND	5.0		µg/Kg	1	5/15/2009 12:34 PM
Toluene	ND	5.0		µg/Kg	1	5/15/2009 12:34 PM
Surr: Bromofluorobenzene (PID)	75.1	65-140		%REC	1	5/15/2009 12:34 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518B	QC Batch: 55378			PrepDate: 5/15/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 11:01 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 11:01 PM
4,4´-DDT	5.0	2.0		µg/Kg	1	5/18/2009 11:01 PM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 11:01 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 11:01 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 11:01 PM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 11:01 PM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 11:01 PM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 11:01 PM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 11:01 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 11:01 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 11:01 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B42 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 2:04:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-021A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC10_090518B	QC Batch: 55378				PrepDate: 5/15/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 11:01 PM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 11:01 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 11:01 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 11:01 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 11:01 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 11:01 PM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 11:01 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 11:01 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 11:01 PM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 11:01 PM
Surr: Decachlorobiphenyl	91.2	20-142		%REC	1	5/18/2009 11:01 PM
Surr: Tetrachloro-m-xylene	67.4	25-115		%REC	1	5/18/2009 11:01 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B43 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 2:10:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-023A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC8_090518C	QC Batch: 55404			PrepDate: 5/18/2009		Analyst: **CBR**
DRO	3.2	1.0		mg/Kg	1	5/19/2009 10:13 AM
ORO	10	1.0		mg/Kg	1	5/19/2009 10:13 AM
Surr: p-Terphenyl	98.5	30-130		%REC	1	5/19/2009 10:13 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090515A	QC Batch: E09VS132			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/15/2009 12:49 PM
Surr: Bromofluorobenzene (FID)	91.2	59-145		%REC	1	5/15/2009 12:49 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090515A	QC Batch: E09VS132			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/15/2009 12:49 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/15/2009 12:49 PM
m,p-Xylene	ND	10		µg/Kg	1	5/15/2009 12:49 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/15/2009 12:49 PM
o-Xylene	ND	5.0		µg/Kg	1	5/15/2009 12:49 PM
Toluene	ND	5.0		µg/Kg	1	5/15/2009 12:49 PM
Surr: Bromofluorobenzene (PID)	80.2	65-140		%REC	1	5/15/2009 12:49 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC10_090518B	QC Batch: 55378			PrepDate: 5/15/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/18/2009 11:15 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/18/2009 11:15 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/18/2009 11:15 PM
Aldrin	ND	1.0		µg/Kg	1	5/18/2009 11:15 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/18/2009 11:15 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 11:15 PM
beta-BHC	ND	1.0		µg/Kg	1	5/18/2009 11:15 PM
Chlordane	ND	8.5		µg/Kg	1	5/18/2009 11:15 PM
delta-BHC	ND	1.0		µg/Kg	1	5/18/2009 11:15 PM
Dieldrin	ND	2.0		µg/Kg	1	5/18/2009 11:15 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/18/2009 11:15 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/18/2009 11:15 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B43 - 0
Lab Order:	105495	**Collection Date:**	5/13/2009 2:10:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-023A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC10_090518B	QC Batch: 55378				PrepDate: 5/15/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/18/2009 11:15 PM
Endrin	ND	2.0		µg/Kg	1	5/18/2009 11:15 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/18/2009 11:15 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/18/2009 11:15 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/18/2009 11:15 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/18/2009 11:15 PM
Heptachlor	ND	1.0		µg/Kg	1	5/18/2009 11:15 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/18/2009 11:15 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/18/2009 11:15 PM
Toxaphene	ND	50		µg/Kg	1	5/18/2009 11:15 PM
Surr: Decachlorobiphenyl	71.1	20-142		%REC	1	5/18/2009 11:15 PM
Surr: Tetrachloro-m-xylene	70.8	25-115		%REC	1	5/18/2009 11:15 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *21-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B43 - 1.5
Lab Order:	105495	**Collection Date:**	5/13/2009 2:15:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105495-024A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519A	QC Batch: 55396			PrepDate:	5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 12:40 PM
Arsenic	4.0	1.0		mg/Kg	1	5/19/2009 12:40 PM
Barium	160	1.0		mg/Kg	1	5/19/2009 12:40 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 12:40 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 12:40 PM
Chromium	14	1.0		mg/Kg	1	5/19/2009 12:40 PM
Cobalt	5.9	1.0		mg/Kg	1	5/19/2009 12:40 PM
Copper	19	2.0		mg/Kg	1	5/19/2009 12:40 PM
Lead	5.7	1.0		mg/Kg	1	5/19/2009 12:40 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 12:40 PM
Nickel	13	1.0		mg/Kg	1	5/19/2009 12:40 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 12:40 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 12:40 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 12:40 PM
Vanadium	31	1.0		mg/Kg	1	5/19/2009 12:40 PM
Zinc	44	1.0		mg/Kg	1	5/19/2009 12:40 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519C	QC Batch: 55365			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 12:10 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105495
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **MB-55396** SampType: **MBLK** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109135**
Client ID: **PBS** Batch ID: **55396** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713553**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	2.0									
Arsenic	ND	1.0									
Barium	ND	1.0									
Beryllium	ND	1.0									
Cadmium	0.011	1.0									
Chromium	0.172	1.0									
Cobalt	ND	1.0									
Copper	0.336	2.0									
Lead	ND	1.0									
Molybdenum	ND	1.0									
Nickel	ND	1.0									
Selenium	ND	1.0									
Silver	0.021	1.0									
Thallium	ND	1.0									
Vanadium	ND	1.0									
Zinc	0.223	1.0									

Sample ID: **LCS-55396** SampType: **LCS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109135**
Client ID: **LCSS** Batch ID: **55396** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713554**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	46.981	2.0	50.00	0	94.0	80	120				
Arsenic	46.540	1.0	50.00	0	93.1	80	120				
Barium	49.822	1.0	50.00	0	99.6	80	120				
Beryllium	48.278	1.0	50.00	0	96.6	80	120				
Cadmium	47.419	1.0	50.00	0.01062	94.8	80	120				
Chromium	45.767	1.0	50.00	0.1722	91.2	80	120				
Cobalt	49.355	1.0	50.00	0	98.7	80	120				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: 105495
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **LCS-55396** SampType: **LCS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109135**
Client ID: **LCSS** Batch ID: **55396** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713554**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	50.674	2.0	50.00	0.3361	101	80	120				
Lead	49.391	1.0	50.00	0	98.8	80	120				
Molybdenum	50.058	1.0	50.00	0	100	80	120				
Nickel	47.319	1.0	50.00	0	94.6	80	120				
Selenium	45.577	1.0	50.00	0	91.2	80	120				
Silver	48.723	1.0	50.00	0.02147	97.4	80	120				
Thallium	42.901	1.0	50.00	0	85.8	80	120				
Vanadium	49.980	1.0	50.00	0	100	80	120				
Zinc	46.908	1.0	50.00	0.2230	93.4	80	120				

Sample ID: **105522-002ADUP** SampType: **DUP** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109135**
Client ID: **ZZZZZZ** Batch ID: **55396** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713557**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	1.050	2.0						0.9843	0	20	
Arsenic	4.344	1.0						4.194	3.52	20	
Barium	89.447	1.0						99.52	10.7	20	
Beryllium	ND	1.0						0	0	20	
Cadmium	0.898	1.0						0.6990	0	20	
Chromium	6.661	1.0						6.559	1.54	20	
Cobalt	3.619	1.0						3.943	8.58	20	
Copper	70.134	2.0						68.57	2.25	20	
Lead	21.323	1.0						18.41	14.7	20	
Molybdenum	0.211	1.0						0.2677	0	20	
Nickel	7.068	1.0						6.179	13.4	20	
Selenium	ND	1.0						0	0	20	
Silver	0.078	1.0						0	0	20	
Thallium	ND	1.0						0	0	20	
Vanadium	15.420	1.0						16.08	4.22	20	
Zinc	1071.343	1.0						946.4	12.4	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
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Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **105522-002AMS** SampType: **MS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109135**
Client ID: **ZZZZZZ** Batch ID: **55396** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713558**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	92.215	2.0	125.0	0.9843	73.0	25	106				
Arsenic	118.760	1.0	125.0	4.194	91.7	42	113				
Barium	197.772	1.0	125.0	99.52	78.6	19	140				
Beryllium	116.111	1.0	125.0	0	92.9	50	109				
Cadmium	105.372	1.0	125.0	0.6990	83.7	48	106				
Chromium	114.384	1.0	125.0	6.559	86.3	44	116				
Cobalt	110.102	1.0	125.0	3.943	84.9	47	107				
Copper	221.113	2.0	125.0	68.57	122	49	124				
Lead	125.850	1.0	125.0	18.41	86.0	33	120				
Molybdenum	117.200	1.0	125.0	0.2677	93.5	46	111				
Nickel	112.871	1.0	125.0	6.179	85.4	43	111				
Selenium	115.077	1.0	125.0	0	92.1	43	104				
Silver	123.647	1.0	125.0	0	98.9	53	114				
Thallium	96.705	1.0	125.0	0	77.4	41	107				
Vanadium	133.864	1.0	125.0	16.08	94.2	48	116				
Zinc	997.882	1.0	125.0	946.4	41.2	24	129				

Sample ID: **105522-002AMSD** SampType: **MSD** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109135**
Client ID: **ZZZZZZ** Batch ID: **55396** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713559**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	89.248	2.0	125.0	0.9843	70.6	25	106	92.22	3.27	20	
Arsenic	121.321	1.0	125.0	4.194	93.7	42	113	118.8	2.13	20	
Barium	193.945	1.0	125.0	99.52	75.5	19	140	197.8	1.95	20	
Beryllium	116.274	1.0	125.0	0	93.0	50	109	116.1	0.141	20	
Cadmium	104.822	1.0	125.0	0.6990	83.3	48	106	105.4	0.524	20	
Chromium	112.352	1.0	125.0	6.559	84.6	44	116	114.4	1.79	20	
Cobalt	108.912	1.0	125.0	3.943	84.0	47	107	110.1	1.09	20	
Copper	195.935	2.0	125.0	68.57	102	49	124	221.1	12.1	20	
Lead	124.060	1.0	125.0	18.41	84.5	33	120	125.9	1.43	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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Work Order: 105495
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **105522-002AMSD** SampType: **MSD** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109135**
Client ID: **ZZZZZZ** Batch ID: **55396** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713559**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	117.804	1.0	125.0	0.2677	94.0	46	111	117.2	0.514	20	
Nickel	111.055	1.0	125.0	6.179	83.9	43	111	112.9	1.62	20	
Selenium	115.811	1.0	125.0	0	92.6	43	104	115.1	0.635	20	
Silver	122.842	1.0	125.0	0	98.3	53	114	123.6	0.653	20	
Thallium	96.500	1.0	125.0	0	77.2	41	107	96.71	0.213	20	
Vanadium	131.700	1.0	125.0	16.08	92.5	48	116	133.9	1.63	20	
Zinc	910.929	1.0	125.0	946.4	-28.4	24	129	997.9	9.11	20	S

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105495
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 7471_S

Sample ID: **MB-55365** SampType: **MBLK** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109134**
Client ID: **PBS** Batch ID: **55365** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713562**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.10									

Sample ID: **LCS-55365** SampType: **LCS** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109134**
Client ID: **LCSS** Batch ID: **55365** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713563**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.947	0.10	0.8300	0	114	80	120				

Sample ID: **105495-024A-MS** SampType: **MS** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109134**
Client ID: **B43 - 1.5** Batch ID: **55365** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713564**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	1.064	0.10	0.8300	0.02447	125	70	130				

Sample ID: **105495-024A-DUP** SampType: **DUP** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109134**
Client ID: **B43 - 1.5** Batch ID: **55365** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713565**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.024	0.10						0.02447	0	20	

Sample ID: **105495-024A-MSD** SampType: **MSD** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109134**
Client ID: **B43 - 1.5** Batch ID: **55365** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713567**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.949	0.10	0.8300	0.02447	111	70	130	1.064	11.5	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105495
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **LCS-55403** SampType: **LCS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109183**
Client ID: **LCSS** Batch ID: **55403** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/20/2009** SeqNo: **1714422**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	25.685	1.0	33.00	0	77.8	35	124				
Surr: p-Terphenyl	2.617		2.670		98.0	30	130				

Sample ID: **MB-55403** SampType: **MBLK** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109183**
Client ID: **PBS** Batch ID: **55403** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/20/2009** SeqNo: **1714423**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0									
ORO	ND	1.0									
Surr: p-Terphenyl	2.576		2.670		96.5	30	130				

Sample ID: **105495-003ADUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109183**
Client ID: **B14 - 0** Batch ID: **55403** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/20/2009** SeqNo: **1714433**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	20.991	2.0						19.17	9.09	20	
ORO	140.508	2.0						135.4	3.67	20	
Surr: p-Terphenyl	1.803		2.670		67.5	30	130		0	0	

Sample ID: **105495-005AMS** SampType: **MS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109183**
Client ID: **B13 - 0** Batch ID: **55403** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/20/2009** SeqNo: **1714435**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	32.948	1.0	33.00	2.590	92.0	12	125				
Surr: p-Terphenyl	2.378		2.670		89.1	30	130				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105495
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **105495-005AMSD** SampType: **MSD** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109183**
Client ID: **B13 - 0** Batch ID: **55403** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/20/2009** SeqNo: **1714436**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	30.540	1.0	33.00	2.590	84.7	12	125	32.95	7.59	20	
Surr: p-Terphenyl	2.339		2.670		87.6	30	130		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105495
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **LCS-55404** SampType: **LCS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109173**
Client ID: **LCSS** Batch ID: **55404** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/19/2009** SeqNo: **1714282**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	31.746	1.0	33.00	0	96.2	35	124				
Surr: p-Terphenyl	3.349		2.670		125	30	130				

Sample ID: **MB-55404** SampType: **MBLK** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109173**
Client ID: **PBS** Batch ID: **55404** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/19/2009** SeqNo: **1714283**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0									
ORO	ND	1.0									
Surr: p-Terphenyl	2.355		2.670		88.2	30	130				

Sample ID: **105494-045ADUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109173**
Client ID: **ZZZZZZ** Batch ID: **55404** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/19/2009** SeqNo: **1714284**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	1.886	1.0						1.874	0.683	20	
ORO	3.873	1.0						3.631	6.46	20	
Surr: p-Terphenyl	2.039		2.670		76.4	30	130		0	0	

Sample ID: **105494-041AMS** SampType: **MS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109173**
Client ID: **ZZZZZZ** Batch ID: **55404** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/19/2009** SeqNo: **1714289**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	24.731	10	33.00	30.74	-18.2	12	125				S
Surr: p-Terphenyl	0		2.670		0	30	130				SDO

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **105494-041AMSD** SampType: **MSD** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109173**
Client ID: **ZZZZZZ** Batch ID: **55404** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/19/2009** SeqNo: **1714290**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	40.539	10	33.00	30.74	29.7	12	125	24.73	48.4	20	R
Surr: p-Terphenyl	0		2.670		0	30	130		0	0	SDO

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **E090514MB3** SampType: **MBLK** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109048**
Client ID: **PBS** Batch ID: **E09VS131** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1711923**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0									
Surr: Bromofluorobenzene (FID)	99.780		100.0		99.8	59	145				

Sample ID: **105495-013ADUP** SampType: **DUP** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109048**
Client ID: **B52 - 0** Batch ID: **E09VS131** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1711933**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0						0	0	20	
Surr: Bromofluorobenzene (FID)	93.480		100.0		93.5	59	145		0	0	

Sample ID: **105495-013AMS** SampType: **MS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109048**
Client ID: **B52 - 0** Batch ID: **E09VS131** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1711934**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	3.368	1.0	5.000	0	67.4	39	135				
Surr: Bromofluorobenzene (FID)	98.921		100.0		98.9	59	145				

Sample ID: **105495-013AMSD** SampType: **MSD** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109048**
Client ID: **B52 - 0** Batch ID: **E09VS131** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1711935**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	3.290	1.0	5.000	0	65.8	39	135	3.368	2.34	20	
Surr: Bromofluorobenzene (FID)	99.322		100.0		99.3	59	145		0	0	

Sample ID: **E090514LCS5** SampType: **LCS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109048**
Client ID: **LCSS** Batch ID: **E09VS131** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1711936**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	4.255	1.0	5.000	0	85.1	73	120				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **E090514LCS5** SampType: **LCS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109048**
Client ID: **LCSS** Batch ID: **E09VS131** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1711936**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Bromofluorobenzene (FID)	98.927		100.0		98.9	59	145				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **E090515LCS1** SampType: **LCS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109100**
Client ID: **LCSS** Batch ID: **E09VS132** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1712847**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	4.522	1.0	5.000	0	90.4	73	120				
Surr: Bromofluorobenzene (FID)	96.357		100.0		96.4	59	145				

Sample ID: **105495-015AMS** SampType: **MS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109100**
Client ID: **B44 - 0** Batch ID: **E09VS132** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1712848**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	4.205	1.0	5.000	0	84.1	39	135				
Surr: Bromofluorobenzene (FID)	98.652		100.0		98.7	59	145				

Sample ID: **105495-015AMSD** SampType: **MSD** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109100**
Client ID: **B44 - 0** Batch ID: **E09VS132** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1712849**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	4.143	1.0	5.000	0	82.9	39	135	4.205	1.49	20	
Surr: Bromofluorobenzene (FID)	100.403		100.0		100	59	145		0	0	

Sample ID: **E090515MB1** SampType: **MBLK** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109100**
Client ID: **PBS** Batch ID: **E09VS132** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1712850**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0									
Surr: Bromofluorobenzene (FID)	100.552		100.0		101	59	145				

Sample ID: **105495-015ADUP** SampType: **DUP** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109100**
Client ID: **B44 - 0** Batch ID: **E09VS132** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1712852**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0						0	0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **105495-015ADUP** SampType: **DUP** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109100**
Client ID: **B44 - 0** Batch ID: **E09VS132** TestNo: **EPA 8015B(M** Analysis Date: **5/15/2009** SeqNo: **1712852**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Bromofluorobenzene (FID)	94.063		100.0		94.1	59	145		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **E090514LCS6** SampType: **LCS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109048**
Client ID: **LCSS** Batch ID: **E09VS131** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1711938**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	91.586	5.0	100.0	0	91.6	80	121				
Ethylbenzene	90.224	5.0	100.0	0	90.2	84	120				
m,p-Xylene	183.840	10	200.0	0	91.9	84	122				
Methyl tert-butyl ether	87.047	5.0	100.0	0	87.0	66	128				
o-Xylene	93.242	5.0	100.0	0	93.2	84	123				
Toluene	91.949	5.0	100.0	0	91.9	84	120				
Surr: Bromofluorobenzene (PID)	88.708		100.0		88.7	65	140				

Sample ID: **E090514MB3** SampType: **MBLK** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109048**
Client ID: **PBS** Batch ID: **E09VS131** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1711939**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0									
Ethylbenzene	ND	5.0									
m,p-Xylene	ND	10									
Methyl tert-butyl ether	ND	5.0									
o-Xylene	ND	5.0									
Toluene	ND	5.0									
Surr: Bromofluorobenzene (PID)	89.404		100.0		89.4	65	140				

Sample ID: **105495-013ADUP** SampType: **DUP** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109048**
Client ID: **B52 - 0** Batch ID: **E09VS131** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1711950**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0						0	0	20	
Ethylbenzene	ND	5.0						0	0	20	
m,p-Xylene	ND	10						0	0	20	
Methyl tert-butyl ether	ND	5.0						0	0	20	
o-Xylene	ND	5.0						0	0	20	
Toluene	ND	5.0						0	0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **105495-013ADUP** SampType: **DUP** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109048**
Client ID: **B52 - 0** Batch ID: **E09VS131** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1711950**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Xylenes, Total	ND	15						0	0	20	
Surr: Bromofluorobenzene (PID)	83.686		100.0		83.7	65	140		0	0	

Sample ID: **105495-013AMS** SampType: **MS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109048**
Client ID: **B52 - 0** Batch ID: **E09VS131** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1711951**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	21.425	5.0	35.75	0	59.9	22	132				
Ethylbenzene	19.973	5.0	49.65	0	40.2	15	133				
m,p-Xylene	91.922	10	199.6	0	46.1	30	118				
Methyl tert-butyl ether	406.699	5.0	578.9	0	70.3	38	136				
o-Xylene	36.772	5.0	78.40	0	46.9	21	119				
Toluene	90.885	5.0	172.2	0	52.8	36	129				
Surr: Bromofluorobenzene (PID)	93.793		100.0		93.8	65	140				

Sample ID: **105495-013AMSD** SampType: **MSD** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109048**
Client ID: **B52 - 0** Batch ID: **E09VS131** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1711952**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	20.705	5.0	35.75	0	57.9	22	132	21.42	3.42	20	
Ethylbenzene	19.792	5.0	49.65	0	39.9	15	133	19.97	0.910	20	
m,p-Xylene	90.761	10	199.6	0	45.5	30	118	91.92	1.27	20	
Methyl tert-butyl ether	392.516	5.0	578.9	0	67.8	38	136	406.7	3.55	20	
o-Xylene	35.993	5.0	78.40	0	45.9	21	119	36.77	2.14	20	
Toluene	90.646	5.0	172.2	0	52.6	36	129	90.88	0.263	20	
Surr: Bromofluorobenzene (PID)	93.725		100.0		93.7	65	140		0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
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Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **E090515LCS2** SampType: **LCS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109100**
Client ID: **LCSS** Batch ID: **E09VS132** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1712865**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	93.943	5.0	100.0	0	93.9	80	121				
Ethylbenzene	94.981	5.0	100.0	0	95.0	84	120				
m,p-Xylene	194.435	10	200.0	0	97.2	84	122				
Methyl tert-butyl ether	88.333	5.0	100.0	0	88.3	66	128				
o-Xylene	97.047	5.0	100.0	0	97.0	84	123				
Toluene	95.505	5.0	100.0	0	95.5	84	120				
Surr: Bromofluorobenzene (PID)	91.846		100.0		91.8	65	140				

Sample ID: **105495-015AMS** SampType: **MS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109100**
Client ID: **B44 - 0** Batch ID: **E09VS132** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1712866**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	25.889	5.0	35.75	0	72.4	22	132				
Ethylbenzene	26.969	5.0	49.65	0	54.3	15	133				
m,p-Xylene	126.466	10	199.6	0	63.4	30	118				
Methyl tert-butyl ether	482.371	5.0	578.9	0	83.3	38	136				
o-Xylene	50.687	5.0	78.40	0	64.7	21	119				
Toluene	126.812	5.0	172.2	0	73.6	36	129				
Surr: Bromofluorobenzene (PID)	93.367		100.0		93.4	65	140				

Sample ID: **105495-015AMSD** SampType: **MSD** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109100**
Client ID: **B44 - 0** Batch ID: **E09VS132** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1712867**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	26.690	5.0	35.75	0	74.7	22	132	25.89	3.05	20	
Ethylbenzene	32.995	5.0	49.65	0	66.5	15	133	26.97	20.1	20	R
m,p-Xylene	132.492	10	199.6	0	66.4	30	118	126.5	4.65	20	
Methyl tert-butyl ether	474.471	5.0	578.9	0	82.0	38	136	482.4	1.65	20	
o-Xylene	49.826	5.0	78.40	0	63.6	21	119	50.69	1.71	20	
Toluene	125.302	5.0	172.2	0	72.7	36	129	126.8	1.20	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **105495-015AMSD** SampType: **MSD** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109100**
Client ID: **B44 - 0** Batch ID: **E09VS132** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1712867**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Bromofluorobenzene (PID)	95.055		100.0		95.1	65	140		0	20	

Sample ID: **E090515MB1** SampType: **MBLK** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109100**
Client ID: **PBS** Batch ID: **E09VS132** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1712868**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0									
Ethylbenzene	ND	5.0									
m,p-Xylene	ND	10									
Methyl tert-butyl ether	ND	5.0									
o-Xylene	ND	5.0									
Toluene	ND	5.0									
Surr: Bromofluorobenzene (PID)	89.726		100.0		89.7	65	140				

Sample ID: **105495-015ADUP** SampType: **DUP** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109100**
Client ID: **B44 - 0** Batch ID: **E09VS132** TestNo: **EPA 8021B** Analysis Date: **5/15/2009** SeqNo: **1712870**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0						0	0	20	
Ethylbenzene	ND	5.0						0	0	20	
m,p-Xylene	ND	10						0	0	20	
Methyl tert-butyl ether	ND	5.0						0	0	20	
o-Xylene	ND	5.0						0	0	20	
Toluene	ND	5.0						0	0	20	
Xylenes, Total	ND	15						0	0	20	
Surr: Bromofluorobenzene (PID)	83.524		100.0		83.5	65	140		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105495
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **MB-55377** SampType: **MBLK** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109130**
Client ID: **PBS** Batch ID: **55377** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713499**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0									
4,4´-DDE	ND	2.0									
4,4´-DDT	ND	2.0									
Aldrin	ND	1.0									
alpha-BHC	ND	1.0									
alpha-Chlordane	ND	1.0									
beta-BHC	ND	1.0									
Chlordane	ND	8.5									
delta-BHC	ND	1.0									
Dieldrin	ND	2.0									
Endosulfan I	ND	1.0									
Endosulfan II	ND	2.0									
Endosulfan sulfate	ND	2.0									
Endrin	ND	2.0									
Endrin aldehyde	ND	2.0									
Endrin ketone	ND	2.0									
gamma-BHC	ND	1.0									
gamma-Chlordane	ND	1.0									
Heptachlor	ND	1.0									
Heptachlor epoxide	ND	1.0									
Methoxychlor	ND	5.0									
Toxaphene	ND	50									
Surr: Tetrachloro-m-xylene	12.219		16.67		73.3	25	115				
Surr: Decachlorobiphenyl	10.222		16.67		61.3	20	142				

Sample ID: **LCS-55377** SampType: **LCS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109130**
Client ID: **LCSS** Batch ID: **55377** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713500**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aldrin	11.921	1.0	16.67	0	71.5	59	113				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **LCS-55377** SampType: **LCS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109130**
Client ID: **LCSS** Batch ID: **55377** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713500**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dieldrin	12.212	2.0	16.67	0	73.3	59	108				
Endrin	11.400	2.0	16.67	0	68.4	41	132				
gamma-BHC	11.668	1.0	16.67	0	70.0	60	111				
Heptachlor	12.767	1.0	16.67	0	76.6	62	108				
Surr: Tetrachloro-m-xylene	11.378		16.67		68.3	25	115				
Surr: Decachlorobiphenyl	9.393		16.67		56.3	20	142				

Sample ID: **105494-045AMS** SampType: **MS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109130**
Client ID: **ZZZZZZ** Batch ID: **55377** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713501**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	13.898	2.0	16.67	0	83.4	29	143				
Aldrin	13.310	1.0	16.67	0	79.8	44	131				
Dieldrin	14.314	2.0	16.67	0	85.9	40	136				
Endrin	14.460	2.0	16.67	0	86.7	41	146				
gamma-BHC	12.909	1.0	16.67	0	77.4	45	129				
Heptachlor	14.266	1.0	16.67	0	85.6	48	126				
Surr: Tetrachloro-m-xylene	10.844		16.67		65.0	25	115				
Surr: Decachlorobiphenyl	11.627		16.67		69.7	20	142				

Sample ID: **105494-045AMSD** SampType: **MSD** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109130**
Client ID: **ZZZZZZ** Batch ID: **55377** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713502**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	12.521	2.0	16.67	0	75.1	29	143	13.90	10.4	20	
Aldrin	12.285	1.0	16.67	0	73.7	44	131	13.31	8.01	20	
Dieldrin	12.977	2.0	16.67	0	77.8	40	136	14.31	9.80	20	
Endrin	12.988	2.0	16.67	0	77.9	41	146	14.46	10.7	20	
gamma-BHC	12.109	1.0	16.67	0	72.6	45	129	12.91	6.39	20	
Heptachlor	13.216	1.0	16.67	0	79.3	48	126	14.27	7.64	20	

Qualifiers:

B Analyte detected in the associated Method Blank
ND Not Detected at the Reporting Limit
DO Surrogate Diluted Out
E Value above quantitation range
R RPD outside accepted recovery limits
Calculations are based on raw values
H Holding times for preparation or analysis exceeded
S Spike/Surrogate outside of limits due to matrix interference

CLIENT: Geocon Consultants, Inc.
Work Order: 105495
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **105494-045AMSD** SampType: **MSD** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109130**
Client ID: **ZZZZZZ** Batch ID: **55377** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713502**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Tetrachloro-m-xylene	10.388		16.67		62.3	25	115		0	0	
Surr: Decachlorobiphenyl	10.318		16.67		61.9	20	142		0	0	

Sample ID: **105494-045ADUP** SampType: **DUP** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109130**
Client ID: **ZZZZZZ** Batch ID: **55377** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713504**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0						0	0	20	
4,4´-DDE	ND	2.0						0	0	20	
4,4´-DDT	ND	2.0						0	0	20	
Aldrin	ND	1.0						0	0	20	
alpha-BHC	ND	1.0						0	0	20	
alpha-Chlordane	ND	1.0						0	0	20	
beta-BHC	ND	1.0						0	0	20	
Chlordane	ND	8.5						0	0	20	
delta-BHC	ND	1.0						0	0	20	
Dieldrin	ND	2.0						0	0	20	
Endosulfan I	ND	1.0						0	0	20	
Endosulfan II	ND	2.0						0	0	20	
Endosulfan sulfate	ND	2.0						0	0	20	
Endrin	ND	2.0						0	0	20	
Endrin aldehyde	ND	2.0						0	0	20	
Endrin ketone	ND	2.0						0	0	20	
gamma-BHC	ND	1.0						0	0	20	
gamma-Chlordane	ND	1.0						0	0	20	
Heptachlor	ND	1.0						0	0	20	
Heptachlor epoxide	ND	1.0						0	0	20	
Methoxychlor	ND	5.0						0	0	20	
Toxaphene	ND	50						0	0	20	
Surr: Tetrachloro-m-xylene	11.078		16.67		66.5	25	115		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105495
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID:	**105494-045ADUP**	SampType:	**DUP**	TestCode:	**8081_S**	Units:	**µg/Kg**		Prep Date:	**5/15/2009**		RunNo:	**109130**	
Client ID:	**ZZZZZZ**	Batch ID:	**55377**	TestNo:	**EPA 8081A**		**EPA 3550B**		Analysis Date:	**5/18/2009**		SeqNo:	**1713504**	
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl		11.165			16.67			67.0	20	142		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105495
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **MB-55378** SampType: **MBLK** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109131**
Client ID: **PBS** Batch ID: **55378** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713514**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0									
4,4´-DDE	ND	2.0									
4,4´-DDT	ND	2.0									
Aldrin	ND	1.0									
alpha-BHC	ND	1.0									
alpha-Chlordane	ND	1.0									
beta-BHC	ND	1.0									
Chlordane	ND	8.5									
delta-BHC	ND	1.0									
Dieldrin	ND	2.0									
Endosulfan I	ND	1.0									
Endosulfan II	ND	2.0									
Endosulfan sulfate	ND	2.0									
Endrin	ND	2.0									
Endrin aldehyde	ND	2.0									
Endrin ketone	ND	2.0									
gamma-BHC	ND	1.0									
gamma-Chlordane	ND	1.0									
Heptachlor	ND	1.0									
Heptachlor epoxide	ND	1.0									
Methoxychlor	ND	5.0									
Toxaphene	ND	50									
Surr: Tetrachloro-m-xylene	12.193		16.67		73.1	25	115				
Surr: Decachlorobiphenyl	9.528		16.67		57.2	20	142				

Sample ID: **LCS-55378** SampType: **LCS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109131**
Client ID: **LCSS** Batch ID: **55378** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713515**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aldrin	11.979	1.0	16.67	0	71.9	59	113				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105495
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **LCS-55378** SampType: **LCS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109131**
Client ID: **LCSS** Batch ID: **55378** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713515**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dieldrin	12.314	2.0	16.67	0	73.9	59	108				
Endrin	11.528	2.0	16.67	0	69.2	41	132				
gamma-BHC	11.775	1.0	16.67	0	70.6	60	111				
Heptachlor	12.880	1.0	16.67	0	77.3	62	108				
Surr: Tetrachloro-m-xylene	11.278		16.67		67.7	25	115				
Surr: Decachlorobiphenyl	9.863		16.67		59.2	20	142				

Sample ID: **105495-015AMS** SampType: **MS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109131**
Client ID: **B44 - 0** Batch ID: **55378** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713516**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	12.686	2.0	16.67	0	76.1	29	143				
Aldrin	12.757	1.0	16.67	0	76.5	44	131				
Dieldrin	13.484	2.0	16.67	0	80.9	40	136				
Endrin	13.488	2.0	16.67	0	80.9	41	146				
gamma-BHC	12.412	1.0	16.67	0	74.5	45	129				
Heptachlor	13.810	1.0	16.67	0	82.8	48	126				
Surr: Tetrachloro-m-xylene	11.022		16.67		66.1	25	115				
Surr: Decachlorobiphenyl	11.417		16.67		68.5	20	142				

Sample ID: **105495-015AMSD** SampType: **MSD** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109131**
Client ID: **B44 - 0** Batch ID: **55378** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713517**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	13.419	2.0	16.67	0	80.5	29	143	12.69	5.62	20	
Aldrin	13.297	1.0	16.67	0	79.8	44	131	12.76	4.15	20	
Dieldrin	13.954	2.0	16.67	0	83.7	40	136	13.48	3.42	20	
Endrin	13.861	2.0	16.67	0	83.1	41	146	13.49	2.73	20	
gamma-BHC	13.015	1.0	16.67	0	78.1	45	129	12.41	4.75	20	
Heptachlor	14.451	1.0	16.67	0	86.7	48	126	13.81	4.54	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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Work Order: 105495
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **105495-015AMSD** SampType: **MSD** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109131**
Client ID: **B44 - 0** Batch ID: **55378** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713517**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Tetrachloro-m-xylene	11.671		16.67		70.0	25	115		0	0	
Surr: Decachlorobiphenyl	11.674		16.67		70.0	20	142		0	0	

Sample ID: **105495-015ADUP** SampType: **DUP** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/15/2009** RunNo: **109131**
Client ID: **B44 - 0** Batch ID: **55378** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/18/2009** SeqNo: **1713519**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0						0	0	20	
4,4´-DDE	ND	2.0						0	0	20	
4,4´-DDT	ND	2.0						0	0	20	
Aldrin	ND	1.0						0	0	20	
alpha-BHC	ND	1.0						0	0	20	
alpha-Chlordane	ND	1.0						0	0	20	
beta-BHC	ND	1.0						0	0	20	
Chlordane	ND	8.5						0	0	20	
delta-BHC	ND	1.0						0	0	20	
Dieldrin	ND	2.0						0	0	20	
Endosulfan I	ND	1.0						0	0	20	
Endosulfan II	ND	2.0						0	0	20	
Endosulfan sulfate	ND	2.0						0	0	20	
Endrin	ND	2.0						0	0	20	
Endrin aldehyde	ND	2.0						0	0	20	
Endrin ketone	ND	2.0						0	0	20	
gamma-BHC	ND	1.0						0	0	20	
gamma-Chlordane	ND	1.0						0	0	20	
Heptachlor	ND	1.0						0	0	20	
Heptachlor epoxide	ND	1.0						0	0	20	
Methoxychlor	ND	5.0						0	0	20	
Toxaphene	ND	50						0	0	20	
Surr: Tetrachloro-m-xylene	12.410		16.67		74.4	25	115		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: 105495
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID:	**105495-015ADUP**	SampType:	**DUP**	TestCode:	**8081_S**	Units:	**µg/Kg**	Prep Date:	**5/15/2009**	RunNo:	**109131**		
Client ID:	**B44 - 0**	Batch ID:	**55378**	TestNo:	**EPA 8081A**	**EPA 3550B**		Analysis Date:	**5/18/2009**	SeqNo:	**1713519**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl	12.115		16.67		72.7	20	142		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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Work Order: 105495
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ANALYTICAL QC SUMMARY REPORT

TestCode: 9045_S

Sample ID: **105484-034ADUP** SampType: **DUP** TestCode: **9045_S** Units: **pH Units** Prep Date: RunNo: **109069**
Client ID: **ZZZZZZ** Batch ID: **R109069** TestNo: **EPA 9045C** Analysis Date: **5/15/2009** SeqNo: **1712327**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	8.580	0.10						8.690	1.27	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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19 May 2009

Diane Galvan
Advanced Technology Labs
3275 Walnut Avenue
Signal Hill, CA 90755

RE:NA

Work Order No.: 0905227

Attached are the results of the analyses for samples received by the laboratory on 05/15/09 13:35.

The samples were received by Sierra Analytical Labs, Inc. with a chain of custody record attached or completed at the submittal of the samples.

The analyses were performed according to the prescribed method as outlined by EPA, Standard Methods, and A.S.T.M.

The remaining portions of the samples will be disposed of within 30 days from the date of this report.
If you require any additional retaining time, please advise us.

Sincerely,

Richard K. Forsyth

Richard K. Forsyth

Laboratory Director

Sierra Analytical Labs, Inc. is certified by the California Department of Health Services (DOHS), Environmental Laboratory Accredidation Program (ELAP) No. 2320.

Advanced Technology Labs 3275 Walnut Avenue Signal Hill CA, 90755	Project: NA Project Number: PO#SC04582 Project Manager: Diane Galvan	**Reported:** 05/19/09 09:40

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
105495-005B / B13-0	0905227-01	Soil	05/13/09 11:35	05/15/09 13:35
105495-017B / B45-0	0905227-02	Soil	05/13/09 13:20	05/15/09 13:35

CASE NARRATIVE

SAMPLE RECEIPT: Samples were received intact, at 4°C, and accompanied by chain of custody documentation.
PRESERVATION: Samples requiring preservation were verified prior to sample preparation and analysis.
HOLDING TIMES: All holding times were met, unless otherwises noted in the report with data qualifiers.
QA/QC CRITERIA: All quality objective criteria were met, except as noted in the report with data qualifiers.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

26052 MERIT CIRCLE SUITE 105, LAGUNA HILLS, CALIFORNIA 92653
TELEPHONE: (949) 348-9389 FAX: (949) 348-9115
E-MAIL: SIERRALABS @ SIERRALABS.NET

Advanced Technology Labs 3275 Walnut Avenue Signal Hill CA, 90755	Project: NA Project Number: PO#SC04582 Project Manager: Diane Galvan	**Reported:** 05/19/09 09:40

Chlorinated Herbicides by EPA Method 8151A

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
105495-005B / B13-0 (0905227-01) Soil Sampled: 05/13/09 11:35 Received: 05/15/09 13:35									
2,4,5-T	ND	1.6	µg/kg	1	B9E1832	05/18/09	05/18/09 20:49	EPA 8151A	
2,4,5-TP (Silvex)	ND	1.6	"	"	"	"	"	"	
2,4-D	ND	1.6	"	"	"	"	"	"	
2,4-DB	ND	4.0	"	"	"	"	"	"	
3,5-Dichlorobenzoic acid	ND	2.0	"	"	"	"	"	"	
4-Nitrophenol	ND	2.0	"	"	"	"	"	"	
Acifluorfen	ND	1.6	"	"	"	"	"	"	
Bentazon	ND	1.6	"	"	"	"	"	"	
Chloramben	ND	1.6	"	"	"	"	"	"	
Dalapon	ND	20	"	"	"	"	"	"	
DCPA diacid	ND	1.6	"	"	"	"	"	"	
Dicamba	ND	1.6	"	"	"	"	"	"	
Dichlorprop	ND	1.6	"	"	"	"	"	"	
Dinoseb	ND	1.6	"	"	"	"	"	"	
Pentachlorophenol	ND	1.6	"	"	"	"	"	"	
Picloram	ND	1.6	"	"	"	"	"	"	
Surrogate: 2,4-Dichlorophenylacetic Acid		*48.0 %*	*35-150*		"	"	"	"	
105495-017B / B45-0 (0905227-02) Soil Sampled: 05/13/09 13:20 Received: 05/15/09 13:35									
2,4,5-T	ND	1.6	µg/kg	1	B9E1832	05/18/09	05/18/09 21:35	EPA 8151A	
2,4,5-TP (Silvex)	ND	1.6	"	"	"	"	"	"	
2,4-D	ND	1.6	"	"	"	"	"	"	
2,4-DB	ND	4.0	"	"	"	"	"	"	
3,5-Dichlorobenzoic acid	ND	2.0	"	"	"	"	"	"	
4-Nitrophenol	ND	2.0	"	"	"	"	"	"	
Acifluorfen	ND	1.6	"	"	"	"	"	"	
Bentazon	ND	1.6	"	"	"	"	"	"	
Chloramben	ND	1.6	"	"	"	"	"	"	
Dalapon	ND	20	"	"	"	"	"	"	
DCPA diacid	ND	1.6	"	"	"	"	"	"	
Dicamba	ND	1.6	"	"	"	"	"	"	
Dichlorprop	ND	1.6	"	"	"	"	"	"	
Dinoseb	ND	1.6	"	"	"	"	"	"	
Pentachlorophenol	ND	1.6	"	"	"	"	"	"	
Picloram	ND	1.6	"	"	"	"	"	"	
Surrogate: 2,4-Dichlorophenylacetic Acid		*41.7 %*	*35-150*		"	"	"	"	

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Advanced Technology Labs 3275 Walnut Avenue Signal Hill CA, 90755	Project: NA Project Number: PO#SC04582 Project Manager: Diane Galvan	**Reported:** 05/19/09 09:40

Chlorinated Herbicides by EPA Method 8151A - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9E1832 - EPA 8151A Herbicides										
Blank (B9E1832-BLK1)				Prepared & Analyzed: 05/18/09						
2,4,5-T	ND	1.6	µg/kg							
2,4,5-TP (Silvex)	ND	1.6	"							
2,4-D	ND	1.6	"							
2,4-DB	ND	4.0	"							
3,5-Dichlorobenzoic acid	ND	2.0	"							
4-Nitrophenol	ND	2.0	"							
Acifluorfen	ND	1.6	"							
Bentazon	ND	1.6	"							
Chloramben	ND	1.6	"							
Dalapon	ND	20	"							
DCPA diacid	ND	1.6	"							
Dicamba	ND	1.6	"							
Dichlorprop	ND	1.6	"							
Dinoseb	ND	1.6	"							
Pentachlorophenol	ND	1.6	"							
Picloram	ND	1.6	"							
Surrogate: 2,4-Dichlorophenylacetic Acid	*57.9*		*"*	*100*		*57.9*	*35-150*			
LCS (B9E1832-BS1)				Prepared & Analyzed: 05/18/09						
2,4,5-T	5.41	1.6	µg/kg	10.0		54.1	20-150			
2,4,5-TP (Silvex)	9.17	1.6	"	10.0		91.7	20-150			
Dichlorprop	3.40	1.6	"	10.0		34.0	20-150			
Dinoseb	9.64	1.6	"	10.0		96.4	20-150			
Matrix Spike (B9E1832-MS1)		**Source: 0905228-07**		Prepared & Analyzed: 05/18/09						
2,4,5-T	5.55	1.6	µg/kg	10.0	ND	55.5	20-150			
2,4,5-TP (Silvex)	5.50	1.6	"	10.0	ND	55.0	20-150			
Dichlorprop	2.73	1.6	"	10.0	ND	27.3	20-150			
Dinoseb	10.0	1.6	"	10.0	ND	100	20-150			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Advanced Technology Labs	Project: NA	
3275 Walnut Avenue	Project Number: PO#SC04582	**Reported:**
Signal Hill CA, 90755	Project Manager: Diane Galvan	05/19/09 09:40

Chlorinated Herbicides by EPA Method 8151A - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9E1832 - EPA 8151A Herbicides										
Matrix Spike Dup (B9E1832-MSD1)		**Source: 0905228-07**		Prepared & Analyzed: 05/18/09						
2,4,5-T	4.47	1.6	µg/kg	10.0	ND	44.7	20-150	21.6	30	
2,4,5-TP (Silvex)	5.69	1.6	"	10.0	ND	56.9	20-150	3.40	30	
Dichlorprop	2.31	1.6	"	10.0	ND	23.1	20-150	16.7	30	
Dinoseb	8.82	1.6	"	10.0	ND	88.2	20-150	12.5	30	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Advanced Technology Labs	Project: NA	
3275 Walnut Avenue	Project Number: PO#SC04582	**Reported:**
Signal Hill CA, 90755	Project Manager: Diane Galvan	05/19/09 09:40

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755-5225
www.atlglobal.com
TEL: (562) 989-4045 FAX: (562) 989-4040

CHAIN-OF-CUSTODY RECORD

QC Level: CT

Subcontractor:
Sierra Laboratories
26052 Merit Circle Suite 105
Laguna Hills, CA 92653

TEL: (949) 348-9389
FAX: (949) 348-9115
Acct #:

Field Sampler: D. WATTS

14-May-09

	Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests: EPA 8151		
01	105495-005B / B13 - 0	Soil	5/13/2009 11:35:00 AM	4OZG	1		
02	105495-017B / B45 - 0	Soil	5/13/2009 1:20:00 PM	4OZG	1		

General Comments: Please email sample receipt acknowledgement to the PM.
Please use PO#: SC04582 Please fax results by: NORMAL TAT
PLEASE SEND REPORT TO DIANE GALVAN

(B-9 soil)

		Date/Time			Date/Time
Relinquished by:		5/14/09	**Received by:**		5/15/09 940
Relinquished by:		5/15/09 1334	**Received by:**		5.15.09 13:35

CHAIN OF CUSTODY RECORD

Advanced Technology Laboratories
3275 Walnut Avenue
Signal Hill, CA 90755
(562) 989-4045 • Fax (562) 989-4040

FOR LABORATORY USE ONLY:

P.O.#:

Logged By: f Date: 5/14/09

Method of Transport: Client ☐ ATL ☐ CA OverN ☐ FEDEX ☐ Other: UPS

Sample Condition Upon Receipt (16.8)

1. CHILLED Y☐ N☑
2. HEADSPACE (VOA) Y☐ N☐ (NA)
3. CONTAINER INTACT Y☑ N☐
4. SEALED Y☐ N☑
5. # OF SPLS MATCH COC Y☐ N☐
6. PRESERVED Y☐ N☑

Client: GEOCON
Attn: C. MERRITT
Address: 6671 BRISA ST.
City LIVERMORE State CA Zip Code 94550
TEL: (925) 371-5900
FAX: (") " 5915

Project Name: JAMESON CANYON Project #: E8481-06-01 Sampler: (Printed Name) D. WATTS (Signature) WATTS

Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
WATTS	5/13/09	1600	UPS	5/13/09	1600
			MAN & [illegible]	5/14/09	930

I hereby authorize ATL to perform the work indicated below:
Project Mgr/Submitter: D. WATTS 5/13/09 (Print Name / Date)
Signature: WATTS

Send Report To: Attn: Co: SEE "CLIENT" Address City State Zip

Bill To: Attn: Co: Address City State Zip

Special Instructions/Comments: SEE E8481-06-01 INSTRUCTIONS (12 MAY 2009)

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample : $2.00 / sample / mo (after 45 days)
- Records : $1.00 / ATL workorder / mo (after 1 year)

Circle or Add Analysis(es) Requested: 6081A (Pesticides), 8082 (PCB), 8260B (Volatiles), 8270C (BNA), 6010B (Total Metal), 8015B (GRO) / 8020 (BTEX), 8015B (DRO), 8021 (BTEX), TITLE 22 / CAM 17 (6010 / 7000)

SPECIFY APPROPRIATE MATRIX: SOIL, WATER, GROUND WATER, WASTEWATER

QA/QC: RTNE ☐ CT ☒ SWRCB ☐ Logcode ____ OTHER ____

ITEM	LAB USE ONLY: Batch #: / Lab No.	Sample Description: Sample I.D. / Location	Date	Time	SOIL	TAT	Container(s) #	Container(s) Type	PRESERVATION	REMARKS
	105495-01	B15-0	5/13/09	1121	X	E	1	T	m	C
	-2	B15-1.5		1127						
	-3	B14-0		1125						
	-4	B14-1.5		1130						
	-5	B13-0		1135						
	-6	B13-1.5		1140						
	-7	B20-0		1151						
	-8	B20-1.5		1157						
	-9	B19-0		1200						
	-10	B19-1.5		1205						

• TAT starts 8 a.m. following day if samples received after 3 p.m.

TAT: A= Overnight ≤ 24 hr B= Emergency Next workday C= Critical 2 Workdays D= Urgent 3 Workdays E= Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=HCl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

DISTRIBUTION: **White** with report. **Yellow** to folder, **Pink** to submitter.

CHAIN OF CU TODY RECORD

Advanced Technology Laboratories
3275 Walnut Avenue
Signal Hill, CA 90755
(562) 989-4045 • Fax (562) 989-4040

FOR LABORATORY USE ONLY:

P.O.#:

Logged By: f Date: 5/14/09

Method of Transport: Client ☐ ATL ☐ CA OverN ☐ FEDEX ☐ Other:

Sample Condition Upon Receipt: 1. CHILLED Y☐ N☐ 2. HEADSPACE (VOA) Y☐ N☐ 3. CONTAINER INTACT Y☐ N☐ 4. SEALED Y☐ N☐ 5. # OF SPLS MATCH COC Y☐ N☐ 6. PRESERVED Y☐ N☐

Client:
Attn:
Address:
City State Zip Code
TEL: ( )
FAX: ( )

Project Name: SEE Pg 1 Project #: Sampler: (Printed Name) (Signature)

Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
WITC	5/13/09	1600	UPS	5/13/09	1600
				5/14/09	930

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: SEE Pg 1
Print Name Date
Signature

Send Report To: Attn: Co: Address City State Zip

Bill To: Attn: Co: Address City State Zip

Special Instructions/Comments:

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

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- Records : $1.00 / ATL workorder / mo (after 1 year)

Circle or Add Analysis(es) Requested: 8081A (Pesticides), 8082 (PCB), 8260B (Volatiles), 8270C (BNA), 6010B (Total Metal), 8015B (GRO) / 8020 (BTEX), 8015B (DRO), 8021 (BTEX), TITLE 22 / CAM 17 (6010 / 7000)

SPECIFY APPROPRIATE MATRIX: SOIL, WATER, GROUND WATER, WASTEWATER

QA/QC: RTNE ☐ CT ☒ SWRCB ☐ Logcode ____ OTHER ____

ITEM	LAB USE ONLY: Batch #: / Lab No.	Sample Description: Sample I.D. / Location	Date	Time	SOIL	TAT	Container(s) #	Container(s) Type	PRESERVATION	REMARKS
	105495 -11	B51 -0	5/13/09	1236	X	E	1	T	M	C
	-12	B51 -1.5		1239						
	-13	B52-0		1235						
	-14	B52-1.5		1240						
	-15	B44-0		1335						
	-16	B44-1.5		1340						
	-17	B45-0		1320						
	-18	B45-1.5		1325						
	-19	B46-0		1326						
	-20	B46-1.5		1331						

• TAT starts 8 a.m. following day if samples received after 3 p.m.

TAT: A= Overnight ≤ 24 hr B= Emergency Next workday C= Critical 2 Workdays D= Urgent 3 Workdays E= Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=Hcl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

DISTRIBUTION: White with report, Yellow to folder, Pink to submitter.

CHAIN OF CU TODY RECORD

Advanced Technology Laboratories
3275 Walnut Avenue
Signal Hill, CA 90755
(562) 989-4045 • Fax (562) 989-4040

FOR LABORATORY USE ONLY:

P.O.#:

Logged By: f Date: 5/14/09

Method of Transport: Client ☐ ATL ☐ CA OverN ☐ FEDEX ☐ Other:

Sample Condition Upon Receipt
1. CHILLED Y☐ N☐ 4. SEALED Y☐ N☐
2. HEADSPACE (VOA) Y☐ N☐ 5. # OF SPLS MATCH COC Y☐ N☐
3. CONTAINER INTACT Y☐ N☐ 6. PRESERVED Y☐ N☐

Client:
Attn: SEE Pg 1
Address:
City State Zip Code
TEL: ( )
FAX: ( )
Project Name: SEE Pg 1 Project #: Sampler: (Printed Name) (Signature)

Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
WLM	5/13/09	1600	UPS	5/13/09	1600
			Mary Alp	5/14/09	930

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: SEE Pg 1
Print Name Date
Signature

Send Report To:
Attn:
Co:
Address
City State Zip

Bill To:
Attn:
Co:
Address
City State Zip

Special Instructions/Comments:

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample : $2.00 / sample / mo (after 45 days)
- Records : $1.00 / ATL workorder / mo (after 1 year)

Circle or Add Analysis(es) Requested: 8081A (Pesticides), 8082 (PCB), 8260B (Volatiles), 8270C (BNA), 6010B (Total Metal), 8015B (GRO) / 8020 (BTEX), 8015B (DRO), 8021 (BTEX), TITLE 22 / CAM 17 (6010 / 7000)

SPECIFY APPROPRIATE MATRIX: SOIL, WATER, GROUND WATER, WASTEWATER

QA/QC: RTNE ☐ CT ☒ SWRCB ☐ Logcode ____ OTHER ____

ITEM	LAB USE ONLY: Batch #: Lab No.	Sample Description: Sample I.D. / Location	Date	Time	SOIL	TAT	Container(s) #	Container(s) Type	PRESERVATION	REMARKS
	105495-21	B42 - 0	5/13/09	1404	X	E	1	T/m	C	
	-22	B42 - 1.5		1407						
	-23	B43 - 0		1410						
	-24	B43 - 1.5		1415						

• TAT starts 8 a.m. following day if samples received after 3 p.m.

TAT: A= Overnight ≤ 24 hr B= Emergency Next workday C= Critical 2 Workdays D= Urgent 3 Workdays E= Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=Hcl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

DISTRIBUTION: White with report, Yellow to folder, Pink to submitter.

E8481-06-01

Soil Sample Laboratory Analyses

The laboratory will be instructed to analyze the samples as outlined below and in Table 1, Soil Sample Analysis Matrix.

- The upper (~0) soil samples ~~collected from shallow soil borings~~ will be analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPHg), TPH as diesel (TPHd), and TPH as motor oil (TPHmo) using Environmental Protection Agency (EPA) Test Method 8015; benzene, toluene, ethylbenzene, and total xylenes (BTEX) and methyl tert-butyl ether (MTBE) using EPA Test Method 8021, and organochlorine pesticides using EPA Test Method 8081. Approximately 25 percent of the upper soil samples will be analyzed for herbicides using EPA Test Method 8151A, and for total California Assessment Manual (CAM) 17 metals using EPA Test Method 6010/7471.
- Based on the results of the upper soil samples, up to 50 percent of the deeper (~1.5) soil samples ~~collected from the shallow soil borings~~ may be analyzed for TPHg, TPHd, and TPHmo using EPA Test Method 8015; and BTEX and MTBE using EPA Test Method 8021.
- Approximately 25 percent of the deeper soil samples ~~collected from the shallow soil borings~~ will be analyzed for total CAM 17 metals using EPA Test Method 6010/7471.
- Soil samples with total metal concentrations greater than ten times their respective STLC concentrations will be further analyzed for soluble metals using the California Waste Extraction Test (WET) method and EPA Test Method 7420.
- Ten percent of all shallow soil samples (randomly selected ~~by the laboratory~~) will be analyzed for pH using EPA Test Method 9045.

Quality assurance/quality control (QA/QC) procedures will be performed for each method of analysis with specificity for each analyte listed in the test method's QA/QC. QA/QC measures will include the following:

- One method blank for every ten samples, batch of samples or type of matrix, whichever is more frequent.
- One sample analyzed in duplicate for every ten samples, batch of samples or type of matrix, whichever is more frequent.
- One spiked sample for every ten samples, batch of samples or type of matrix, whichever is more frequent, with spike made at ten times the detection limit or at the analyte level.

TABLE 1
Soil Sample Analysis Matix
Jameson Canyon (E8481-06-01)
Napa and Solano Counties, California

Sample Location	Sample No.	TPHg/BTEX/MTBE (EPA 8015/8021)	TPHd/mo (EPA 8015)	CAM 17 Metals (EPA 6010/7471)	Soluble Metals (WET/EPA 7420)	Pesticides (EPA 8081)	Herbicides (EPA 8151A)	pH (EPA 9045)
B1	0	1	1	1	as needed	1	1	1
B1	1.5	as needed	as needed	---	---	---	---	---
B2	0	1	1	---	---	1	---	---
B2	1.5	as needed	as needed	---	---	---	---	---
B3	0	1	1	---	---	1	---	---
B3	1.5	as needed	as needed	1	as needed	---	---	---
B4	0	1	1	---	---	1	---	---
B4	1.5	as needed	as needed	---	---	---	---	---
B5	0	1	1	1	as needed	1	1	---
B5	1.5	as needed	as needed	---	---	---	---	1
B6	0	1	1	---	---	1	---	---
B6	1.5	as needed	as needed	---	---	---	---	---
B7	0	1	1	---	---	1	---	---
B7	1.5	as needed	as needed	1	as needed	---	---	---
B8	0	1	1	---	---	1	---	---
B8	1.5	as needed	as needed	---	---	---	---	---
B9	0	1	1	1	as needed	1	1	---
B9	1.5	as needed	as needed	---	---	---	---	---
B10	0	1	1	---	---	1	---	1
B10	1.5	as needed	as needed	---	---	---	---	---
B11	0	1	1	---	---	1	---	---
B11	1.5	as needed	as needed	1	as needed	---	---	---
B12	0	1	1	---	---	1	---	---
B12	1.5	as needed	as needed	---	---	---	---	---
B13	0	1	1	1	as needed	1	1	---
B13	1.5	as needed	as needed	---	---	---	---	---

TABLE 1
Soil Sample Analysis Matix
Jameson Canyon (E8481-06-01)
Napa and Solano Counties, California

Sample Location	Sample No.	TPHg/BTEX/MTBE (EPA 8015/8021)	TPHd/mo (EPA 8015)	CAM 17 Metals (EPA 6010/7471)	Soluble Metals (WET/EPA 7420)	Pesticides (EPA 8081)	Herbicides (EPA 8151A)	pH (EPA 9045)
B14	0	1	1	---	---	1	---	---
B14	1.5	as needed	as needed	---	---	---	---	1
B15	0	1	1	---	---	1	---	---
B15	1.5	as needed	as needed	1	as needed	---	---	---
B16	0	1	1	---	---	1	---	---
B16	1.5	as needed	as needed	---	---	---	---	---
B17	0	1	1	1	as needed	1	1	---
B17	1.5	as needed	as needed	---	---	---	---	---
B18	0	1	1	---	---	1	---	---
B18	1.5	as needed	as needed	---	---	---	---	---
B19	0	1	1	---	---	1	---	1
B19	1.5	as needed	as needed	1	as needed	---	---	---
B20	0	1	1	---	---	1	---	---
B20	1.5	as needed	as needed	---	---	---	---	---
B21	0	1	1	1	as needed	1	1	---
B21	1.5	as needed	as needed	---	---	---	---	---
B22	0	1	1	---	---	1	---	---
B22	1.5	as needed	as needed	---	---	---	---	---
B23	0	1	1	---	---	1	---	---
B23	1.5	as needed	as needed	1	as needed	---	---	1
B24	0	1	1	---	---	1	---	---
B24	1.5	as needed	as needed	---	---	---	---	---
B25	0	1	1	1	as needed	1	1	---
B25	1.5	as needed	as needed	---	---	---	---	---
B26	0	1	1	---	---	1	---	---
B26	1.5	as needed	as needed	---	---	---	---	---

TABLE 1
Soil Sample Analysis Matix
Jameson Canyon (E8481-06-01)
Napa and Solano Counties, California

Sample Location	Sample No.	TPHg/BTEX/MTBE (EPA 8015/8021)	TPHd/mo (EPA 8015)	CAM 17 Metals (EPA 6010/7471)	Soluble Metals (WET/EPA 7420)	Pesticides (EPA 8081)	Herbicides (EPA 8151A)	pH (EPA 9045)
B27	0	1	1	---	---	1	---	---
B27	1.5	as needed	as needed	1	as needed	---	---	---
B28	0	1	1	---	---	1	---	1
B28	1.5	as needed	as needed	---	---	---	---	---
B29	0	1	1	1	as needed	1	1	---
B29	1.5	as needed	as needed	---	---	---	---	---
B30	0	1	1	---	---	1	---	---
B30	1.5	as needed	as needed	---	---	---	---	---
B31	0	1	1	---	---	1	---	---
B31	1.5	as needed	as needed	1	as needed	---	---	---
B32	0	1	1	---	---	1	---	---
B32	1.5	as needed	as needed	---	---	---	---	1
B33	0	1	1	1	as needed	1	1	---
B33	1.5	as needed	as needed	---	---	---	---	---
B34	0	1	1	---	---	1	---	---
B34	1.5	as needed	as needed	---	---	---	---	---
B35	0	1	1	---	---	1	---	---
B35	1.5	as needed	as needed	1	as needed	---	---	---
B36	0	1	1	---	---	1	---	---
B36	1.5	as needed	as needed	---	---	---	---	---
B37	0	1	1	1	as needed	1	1	1
B37	1.5	as needed	as needed	---	---	---	---	---
B38	0	1	1	---	---	1	---	---
B38	1.5	as needed	as needed	---	---	---	---	---
B39	0	1	1	---	---	1	---	---
B39	1.5	as needed	as needed	1	as needed	---	---	---

TABLE 1
Soil Sample Analysis Matix
Jameson Canyon (E8481-06-01)
Napa and Solano Counties, California

Sample Location	Sample No.	TPHg/BTEX/MTBE (EPA 8015/8021)	TPHd/mo (EPA 8015)	CAM 17 Metals (EPA 6010/7471)	Soluble Metals (WET/EPA 7420)	Pesticides (EPA 8081)	Herbicides (EPA 8151A)	pH (EPA 9045)
B40	0	1	1	---	---	1	---	---
B40	1.5	as needed	as needed	---	---	---	---	---
B41	0	1	1	1	as needed	1	1	---
B41	1.5	as needed	as needed	---	---	---	---	1
B42	0	1	1	---	---	1	---	---
B42	1.5	as needed	as needed	---	---	---	---	---
B43	0	1	1	---	---	1	---	---
B43	1.5	as needed	as needed	1	as needed	---	---	---
B44	0	1	1	---	---	1	---	---
B44	1.5	as needed	as needed	---	---	---	---	---
B45	0	1	1	1	as needed	1	1	---
B45	1.5	as needed	as needed	---	---	---	---	---
B46	0	1	1	---	---	1	---	1
B46	1.5	as needed	as needed	---	---	---	---	---
B47	0	1	1	---	---	1	---	---
B47	1.5	as needed	as needed	1	as needed	---	---	---
B48	0	1	1	---	---	1	---	---
B48	1.5	as needed	as needed	---	---	---	---	---
B49	0	1	1	1	as needed	1	1	---
B49	1.5	as needed	as needed	---	---	---	---	---
B50	0	1	1	---	---	1	---	---
B50	1.5	as needed	as needed	---	---	---	---	1
B51	0	1	1	---	---	1	---	---
B51	1.5	as needed	as needed	1	as needed	---	---	---
B52	0	1	1	---	---	1	---	---
B52	1.5	as needed	as needed	---	---	---	---	---

TABLE 1
Soil Sample Analysis Matix
Jameson Canyon (E8481-06-01)
Napa and Solano Counties, California

Sample Location	Sample No.	TPHg/BTEX/MTBE (EPA 8015/8021)	TPHd/mo (EPA 8015)	CAM 17 Metals (EPA 6010/7471)	Soluble Metals (WET/EPA 7420)	Pesticides (EPA 8081)	Herbicides (EPA 8151A)	pH (EPA 9045)
B53	0	1	1	1	as needed	1	1	---
B53	1.5	as needed	as needed	---	---	---	---	---
B54	0	1	1	---	---	1	---	---
B54	1.5	as needed	as needed	---	---	---	---	---
B55	0	1	1	---	---	1	---	1
B55	1.5	as needed	as needed	1	as needed	---	---	---
B56	0	1	1	---	---	1	---	---
B56	1.5	as needed	as needed	---	---	---	---	---
B57	0	1	1	1	as needed	1	1	---
B57	1.5	as needed	as needed	---	---	---	---	---
B58	0	1	1	---	---	1	---	---
B58	1.5	as needed	as needed	---	---	---	---	---
	TOTAL	**58**	**58**	**29**	**0**	**58**	**15**	**13**
		23	23	10		23	7	5
		12	12	6		12	2	3

May 26, 2009

ELAP No.: 1838
NELAP No.: 02107CA
NEVADA.: CA-401
CSDLAC No.: 10196

Workorder No.: 105533

Chris Merritt
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

TEL: (925) 371-5900
FAX: (925) 371-5915

RE: Jameson Canyon, E8481-06-01

Attention: Chris Merritt

Enclosed are the results for sample(s) received on May 16, 2009 by Advanced Technology Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (562)989-4045 if I can be of further assistance to your company.

Sincerely,

Eddie F. Rodriguez
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories.

Advanced Technology Laboratories
3275 Walnut Avenue Signal Hill, CA 90755 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: *26-May-09*

CLIENT: Geocon Consultants, Inc.
Project: Jameson Canyon, E8481-06-01
Lab Order: 105533

CASE NARRATIVE

Samples for Herbicides (8151) were subcontracted to Sierra Analytical Laboratories, Inc. with ELAP Cert.#2320.

Analytical Comments for Method 8015 (DRO/ORO)

Dilution was necessary for samples 105533-001A and 105533-003A, due to sample matrix.

RPD for Duplicate (DUP) is outside criteria for samples 105533-017ADUP and 105533-041ADUP; however, the Laboratory Control Sample (LCS) validated the analytical batch.

Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B21-0
Lab Order:	105533	**Collection Date:**	5/15/2009 10:01:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-001A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090522C	QC Batch: 55415			PrepDate: 5/19/2009		Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/22/2009 02:00 PM
Arsenic	6.0	1.0		mg/Kg	1	5/22/2009 02:00 PM
Barium	100	1.0		mg/Kg	1	5/22/2009 02:00 PM
Beryllium	ND	1.0		mg/Kg	1	5/22/2009 02:00 PM
Cadmium	ND	1.0		mg/Kg	1	5/22/2009 02:00 PM
Chromium	16	1.0		mg/Kg	1	5/22/2009 02:00 PM
Cobalt	7.7	1.0		mg/Kg	1	5/22/2009 02:00 PM
Copper	22	2.0		mg/Kg	1	5/22/2009 02:00 PM
Lead	38	1.0		mg/Kg	1	5/22/2009 02:00 PM
Molybdenum	ND	1.0		mg/Kg	1	5/22/2009 02:00 PM
Nickel	15	1.0		mg/Kg	1	5/22/2009 02:00 PM
Selenium	ND	1.0		mg/Kg	1	5/22/2009 02:00 PM
Silver	ND	1.0		mg/Kg	1	5/22/2009 02:00 PM
Thallium	ND	1.0		mg/Kg	1	5/22/2009 02:00 PM
Vanadium	37	1.0		mg/Kg	1	5/22/2009 02:00 PM
Zinc	61	1.0		mg/Kg	1	5/22/2009 02:00 PM
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
	EPA 3550B			**EPA 8015B(M)**		
RunID: GC16_090521B	QC Batch: 55419			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	120	20		mg/Kg	10	5/21/2009 11:47 AM
ORO	890	20		mg/Kg	10	5/21/2009 11:47 AM
Surr: p-Terphenyl	77.4	30-130		%REC	10	5/21/2009 11:47 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 11:53 AM
Surr: Bromofluorobenzene (FID)	90.1	59-145		%REC	1	5/19/2009 11:53 AM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 11:53 AM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 11:53 AM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 11:53 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B21-0
Lab Order:	105533	**Collection Date:**	5/15/2009 10:01:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-001A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519A	QC Batch:	E09VS134			PrepDate:	Analyst: **KHN**
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 11:53 AM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 11:53 AM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 11:53 AM
Surr: Bromofluorobenzene (PID)	91.3	65-140		%REC	1	5/19/2009 11:53 AM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090520A	QC Batch:	55440			PrepDate:	5/20/2009 Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/20/2009 10:01 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/20/2009 10:01 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/20/2009 10:01 PM
Aldrin	ND	1.0		µg/Kg	1	5/20/2009 10:01 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:01 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 10:01 PM
beta-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:01 PM
Chlordane	ND	8.5		µg/Kg	1	5/20/2009 10:01 PM
delta-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:01 PM
Dieldrin	ND	2.0		µg/Kg	1	5/20/2009 10:01 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/20/2009 10:01 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/20/2009 10:01 PM
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/20/2009 10:01 PM
Endrin	ND	2.0		µg/Kg	1	5/20/2009 10:01 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/20/2009 10:01 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/20/2009 10:01 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:01 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 10:01 PM
Heptachlor	ND	1.0		µg/Kg	1	5/20/2009 10:01 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/20/2009 10:01 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/20/2009 10:01 PM
Toxaphene	ND	50		µg/Kg	1	5/20/2009 10:01 PM
Surr: Decachlorobiphenyl	32.0	20-142		%REC	1	5/20/2009 10:01 PM
Surr: Tetrachloro-m-xylene	41.2	25-115		%REC	1	5/20/2009 10:01 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090520B	QC Batch:	55413			PrepDate:	5/19/2009 Analyst: **IL**

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B21-0
Lab Order:	105533	**Collection Date:**	5/15/2009 10:01:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-001A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY BY COLD VAPOR TECHNIQUE						
			EPA 7471A			
RunID: AA5_090520B	QC Batch: 55413			PrepDate:	5/19/2009	Analyst: **IL**
Mercury	ND	0.10		mg/Kg	1	5/20/2009 11:35 AM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B22-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:54:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-003A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521B	QC Batch: 55419			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	110	20		mg/Kg	10	5/21/2009 11:57 AM
ORO	590	20		mg/Kg	10	5/21/2009 11:57 AM
Surr: p-Terphenyl	73.7	30-130		%REC	10	5/21/2009 11:57 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 12:25 PM
Surr: Bromofluorobenzene (FID)	88.8	59-145		%REC	1	5/19/2009 12:25 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 12:25 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 12:25 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 12:25 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 12:25 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 12:25 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 12:25 PM
Surr: Bromofluorobenzene (PID)	88.7	65-140		%REC	1	5/19/2009 12:25 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090520A	QC Batch: 55440			PrepDate: 5/20/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/20/2009 10:15 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/20/2009 10:15 PM
4,4´-DDT	3.0	2.0		µg/Kg	1	5/20/2009 10:15 PM
Aldrin	ND	1.0		µg/Kg	1	5/20/2009 10:15 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:15 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 10:15 PM
beta-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:15 PM
Chlordane	ND	8.5		µg/Kg	1	5/20/2009 10:15 PM
delta-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:15 PM
Dieldrin	ND	2.0		µg/Kg	1	5/20/2009 10:15 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/20/2009 10:15 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/20/2009 10:15 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B22-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:54:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-003A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090520A	QC Batch: 55440				PrepDate: 5/20/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/20/2009 10:15 PM
Endrin	ND	2.0		µg/Kg	1	5/20/2009 10:15 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/20/2009 10:15 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/20/2009 10:15 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:15 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 10:15 PM
Heptachlor	ND	1.0		µg/Kg	1	5/20/2009 10:15 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/20/2009 10:15 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/20/2009 10:15 PM
Toxaphene	ND	50		µg/Kg	1	5/20/2009 10:15 PM
Surr: Decachlorobiphenyl	63.1	20-142		%REC	1	5/20/2009 10:15 PM
Surr: Tetrachloro-m-xylene	64.0	25-115		%REC	1	5/20/2009 10:15 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B23-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:55:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-005A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521B	QC Batch: 55419			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	2.2	1.0		mg/Kg	1	5/21/2009 10:15 AM
ORO	10	1.0		mg/Kg	1	5/21/2009 10:15 AM
Surr: p-Terphenyl	74.2	30-130		%REC	1	5/21/2009 10:15 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 12:41 PM
Surr: Bromofluorobenzene (FID)	99.8	59-145		%REC	1	5/19/2009 12:41 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 12:41 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 12:41 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 12:41 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 12:41 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 12:41 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 12:41 PM
Surr: Bromofluorobenzene (PID)	99.5	65-140		%REC	1	5/19/2009 12:41 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090520A	QC Batch: 55440			PrepDate: 5/20/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/20/2009 10:29 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/20/2009 10:29 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/20/2009 10:29 PM
Aldrin	ND	1.0		µg/Kg	1	5/20/2009 10:29 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:29 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 10:29 PM
beta-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:29 PM
Chlordane	ND	8.5		µg/Kg	1	5/20/2009 10:29 PM
delta-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:29 PM
Dieldrin	ND	2.0		µg/Kg	1	5/20/2009 10:29 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/20/2009 10:29 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/20/2009 10:29 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B23-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:55:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-005A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090520A	QC Batch: 55440				PrepDate: 5/20/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/20/2009 10:29 PM
Endrin	ND	2.0		µg/Kg	1	5/20/2009 10:29 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/20/2009 10:29 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/20/2009 10:29 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:29 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 10:29 PM
Heptachlor	ND	1.0		µg/Kg	1	5/20/2009 10:29 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/20/2009 10:29 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/20/2009 10:29 PM
Toxaphene	ND	50		µg/Kg	1	5/20/2009 10:29 PM
Surr: Decachlorobiphenyl	50.8	20-142		%REC	1	5/20/2009 10:29 PM
Surr: Tetrachloro-m-xylene	69.2	25-115		%REC	1	5/20/2009 10:29 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B23-1.5
Lab Order:	105533	**Collection Date:**	5/15/2009 10:00:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-006A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519B	QC Batch: 55398			PrepDate: 5/18/2009		Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 12:56 PM
Arsenic	5.3	1.0		mg/Kg	1	5/19/2009 12:56 PM
Barium	88	1.0		mg/Kg	1	5/19/2009 12:56 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 12:56 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 12:56 PM
Chromium	16	1.0		mg/Kg	1	5/19/2009 12:56 PM
Cobalt	7.0	1.0		mg/Kg	1	5/19/2009 12:56 PM
Copper	18	2.0		mg/Kg	1	5/19/2009 12:56 PM
Lead	6.0	1.0		mg/Kg	1	5/19/2009 12:56 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 12:56 PM
Nickel	9.7	1.0		mg/Kg	1	5/19/2009 12:56 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 12:56 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 12:56 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 12:56 PM
Vanadium	40	1.0		mg/Kg	1	5/19/2009 12:56 PM
Zinc	33	1.0		mg/Kg	1	5/19/2009 12:56 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519D	QC Batch: 55390			PrepDate: 5/18/2009		Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 12:49 PM
PH						
				EPA 9045C		
RunID: WETCHEM_090521A	QC Batch: R109220			PrepDate:		Analyst: **DDL**
pH	6.9	0.10		pH Units	1	5/21/2009

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B24-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:47:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-007A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521B	QC Batch: 55419			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	9.1	1.0		mg/Kg	1	5/21/2009 11:01 AM
ORO	59	1.0		mg/Kg	1	5/21/2009 11:01 AM
Surr: p-Terphenyl	73.5	30-130		%REC	1	5/21/2009 11:01 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 12:56 PM
Surr: Bromofluorobenzene (FID)	92.5	59-145		%REC	1	5/19/2009 12:56 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 12:56 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 12:56 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 12:56 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 12:56 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 12:56 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 12:56 PM
Surr: Bromofluorobenzene (PID)	91.8	65-140		%REC	1	5/19/2009 12:56 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090520A	QC Batch: 55440			PrepDate: 5/20/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/20/2009 10:43 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/20/2009 10:43 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/20/2009 10:43 PM
Aldrin	ND	1.0		µg/Kg	1	5/20/2009 10:43 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:43 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 10:43 PM
beta-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:43 PM
Chlordane	ND	8.5		µg/Kg	1	5/20/2009 10:43 PM
delta-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:43 PM
Dieldrin	ND	2.0		µg/Kg	1	5/20/2009 10:43 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/20/2009 10:43 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/20/2009 10:43 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B24-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:47:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-007A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090520A	QC Batch: 55440				PrepDate: 5/20/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/20/2009 10:43 PM
Endrin	ND	2.0		µg/Kg	1	5/20/2009 10:43 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/20/2009 10:43 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/20/2009 10:43 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:43 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 10:43 PM
Heptachlor	ND	1.0		µg/Kg	1	5/20/2009 10:43 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/20/2009 10:43 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/20/2009 10:43 PM
Toxaphene	ND	50		µg/Kg	1	5/20/2009 10:43 PM
Surr: Decachlorobiphenyl	51.1	20-142		%REC	1	5/20/2009 10:43 PM
Surr: Tetrachloro-m-xylene	73.1	25-115		%REC	1	5/20/2009 10:43 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B25-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:35:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-009A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
EPA 3050B				**EPA 6010B**		
RunID: ICP8_090522C	QC Batch: 55415			PrepDate: 5/19/2009		Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/22/2009 02:13 PM
Arsenic	4.1	1.0		mg/Kg	1	5/22/2009 02:13 PM
Barium	120	1.0		mg/Kg	1	5/22/2009 02:13 PM
Beryllium	ND	1.0		mg/Kg	1	5/22/2009 02:13 PM
Cadmium	ND	1.0		mg/Kg	1	5/22/2009 02:13 PM
Chromium	14	1.0		mg/Kg	1	5/22/2009 02:13 PM
Cobalt	6.8	1.0		mg/Kg	1	5/22/2009 02:13 PM
Copper	10	2.0		mg/Kg	1	5/22/2009 02:13 PM
Lead	4.2	1.0		mg/Kg	1	5/22/2009 02:13 PM
Molybdenum	ND	1.0		mg/Kg	1	5/22/2009 02:13 PM
Nickel	15	1.0		mg/Kg	1	5/22/2009 02:13 PM
Selenium	ND	1.0		mg/Kg	1	5/22/2009 02:13 PM
Silver	ND	1.0		mg/Kg	1	5/22/2009 02:13 PM
Thallium	ND	1.0		mg/Kg	1	5/22/2009 02:13 PM
Vanadium	28	1.0		mg/Kg	1	5/22/2009 02:13 PM
Zinc	35	1.0		mg/Kg	1	5/22/2009 02:13 PM
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521B	QC Batch: 55419			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	1.2	1.0		mg/Kg	1	5/21/2009 10:06 AM
ORO	3.8	1.0		mg/Kg	1	5/21/2009 10:06 AM
Surr: p-Terphenyl	69.9	30-130		%REC	1	5/21/2009 10:06 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 01:12 PM
Surr: Bromofluorobenzene (FID)	104	59-145		%REC	1	5/19/2009 01:12 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 01:12 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 01:12 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 01:12 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B25-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:35:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-009A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519A	QC Batch:	E09VS134			PrepDate:	Analyst: **KHN**
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 01:12 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 01:12 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 01:12 PM
Surr: Bromofluorobenzene (PID)	103	65-140		%REC	1	5/19/2009 01:12 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090520A	QC Batch:	55440			PrepDate:	5/20/2009 Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/20/2009 08:21 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/20/2009 08:21 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/20/2009 08:21 PM
Aldrin	ND	1.0		µg/Kg	1	5/20/2009 08:21 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/20/2009 08:21 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 08:21 PM
beta-BHC	ND	1.0		µg/Kg	1	5/20/2009 08:21 PM
Chlordane	ND	8.5		µg/Kg	1	5/20/2009 08:21 PM
delta-BHC	ND	1.0		µg/Kg	1	5/20/2009 08:21 PM
Dieldrin	ND	2.0		µg/Kg	1	5/20/2009 08:21 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/20/2009 08:21 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/20/2009 08:21 PM
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/20/2009 08:21 PM
Endrin	ND	2.0		µg/Kg	1	5/20/2009 08:21 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/20/2009 08:21 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/20/2009 08:21 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/20/2009 08:21 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 08:21 PM
Heptachlor	ND	1.0		µg/Kg	1	5/20/2009 08:21 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/20/2009 08:21 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/20/2009 08:21 PM
Toxaphene	ND	50		µg/Kg	1	5/20/2009 08:21 PM
Surr: Decachlorobiphenyl	70.5	20-142		%REC	1	5/20/2009 08:21 PM
Surr: Tetrachloro-m-xylene	77.9	25-115		%REC	1	5/20/2009 08:21 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090520B	QC Batch:	55413			PrepDate:	5/19/2009 Analyst: **IL**

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B25-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:35:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-009A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY BY COLD VAPOR TECHNIQUE						
			EPA 7471A			
RunID: AA5_090520B	QC Batch: 55413			PrepDate:	5/19/2009	Analyst: **IL**
Mercury	ND	0.10		mg/Kg	1	5/20/2009 11:43 AM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B26-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:18:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-011A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521B	QC Batch: 55419			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	4.1	1.0		mg/Kg	1	5/21/2009 10:33 AM
ORO	28	1.0		mg/Kg	1	5/21/2009 10:33 AM
Surr: p-Terphenyl	63.9	30-130		%REC	1	5/21/2009 10:33 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 01:28 PM
Surr: Bromofluorobenzene (FID)	90.4	59-145		%REC	1	5/19/2009 01:28 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 01:28 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 01:28 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 01:28 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 01:28 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 01:28 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 01:28 PM
Surr: Bromofluorobenzene (PID)	90.1	65-140		%REC	1	5/19/2009 01:28 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090520A	QC Batch: 55440			PrepDate: 5/20/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/20/2009 10:57 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/20/2009 10:57 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/20/2009 10:57 PM
Aldrin	ND	1.0		µg/Kg	1	5/20/2009 10:57 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:57 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 10:57 PM
beta-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:57 PM
Chlordane	ND	8.5		µg/Kg	1	5/20/2009 10:57 PM
delta-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:57 PM
Dieldrin	ND	2.0		µg/Kg	1	5/20/2009 10:57 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/20/2009 10:57 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/20/2009 10:57 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B26-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:18:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-011A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090520A	QC Batch: 55440				PrepDate: 5/20/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/20/2009 10:57 PM
Endrin	ND	2.0		µg/Kg	1	5/20/2009 10:57 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/20/2009 10:57 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/20/2009 10:57 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/20/2009 10:57 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 10:57 PM
Heptachlor	ND	1.0		µg/Kg	1	5/20/2009 10:57 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/20/2009 10:57 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/20/2009 10:57 PM
Toxaphene	ND	50		µg/Kg	1	5/20/2009 10:57 PM
Surr: Decachlorobiphenyl	49.5	20-142		%REC	1	5/20/2009 10:57 PM
Surr: Tetrachloro-m-xylene	72.3	25-115		%REC	1	5/20/2009 10:57 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B27-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:20:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-013A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521B	QC Batch: 55419			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	2.4	1.0		mg/Kg	1	5/21/2009 10:24 AM
ORO	16	1.0		mg/Kg	1	5/21/2009 10:24 AM
Surr: p-Terphenyl	73.1	30-130		%REC	1	5/21/2009 10:24 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 01:44 PM
Surr: Bromofluorobenzene (FID)	94.6	59-145		%REC	1	5/19/2009 01:44 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 01:44 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 01:44 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 01:44 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 01:44 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 01:44 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 01:44 PM
Surr: Bromofluorobenzene (PID)	94.2	65-140		%REC	1	5/19/2009 01:44 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090520A	QC Batch: 55440			PrepDate: 5/20/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/20/2009 11:12 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/20/2009 11:12 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/20/2009 11:12 PM
Aldrin	ND	1.0		µg/Kg	1	5/20/2009 11:12 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:12 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 11:12 PM
beta-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:12 PM
Chlordane	ND	8.5		µg/Kg	1	5/20/2009 11:12 PM
delta-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:12 PM
Dieldrin	ND	2.0		µg/Kg	1	5/20/2009 11:12 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/20/2009 11:12 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/20/2009 11:12 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B27-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:20:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-013A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090520A	QC Batch: 55440				PrepDate: 5/20/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/20/2009 11:12 PM
Endrin	ND	2.0		µg/Kg	1	5/20/2009 11:12 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/20/2009 11:12 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/20/2009 11:12 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:12 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 11:12 PM
Heptachlor	ND	1.0		µg/Kg	1	5/20/2009 11:12 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/20/2009 11:12 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/20/2009 11:12 PM
Toxaphene	ND	50		µg/Kg	1	5/20/2009 11:12 PM
Surr: Decachlorobiphenyl	53.9	20-142		%REC	1	5/20/2009 11:12 PM
Surr: Tetrachloro-m-xylene	71.4	25-115		%REC	1	5/20/2009 11:12 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B27-1.5
Lab Order:	105533	**Collection Date:**	5/15/2009 9:25:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-014A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519B	QC Batch: 55398			PrepDate:	5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 12:59 PM
Arsenic	8.2	1.0		mg/Kg	1	5/19/2009 12:59 PM
Barium	400	1.0		mg/Kg	1	5/19/2009 12:59 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 12:59 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 12:59 PM
Chromium	20	1.0		mg/Kg	1	5/19/2009 12:59 PM
Cobalt	6.7	1.0		mg/Kg	1	5/19/2009 12:59 PM
Copper	31	2.0		mg/Kg	1	5/19/2009 12:59 PM
Lead	13	1.0		mg/Kg	1	5/19/2009 12:59 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 12:59 PM
Nickel	24	1.0		mg/Kg	1	5/19/2009 12:59 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 12:59 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 12:59 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 12:59 PM
Vanadium	56	1.0		mg/Kg	1	5/19/2009 12:59 PM
Zinc	58	1.0		mg/Kg	1	5/19/2009 12:59 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519D	QC Batch: 55390			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 12:51 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B28-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:07:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-015A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521B	QC Batch: 55419			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	12	1.0		mg/Kg	1	5/21/2009 10:43 AM
ORO	57	1.0		mg/Kg	1	5/21/2009 10:43 AM
Surr: p-Terphenyl	59.3	30-130		%REC	1	5/21/2009 10:43 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 02:00 PM
Surr: Bromofluorobenzene (FID)	93.8	59-145		%REC	1	5/19/2009 02:00 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 02:00 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 02:00 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 02:00 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 02:00 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 02:00 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 02:00 PM
Surr: Bromofluorobenzene (PID)	93.0	65-140		%REC	1	5/19/2009 02:00 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090520A	QC Batch: 55440			PrepDate: 5/20/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/20/2009 11:26 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/20/2009 11:26 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/20/2009 11:26 PM
Aldrin	ND	1.0		µg/Kg	1	5/20/2009 11:26 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:26 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 11:26 PM
beta-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:26 PM
Chlordane	ND	8.5		µg/Kg	1	5/20/2009 11:26 PM
delta-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:26 PM
Dieldrin	ND	2.0		µg/Kg	1	5/20/2009 11:26 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/20/2009 11:26 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/20/2009 11:26 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B28-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:07:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-015A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090520A	QC Batch: 55440			PrepDate: 5/20/2009		Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/20/2009 11:26 PM
Endrin	ND	2.0		µg/Kg	1	5/20/2009 11:26 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/20/2009 11:26 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/20/2009 11:26 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:26 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 11:26 PM
Heptachlor	ND	1.0		µg/Kg	1	5/20/2009 11:26 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/20/2009 11:26 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/20/2009 11:26 PM
Toxaphene	ND	50		µg/Kg	1	5/20/2009 11:26 PM
Surr: Decachlorobiphenyl	59.0	20-142		%REC	1	5/20/2009 11:26 PM
Surr: Tetrachloro-m-xylene	69.6	25-115		%REC	1	5/20/2009 11:26 PM
PH						
				EPA 9045C		
RunID: WETCHEM_090521A	QC Batch: R109220			PrepDate:		Analyst: **DDL**
pH	7.4	0.10		pH Units	1	5/21/2009

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B29-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:00:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-017A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
EPA 3050B				**EPA 6010B**		
RunID: ICP8_090522C	QC Batch: 55415			PrepDate: 5/19/2009		Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/22/2009 02:17 PM
Arsenic	4.5	1.0		mg/Kg	1	5/22/2009 02:17 PM
Barium	120	1.0		mg/Kg	1	5/22/2009 02:17 PM
Beryllium	ND	1.0		mg/Kg	1	5/22/2009 02:17 PM
Cadmium	ND	1.0		mg/Kg	1	5/22/2009 02:17 PM
Chromium	14	1.0		mg/Kg	1	5/22/2009 02:17 PM
Cobalt	8.6	1.0		mg/Kg	1	5/22/2009 02:17 PM
Copper	22	2.0		mg/Kg	1	5/22/2009 02:17 PM
Lead	45	1.0		mg/Kg	1	5/22/2009 02:17 PM
Molybdenum	ND	1.0		mg/Kg	1	5/22/2009 02:17 PM
Nickel	14	1.0		mg/Kg	1	5/22/2009 02:17 PM
Selenium	ND	1.0		mg/Kg	1	5/22/2009 02:17 PM
Silver	ND	1.0		mg/Kg	1	5/22/2009 02:17 PM
Thallium	ND	1.0		mg/Kg	1	5/22/2009 02:17 PM
Vanadium	31	1.0		mg/Kg	1	5/22/2009 02:17 PM
Zinc	140	1.0		mg/Kg	1	5/22/2009 02:17 PM
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521B	QC Batch: 55419			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	9.9	1.0		mg/Kg	1	5/21/2009 10:52 AM
ORO	52	1.0		mg/Kg	1	5/21/2009 10:52 AM
Surr: p-Terphenyl	57.0	30-130		%REC	1	5/21/2009 10:52 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 02:15 PM
Surr: Bromofluorobenzene (FID)	93.9	59-145		%REC	1	5/19/2009 02:15 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 02:15 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 02:15 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 02:15 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B29-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:00:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-017A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519A	QC Batch:	E09VS134			PrepDate:	Analyst: **KHN**
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 02:15 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 02:15 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 02:15 PM
Surr: Bromofluorobenzene (PID)	93.6	65-140		%REC	1	5/19/2009 02:15 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090520A	QC Batch:	55440			PrepDate:	5/20/2009 Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/20/2009 11:40 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/20/2009 11:40 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/20/2009 11:40 PM
Aldrin	ND	1.0		µg/Kg	1	5/20/2009 11:40 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:40 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 11:40 PM
beta-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:40 PM
Chlordane	ND	8.5		µg/Kg	1	5/20/2009 11:40 PM
delta-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:40 PM
Dieldrin	ND	2.0		µg/Kg	1	5/20/2009 11:40 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/20/2009 11:40 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/20/2009 11:40 PM
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/20/2009 11:40 PM
Endrin	ND	2.0		µg/Kg	1	5/20/2009 11:40 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/20/2009 11:40 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/20/2009 11:40 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:40 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 11:40 PM
Heptachlor	ND	1.0		µg/Kg	1	5/20/2009 11:40 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/20/2009 11:40 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/20/2009 11:40 PM
Toxaphene	ND	50		µg/Kg	1	5/20/2009 11:40 PM
Surr: Decachlorobiphenyl	51.9	20-142		%REC	1	5/20/2009 11:40 PM
Surr: Tetrachloro-m-xylene	72.0	25-115		%REC	1	5/20/2009 11:40 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090520B	QC Batch:	55413			PrepDate:	5/19/2009 Analyst: **IL**

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B29-0
Lab Order:	105533	**Collection Date:**	5/15/2009 9:00:00 AM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-017A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY BY COLD VAPOR TECHNIQUE						
			EPA 7471A			
RunID: AA5_090520B	QC Batch: 55413			PrepDate:	5/19/2009	Analyst: **IL**
Mercury	ND	0.10		mg/Kg	1	5/20/2009 11:45 AM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B30-0
Lab Order:	105533	**Collection Date:**	5/14/2009 4:09:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-019A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521B	QC Batch: 55419			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	8.4	1.0		mg/Kg	1	5/21/2009 11:38 AM
ORO	44	1.0		mg/Kg	1	5/21/2009 11:38 AM
Surr: p-Terphenyl	62.7	30-130		%REC	1	5/21/2009 11:38 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 02:31 PM
Surr: Bromofluorobenzene (FID)	91.4	59-145		%REC	1	5/19/2009 02:31 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519A	QC Batch: E09VS134			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 02:31 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 02:31 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 02:31 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 02:31 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 02:31 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 02:31 PM
Surr: Bromofluorobenzene (PID)	90.8	65-140		%REC	1	5/19/2009 02:31 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090520A	QC Batch: 55440			PrepDate: 5/20/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/20/2009 11:54 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/20/2009 11:54 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/20/2009 11:54 PM
Aldrin	ND	1.0		µg/Kg	1	5/20/2009 11:54 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:54 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 11:54 PM
beta-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:54 PM
Chlordane	ND	8.5		µg/Kg	1	5/20/2009 11:54 PM
delta-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:54 PM
Dieldrin	7.5	2.0		µg/Kg	1	5/20/2009 11:54 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/20/2009 11:54 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/20/2009 11:54 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B30-0
Lab Order:	105533	**Collection Date:**	5/14/2009 4:09:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-019A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090520A	QC Batch: 55440				PrepDate: 5/20/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/20/2009 11:54 PM
Endrin	ND	2.0		µg/Kg	1	5/20/2009 11:54 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/20/2009 11:54 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/20/2009 11:54 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/20/2009 11:54 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/20/2009 11:54 PM
Heptachlor	ND	1.0		µg/Kg	1	5/20/2009 11:54 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/20/2009 11:54 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/20/2009 11:54 PM
Toxaphene	ND	50		µg/Kg	1	5/20/2009 11:54 PM
Surr: Decachlorobiphenyl	52.7	20-142		%REC	1	5/20/2009 11:54 PM
Surr: Tetrachloro-m-xylene	75.4	25-115		%REC	1	5/20/2009 11:54 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B31-0
Lab Order:	105533	**Collection Date:**	5/14/2009 3:49:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-021A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521A	QC Batch: 55420			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	18	1.0		mg/Kg	1	5/21/2009 03:05 PM
ORO	120	1.0		mg/Kg	1	5/21/2009 03:05 PM
Surr: p-Terphenyl	73.4	30-130		%REC	1	5/21/2009 03:05 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 07:46 PM
Surr: Bromofluorobenzene (FID)	86.5	59-145		%REC	1	5/19/2009 07:46 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 07:46 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 07:46 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 07:46 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 07:46 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 07:46 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 07:46 PM
Surr: Bromofluorobenzene (PID)	87.6	65-140		%REC	1	5/19/2009 07:46 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454			PrepDate: 5/20/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/21/2009 04:43 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/21/2009 04:43 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/21/2009 04:43 PM
Aldrin	ND	1.0		µg/Kg	1	5/21/2009 04:43 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:43 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 04:43 PM
beta-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:43 PM
Chlordane	ND	8.5		µg/Kg	1	5/21/2009 04:43 PM
delta-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:43 PM
Dieldrin	ND	2.0		µg/Kg	1	5/21/2009 04:43 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/21/2009 04:43 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/21/2009 04:43 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B31-0
Lab Order:	105533	**Collection Date:**	5/14/2009 3:49:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-021A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454				PrepDate: 5/20/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/21/2009 04:43 PM
Endrin	ND	2.0		µg/Kg	1	5/21/2009 04:43 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/21/2009 04:43 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/21/2009 04:43 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:43 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 04:43 PM
Heptachlor	ND	1.0		µg/Kg	1	5/21/2009 04:43 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/21/2009 04:43 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/21/2009 04:43 PM
Toxaphene	ND	50		µg/Kg	1	5/21/2009 04:43 PM
Surr: Decachlorobiphenyl	93.9	20-142		%REC	1	5/21/2009 04:43 PM
Surr: Tetrachloro-m-xylene	67.6	25-115		%REC	1	5/21/2009 04:43 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B31-1.5
Lab Order:	105533	**Collection Date:**	5/14/2009 3:51:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-022A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519B	QC Batch: 55398			PrepDate:	5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 01:10 PM
Arsenic	3.7	1.0		mg/Kg	1	5/19/2009 01:10 PM
Barium	180	1.0		mg/Kg	1	5/19/2009 01:10 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 01:10 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 01:10 PM
Chromium	10	1.0		mg/Kg	1	5/19/2009 01:10 PM
Cobalt	8.7	1.0		mg/Kg	1	5/19/2009 01:10 PM
Copper	15	2.0		mg/Kg	1	5/19/2009 01:10 PM
Lead	8.3	1.0		mg/Kg	1	5/19/2009 01:10 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 01:10 PM
Nickel	11	1.0		mg/Kg	1	5/19/2009 01:10 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 01:10 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 01:10 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 01:10 PM
Vanadium	26	1.0		mg/Kg	1	5/19/2009 01:10 PM
Zinc	32	1.0		mg/Kg	1	5/19/2009 01:10 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519D	QC Batch: 55390			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 12:57 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B32-0
Lab Order:	105533	**Collection Date:**	5/14/2009 3:40:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-023A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521A	QC Batch: 55420			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	2.5	1.0		mg/Kg	1	5/21/2009 01:31 PM
ORO	17	1.0		mg/Kg	1	5/21/2009 01:31 PM
Surr: p-Terphenyl	81.0	30-130		%REC	1	5/21/2009 01:31 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 08:17 PM
Surr: Bromofluorobenzene (FID)	96.1	59-145		%REC	1	5/19/2009 08:17 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 08:17 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 08:17 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 08:17 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 08:17 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 08:17 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 08:17 PM
Surr: Bromofluorobenzene (PID)	97.2	65-140		%REC	1	5/19/2009 08:17 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454			PrepDate: 5/20/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/21/2009 04:56 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/21/2009 04:56 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/21/2009 04:56 PM
Aldrin	ND	1.0		µg/Kg	1	5/21/2009 04:56 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:56 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 04:56 PM
beta-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:56 PM
Chlordane	ND	8.5		µg/Kg	1	5/21/2009 04:56 PM
delta-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:56 PM
Dieldrin	ND	2.0		µg/Kg	1	5/21/2009 04:56 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/21/2009 04:56 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/21/2009 04:56 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B32-0
Lab Order:	105533	**Collection Date:**	5/14/2009 3:40:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-023A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454				PrepDate: 5/20/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/21/2009 04:56 PM
Endrin	ND	2.0		µg/Kg	1	5/21/2009 04:56 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/21/2009 04:56 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/21/2009 04:56 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:56 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 04:56 PM
Heptachlor	ND	1.0		µg/Kg	1	5/21/2009 04:56 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/21/2009 04:56 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/21/2009 04:56 PM
Toxaphene	ND	50		µg/Kg	1	5/21/2009 04:56 PM
Surr: Decachlorobiphenyl	86.7	20-142		%REC	1	5/21/2009 04:56 PM
Surr: Tetrachloro-m-xylene	81.7	25-115		%REC	1	5/21/2009 04:56 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B32-1.5
Lab Order:	105533	**Collection Date:**	5/14/2009 3:45:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-024A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
PH						
				EPA 9045C		
RunID: WETCHEM_090521A	QC Batch: R109220			PrepDate:		Analyst: **DDL**
pH	7.2	0.10		pH Units	1	5/21/2009

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B33-0
Lab Order:	105533	**Collection Date:**	5/14/2009 3:30:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-025A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
EPA 3050B				**EPA 6010B**		
RunID: ICP8_090522C	QC Batch: 55415			PrepDate: 5/19/2009		Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/22/2009 02:31 PM
Arsenic	6.3	1.0		mg/Kg	1	5/22/2009 02:31 PM
Barium	120	1.0		mg/Kg	1	5/22/2009 02:31 PM
Beryllium	ND	1.0		mg/Kg	1	5/22/2009 02:31 PM
Cadmium	1.0	1.0		mg/Kg	1	5/22/2009 02:31 PM
Chromium	13	1.0		mg/Kg	1	5/22/2009 02:31 PM
Cobalt	9.2	1.0		mg/Kg	1	5/22/2009 02:31 PM
Copper	17	2.0		mg/Kg	1	5/22/2009 02:31 PM
Lead	19	1.0		mg/Kg	1	5/22/2009 02:31 PM
Molybdenum	ND	1.0		mg/Kg	1	5/22/2009 02:31 PM
Nickel	19	1.0		mg/Kg	1	5/22/2009 02:31 PM
Selenium	ND	1.0		mg/Kg	1	5/22/2009 02:31 PM
Silver	ND	1.0		mg/Kg	1	5/22/2009 02:31 PM
Thallium	ND	1.0		mg/Kg	1	5/22/2009 02:31 PM
Vanadium	48	1.0		mg/Kg	1	5/22/2009 02:31 PM
Zinc	59	1.0		mg/Kg	1	5/22/2009 02:31 PM
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521A	QC Batch: 55420			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	5.3	1.0		mg/Kg	1	5/21/2009 01:40 PM
ORO	29	1.0		mg/Kg	1	5/21/2009 01:40 PM
Surr: p-Terphenyl	79.9	30-130		%REC	1	5/21/2009 01:40 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 08:32 PM
Surr: Bromofluorobenzene (FID)	89.0	59-145		%REC	1	5/19/2009 08:32 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 08:32 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 08:32 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 08:32 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B33-0
Lab Order:	105533	**Collection Date:**	5/14/2009 3:30:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-025A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519B	QC Batch:	E09VS135			PrepDate:	Analyst: **KHN**
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 08:32 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 08:32 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 08:32 PM
Surr: Bromofluorobenzene (PID)	89.7	65-140		%REC	1	5/19/2009 08:32 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC13_090521A	QC Batch:	55454			PrepDate:	5/20/2009 Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/21/2009 05:09 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/21/2009 05:09 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/21/2009 05:09 PM
Aldrin	ND	1.0		µg/Kg	1	5/21/2009 05:09 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:09 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 05:09 PM
beta-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:09 PM
Chlordane	ND	8.5		µg/Kg	1	5/21/2009 05:09 PM
delta-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:09 PM
Dieldrin	ND	2.0		µg/Kg	1	5/21/2009 05:09 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/21/2009 05:09 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/21/2009 05:09 PM
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/21/2009 05:09 PM
Endrin	ND	2.0		µg/Kg	1	5/21/2009 05:09 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/21/2009 05:09 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/21/2009 05:09 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:09 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 05:09 PM
Heptachlor	ND	1.0		µg/Kg	1	5/21/2009 05:09 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/21/2009 05:09 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/21/2009 05:09 PM
Toxaphene	ND	50		µg/Kg	1	5/21/2009 05:09 PM
Surr: Decachlorobiphenyl	81.0	20-142		%REC	1	5/21/2009 05:09 PM
Surr: Tetrachloro-m-xylene	73.8	25-115		%REC	1	5/21/2009 05:09 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090520B	QC Batch:	55413			PrepDate:	5/19/2009 Analyst: **IL**

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B33-0
Lab Order:	105533	**Collection Date:**	5/14/2009 3:30:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-025A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY BY COLD VAPOR TECHNIQUE						
EPA 7471A						
RunID: AA5_090520B QC Batch: 55413 PrepDate: 5/19/2009 Analyst: **IL**						
Mercury	ND	0.10		mg/Kg	1	5/20/2009 11:47 AM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B34-0
Lab Order:	105533	**Collection Date:**	5/14/2009 3:31:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-027A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521A	QC Batch: 55420			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	6.7	1.0		mg/Kg	1	5/21/2009 01:48 PM
ORO	52	1.0		mg/Kg	1	5/21/2009 01:48 PM
Surr: p-Terphenyl	78.7	30-130		%REC	1	5/21/2009 01:48 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 08:48 PM
Surr: Bromofluorobenzene (FID)	92.4	59-145		%REC	1	5/19/2009 08:48 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 08:48 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 08:48 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 08:48 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 08:48 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 08:48 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 08:48 PM
Surr: Bromofluorobenzene (PID)	93.9	65-140		%REC	1	5/19/2009 08:48 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454			PrepDate: 5/20/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/21/2009 05:23 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/21/2009 05:23 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/21/2009 05:23 PM
Aldrin	ND	1.0		µg/Kg	1	5/21/2009 05:23 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:23 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 05:23 PM
beta-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:23 PM
Chlordane	ND	8.5		µg/Kg	1	5/21/2009 05:23 PM
delta-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:23 PM
Dieldrin	ND	2.0		µg/Kg	1	5/21/2009 05:23 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/21/2009 05:23 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/21/2009 05:23 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B34-0
Lab Order:	105533	**Collection Date:**	5/14/2009 3:31:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-027A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454				PrepDate: 5/20/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/21/2009 05:23 PM
Endrin	ND	2.0		µg/Kg	1	5/21/2009 05:23 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/21/2009 05:23 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/21/2009 05:23 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:23 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 05:23 PM
Heptachlor	ND	1.0		µg/Kg	1	5/21/2009 05:23 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/21/2009 05:23 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/21/2009 05:23 PM
Toxaphene	ND	50		µg/Kg	1	5/21/2009 05:23 PM
Surr: Decachlorobiphenyl	79.6	20-142		%REC	1	5/21/2009 05:23 PM
Surr: Tetrachloro-m-xylene	74.0	25-115		%REC	1	5/21/2009 05:23 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B35-0
Lab Order:	105533	**Collection Date:**	5/14/2009 3:15:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-029A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521A	QC Batch: 55420			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	11	1.0		mg/Kg	1	5/21/2009 02:47 PM
ORO	62	1.0		mg/Kg	1	5/21/2009 02:47 PM
Surr: p-Terphenyl	79.3	30-130		%REC	1	5/21/2009 02:47 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 09:04 PM
Surr: Bromofluorobenzene (FID)	81.9	59-145		%REC	1	5/19/2009 09:04 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 09:04 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 09:04 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 09:04 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 09:04 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 09:04 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 09:04 PM
Surr: Bromofluorobenzene (PID)	82.8	65-140		%REC	1	5/19/2009 09:04 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454			PrepDate: 5/20/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/21/2009 05:36 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/21/2009 05:36 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/21/2009 05:36 PM
Aldrin	ND	1.0		µg/Kg	1	5/21/2009 05:36 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:36 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 05:36 PM
beta-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:36 PM
Chlordane	ND	8.5		µg/Kg	1	5/21/2009 05:36 PM
delta-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:36 PM
Dieldrin	ND	2.0		µg/Kg	1	5/21/2009 05:36 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/21/2009 05:36 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/21/2009 05:36 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B35-0
Lab Order:	105533	**Collection Date:**	5/14/2009 3:15:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-029A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454				PrepDate: 5/20/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/21/2009 05:36 PM
Endrin	ND	2.0		µg/Kg	1	5/21/2009 05:36 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/21/2009 05:36 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/21/2009 05:36 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:36 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 05:36 PM
Heptachlor	ND	1.0		µg/Kg	1	5/21/2009 05:36 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/21/2009 05:36 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/21/2009 05:36 PM
Toxaphene	ND	50		µg/Kg	1	5/21/2009 05:36 PM
Surr: Decachlorobiphenyl	84.7	20-142		%REC	1	5/21/2009 05:36 PM
Surr: Tetrachloro-m-xylene	74.4	25-115		%REC	1	5/21/2009 05:36 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B35-1.5
Lab Order:	105533	**Collection Date:**	5/14/2009 3:20:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-030A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519B	QC Batch: 55398			PrepDate:	5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 01:13 PM
Arsenic	4.8	1.0		mg/Kg	1	5/19/2009 01:13 PM
Barium	130	1.0		mg/Kg	1	5/19/2009 01:13 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 01:13 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 01:13 PM
Chromium	16	1.0		mg/Kg	1	5/19/2009 01:13 PM
Cobalt	8.0	1.0		mg/Kg	1	5/19/2009 01:13 PM
Copper	23	2.0		mg/Kg	1	5/19/2009 01:13 PM
Lead	18	1.0		mg/Kg	1	5/19/2009 01:13 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 01:13 PM
Nickel	15	1.0		mg/Kg	1	5/19/2009 01:13 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 01:13 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 01:13 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 01:13 PM
Vanadium	35	1.0		mg/Kg	1	5/19/2009 01:13 PM
Zinc	120	1.0		mg/Kg	1	5/19/2009 01:13 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519D	QC Batch: 55390			PrepDate:	5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 12:59 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B36-0
Lab Order:	105533	**Collection Date:**	5/14/2009 2:55:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-031A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521A	QC Batch: 55420			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	1.2	1.0		mg/Kg	1	5/21/2009 01:22 PM
ORO	5.3	1.0		mg/Kg	1	5/21/2009 01:22 PM
Surr: p-Terphenyl	67.7	30-130		%REC	1	5/21/2009 01:22 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 09:19 PM
Surr: Bromofluorobenzene (FID)	101	59-145		%REC	1	5/19/2009 09:19 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 09:19 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 09:19 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 09:19 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 09:19 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 09:19 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 09:19 PM
Surr: Bromofluorobenzene (PID)	102	65-140		%REC	1	5/19/2009 09:19 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454			PrepDate: 5/20/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/21/2009 04:17 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/21/2009 04:17 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/21/2009 04:17 PM
Aldrin	ND	1.0		µg/Kg	1	5/21/2009 04:17 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:17 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 04:17 PM
beta-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:17 PM
Chlordane	ND	8.5		µg/Kg	1	5/21/2009 04:17 PM
delta-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:17 PM
Dieldrin	ND	2.0		µg/Kg	1	5/21/2009 04:17 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/21/2009 04:17 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/21/2009 04:17 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B36-0
Lab Order:	105533	**Collection Date:**	5/14/2009 2:55:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-031A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454				PrepDate: 5/20/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/21/2009 04:17 PM
Endrin	ND	2.0		µg/Kg	1	5/21/2009 04:17 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/21/2009 04:17 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/21/2009 04:17 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:17 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 04:17 PM
Heptachlor	ND	1.0		µg/Kg	1	5/21/2009 04:17 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/21/2009 04:17 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/21/2009 04:17 PM
Toxaphene	ND	50		µg/Kg	1	5/21/2009 04:17 PM
Surr: Decachlorobiphenyl	81.6	20-142		%REC	1	5/21/2009 04:17 PM
Surr: Tetrachloro-m-xylene	71.6	25-115		%REC	1	5/21/2009 04:17 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B37-0
Lab Order:	105533	**Collection Date:**	5/14/2009 2:41:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-033A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090522C	QC Batch: 55415			PrepDate: 5/19/2009		Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/22/2009 02:37 PM
Arsenic	4.5	1.0		mg/Kg	1	5/22/2009 02:37 PM
Barium	150	1.0		mg/Kg	1	5/22/2009 02:37 PM
Beryllium	ND	1.0		mg/Kg	1	5/22/2009 02:37 PM
Cadmium	ND	1.0		mg/Kg	1	5/22/2009 02:37 PM
Chromium	14	1.0		mg/Kg	1	5/22/2009 02:37 PM
Cobalt	7.5	1.0		mg/Kg	1	5/22/2009 02:37 PM
Copper	22	2.0		mg/Kg	1	5/22/2009 02:37 PM
Lead	20	1.0		mg/Kg	1	5/22/2009 02:37 PM
Molybdenum	ND	1.0		mg/Kg	1	5/22/2009 02:37 PM
Nickel	13	1.0		mg/Kg	1	5/22/2009 02:37 PM
Selenium	ND	1.0		mg/Kg	1	5/22/2009 02:37 PM
Silver	ND	1.0		mg/Kg	1	5/22/2009 02:37 PM
Thallium	ND	1.0		mg/Kg	1	5/22/2009 02:37 PM
Vanadium	30	1.0		mg/Kg	1	5/22/2009 02:37 PM
Zinc	73	1.0		mg/Kg	1	5/22/2009 02:37 PM
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
	EPA 3550B			**EPA 8015B(M)**		
RunID: GC16_090521A	QC Batch: 55420			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	16	1.0		mg/Kg	1	5/21/2009 03:14 PM
ORO	94	1.0		mg/Kg	1	5/21/2009 03:14 PM
Surr: p-Terphenyl	64.2	30-130		%REC	1	5/21/2009 03:14 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 09:35 PM
Surr: Bromofluorobenzene (FID)	84.7	59-145		%REC	1	5/19/2009 09:35 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 09:35 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 09:35 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 09:35 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B37-0
Lab Order:	105533	**Collection Date:**	5/14/2009 2:41:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-033A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519B	QC Batch:	E09VS135			PrepDate:	Analyst: **KHN**
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 09:35 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 09:35 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 09:35 PM
Surr: Bromofluorobenzene (PID)	85.2	65-140		%REC	1	5/19/2009 09:35 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC13_090521A	QC Batch:	55454			PrepDate:	5/20/2009 Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/21/2009 05:49 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/21/2009 05:49 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/21/2009 05:49 PM
Aldrin	ND	1.0		µg/Kg	1	5/21/2009 05:49 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:49 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 05:49 PM
beta-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:49 PM
Chlordane	ND	8.5		µg/Kg	1	5/21/2009 05:49 PM
delta-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:49 PM
Dieldrin	ND	2.0		µg/Kg	1	5/21/2009 05:49 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/21/2009 05:49 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/21/2009 05:49 PM
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/21/2009 05:49 PM
Endrin	ND	2.0		µg/Kg	1	5/21/2009 05:49 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/21/2009 05:49 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/21/2009 05:49 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:49 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 05:49 PM
Heptachlor	ND	1.0		µg/Kg	1	5/21/2009 05:49 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/21/2009 05:49 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/21/2009 05:49 PM
Toxaphene	ND	50		µg/Kg	1	5/21/2009 05:49 PM
Surr: Decachlorobiphenyl	75.4	20-142		%REC	1	5/21/2009 05:49 PM
Surr: Tetrachloro-m-xylene	64.0	25-115		%REC	1	5/21/2009 05:49 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090520B	QC Batch:	55413			PrepDate:	5/19/2009 Analyst: **IL**

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B37-0
Lab Order:	105533	**Collection Date:**	5/14/2009 2:41:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-033A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090520B	QC Batch: 55413			PrepDate: 5/19/2009		Analyst: **IL**
Mercury	0.10	0.10		mg/Kg	1	5/20/2009 11:49 AM
PH						
				EPA 9045C		
RunID: WETCHEM_090521A	QC Batch: R109220			PrepDate:		Analyst: **DDL**
pH	6.2	0.10		pH Units	1	5/21/2009

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B38-0
Lab Order:	105533	**Collection Date:**	5/14/2009 2:30:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-035A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521A	QC Batch: 55420			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	2.3	1.0		mg/Kg	1	5/21/2009 02:31 PM
ORO	18	1.0		mg/Kg	1	5/21/2009 02:31 PM
Surr: p-Terphenyl	60.0	30-130		%REC	1	5/21/2009 02:31 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 09:50 PM
Surr: Bromofluorobenzene (FID)	92.1	59-145		%REC	1	5/19/2009 09:50 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 09:50 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 09:50 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 09:50 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 09:50 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 09:50 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 09:50 PM
Surr: Bromofluorobenzene (PID)	92.6	65-140		%REC	1	5/19/2009 09:50 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454			PrepDate: 5/20/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/21/2009 06:02 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/21/2009 06:02 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/21/2009 06:02 PM
Aldrin	ND	1.0		µg/Kg	1	5/21/2009 06:02 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/21/2009 06:02 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 06:02 PM
beta-BHC	ND	1.0		µg/Kg	1	5/21/2009 06:02 PM
Chlordane	ND	8.5		µg/Kg	1	5/21/2009 06:02 PM
delta-BHC	ND	1.0		µg/Kg	1	5/21/2009 06:02 PM
Dieldrin	ND	2.0		µg/Kg	1	5/21/2009 06:02 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/21/2009 06:02 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/21/2009 06:02 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B38-0
Lab Order:	105533	**Collection Date:**	5/14/2009 2:30:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-035A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454				PrepDate: 5/20/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/21/2009 06:02 PM
Endrin	ND	2.0		µg/Kg	1	5/21/2009 06:02 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/21/2009 06:02 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/21/2009 06:02 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/21/2009 06:02 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 06:02 PM
Heptachlor	ND	1.0		µg/Kg	1	5/21/2009 06:02 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/21/2009 06:02 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/21/2009 06:02 PM
Toxaphene	ND	50		µg/Kg	1	5/21/2009 06:02 PM
Surr: Decachlorobiphenyl	74.9	20-142		%REC	1	5/21/2009 06:02 PM
Surr: Tetrachloro-m-xylene	69.9	25-115		%REC	1	5/21/2009 06:02 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B39-0
Lab Order:	105533	**Collection Date:**	5/14/2009 2:21:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-037A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521A	QC Batch: 55420			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	20	1.0		mg/Kg	1	5/21/2009 03:23 PM
ORO	93	1.0		mg/Kg	1	5/21/2009 03:23 PM
Surr: p-Terphenyl	54.2	30-130		%REC	1	5/21/2009 03:23 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 10:06 PM
Surr: Bromofluorobenzene (FID)	93.5	59-145		%REC	1	5/19/2009 10:06 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 10:06 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 10:06 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 10:06 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 10:06 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 10:06 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 10:06 PM
Surr: Bromofluorobenzene (PID)	95.0	65-140		%REC	1	5/19/2009 10:06 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454			PrepDate: 5/20/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/21/2009 06:15 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/21/2009 06:15 PM
4,4´-DDT	2.6	2.0		µg/Kg	1	5/21/2009 06:15 PM
Aldrin	ND	1.0		µg/Kg	1	5/21/2009 06:15 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/21/2009 06:15 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 06:15 PM
beta-BHC	ND	1.0		µg/Kg	1	5/21/2009 06:15 PM
Chlordane	ND	8.5		µg/Kg	1	5/21/2009 06:15 PM
delta-BHC	ND	1.0		µg/Kg	1	5/21/2009 06:15 PM
Dieldrin	ND	2.0		µg/Kg	1	5/21/2009 06:15 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/21/2009 06:15 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/21/2009 06:15 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B39-0
Lab Order:	105533	**Collection Date:**	5/14/2009 2:21:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-037A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454				PrepDate: 5/20/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/21/2009 06:15 PM
Endrin	ND	2.0		µg/Kg	1	5/21/2009 06:15 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/21/2009 06:15 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/21/2009 06:15 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/21/2009 06:15 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 06:15 PM
Heptachlor	ND	1.0		µg/Kg	1	5/21/2009 06:15 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/21/2009 06:15 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/21/2009 06:15 PM
Toxaphene	ND	50		µg/Kg	1	5/21/2009 06:15 PM
Surr: Decachlorobiphenyl	91.1	20-142		%REC	1	5/21/2009 06:15 PM
Surr: Tetrachloro-m-xylene	72.8	25-115		%REC	1	5/21/2009 06:15 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B39-1.5
Lab Order:	105533	**Collection Date:**	5/14/2009 2:24:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-038A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519B	QC Batch: 55398				PrepDate: 5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 01:15 PM
Arsenic	6.2	1.0		mg/Kg	1	5/19/2009 01:15 PM
Barium	310	1.0		mg/Kg	1	5/19/2009 01:15 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 01:15 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 01:15 PM
Chromium	13	1.0		mg/Kg	1	5/19/2009 01:15 PM
Cobalt	9.2	1.0		mg/Kg	1	5/19/2009 01:15 PM
Copper	31	2.0		mg/Kg	1	5/19/2009 01:15 PM
Lead	17	1.0		mg/Kg	1	5/19/2009 01:15 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 01:15 PM
Nickel	17	1.0		mg/Kg	1	5/19/2009 01:15 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 01:15 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 01:15 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 01:15 PM
Vanadium	39	1.0		mg/Kg	1	5/19/2009 01:15 PM
Zinc	51	1.0		mg/Kg	1	5/19/2009 01:15 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519D	QC Batch: 55390				PrepDate: 5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 12:47 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B47-0
Lab Order:	105533	**Collection Date:**	5/14/2009 1:39:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-039A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090521A	QC Batch: 55420			PrepDate: 5/19/2009		Analyst: **CBR**
DRO	8.7	1.0		mg/Kg	1	5/21/2009 02:56 PM
ORO	53	1.0		mg/Kg	1	5/21/2009 02:56 PM
Surr: p-Terphenyl	73.7	30-130		%REC	1	5/21/2009 02:56 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/19/2009 10:22 PM
Surr: Bromofluorobenzene (FID)	98.5	59-145		%REC	1	5/19/2009 10:22 PM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519B	QC Batch: E09VS135			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/19/2009 10:22 PM
Ethylbenzene	ND	5.0		µg/Kg	1	5/19/2009 10:22 PM
m,p-Xylene	ND	10		µg/Kg	1	5/19/2009 10:22 PM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/19/2009 10:22 PM
o-Xylene	ND	5.0		µg/Kg	1	5/19/2009 10:22 PM
Toluene	ND	5.0		µg/Kg	1	5/19/2009 10:22 PM
Surr: Bromofluorobenzene (PID)	99.7	65-140		%REC	1	5/19/2009 10:22 PM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454			PrepDate: 5/20/2009		Analyst: **SMH**
4,4´-DDD	ND	2.0		µg/Kg	1	5/21/2009 06:29 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/21/2009 06:29 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/21/2009 06:29 PM
Aldrin	ND	1.0		µg/Kg	1	5/21/2009 06:29 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/21/2009 06:29 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 06:29 PM
beta-BHC	ND	1.0		µg/Kg	1	5/21/2009 06:29 PM
Chlordane	ND	8.5		µg/Kg	1	5/21/2009 06:29 PM
delta-BHC	ND	1.0		µg/Kg	1	5/21/2009 06:29 PM
Dieldrin	ND	2.0		µg/Kg	1	5/21/2009 06:29 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/21/2009 06:29 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/21/2009 06:29 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B47-0
Lab Order:	105533	**Collection Date:**	5/14/2009 1:39:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-039A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC13_090521A	QC Batch: 55454				PrepDate: 5/20/2009	Analyst: **SMH**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/21/2009 06:29 PM
Endrin	ND	2.0		µg/Kg	1	5/21/2009 06:29 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/21/2009 06:29 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/21/2009 06:29 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/21/2009 06:29 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 06:29 PM
Heptachlor	ND	1.0		µg/Kg	1	5/21/2009 06:29 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/21/2009 06:29 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/21/2009 06:29 PM
Toxaphene	ND	50		µg/Kg	1	5/21/2009 06:29 PM
Surr: Decachlorobiphenyl	81.0	20-142		%REC	1	5/21/2009 06:29 PM
Surr: Tetrachloro-m-xylene	70.6	25-115		%REC	1	5/21/2009 06:29 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B47-1.5
Lab Order:	105533	**Collection Date:**	5/14/2009 1:41:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-040A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090519B	QC Batch: 55398				PrepDate: 5/18/2009	Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/19/2009 01:27 PM
Arsenic	5.0	1.0		mg/Kg	1	5/19/2009 01:27 PM
Barium	240	1.0		mg/Kg	1	5/19/2009 01:27 PM
Beryllium	ND	1.0		mg/Kg	1	5/19/2009 01:27 PM
Cadmium	ND	1.0		mg/Kg	1	5/19/2009 01:27 PM
Chromium	13	1.0		mg/Kg	1	5/19/2009 01:27 PM
Cobalt	7.5	1.0		mg/Kg	1	5/19/2009 01:27 PM
Copper	22	2.0		mg/Kg	1	5/19/2009 01:27 PM
Lead	7.3	1.0		mg/Kg	1	5/19/2009 01:27 PM
Molybdenum	ND	1.0		mg/Kg	1	5/19/2009 01:27 PM
Nickel	15	1.0		mg/Kg	1	5/19/2009 01:27 PM
Selenium	ND	1.0		mg/Kg	1	5/19/2009 01:27 PM
Silver	ND	1.0		mg/Kg	1	5/19/2009 01:27 PM
Thallium	ND	1.0		mg/Kg	1	5/19/2009 01:27 PM
Vanadium	29	1.0		mg/Kg	1	5/19/2009 01:27 PM
Zinc	44	1.0		mg/Kg	1	5/19/2009 01:27 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090519A	QC Batch: 55394				PrepDate: 5/18/2009	Analyst: **RQ**
Mercury	ND	0.10		mg/Kg	1	5/19/2009 10:55 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B48-0
Lab Order:	105533	**Collection Date:**	5/14/2009 2:27:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-041A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520F	QC Batch: 55433			PrepDate: 5/20/2009		Analyst: **CBR**
DRO	1.3	1.0		mg/Kg	1	5/21/2009 01:19 AM
ORO	7.1	1.0		mg/Kg	1	5/21/2009 01:19 AM
Surr: p-Terphenyl	92.7	30-130		%REC	1	5/21/2009 01:19 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519C	QC Batch: E09VS136			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/20/2009 03:49 AM
Surr: Bromofluorobenzene (FID)	96.1	59-145		%REC	1	5/20/2009 03:49 AM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519C	QC Batch: E09VS136			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/20/2009 03:49 AM
Ethylbenzene	ND	5.0		µg/Kg	1	5/20/2009 03:49 AM
m,p-Xylene	ND	10		µg/Kg	1	5/20/2009 03:49 AM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/20/2009 03:49 AM
o-Xylene	ND	5.0		µg/Kg	1	5/20/2009 03:49 AM
Toluene	ND	5.0		µg/Kg	1	5/20/2009 03:49 AM
Surr: Bromofluorobenzene (PID)	96.7	65-140		%REC	1	5/20/2009 03:49 AM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090521A	QC Batch: 55455			PrepDate: 5/20/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/21/2009 04:20 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/21/2009 04:20 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/21/2009 04:20 PM
Aldrin	ND	1.0		µg/Kg	1	5/21/2009 04:20 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:20 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 04:20 PM
beta-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:20 PM
Chlordane	ND	8.5		µg/Kg	1	5/21/2009 04:20 PM
delta-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:20 PM
Dieldrin	ND	2.0		µg/Kg	1	5/21/2009 04:20 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/21/2009 04:20 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/21/2009 04:20 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B48-0
Lab Order:	105533	**Collection Date:**	5/14/2009 2:27:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-041A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090521A	QC Batch: 55455				PrepDate: 5/20/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/21/2009 04:20 PM
Endrin	ND	2.0		µg/Kg	1	5/21/2009 04:20 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/21/2009 04:20 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/21/2009 04:20 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:20 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 04:20 PM
Heptachlor	ND	1.0		µg/Kg	1	5/21/2009 04:20 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/21/2009 04:20 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/21/2009 04:20 PM
Toxaphene	ND	50		µg/Kg	1	5/21/2009 04:20 PM
Surr: Decachlorobiphenyl	58.1	20-142		%REC	1	5/21/2009 04:20 PM
Surr: Tetrachloro-m-xylene	66.4	25-115		%REC	1	5/21/2009 04:20 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B49-0
Lab Order:	105533	**Collection Date:**	5/14/2009 12:50:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-043A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS						
	EPA 3050B			**EPA 6010B**		
RunID: ICP8_090522C	QC Batch: 55415			PrepDate: 5/19/2009		Analyst: **CL**
Antimony	ND	2.0		mg/Kg	1	5/22/2009 02:56 PM
Arsenic	6.7	1.0		mg/Kg	1	5/22/2009 02:56 PM
Barium	120	1.0		mg/Kg	1	5/22/2009 02:56 PM
Beryllium	ND	1.0		mg/Kg	1	5/22/2009 02:56 PM
Cadmium	ND	1.0		mg/Kg	1	5/22/2009 02:56 PM
Chromium	20	1.0		mg/Kg	1	5/22/2009 02:56 PM
Cobalt	10	1.0		mg/Kg	1	5/22/2009 02:56 PM
Copper	27	2.0		mg/Kg	1	5/22/2009 02:56 PM
Lead	9.0	1.0		mg/Kg	1	5/22/2009 02:56 PM
Molybdenum	ND	1.0		mg/Kg	1	5/22/2009 02:56 PM
Nickel	19	1.0		mg/Kg	1	5/22/2009 02:56 PM
Selenium	ND	1.0		mg/Kg	1	5/22/2009 02:56 PM
Silver	ND	1.0		mg/Kg	1	5/22/2009 02:56 PM
Thallium	ND	1.0		mg/Kg	1	5/22/2009 02:56 PM
Vanadium	44	1.0		mg/Kg	1	5/22/2009 02:56 PM
Zinc	55	1.0		mg/Kg	1	5/22/2009 02:56 PM
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
	EPA 3550B			**EPA 8015B(M)**		
RunID: GC16_090520F	QC Batch: 55433			PrepDate: 5/20/2009		Analyst: **CBR**
DRO	2.4	1.0		mg/Kg	1	5/21/2009 01:56 AM
ORO	13	1.0		mg/Kg	1	5/21/2009 01:56 AM
Surr: p-Terphenyl	84.9	30-130		%REC	1	5/21/2009 01:56 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519C	QC Batch: E09VS136			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/20/2009 04:20 AM
Surr: Bromofluorobenzene (FID)	96.0	59-145		%REC	1	5/20/2009 04:20 AM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519C	QC Batch: E09VS136			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/20/2009 04:20 AM
Ethylbenzene	ND	5.0		µg/Kg	1	5/20/2009 04:20 AM
m,p-Xylene	ND	10		µg/Kg	1	5/20/2009 04:20 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B49-0
Lab Order:	105533	**Collection Date:**	5/14/2009 12:50:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-043A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519C	QC Batch:	E09VS136		PrepDate:		Analyst: **KHN**
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/20/2009 04:20 AM
o-Xylene	ND	5.0		µg/Kg	1	5/20/2009 04:20 AM
Toluene	ND	5.0		µg/Kg	1	5/20/2009 04:20 AM
Surr: Bromofluorobenzene (PID)	97.5	65-140		%REC	1	5/20/2009 04:20 AM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
	EPA 3550B			**EPA 8081A**		
RunID: GC9_090521A	QC Batch:	55455		PrepDate:	5/20/2009	Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/21/2009 04:48 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/21/2009 04:48 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/21/2009 04:48 PM
Aldrin	ND	1.0		µg/Kg	1	5/21/2009 04:48 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:48 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 04:48 PM
beta-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:48 PM
Chlordane	ND	8.5		µg/Kg	1	5/21/2009 04:48 PM
delta-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:48 PM
Dieldrin	ND	2.0		µg/Kg	1	5/21/2009 04:48 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/21/2009 04:48 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/21/2009 04:48 PM
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/21/2009 04:48 PM
Endrin	ND	2.0		µg/Kg	1	5/21/2009 04:48 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/21/2009 04:48 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/21/2009 04:48 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/21/2009 04:48 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 04:48 PM
Heptachlor	ND	1.0		µg/Kg	1	5/21/2009 04:48 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/21/2009 04:48 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/21/2009 04:48 PM
Toxaphene	ND	50		µg/Kg	1	5/21/2009 04:48 PM
Surr: Decachlorobiphenyl	65.5	20-142		%REC	1	5/21/2009 04:48 PM
Surr: Tetrachloro-m-xylene	76.3	25-115		%REC	1	5/21/2009 04:48 PM
MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA5_090520B	QC Batch:	55413		PrepDate:	5/19/2009	Analyst: **IL**

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B49-0
Lab Order:	105533	**Collection Date:**	5/14/2009 12:50:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-043A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
MERCURY BY COLD VAPOR TECHNIQUE						
			EPA 7471A			
RunID: AA5_090520B	QC Batch: 55413			PrepDate:	5/19/2009	Analyst: **IL**
Mercury	ND	0.10		mg/Kg	1	5/20/2009 11:51 AM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B50-0
Lab Order:	105533	**Collection Date:**	5/14/2009 1:11:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-045A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090520F	QC Batch: 55433			PrepDate: 5/20/2009		Analyst: **CBR**
DRO	4.8	1.0		mg/Kg	1	5/21/2009 02:05 AM
ORO	39	1.0		mg/Kg	1	5/21/2009 02:05 AM
Surr: p-Terphenyl	72.1	30-130		%REC	1	5/21/2009 02:05 AM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B(M)		
RunID: GC2_090519C	QC Batch: E09VS136			PrepDate:		Analyst: **KHN**
GRO	ND	1.0		mg/Kg	1	5/20/2009 04:35 AM
Surr: Bromofluorobenzene (FID)	99.5	59-145		%REC	1	5/20/2009 04:35 AM
VOLATILE ORGANIC COMPOUNDS BY GC/PID						
				EPA 8021B		
RunID: GC2_090519C	QC Batch: E09VS136			PrepDate:		Analyst: **KHN**
Benzene	ND	5.0		µg/Kg	1	5/20/2009 04:35 AM
Ethylbenzene	ND	5.0		µg/Kg	1	5/20/2009 04:35 AM
m,p-Xylene	ND	10		µg/Kg	1	5/20/2009 04:35 AM
Methyl tert-butyl ether	ND	5.0		µg/Kg	1	5/20/2009 04:35 AM
o-Xylene	ND	5.0		µg/Kg	1	5/20/2009 04:35 AM
Toluene	ND	5.0		µg/Kg	1	5/20/2009 04:35 AM
Surr: Bromofluorobenzene (PID)	100	65-140		%REC	1	5/20/2009 04:35 AM
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090521A	QC Batch: 55455			PrepDate: 5/20/2009		Analyst: **HL**
4,4´-DDD	ND	2.0		µg/Kg	1	5/21/2009 05:02 PM
4,4´-DDE	ND	2.0		µg/Kg	1	5/21/2009 05:02 PM
4,4´-DDT	ND	2.0		µg/Kg	1	5/21/2009 05:02 PM
Aldrin	ND	1.0		µg/Kg	1	5/21/2009 05:02 PM
alpha-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:02 PM
alpha-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 05:02 PM
beta-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:02 PM
Chlordane	ND	8.5		µg/Kg	1	5/21/2009 05:02 PM
delta-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:02 PM
Dieldrin	ND	2.0		µg/Kg	1	5/21/2009 05:02 PM
Endosulfan I	ND	1.0		µg/Kg	1	5/21/2009 05:02 PM
Endosulfan II	ND	2.0		µg/Kg	1	5/21/2009 05:02 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B50-0
Lab Order:	105533	**Collection Date:**	5/14/2009 1:11:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-045A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES BY GC/ECD						
EPA 3550B				**EPA 8081A**		
RunID: GC9_090521A	QC Batch: 55455				PrepDate: 5/20/2009	Analyst: **HL**
Endosulfan sulfate	ND	2.0		µg/Kg	1	5/21/2009 05:02 PM
Endrin	ND	2.0		µg/Kg	1	5/21/2009 05:02 PM
Endrin aldehyde	ND	2.0		µg/Kg	1	5/21/2009 05:02 PM
Endrin ketone	ND	2.0		µg/Kg	1	5/21/2009 05:02 PM
gamma-BHC	ND	1.0		µg/Kg	1	5/21/2009 05:02 PM
gamma-Chlordane	ND	1.0		µg/Kg	1	5/21/2009 05:02 PM
Heptachlor	ND	1.0		µg/Kg	1	5/21/2009 05:02 PM
Heptachlor epoxide	ND	1.0		µg/Kg	1	5/21/2009 05:02 PM
Methoxychlor	ND	5.0		µg/Kg	1	5/21/2009 05:02 PM
Toxaphene	ND	50		µg/Kg	1	5/21/2009 05:02 PM
Surr: Decachlorobiphenyl	65.6	20-142		%REC	1	5/21/2009 05:02 PM
Surr: Tetrachloro-m-xylene	74.4	25-115		%REC	1	5/21/2009 05:02 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *26-May-09*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	B50-1.5
Lab Order:	105533	**Collection Date:**	5/14/2009 1:14:00 PM
Project:	Jameson Canyon, E8481-06-01	**Matrix:**	SOIL
Lab ID:	105533-046A		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
PH						
				EPA 9045C		
RunID: WETCHEM_090521A	QC Batch: R109220			PrepDate:		Analyst: **DDL**
pH	7.2	0.10		pH Units	1	5/21/2009

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **MB-55398** SampType: **MBLK** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109140**
Client ID: **PBS** Batch ID: **55398** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713674**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	2.0									
Arsenic	ND	1.0									
Barium	ND	1.0									
Beryllium	ND	1.0									
Cadmium	0.017	1.0									
Chromium	0.117	1.0									
Cobalt	ND	1.0									
Copper	ND	2.0									
Lead	ND	1.0									
Molybdenum	ND	1.0									
Nickel	ND	1.0									
Selenium	ND	1.0									
Silver	ND	1.0									
Thallium	ND	1.0									
Vanadium	ND	1.0									
Zinc	0.306	1.0									

Sample ID: **LCS-55398** SampType: **LCS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109140**
Client ID: **LCSS** Batch ID: **55398** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713675**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	49.071	2.0	50.00	0	98.1	80	120				
Arsenic	48.868	1.0	50.00	0	97.7	80	120				
Barium	52.474	1.0	50.00	0	105	80	120				
Beryllium	50.311	1.0	50.00	0	101	80	120				
Cadmium	50.234	1.0	50.00	0.01689	100	80	120				
Chromium	48.370	1.0	50.00	0.1166	96.5	80	120				
Cobalt	52.072	1.0	50.00	0	104	80	120				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **LCS-55398** SampType: **LCS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109140**
Client ID: **LCSS** Batch ID: **55398** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713675**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	52.824	2.0	50.00	0	106	80	120				
Lead	51.713	1.0	50.00	0	103	80	120				
Molybdenum	52.680	1.0	50.00	0	105	80	120				
Nickel	50.076	1.0	50.00	0	100	80	120				
Selenium	47.769	1.0	50.00	0	95.5	80	120				
Silver	51.066	1.0	50.00	0	102	80	120				
Thallium	45.126	1.0	50.00	0	90.3	80	120				
Vanadium	52.757	1.0	50.00	0	106	80	120				
Zinc	49.741	1.0	50.00	0.3057	98.9	80	120				

Sample ID: **105533-038ADUP** SampType: **DUP** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109140**
Client ID: **B39-1.5** Batch ID: **55398** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713681**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	0.313	2.0						0.3475	0	20	
Arsenic	5.737	1.0						6.207	7.87	20	
Barium	294.355	1.0						306.9	4.19	20	
Beryllium	0.569	1.0						0.6058	0	20	
Cadmium	0.605	1.0						0.6484	0	20	
Chromium	11.290	1.0						12.57	10.7	20	
Cobalt	9.801	1.0						9.192	6.41	20	
Copper	28.287	2.0						30.69	8.15	20	
Lead	14.255	1.0						16.86	16.8	20	
Molybdenum	ND	1.0						0	0	20	
Nickel	16.699	1.0						16.98	1.68	20	
Selenium	ND	1.0						0	0	20	
Silver	ND	1.0						0	0	20	
Thallium	ND	1.0						0	0	20	
Vanadium	35.546	1.0						39.07	9.44	20	
Zinc	46.833	1.0						50.90	8.32	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **105533-038AMS** SampType: **MS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109140**
Client ID: **B39-1.5** Batch ID: **55398** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713682**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	82.869	2.0	125.0	0.3475	66.0	25	106				
Arsenic	103.980	1.0	125.0	6.207	78.2	42	113				
Barium	412.383	1.0	125.0	306.9	84.4	19	140				
Beryllium	101.346	1.0	125.0	0.6058	80.6	50	109				
Cadmium	96.858	1.0	125.0	0.6484	77.0	48	106				
Chromium	111.779	1.0	125.0	12.57	79.4	44	116				
Cobalt	106.985	1.0	125.0	9.192	78.2	47	107				
Copper	144.124	2.0	125.0	30.69	90.7	49	124				
Lead	110.194	1.0	125.0	16.86	74.7	33	120				
Molybdenum	97.749	1.0	125.0	0	78.2	46	111				
Nickel	116.610	1.0	125.0	16.98	79.7	43	111				
Selenium	95.154	1.0	125.0	0	76.1	43	104				
Silver	104.270	1.0	125.0	0	83.4	53	114				
Thallium	88.762	1.0	125.0	0	71.0	41	107				
Vanadium	150.030	1.0	125.0	39.07	88.8	48	116				
Zinc	149.349	1.0	125.0	50.90	78.8	24	129				

Sample ID: **105533-038AMSD** SampType: **MSD** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109140**
Client ID: **B39-1.5** Batch ID: **55398** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713683**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	78.763	2.0	125.0	0.3475	62.7	25	106	82.87	5.08	20	
Arsenic	103.709	1.0	125.0	6.207	78.0	42	113	104.0	0.261	20	
Barium	428.252	1.0	125.0	306.9	97.0	19	140	412.4	3.78	20	
Beryllium	100.726	1.0	125.0	0.6058	80.1	50	109	101.3	0.613	20	
Cadmium	95.799	1.0	125.0	0.6484	76.1	48	106	96.86	1.10	20	
Chromium	116.489	1.0	125.0	12.57	83.1	44	116	111.8	4.13	20	
Cobalt	106.260	1.0	125.0	9.192	77.7	47	107	107.0	0.679	20	
Copper	145.300	2.0	125.0	30.69	91.7	49	124	144.1	0.812	20	
Lead	112.915	1.0	125.0	16.86	76.8	33	120	110.2	2.44	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **105533-038AMSD** SampType: **MSD** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109140**
Client ID: **B39-1.5** Batch ID: **55398** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/19/2009** SeqNo: **1713683**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	96.703	1.0	125.0	0	77.4	46	111	97.75	1.08	20	
Nickel	117.495	1.0	125.0	16.98	80.4	43	111	116.6	0.756	20	
Selenium	93.998	1.0	125.0	0	75.2	43	104	95.15	1.22	20	
Silver	104.261	1.0	125.0	0	83.4	53	114	104.3	0.00949	20	
Thallium	87.749	1.0	125.0	0	70.2	41	107	88.76	1.15	20	
Vanadium	158.079	1.0	125.0	39.07	95.2	48	116	150.0	5.22	20	
Zinc	152.725	1.0	125.0	50.90	81.5	24	129	149.3	2.24	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **MB-55415** SampType: **MBLK** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109255**
Client ID: **PBS** Batch ID: **55415** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/22/2009** SeqNo: **1715937**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	2.0									
Arsenic	ND	1.0									
Barium	ND	1.0									
Beryllium	ND	1.0									
Cadmium	0.037	1.0									
Chromium	0.170	1.0									
Cobalt	ND	1.0									
Copper	ND	2.0									
Lead	0.274	1.0									
Molybdenum	ND	1.0									
Nickel	0.080	1.0									
Selenium	ND	1.0									
Silver	0.148	1.0									
Thallium	0.367	1.0									
Vanadium	ND	1.0									
Zinc	0.198	1.0									

Sample ID: **LCS-55415** SampType: **LCS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109255**
Client ID: **LCSS** Batch ID: **55415** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/22/2009** SeqNo: **1715938**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	49.467	2.0	50.00	0	98.9	80	120				
Arsenic	49.099	1.0	50.00	0	98.2	80	120				
Barium	51.871	1.0	50.00	0	104	80	120				
Beryllium	50.261	1.0	50.00	0	101	80	120				
Cadmium	49.473	1.0	50.00	0.03724	98.9	80	120				
Chromium	47.890	1.0	50.00	0.1697	95.4	80	120				
Cobalt	51.339	1.0	50.00	0	103	80	120				
Copper	52.549	2.0	50.00	0	105	80	120				
Lead	51.906	1.0	50.00	0.2739	103	80	120				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **LCS-55415** SampType: **LCS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109255**
Client ID: **LCSS** Batch ID: **55415** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/22/2009** SeqNo: **1715938**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	52.742	1.0	50.00	0	105	80	120				
Nickel	49.299	1.0	50.00	0.07953	98.4	80	120				
Selenium	46.670	1.0	50.00	0	93.3	80	120				
Silver	48.870	1.0	50.00	0.1479	97.4	80	120				
Thallium	46.051	1.0	50.00	0.3670	91.4	80	120				
Vanadium	52.134	1.0	50.00	0	104	80	120				
Zinc	48.746	1.0	50.00	0.1980	97.1	80	120				

Sample ID: **105533-033A** SampType: **DUP** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109255**
Client ID: **B37-0** Batch ID: **55415** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/22/2009** SeqNo: **1715944**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	0.380	2.0						0.3090	0	20	
Arsenic	4.381	1.0						4.482	2.28	20	
Barium	147.296	1.0						146.3	0.653	20	
Beryllium	0.208	1.0						0.1982	0	20	
Cadmium	0.528	1.0						0.5289	0	20	
Chromium	13.833	1.0						13.71	0.930	20	
Cobalt	7.662	1.0						7.460	2.66	20	
Copper	21.569	2.0						21.89	1.47	20	
Lead	19.965	1.0						20.12	0.747	20	
Molybdenum	ND	1.0						0	0	20	
Nickel	12.957	1.0						12.71	1.92	20	
Selenium	ND	1.0						0	0	20	
Silver	ND	1.0						0	0	20	
Thallium	ND	1.0						0	0	20	
Vanadium	30.353	1.0						29.93	1.41	20	
Zinc	73.664	1.0						73.39	0.379	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **105533-033AMS** SampType: **MS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109255**
Client ID: **B37-0** Batch ID: **55415** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/22/2009** SeqNo: **1715945**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	75.638	2.0	125.0	0.3090	60.3	25	106				
Arsenic	101.869	1.0	125.0	4.482	77.9	42	113				
Barium	251.177	1.0	125.0	146.3	83.9	19	140				
Beryllium	101.283	1.0	125.0	0.1982	80.9	50	109				
Cadmium	96.474	1.0	125.0	0.5289	76.8	48	106				
Chromium	111.424	1.0	125.0	13.71	78.2	44	116				
Cobalt	107.153	1.0	125.0	7.460	79.8	47	107				
Copper	133.382	2.0	125.0	21.89	89.2	49	124				
Lead	118.467	1.0	125.0	20.12	78.7	33	120				
Molybdenum	100.968	1.0	125.0	0	80.8	46	111				
Nickel	111.636	1.0	125.0	12.71	79.1	43	111				
Selenium	95.920	1.0	125.0	0	76.7	43	104				
Silver	103.077	1.0	125.0	0	82.5	53	114				
Thallium	90.055	1.0	125.0	0	72.0	41	107				
Vanadium	134.550	1.0	125.0	29.93	83.7	48	116				
Zinc	168.163	1.0	125.0	73.39	75.8	24	129				

Sample ID: **105533-033AMSD** SampType: **MSD** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109255**
Client ID: **B37-0** Batch ID: **55415** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/22/2009** SeqNo: **1715946**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	80.472	2.0	125.0	0.3090	64.1	25	106	75.64	6.19	20	
Arsenic	105.193	1.0	125.0	4.482	80.6	42	113	101.9	3.21	20	
Barium	251.640	1.0	125.0	146.3	84.2	19	140	251.2	0.184	20	
Beryllium	105.421	1.0	125.0	0.1982	84.2	50	109	101.3	4.00	20	
Cadmium	100.820	1.0	125.0	0.5289	80.2	48	106	96.47	4.41	20	
Chromium	115.750	1.0	125.0	13.71	81.6	44	116	111.4	3.81	20	
Cobalt	111.410	1.0	125.0	7.460	83.2	47	107	107.2	3.90	20	
Copper	138.134	2.0	125.0	21.89	93.0	49	124	133.4	3.50	20	
Lead	122.122	1.0	125.0	20.12	81.6	33	120	118.5	3.04	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **105533-033AMSD** SampType: **MSD** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109255**
Client ID: **B37-0** Batch ID: **55415** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **5/22/2009** SeqNo: **1715946**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	104.676	1.0	125.0	0	83.7	46	111	101.0	3.61	20	
Nickel	116.204	1.0	125.0	12.71	82.8	43	111	111.6	4.01	20	
Selenium	98.817	1.0	125.0	0	79.1	43	104	95.92	2.97	20	
Silver	107.533	1.0	125.0	0	86.0	53	114	103.1	4.23	20	
Thallium	93.317	1.0	125.0	0	74.7	41	107	90.06	3.56	20	
Vanadium	138.893	1.0	125.0	29.93	87.2	48	116	134.6	3.18	20	
Zinc	172.893	1.0	125.0	73.39	79.6	24	129	168.2	2.77	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 7471_S

Sample ID: **MB-55390** SampType: **MBLK** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109137**
Client ID: **PBS** Batch ID: **55390** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713628**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.10									

Sample ID: **LCS-55390** SampType: **LCS** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109137**
Client ID: **LCSS** Batch ID: **55390** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713629**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.987	0.10	0.8300	0	119	80	120				

Sample ID: **105533-038A-MS** SampType: **MS** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109137**
Client ID: **B39-1.5** Batch ID: **55390** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713630**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.955	0.10	0.8300	0.08542	105	70	130				

Sample ID: **105533-038A-MSD** SampType: **MSD** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109137**
Client ID: **B39-1.5** Batch ID: **55390** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713631**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.943	0.10	0.8300	0.08542	103	70	130	0.9550	1.22	20	

Sample ID: **105533-038A-DUP** SampType: **DUP** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109137**
Client ID: **B39-1.5** Batch ID: **55390** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713632**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.083	0.10						0.08542	0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 7471_S

Sample ID: **MB-55394** SampType: **MBLK** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109132**
Client ID: **PBS** Batch ID: **55394** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713524**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.10									

Sample ID: **LCS-55394** SampType: **LCS** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109132**
Client ID: **LCSS** Batch ID: **55394** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713525**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.793	0.10	0.8300	0	95.5	80	120				

Sample ID: **105522-002A-MS** SampType: **MS** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109132**
Client ID: **ZZZZZZ** Batch ID: **55394** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713526**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.872	0.10	0.8300	0	105	70	130				

Sample ID: **105522-002A-MSD** SampType: **MSD** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109132**
Client ID: **ZZZZZZ** Batch ID: **55394** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713527**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.914	0.10	0.8300	0	110	70	130	0.8715	4.81	20	

Sample ID: **105522-002A-DUP** SampType: **DUP** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/18/2009** RunNo: **109132**
Client ID: **ZZZZZZ** Batch ID: **55394** TestNo: **EPA 7471A** Analysis Date: **5/19/2009** SeqNo: **1713528**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.10						0	0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
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DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 7471_S

Sample ID: **MB-55413** SampType: **MBLK** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109163**
Client ID: **PBS** Batch ID: **55413** TestNo: **EPA 7471A** Analysis Date: **5/20/2009** SeqNo: **1714155**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.10									

Sample ID: **LCS-55413** SampType: **LCS** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109163**
Client ID: **LCSS** Batch ID: **55413** TestNo: **EPA 7471A** Analysis Date: **5/20/2009** SeqNo: **1714156**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.827	0.10	0.8300	0	99.7	80	120				

Sample ID: **105539-002A-MS** SampType: **MS** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109163**
Client ID: **ZZZZZZ** Batch ID: **55413** TestNo: **EPA 7471A** Analysis Date: **5/20/2009** SeqNo: **1714157**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.848	0.10	0.8300	0	102	70	130				

Sample ID: **105539-002A-MSD** SampType: **MSD** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109163**
Client ID: **ZZZZZZ** Batch ID: **55413** TestNo: **EPA 7471A** Analysis Date: **5/20/2009** SeqNo: **1714158**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.869	0.10	0.8300	0	105	70	130	0.8477	2.48	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **MB-55419** SampType: **MBLK** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109254**
Client ID: **PBS** Batch ID: **55419** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715902**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0									
ORO	ND	1.0									
Surr: p-Terphenyl	2.359		2.670		88.4	30	130				

Sample ID: **LCS-55419** SampType: **LCS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109254**
Client ID: **LCSS** Batch ID: **55419** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715903**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	21.481	1.0	33.00	0	65.1	35	124				
Surr: p-Terphenyl	2.377		2.670		89.0	30	130				

Sample ID: **105533-017ADUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109254**
Client ID: **B29-0** Batch ID: **55419** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715911**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	6.900	1.0						9.899	35.7	20	R
ORO	36.866	1.0						51.74	33.6	20	R
Surr: p-Terphenyl	1.477		2.670		55.3	30	130		0	0	

Sample ID: **105533-015AMS** SampType: **MS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109254**
Client ID: **B28-0** Batch ID: **55419** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715912**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	37.766	1.0	33.00	12.17	77.6	12	125				
Surr: p-Terphenyl	2.076		2.670		77.8	30	130				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **105533-015AMSD** SampType: **MSD** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109254**
Client ID: **B28-0** Batch ID: **55419** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715913**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	41.466	1.0	33.00	12.17	88.8	12	125	37.77	9.34	20	
Surr: p-Terphenyl	1.954		2.670		73.2	30	130		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **LCS-55420** SampType: **LCS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109236**
Client ID: **LCSS** Batch ID: **55420** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715538**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	22.470	1.0	33.00	0	68.1	35	124				
Surr: p-Terphenyl	2.322		2.670		87.0	30	130				

Sample ID: **105533-035AMS** SampType: **MS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109236**
Client ID: **B38-0** Batch ID: **55420** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715544**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	19.823	1.0	33.00	2.279	53.2	12	125				
Surr: p-Terphenyl	1.647		2.670		61.7	30	130				

Sample ID: **105533-035AMSD** SampType: **MSD** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109236**
Client ID: **B38-0** Batch ID: **55420** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715545**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	19.825	1.0	33.00	2.279	53.2	12	125	19.82	0.00841	20	
Surr: p-Terphenyl	2.037		2.670		76.3	30	130		0	0	

Sample ID: **105533-035ADUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109236**
Client ID: **B38-0** Batch ID: **55420** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715546**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	2.742	1.0						2.279	18.4	20	
ORO	17.101	1.0						17.84	4.21	20	
Surr: p-Terphenyl	1.883		2.670		70.5	30	130		0	0	

Sample ID: **MB-55420** SampType: **MBLK** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109236**
Client ID: **PBS** Batch ID: **55420** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715553**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **MB-55420** SampType: **MBLK** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/19/2009** RunNo: **109236**
Client ID: **PBS** Batch ID: **55420** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715553**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0									
ORO	ND	1.0									
Surr: p-Terphenyl	2.284		2.670		85.6	30	130				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **MB-55433** SampType: **MBLK** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/20/2009** RunNo: **109235**
Client ID: **PBS** Batch ID: **55433** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715526**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0									
ORO	ND	1.0									
Surr: p-Terphenyl	2.887		2.670		108	30	130				

Sample ID: **LCS-55433** SampType: **LCS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/20/2009** RunNo: **109235**
Client ID: **LCSS** Batch ID: **55433** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715527**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	21.733	1.0	33.00	0	65.9	35	124				
Surr: p-Terphenyl	2.153		2.670		80.6	30	130				

Sample ID: **105533-041AMS** SampType: **MS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/20/2009** RunNo: **109235**
Client ID: **B48-0** Batch ID: **55433** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715533**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	28.788	1.0	33.00	1.278	83.4	12	125				
Surr: p-Terphenyl	2.365		2.670		88.6	30	130				

Sample ID: **105533-041AMSD** SampType: **MSD** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/20/2009** RunNo: **109235**
Client ID: **B48-0** Batch ID: **55433** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715534**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	26.055	1.0	33.00	1.278	75.1	12	125	28.79	9.97	20	
Surr: p-Terphenyl	2.372		2.670		88.8	30	130		0	0	

Sample ID: **105533-041ADUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/20/2009** RunNo: **109235**
Client ID: **B48-0** Batch ID: **55433** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715535**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **105533-041ADUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/20/2009** RunNo: **109235**
Client ID: **B48-0** Batch ID: **55433** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715535**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	1.614	1.0						1.278	23.3	20	R
ORO	9.611	1.0						7.109	29.9	20	R
Surr: p-Terphenyl	2.285		2.670		85.6	30	130		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **E090519LCS1** SampType: **LCS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109153**
Client ID: **LCSS** Batch ID: **E09VS134** TestNo: **EPA 8015B(M** Analysis Date: **5/19/2009** SeqNo: **1713913**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	4.362	1.0	5.000	0	87.2	73	120				
Surr: Bromofluorobenzene (FID)	96.651		100.0		96.7	59	145				

Sample ID: **105533-001AMS** SampType: **MS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109153**
Client ID: **B21-0** Batch ID: **E09VS134** TestNo: **EPA 8015B(M** Analysis Date: **5/19/2009** SeqNo: **1713914**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	3.870	1.0	5.000	0	77.4	39	135				
Surr: Bromofluorobenzene (FID)	96.365		100.0		96.4	59	145				

Sample ID: **105533-001AMSD** SampType: **MSD** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109153**
Client ID: **B21-0** Batch ID: **E09VS134** TestNo: **EPA 8015B(M** Analysis Date: **5/19/2009** SeqNo: **1713915**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	3.946	1.0	5.000	0	78.9	39	135	3.870	1.94	20	
Surr: Bromofluorobenzene (FID)	96.638		100.0		96.6	59	145		0	0	

Sample ID: **E090519MB1** SampType: **MBLK** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109153**
Client ID: **PBS** Batch ID: **E09VS134** TestNo: **EPA 8015B(M** Analysis Date: **5/19/2009** SeqNo: **1713916**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0									
Surr: Bromofluorobenzene (FID)	100.033		100.0		100	59	145				

Sample ID: **105533-001ADUP** SampType: **DUP** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109153**
Client ID: **B21-0** Batch ID: **E09VS134** TestNo: **EPA 8015B(M** Analysis Date: **5/19/2009** SeqNo: **1713918**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0						0	0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **105533-001ADUP** SampType: **DUP** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109153**
Client ID: **B21-0** Batch ID: **E09VS134** TestNo: **EPA 8015B(M** Analysis Date: **5/19/2009** SeqNo: **1713918**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Bromofluorobenzene (FID)	92.411		100.0		92.4	59	145		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **E090519LCS3** SampType: **LCS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109157**
Client ID: **LCSS** Batch ID: **E09VS135** TestNo: **EPA 8015B(M** Analysis Date: **5/19/2009** SeqNo: **1714029**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	4.200	1.0	5.000	0	84.0	73	120				
Surr: Bromofluorobenzene (FID)	94.651		100.0		94.7	59	145				

Sample ID: **105533-021AMS** SampType: **MS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109157**
Client ID: **B31-0** Batch ID: **E09VS135** TestNo: **EPA 8015B(M** Analysis Date: **5/19/2009** SeqNo: **1714030**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	3.056	1.0	5.000	0	61.1	39	135				
Surr: Bromofluorobenzene (FID)	94.734		100.0		94.7	59	145				

Sample ID: **105533-021AMSD** SampType: **MSD** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109157**
Client ID: **B31-0** Batch ID: **E09VS135** TestNo: **EPA 8015B(M** Analysis Date: **5/19/2009** SeqNo: **1714031**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	3.180	1.0	5.000	0	63.6	39	135	3.056	3.98	20	
Surr: Bromofluorobenzene (FID)	92.114		100.0		92.1	59	145		0	0	

Sample ID: **E050519MB2** SampType: **MBLK** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109157**
Client ID: **PBS** Batch ID: **E09VS135** TestNo: **EPA 8015B(M** Analysis Date: **5/19/2009** SeqNo: **1714032**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0									
Surr: Bromofluorobenzene (FID)	96.672		100.0		96.7	59	145				

Sample ID: **105533-021ADUP** SampType: **DUP** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109157**
Client ID: **B31-0** Batch ID: **E09VS135** TestNo: **EPA 8015B(M** Analysis Date: **5/19/2009** SeqNo: **1714034**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0						0	0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **105533-021ADUP** SampType: **DUP** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109157**
Client ID: **B31-0** Batch ID: **E09VS135** TestNo: **EPA 8015B(M** Analysis Date: **5/19/2009** SeqNo: **1714034**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Bromofluorobenzene (FID)	87.124		100.0		87.1	59	145		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **E090519LCS5** SampType: **LCS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109158**
Client ID: **LCSS** Batch ID: **E09VS136** TestNo: **EPA 8015B(M** Analysis Date: **5/20/2009** SeqNo: **1714075**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	4.046	1.0	5.000	0	80.9	73	120				
Surr: Bromofluorobenzene (FID)	94.763		100.0		94.8	59	145				

Sample ID: **105546-041AMS** SampType: **MS** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109158**
Client ID: **ZZZZZZ** Batch ID: **E09VS136** TestNo: **EPA 8015B(M** Analysis Date: **5/20/2009** SeqNo: **1714076**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	3.353	1.0	5.000	0	67.1	39	135				
Surr: Bromofluorobenzene (FID)	96.452		100.0		96.5	59	145				

Sample ID: **105546-041AMSD** SampType: **MSD** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109158**
Client ID: **ZZZZZZ** Batch ID: **E09VS136** TestNo: **EPA 8015B(M** Analysis Date: **5/20/2009** SeqNo: **1714077**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	3.527	1.0	5.000	0	70.5	39	135	3.353	5.06	20	
Surr: Bromofluorobenzene (FID)	99.730		100.0		99.7	59	145		0	0	

Sample ID: **E090519MB3** SampType: **MBLK** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109158**
Client ID: **PBS** Batch ID: **E09VS136** TestNo: **EPA 8015B(M** Analysis Date: **5/20/2009** SeqNo: **1714078**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0									
Surr: Bromofluorobenzene (FID)	97.532		100.0		97.5	59	145				

Sample ID: **105533-041ADUP** SampType: **DUP** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109158**
Client ID: **B48-0** Batch ID: **E09VS136** TestNo: **EPA 8015B(M** Analysis Date: **5/20/2009** SeqNo: **1714080**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0						0	0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_GAS

Sample ID: **105533-041ADUP** SampType: **DUP** TestCode: **8015_S_GAS** Units: **mg/Kg** Prep Date: RunNo: **109158**
Client ID: **B48-0** Batch ID: **E09VS136** TestNo: **EPA 8015B(M** Analysis Date: **5/20/2009** SeqNo: **1714080**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Bromofluorobenzene (FID)	101.958		100.0		102	59	145		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **E090519LCS2** SampType: **LCS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109153**
Client ID: **LCSS** Batch ID: **E09VS134** TestNo: **EPA 8021B** Analysis Date: **5/19/2009** SeqNo: **1713928**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	110.351	5.0	100.0	0	110	80	121				
Ethylbenzene	112.229	5.0	100.0	0	112	84	120				
m,p-Xylene	229.116	10	200.0	0	115	84	122				
Methyl tert-butyl ether	102.109	5.0	100.0	0	102	66	128				
o-Xylene	113.915	5.0	100.0	0	114	84	123				
Toluene	113.095	5.0	100.0	0	113	84	120				
Surr: Bromofluorobenzene (PID)	101.926		100.0		102	65	140				

Sample ID: **105533-001AMS** SampType: **MS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109153**
Client ID: **B21-0** Batch ID: **E09VS134** TestNo: **EPA 8021B** Analysis Date: **5/19/2009** SeqNo: **1713929**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	28.996	5.0	35.75	0	81.1	22	132				
Ethylbenzene	36.495	5.0	49.65	0	73.5	15	133				
m,p-Xylene	146.822	10	199.6	0	73.6	30	118				
Methyl tert-butyl ether	531.948	5.0	578.9	0	91.9	38	136				
o-Xylene	55.022	5.0	78.40	0	70.2	21	119				
Toluene	141.596	5.0	172.2	0	82.2	36	129				
Xylenes, Total	201.844	15	278.0	0	72.6	70	130				
Surr: Bromofluorobenzene (PID)	102.815		100.0		103	65	140				

Sample ID: **105533-001AMSD** SampType: **MSD** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109153**
Client ID: **B21-0** Batch ID: **E09VS134** TestNo: **EPA 8021B** Analysis Date: **5/19/2009** SeqNo: **1713930**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	30.024	5.0	35.75	0	84.0	22	132	29.00	3.48	20	
Ethylbenzene	37.288	5.0	49.65	0	75.1	15	133	36.50	2.15	20	
m,p-Xylene	150.532	10	199.6	0	75.4	30	118	146.8	2.50	20	
Methyl tert-butyl ether	542.342	5.0	578.9	0	93.7	38	136	531.9	1.94	20	
o-Xylene	56.167	5.0	78.40	0	71.6	21	119	55.02	2.06	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **105533-001AMSD** SampType: **MSD** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109153**
Client ID: **B21-0** Batch ID: **E09VS134** TestNo: **EPA 8021B** Analysis Date: **5/19/2009** SeqNo: **1713930**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toluene	145.402	5.0	172.2	0	84.4	36	129	141.6	2.65	20	
Xylenes, Total	206.699	15	278.0	0	74.4	70	130	201.8	2.38	20	
Surr: Bromofluorobenzene (PID)	103.119		100.0		103	65	140		0	20	

Sample ID: **E090519MB1** SampType: **MBLK** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109153**
Client ID: **PBS** Batch ID: **E09VS134** TestNo: **EPA 8021B** Analysis Date: **5/19/2009** SeqNo: **1713931**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0									
Ethylbenzene	ND	5.0									
m,p-Xylene	ND	10									
Methyl tert-butyl ether	ND	5.0									
o-Xylene	ND	5.0									
Toluene	ND	5.0									
Surr: Bromofluorobenzene (PID)	100.867		100.0		101	65	140				

Sample ID: **105533-001ADUP** SampType: **DUP** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109153**
Client ID: **B21-0** Batch ID: **E09VS134** TestNo: **EPA 8021B** Analysis Date: **5/19/2009** SeqNo: **1713933**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0						0	0	20	
Ethylbenzene	ND	5.0						0	0	20	
m,p-Xylene	ND	10						0	0	20	
Methyl tert-butyl ether	ND	5.0						0	0	20	
o-Xylene	ND	5.0						0	0	20	
Toluene	ND	5.0						0	0	20	
Xylenes, Total	ND	15						0	0	20	
Surr: Bromofluorobenzene (PID)	92.444		100.0		92.4	65	140		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **E090519LCS4** SampType: **LCS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109157**
Client ID: **LCSS** Batch ID: **E09VS135** TestNo: **EPA 8021B** Analysis Date: **5/19/2009** SeqNo: **1714044**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	99.241	5.0	100.0	0	99.2	80	121				
Ethylbenzene	98.688	5.0	100.0	0	98.7	84	120				
m,p-Xylene	200.914	10	200.0	0	100	84	122				
Methyl tert-butyl ether	91.761	5.0	100.0	0	91.8	66	128				
o-Xylene	100.618	5.0	100.0	0	101	84	123				
Toluene	99.923	5.0	100.0	0	99.9	84	120				
Surr: Bromofluorobenzene (PID)	89.976		100.0		90.0	65	140				

Sample ID: **105533-021AMS** SampType: **MS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109157**
Client ID: **B31-0** Batch ID: **E09VS135** TestNo: **EPA 8021B** Analysis Date: **5/19/2009** SeqNo: **1714045**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	25.216	5.0	35.75	0	70.5	22	132				
Ethylbenzene	29.339	5.0	49.65	0	59.1	15	133				
m,p-Xylene	121.601	10	199.6	0	60.9	30	118				
Methyl tert-butyl ether	461.215	5.0	578.9	0	79.7	38	136				
o-Xylene	43.935	5.0	78.40	0	56.0	21	119				
Toluene	115.569	5.0	172.2	0	67.1	36	129				
Surr: Bromofluorobenzene (PID)	100.340		100.0		100	65	140				

Sample ID: **105533-021AMSD** SampType: **MSD** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109157**
Client ID: **B31-0** Batch ID: **E09VS135** TestNo: **EPA 8021B** Analysis Date: **5/19/2009** SeqNo: **1714046**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	26.197	5.0	35.75	0	73.3	22	132	25.22	3.82	20	
Ethylbenzene	29.263	5.0	49.65	0	58.9	15	133	29.34	0.259	20	
m,p-Xylene	115.722	10	199.6	0	58.0	30	118	121.6	4.95	20	
Methyl tert-butyl ether	509.182	5.0	578.9	0	88.0	38	136	461.2	9.89	20	
o-Xylene	42.894	5.0	78.40	0	54.7	21	119	43.94	2.40	20	
Toluene	116.176	5.0	172.2	0	67.4	36	129	115.6	0.524	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **105533-021AMSD** SampType: **MSD** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109157**
Client ID: **B31-0** Batch ID: **E09VS135** TestNo: **EPA 8021B** Analysis Date: **5/19/2009** SeqNo: **1714046**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Bromofluorobenzene (PID)	97.662		100.0		97.7	65	140		0	20	

Sample ID: **E050519MB2** SampType: **MBLK** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109157**
Client ID: **PBS** Batch ID: **E09VS135** TestNo: **EPA 8021B** Analysis Date: **5/19/2009** SeqNo: **1714047**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0									
Ethylbenzene	ND	5.0									
m,p-Xylene	ND	10									
Methyl tert-butyl ether	ND	5.0									
o-Xylene	ND	5.0									
Toluene	ND	5.0									
Surr: Bromofluorobenzene (PID)	97.824		100.0		97.8	65	140				

Sample ID: **105533-021ADUP** SampType: **DUP** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109157**
Client ID: **B31-0** Batch ID: **E09VS135** TestNo: **EPA 8021B** Analysis Date: **5/19/2009** SeqNo: **1714049**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0						0	0	20	
Ethylbenzene	ND	5.0						0	0	20	
m,p-Xylene	ND	10						0	0	20	
Methyl tert-butyl ether	ND	5.0						0	0	20	
o-Xylene	ND	5.0						0	0	20	
Toluene	ND	5.0						0	0	20	
Xylenes, Total	ND	15						0	0	20	
Surr: Bromofluorobenzene (PID)	88.177		100.0		88.2	65	140		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **E090519LCS6** SampType: **LCS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109158**
Client ID: **LCSS** Batch ID: **E09VS136** TestNo: **EPA 8021B** Analysis Date: **5/20/2009** SeqNo: **1714083**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	105.365	5.0	100.0	0	105	80	121				
Ethylbenzene	102.497	5.0	100.0	0	102	84	120				
m,p-Xylene	207.175	10	200.0	0	104	84	122				
Methyl tert-butyl ether	98.344	5.0	100.0	0	98.3	66	128				
o-Xylene	105.388	5.0	100.0	0	105	84	123				
Toluene	105.564	5.0	100.0	0	106	84	120				
Surr: Bromofluorobenzene (PID)	98.294		100.0		98.3	65	140				

Sample ID: **105533-041AMS** SampType: **MS** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109158**
Client ID: **B48-0** Batch ID: **E09VS136** TestNo: **EPA 8021B** Analysis Date: **5/20/2009** SeqNo: **1714084**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	27.195	5.0	35.75	0	76.1	22	132				
Ethylbenzene	32.191	5.0	49.65	0	64.8	15	133				
m,p-Xylene	133.697	10	199.6	0	67.0	30	118				
Methyl tert-butyl ether	466.162	5.0	578.9	0	80.5	38	136				
o-Xylene	48.729	5.0	78.40	0	62.2	21	119				
Toluene	125.029	5.0	172.2	0	72.6	36	129				
Surr: Bromofluorobenzene (PID)	102.885		100.0		103	65	140				

Sample ID: **105533-041AMSD** SampType: **MSD** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109158**
Client ID: **B48-0** Batch ID: **E09VS136** TestNo: **EPA 8021B** Analysis Date: **5/20/2009** SeqNo: **1714085**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	26.525	5.0	35.75	0	74.2	22	132	27.20	2.49	20	
Ethylbenzene	33.269	5.0	49.65	0	67.0	15	133	32.19	3.29	20	
m,p-Xylene	132.612	10	199.6	0	66.5	30	118	133.7	0.815	20	
Methyl tert-butyl ether	472.518	5.0	578.9	0	81.6	38	136	466.2	1.35	20	
o-Xylene	50.126	5.0	78.40	0	63.9	21	119	48.73	2.83	20	
Toluene	128.625	5.0	172.2	0	74.7	36	129	125.0	2.84	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8021_S_BTEX

Sample ID: **105533-041AMSD** SampType: **MSD** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109158**
Client ID: **B48-0** Batch ID: **E09VS136** TestNo: **EPA 8021B** Analysis Date: **5/20/2009** SeqNo: **1714085**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Bromofluorobenzene (PID)	105.872		100.0		106	65	140		0	20	

Sample ID: **E090519MB3** SampType: **MBLK** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109158**
Client ID: **PBS** Batch ID: **E09VS136** TestNo: **EPA 8021B** Analysis Date: **5/20/2009** SeqNo: **1714086**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0									
Ethylbenzene	ND	5.0									
m,p-Xylene	ND	10									
Methyl tert-butyl ether	ND	5.0									
o-Xylene	ND	5.0									
Toluene	ND	5.0									
Surr: Bromofluorobenzene (PID)	98.194		100.0		98.2	65	140				

Sample ID: **105533-041ADUP** SampType: **DUP** TestCode: **8021_S_BTE** Units: **µg/Kg** Prep Date: RunNo: **109158**
Client ID: **B48-0** Batch ID: **E09VS136** TestNo: **EPA 8021B** Analysis Date: **5/20/2009** SeqNo: **1714088**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.0						0	0	20	
Ethylbenzene	ND	5.0						0	0	20	
m,p-Xylene	ND	10						0	0	20	
Methyl tert-butyl ether	ND	5.0						0	0	20	
o-Xylene	ND	5.0						0	0	20	
Toluene	ND	5.0						0	0	20	
Xylenes, Total	ND	15						0	0	20	
Surr: Bromofluorobenzene (PID)	102.753		100.0		103	65	140		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **MB-55440** SampType: **MBLK** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109202**
Client ID: **PBS** Batch ID: **55440** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/20/2009** SeqNo: **1714847**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0									
4,4´-DDE	ND	2.0									
4,4´-DDT	ND	2.0									
Aldrin	ND	1.0									
alpha-BHC	ND	1.0									
alpha-Chlordane	ND	1.0									
beta-BHC	ND	1.0									
Chlordane	ND	8.5									
delta-BHC	ND	1.0									
Dieldrin	ND	2.0									
Endosulfan I	ND	1.0									
Endosulfan II	ND	2.0									
Endosulfan sulfate	ND	2.0									
Endrin	ND	2.0									
Endrin aldehyde	ND	2.0									
Endrin ketone	ND	2.0									
gamma-BHC	ND	1.0									
gamma-Chlordane	ND	1.0									
Heptachlor	ND	1.0									
Heptachlor epoxide	ND	1.0									
Methoxychlor	ND	5.0									
Toxaphene	ND	50									
Surr: Tetrachloro-m-xylene	12.992		16.67		77.9	25	115				
Surr: Decachlorobiphenyl	11.290		16.67		67.7	20	142				

Sample ID: **LCS-55440** SampType: **LCS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109202**
Client ID: **LCSS** Batch ID: **55440** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/20/2009** SeqNo: **1714848**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aldrin	14.215	1.0	16.67	0	85.3	59	113				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **LCS-55440** SampType: **LCS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109202**
Client ID: **LCSS** Batch ID: **55440** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/20/2009** SeqNo: **1714848**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dieldrin	13.897	2.0	16.67	0	83.4	59	108				
Endrin	13.733	2.0	16.67	0	82.4	41	132				
gamma-BHC	14.391	1.0	16.67	0	86.3	60	111				
Heptachlor	15.037	1.0	16.67	0	90.2	62	108				
Surr: Tetrachloro-m-xylene	12.883		16.67		77.3	25	115				
Surr: Decachlorobiphenyl	9.936		16.67		59.6	20	142				

Sample ID: **105533-009AMS** SampType: **MS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109202**
Client ID: **B25-0** Batch ID: **55440** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/20/2009** SeqNo: **1714849**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	15.194	2.0	16.67	0	91.1	29	143				
Aldrin	14.767	1.0	16.67	0	88.6	44	131				
Dieldrin	15.125	2.0	16.67	0	90.7	40	136				
Endrin	15.459	2.0	16.67	0	92.7	41	146				
gamma-BHC	15.733	1.0	16.67	0	94.4	45	129				
Heptachlor	14.399	1.0	16.67	0	86.4	48	126				
Surr: Tetrachloro-m-xylene	12.922		16.67		77.5	25	115				
Surr: Decachlorobiphenyl	11.666		16.67		70.0	20	142				

Sample ID: **105533-009AMSD** SampType: **MSD** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109202**
Client ID: **B25-0** Batch ID: **55440** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/20/2009** SeqNo: **1714850**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	15.198	2.0	16.67	0	91.2	29	143	15.19	0.0285	20	
Aldrin	15.431	1.0	16.67	0	92.6	44	131	14.77	4.39	20	
Dieldrin	15.185	2.0	16.67	0	91.1	40	136	15.13	0.393	20	
Endrin	15.589	2.0	16.67	0	93.5	41	146	15.46	0.834	20	
gamma-BHC	16.247	1.0	16.67	0	97.5	45	129	15.73	3.21	20	
Heptachlor	15.542	1.0	16.67	0	93.2	48	126	14.40	7.63	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **105533-009AMSD**	SampType: **MSD**	TestCode: **8081_S**	Units: **µg/Kg**	Prep Date: **5/20/2009**	RunNo: **109202**
Client ID: **B25-0**	Batch ID: **55440**	TestNo: **EPA 8081A**	**EPA 3550B**	Analysis Date: **5/20/2009**	SeqNo: **1714850**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Tetrachloro-m-xylene	13.140		16.67		78.8	25	115		0	0	
Surr: Decachlorobiphenyl	11.591		16.67		69.5	20	142		0	0	

Sample ID: **105533-009ADUP**	SampType: **DUP**	TestCode: **8081_S**	Units: **µg/Kg**	Prep Date: **5/20/2009**	RunNo: **109202**
Client ID: **B25-0**	Batch ID: **55440**	TestNo: **EPA 8081A**	**EPA 3550B**	Analysis Date: **5/20/2009**	SeqNo: **1714852**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0						0	0	20	
4,4´-DDE	ND	2.0						0	0	20	
4,4´-DDT	ND	2.0						0	0	20	
Aldrin	ND	1.0						0	0	20	
alpha-BHC	ND	1.0						0	0	20	
alpha-Chlordane	ND	1.0						0	0	20	
beta-BHC	ND	1.0						0	0	20	
Chlordane	ND	8.5						0	0	20	
delta-BHC	ND	1.0						0	0	20	
Dieldrin	ND	2.0						0	0	20	
Endosulfan I	ND	1.0						0	0	20	
Endosulfan II	ND	2.0						0	0	20	
Endosulfan sulfate	ND	2.0						0	0	20	
Endrin	ND	2.0						0	0	20	
Endrin aldehyde	ND	2.0						0	0	20	
Endrin ketone	ND	2.0						0	0	20	
gamma-BHC	ND	1.0						0	0	20	
gamma-Chlordane	ND	1.0						0	0	20	
Heptachlor	ND	1.0						0	0	20	
Heptachlor epoxide	ND	1.0						0	0	20	
Methoxychlor	ND	5.0						0	0	20	
Toxaphene	ND	50						0	0	20	
Surr: Tetrachloro-m-xylene	11.424		16.67		68.5	25	115		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID:	**105533-009ADUP**	SampType:	**DUP**	TestCode:	**8081_S**	Units:	**µg/Kg**		Prep Date:	**5/20/2009**		RunNo:	**109202**	
Client ID:	**B25-0**	Batch ID:	**55440**	TestNo:	**EPA 8081A**	**EPA 3550B**			Analysis Date:	**5/20/2009**		SeqNo:	**1714852**	
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl		9.828			16.67			59.0	20	142		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **MB-55454** SampType: **MBLK** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109234**
Client ID: **PBS** Batch ID: **55454** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715499**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0									
4,4´-DDE	ND	2.0									
4,4´-DDT	ND	2.0									
Aldrin	ND	1.0									
alpha-BHC	ND	1.0									
alpha-Chlordane	ND	1.0									
beta-BHC	ND	1.0									
Chlordane	ND	8.5									
delta-BHC	ND	1.0									
Dieldrin	ND	2.0									
Endosulfan I	ND	1.0									
Endosulfan II	ND	2.0									
Endosulfan sulfate	ND	2.0									
Endrin	ND	2.0									
Endrin aldehyde	ND	2.0									
Endrin ketone	ND	2.0									
gamma-BHC	ND	1.0									
gamma-Chlordane	ND	1.0									
Heptachlor	ND	1.0									
Heptachlor epoxide	ND	1.0									
Methoxychlor	ND	5.0									
Toxaphene	ND	50									
Surr: Tetrachloro-m-xylene	11.999		16.67		72.0	25	115				
Surr: Decachlorobiphenyl	11.299		16.67		67.8	20	142				

Sample ID: **LCS-55454** SampType: **LCS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109234**
Client ID: **LCSS** Batch ID: **55454** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715500**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aldrin	14.275	1.0	16.67	0	85.6	59	113				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **LCS-55454** SampType: **LCS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109234**
Client ID: **LCSS** Batch ID: **55454** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715500**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dieldrin	13.968	2.0	16.67	0	83.8	59	108				
Endrin	14.325	2.0	16.67	0	85.9	41	132				
gamma-BHC	13.981	1.0	16.67	0	83.9	60	111				
Heptachlor	13.865	1.0	16.67	0	83.2	62	108				
Surr: Tetrachloro-m-xylene	13.047		16.67		78.3	25	115				
Surr: Decachlorobiphenyl	12.774		16.67		76.6	20	142				

Sample ID: **105533-031AMS** SampType: **MS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109234**
Client ID: **B36-0** Batch ID: **55454** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715501**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	12.689	2.0	16.67	0	76.1	29	143				
Aldrin	12.947	1.0	16.67	0	77.7	44	131				
Dieldrin	13.768	2.0	16.67	0	82.6	40	136				
Endrin	13.261	2.0	16.67	0	79.6	41	146				
gamma-BHC	12.700	1.0	16.67	0	76.2	45	129				
Heptachlor	12.450	1.0	16.67	0	74.7	48	126				
Surr: Tetrachloro-m-xylene	11.118		16.67		66.7	25	115				
Surr: Decachlorobiphenyl	15.780		16.67		94.7	20	142				

Sample ID: **105533-031AMSD** SampType: **MSD** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109234**
Client ID: **B36-0** Batch ID: **55454** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715502**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	11.604	2.0	16.67	0	69.6	29	143	12.69	8.93	20	
Aldrin	12.360	1.0	16.67	0	74.1	44	131	12.95	4.63	20	
Dieldrin	12.727	2.0	16.67	0	76.3	40	136	13.77	7.85	20	
Endrin	12.747	2.0	16.67	0	76.5	41	146	13.26	3.96	20	
gamma-BHC	12.159	1.0	16.67	0	72.9	45	129	12.70	4.36	20	
Heptachlor	11.883	1.0	16.67	0	71.3	48	126	12.45	4.66	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **105533-031AMSD** SampType: **MSD** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109234**
Client ID: **B36-0** Batch ID: **55454** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715502**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Tetrachloro-m-xylene	10.505		16.67		63.0	25	115		0	0	
Surr: Decachlorobiphenyl	15.146		16.67		90.9	20	142		0	0	

Sample ID: **105533-031ADUP** SampType: **DUP** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109234**
Client ID: **B36-0** Batch ID: **55454** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715504**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0						0	0	20	
4,4´-DDE	ND	2.0						0	0	20	
4,4´-DDT	1.135	2.0						0	0	20	
Aldrin	ND	1.0						0	0	20	
alpha-BHC	ND	1.0						0	0	20	
alpha-Chlordane	ND	1.0						0	0	20	
beta-BHC	ND	1.0						0	0	20	
Chlordane	ND	8.5						0	0	20	
delta-BHC	ND	1.0						0	0	20	
Dieldrin	ND	2.0						0	0	20	
Endosulfan I	ND	1.0						0	0	20	
Endosulfan II	ND	2.0						0	0	20	
Endosulfan sulfate	ND	2.0						0	0	20	
Endrin	ND	2.0						0	0	20	
Endrin aldehyde	ND	2.0						0	0	20	
Endrin ketone	ND	2.0						0	0	20	
gamma-BHC	ND	1.0						0	0	20	
gamma-Chlordane	ND	1.0						0	0	20	
Heptachlor	ND	1.0						0	0	20	
Heptachlor epoxide	ND	1.0						0	0	20	
Methoxychlor	ND	5.0						0	0	20	
Toxaphene	ND	50						0	0	20	
Surr: Tetrachloro-m-xylene	11.138		16.67		66.8	25	115		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

Advanced Technology Laboratories
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CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID:	**105533-031ADUP**	SampType:	**DUP**	TestCode:	**8081_S**	Units:	**µg/Kg**		Prep Date:	**5/20/2009**		RunNo:	**109234**	
Client ID:	**B36-0**	Batch ID:	**55454**	TestNo:	**EPA 8081A**	**EPA 3550B**			Analysis Date:	**5/21/2009**		SeqNo:	**1715504**	
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Surr: Decachlorobiphenyl		19.153			16.67		115	20	142		0	0		

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **MB-55455** SampType: **MBLK** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109230**
Client ID: **PBS** Batch ID: **55455** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715309**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0									
4,4´-DDE	ND	2.0									
4,4´-DDT	ND	2.0									
Aldrin	ND	1.0									
alpha-BHC	ND	1.0									
alpha-Chlordane	ND	1.0									
beta-BHC	ND	1.0									
Chlordane	ND	8.5									
delta-BHC	ND	1.0									
Dieldrin	ND	2.0									
Endosulfan I	ND	1.0									
Endosulfan II	ND	2.0									
Endosulfan sulfate	ND	2.0									
Endrin	ND	2.0									
Endrin aldehyde	ND	2.0									
Endrin ketone	ND	2.0									
gamma-BHC	ND	1.0									
gamma-Chlordane	ND	1.0									
Heptachlor	ND	1.0									
Heptachlor epoxide	ND	1.0									
Methoxychlor	ND	5.0									
Toxaphene	ND	50									
Surr: Tetrachloro-m-xylene	13.355		16.67		80.1	25	115				
Surr: Decachlorobiphenyl	9.784		16.67		58.7	20	142				

Sample ID: **LCS-55455** SampType: **LCS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109230**
Client ID: **LCSS** Batch ID: **55455** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715310**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aldrin	14.687	1.0	16.67	0	88.1	59	113				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **LCS-55455** SampType: **LCS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109230**
Client ID: **LCSS** Batch ID: **55455** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715310**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dieldrin	14.124	2.0	16.67	0	84.7	59	108				
Endrin	14.255	2.0	16.67	0	85.5	41	132				
gamma-BHC	14.694	1.0	16.67	0	88.1	60	111				
Heptachlor	14.999	1.0	16.67	0	90.0	62	108				
Surr: Tetrachloro-m-xylene	13.348		16.67		80.1	25	115				
Surr: Decachlorobiphenyl	10.291		16.67		61.7	20	142				

Sample ID: **105533-041AMS** SampType: **MS** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109230**
Client ID: **B48-0** Batch ID: **55455** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715311**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	11.860	2.0	16.67	0	71.1	29	143				
Aldrin	13.162	1.0	16.67	0	79.0	44	131				
Dieldrin	13.094	2.0	16.67	0	78.5	40	136				
Endrin	13.382	2.0	16.67	0	80.3	41	146				
gamma-BHC	13.072	1.0	16.67	0	78.4	45	129				
Heptachlor	13.170	1.0	16.67	0	79.0	48	126				
Surr: Tetrachloro-m-xylene	10.878		16.67		65.3	25	115				
Surr: Decachlorobiphenyl	10.187		16.67		61.1	20	142				

Sample ID: **105533-041AMSD** SampType: **MSD** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109230**
Client ID: **B48-0** Batch ID: **55455** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715312**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDT	11.020	2.0	16.67	0	66.1	29	143	11.86	7.35	20	
Aldrin	12.798	1.0	16.67	0	76.8	44	131	13.16	2.80	20	
Dieldrin	11.865	2.0	16.67	0	71.2	40	136	13.09	9.85	20	
Endrin	12.341	2.0	16.67	0	74.0	41	146	13.38	8.09	20	
gamma-BHC	12.914	1.0	16.67	0	77.5	45	129	13.07	1.22	20	
Heptachlor	12.749	1.0	16.67	0	76.5	48	126	13.17	3.25	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID: **105533-041AMSD** SampType: **MSD** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109230**
Client ID: **B48-0** Batch ID: **55455** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715312**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Tetrachloro-m-xylene	10.906		16.67		65.4	25	115		0	0	
Surr: Decachlorobiphenyl	9.639		16.67		57.8	20	142		0	0	

Sample ID: **105533-041ADUP** SampType: **DUP** TestCode: **8081_S** Units: **µg/Kg** Prep Date: **5/20/2009** RunNo: **109230**
Client ID: **B48-0** Batch ID: **55455** TestNo: **EPA 8081A** **EPA 3550B** Analysis Date: **5/21/2009** SeqNo: **1715314**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4,4´-DDD	ND	2.0						0	0	20	
4,4´-DDE	ND	2.0						0	0	20	
4,4´-DDT	ND	2.0						0	0	20	
Aldrin	ND	1.0						0	0	20	
alpha-BHC	ND	1.0						0	0	20	
alpha-Chlordane	ND	1.0						0	0	20	
beta-BHC	ND	1.0						0	0	20	
Chlordane	ND	8.5						0	0	20	
delta-BHC	ND	1.0						0	0	20	
Dieldrin	ND	2.0						0	0	20	
Endosulfan I	ND	1.0						0	0	20	
Endosulfan II	ND	2.0						0	0	20	
Endosulfan sulfate	ND	2.0						0	0	20	
Endrin	ND	2.0						0	0	20	
Endrin aldehyde	ND	2.0						0	0	20	
Endrin ketone	ND	2.0						0	0	20	
gamma-BHC	ND	1.0						0	0	20	
gamma-Chlordane	ND	1.0						0	0	20	
Heptachlor	ND	1.0						0	0	20	
Heptachlor epoxide	ND	1.0						0	0	20	
Methoxychlor	ND	5.0						0	0	20	
Toxaphene	ND	50						0	0	20	
Surr: Tetrachloro-m-xylene	9.807		16.67		58.8	25	115		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

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CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8081_S

Sample ID:	**105533-041ADUP**	SampType:	**DUP**	TestCode:	**8081_S**	Units:	**µg/Kg**		Prep Date:	**5/20/2009**		RunNo:	**109230**	
Client ID:	**B48-0**	Batch ID:	**55455**	TestNo:	**EPA 8081A**	**EPA 3550B**			Analysis Date:	**5/21/2009**		SeqNo:	**1715314**	
Analyte		Result		PQL	SPK value	SPK Ref Val		%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Decachlorobiphenyl		8.603			16.67			51.6	20	142		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 9045_S

Sample ID: **105533-033ADUP** SampType: **DUP** TestCode: **9045_S** Units: **pH Units** Prep Date: RunNo: **109220**
Client ID: **B37-0** Batch ID: **R109220** TestNo: **EPA 9045C** Analysis Date: **5/21/2009** SeqNo: **1715129**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	6.120	0.10						6.160	0.651	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

20 May 2009

Diane Galvan
Advanced Technology Labs
3275 Walnut Avenue
Signal Hill, CA 90755

RE:NA

Work Order No.: 0905243

Attached are the results of the analyses for samples received by the laboratory on 05/18/09 12:05.

The samples were received by Sierra Analytical Labs, Inc. with a chain of custody record attached or completed at the submittal of the samples.

The analyses were performed according to the prescribed method as outlined by EPA, Standard Methods, and A.S.T.M.

The remaining portions of the samples will be disposed of within 30 days from the date of this report.
If you require any additional retaining time, please advise us.

Sincerely,

Richard K. Forsyth

Richard K. Forsyth

Laboratory Director

Sierra Analytical Labs, Inc. is certified by the California Department of Health Services (DOHS), Environmental Laboratory Accredidation Program (ELAP) No. 2320.

Advanced Technology Labs 3275 Walnut Avenue Signal Hill CA, 90755	Project: NA Project Number: PO#SC04586 Project Manager: Diane Galvan	**Reported:** 05/20/09 11:27

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
105533-001B / B21-0	0905243-01	Soil	05/15/09 10:01	05/18/09 12:05
105533-009B / B25-0	0905243-02	Soil	05/15/09 09:35	05/18/09 12:05
105533-017B / B29-0	0905243-03	Soil	05/15/09 09:00	05/18/09 12:05
105533-025B / B33-0	0905243-04	Soil	05/14/09 15:30	05/18/09 12:05
105533-033B / B37-0	0905243-05	Soil	05/14/09 14:41	05/18/09 12:05
105533-043B / B49-0	0905243-06	Soil	05/14/09 12:50	05/18/09 12:05

CASE NARRATIVE

SAMPLE RECEIPT: Samples were received intact, at 4°C, and accompanied by chain of custody documentation.
PRESERVATION: Samples requiring preservation were verified prior to sample preparation and analysis.
HOLDING TIMES: All holding times were met, unless otherwises noted in the report with data qualifiers.
QA/QC CRITERIA: All quality objective criteria were met, except as noted in the report with data qualifiers.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

26052 Merit Circle Suite 105, Laguna Hills, California 92653
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E-Mail: sierralabs @ sierralabs.net

Advanced Technology Labs 3275 Walnut Avenue Signal Hill CA, 90755	Project: NA Project Number: PO#SC04586 Project Manager: Diane Galvan	**Reported:** 05/20/09 11:27

Chlorinated Herbicides by EPA Method 8151A

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
105533-001B / B21-0 (0905243-01) Soil Sampled: 05/15/09 10:01 Received: 05/18/09 12:05									
2,4,5-T	ND	1.6	µg/kg	1	B9E1917	05/19/09	05/19/09 18:24	EPA 8151A	
2,4,5-TP (Silvex)	ND	1.6	"	"	"	"	"	"	
2,4-D	ND	1.6	"	"	"	"	"	"	
2,4-DB	ND	4.0	"	"	"	"	"	"	
3,5-Dichlorobenzoic acid	ND	2.0	"	"	"	"	"	"	
4-Nitrophenol	ND	2.0	"	"	"	"	"	"	
Acifluorfen	ND	1.6	"	"	"	"	"	"	
Bentazon	ND	1.6	"	"	"	"	"	"	
Chloramben	ND	1.6	"	"	"	"	"	"	
Dalapon	ND	20	"	"	"	"	"	"	
DCPA diacid	ND	1.6	"	"	"	"	"	"	
Dicamba	ND	1.6	"	"	"	"	"	"	
Dichlorprop	ND	1.6	"	"	"	"	"	"	
Dinoseb	ND	1.6	"	"	"	"	"	"	
Pentachlorophenol	ND	1.6	"	"	"	"	"	"	
Picloram	ND	1.6	"	"	"	"	"	"	
Surrogate: 2,4-Dichlorophenylacetic Acid		*97.5 %*	*35-150*		"	"	"	"	
105533-009B / B25-0 (0905243-02) Soil Sampled: 05/15/09 09:35 Received: 05/18/09 12:05									
2,4,5-T	ND	1.6	µg/kg	1	B9E1917	05/19/09	05/19/09 19:10	EPA 8151A	
2,4,5-TP (Silvex)	ND	1.6	"	"	"	"	"	"	
2,4-D	ND	1.6	"	"	"	"	"	"	
2,4-DB	ND	4.0	"	"	"	"	"	"	
3,5-Dichlorobenzoic acid	ND	2.0	"	"	"	"	"	"	
4-Nitrophenol	ND	2.0	"	"	"	"	"	"	
Acifluorfen	ND	1.6	"	"	"	"	"	"	
Bentazon	ND	1.6	"	"	"	"	"	"	
Chloramben	ND	1.6	"	"	"	"	"	"	
Dalapon	ND	20	"	"	"	"	"	"	
DCPA diacid	ND	1.6	"	"	"	"	"	"	
Dicamba	ND	1.6	"	"	"	"	"	"	
Dichlorprop	ND	1.6	"	"	"	"	"	"	
Dinoseb	ND	1.6	"	"	"	"	"	"	
Pentachlorophenol	ND	1.6	"	"	"	"	"	"	
Picloram	ND	1.6	"	"	"	"	"	"	
Surrogate: 2,4-Dichlorophenylacetic Acid		*48.7 %*	*35-150*		"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Advanced Technology Labs 3275 Walnut Avenue Signal Hill CA, 90755	Project: NA Project Number: PO#SC04586 Project Manager: Diane Galvan	**Reported:** 05/20/09 11:27

Chlorinated Herbicides by EPA Method 8151A

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
105533-017B / B29-0 (0905243-03) Soil Sampled: 05/15/09 09:00 Received: 05/18/09 12:05									
2,4,5-T	ND	1.6	µg/kg	1	B9E1917	05/19/09	05/19/09 19:57	EPA 8151A	
2,4,5-TP (Silvex)	ND	1.6	"	"	"	"	"	"	
2,4-D	ND	1.6	"	"	"	"	"	"	
2,4-DB	ND	4.0	"	"	"	"	"	"	
3,5-Dichlorobenzoic acid	ND	2.0	"	"	"	"	"	"	
4-Nitrophenol	ND	2.0	"	"	"	"	"	"	
Acifluorfen	ND	1.6	"	"	"	"	"	"	
Bentazon	ND	1.6	"	"	"	"	"	"	
Chloramben	ND	1.6	"	"	"	"	"	"	
Dalapon	ND	20	"	"	"	"	"	"	
DCPA diacid	ND	1.6	"	"	"	"	"	"	
Dicamba	ND	1.6	"	"	"	"	"	"	
Dichlorprop	ND	1.6	"	"	"	"	"	"	
Dinoseb	ND	1.6	"	"	"	"	"	"	
Pentachlorophenol	ND	1.6	"	"	"	"	"	"	
Picloram	ND	1.6	"	"	"	"	"	"	
Surrogate: 2,4-Dichlorophenylacetic Acid		*64.6 %*	*35-150*		"	"	"	"	
105533-025B / B33-0 (0905243-04) Soil Sampled: 05/14/09 15:30 Received: 05/18/09 12:05									
2,4,5-T	ND	1.6	µg/kg	1	B9E1917	05/19/09	05/19/09 20:43	EPA 8151A	
2,4,5-TP (Silvex)	ND	1.6	"	"	"	"	"	"	
2,4-D	ND	1.6	"	"	"	"	"	"	
2,4-DB	ND	4.0	"	"	"	"	"	"	
3,5-Dichlorobenzoic acid	ND	2.0	"	"	"	"	"	"	
4-Nitrophenol	ND	2.0	"	"	"	"	"	"	
Acifluorfen	ND	1.6	"	"	"	"	"	"	
Bentazon	ND	1.6	"	"	"	"	"	"	
Chloramben	ND	1.6	"	"	"	"	"	"	
Dalapon	ND	20	"	"	"	"	"	"	
DCPA diacid	ND	1.6	"	"	"	"	"	"	
Dicamba	ND	1.6	"	"	"	"	"	"	
Dichlorprop	ND	1.6	"	"	"	"	"	"	
Dinoseb	ND	1.6	"	"	"	"	"	"	
Pentachlorophenol	ND	1.6	"	"	"	"	"	"	
Picloram	ND	1.6	"	"	"	"	"	"	
Surrogate: 2,4-Dichlorophenylacetic Acid		*83.1 %*	*35-150*		"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Advanced Technology Labs 3275 Walnut Avenue Signal Hill CA, 90755	Project: NA Project Number: PO#SC04586 Project Manager: Diane Galvan	**Reported:** 05/20/09 11:27

Chlorinated Herbicides by EPA Method 8151A

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
105533-033B / B37-0 (0905243-05) Soil Sampled: 05/14/09 14:41 Received: 05/18/09 12:05									
2,4,5-T	ND	1.6	µg/kg	1	B9E1917	05/19/09	05/19/09 21:30	EPA 8151A	
2,4,5-TP (Silvex)	ND	1.6	"	"	"	"	"	"	
2,4-D	ND	1.6	"	"	"	"	"	"	
2,4-DB	ND	4.0	"	"	"	"	"	"	
3,5-Dichlorobenzoic acid	ND	2.0	"	"	"	"	"	"	
4-Nitrophenol	ND	2.0	"	"	"	"	"	"	
Acifluorfen	ND	1.6	"	"	"	"	"	"	
Bentazon	ND	1.6	"	"	"	"	"	"	
Chloramben	ND	1.6	"	"	"	"	"	"	
Dalapon	ND	20	"	"	"	"	"	"	
DCPA diacid	ND	1.6	"	"	"	"	"	"	
Dicamba	ND	1.6	"	"	"	"	"	"	
Dichlorprop	ND	1.6	"	"	"	"	"	"	
Dinoseb	ND	1.6	"	"	"	"	"	"	
Pentachlorophenol	ND	1.6	"	"	"	"	"	"	
Picloram	ND	1.6	"	"	"	"	"	"	
Surrogate: 2,4-Dichlorophenylacetic Acid		*55.9 %*	*35-150*		"	"	"	"	
105533-043B / B49-0 (0905243-06) Soil Sampled: 05/14/09 12:50 Received: 05/18/09 12:05									
2,4,5-T	ND	1.6	µg/kg	1	B9E1917	05/19/09	05/19/09 22:16	EPA 8151A	
2,4,5-TP (Silvex)	ND	1.6	"	"	"	"	"	"	
2,4-D	ND	1.6	"	"	"	"	"	"	
2,4-DB	ND	4.0	"	"	"	"	"	"	
3,5-Dichlorobenzoic acid	ND	2.0	"	"	"	"	"	"	
4-Nitrophenol	ND	2.0	"	"	"	"	"	"	
Acifluorfen	ND	1.6	"	"	"	"	"	"	
Bentazon	ND	1.6	"	"	"	"	"	"	
Chloramben	ND	1.6	"	"	"	"	"	"	
Dalapon	ND	20	"	"	"	"	"	"	
DCPA diacid	ND	1.6	"	"	"	"	"	"	
Dicamba	ND	1.6	"	"	"	"	"	"	
Dichlorprop	ND	1.6	"	"	"	"	"	"	
Dinoseb	ND	1.6	"	"	"	"	"	"	
Pentachlorophenol	ND	1.6	"	"	"	"	"	"	
Picloram	ND	1.6	"	"	"	"	"	"	
Surrogate: 2,4-Dichlorophenylacetic Acid		*45.5 %*	*35-150*		"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Advanced Technology Labs 3275 Walnut Avenue Signal Hill CA, 90755	Project: NA Project Number: PO#SC04586 Project Manager: Diane Galvan	**Reported:** 05/20/09 11:27

Chlorinated Herbicides by EPA Method 8151A - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9E1917 - EPA 8151A Herbicides										
Blank (B9E1917-BLK1)				Prepared & Analyzed: 05/19/09						
2,4,5-T	ND	1.6	µg/kg							
2,4,5-TP (Silvex)	ND	1.6	"							
2,4-D	ND	1.6	"							
2,4-DB	ND	4.0	"							
3,5-Dichlorobenzoic acid	ND	2.0	"							
4-Nitrophenol	ND	2.0	"							
Acifluorfen	ND	1.6	"							
Bentazon	ND	1.6	"							
Chloramben	ND	1.6	"							
Dalapon	ND	20	"							
DCPA diacid	ND	1.6	"							
Dicamba	ND	1.6	"							
Dichlorprop	ND	1.6	"							
Dinoseb	ND	1.6	"							
Pentachlorophenol	ND	1.6	"							
Picloram	ND	1.6	"							
Surrogate: 2,4-Dichlorophenylacetic Acid	*85.0*		*"*	*100*		*85.0*	*35-150*			
LCS (B9E1917-BS1)				Prepared & Analyzed: 05/19/09						
2,4,5-T	13.7	1.6	µg/kg	10.0		137	20-150			
2,4,5-TP (Silvex)	13.4	1.6	"	10.0		134	20-150			
Dichlorprop	8.27	1.6	"	10.0		82.7	20-150			
Dinoseb	8.09	1.6	"	10.0		80.9	20-150			
Matrix Spike (B9E1917-MS1)		**Source: 0905243-06**		Prepared & Analyzed: 05/19/09						
2,4,5-T	6.89	1.6	µg/kg	10.0	ND	68.9	20-150			
2,4,5-TP (Silvex)	5.82	1.6	"	10.0	ND	58.2	20-150			
Dichlorprop	5.73	1.6	"	10.0	ND	57.3	20-150			
Dinoseb	4.73	1.6	"	10.0	ND	47.3	20-150			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Advanced Technology Labs	Project: NA	
3275 Walnut Avenue	Project Number: PO#SC04586	**Reported:**
Signal Hill CA, 90755	Project Manager: Diane Galvan	05/20/09 11:27

Chlorinated Herbicides by EPA Method 8151A - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9E1917 - EPA 8151A Herbicides										
Matrix Spike Dup (B9E1917-MSD1)		**Source: 0905243-06**		Prepared & Analyzed: 05/19/09						
2,4,5-T	8.92	1.6	µg/kg	10.0	ND	89.2	20-150	25.7	30	
2,4,5-TP (Silvex)	6.47	1.6	"	10.0	ND	64.7	20-150	10.6	30	
Dichlorprop	5.72	1.6	"	10.0	ND	57.2	20-150	0.175	30	
Dinoseb	6.13	1.6	"	10.0	ND	61.3	20-150	25.8	30	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755-5225
www.atlglobal.com
TEL: (562) 989-4045 *FAX: (562) 989-4040*

CHAIN-OF-CUSTODY RECORD

QC Level: CT

Subcontractor:
Sierra Laboratories
26052 Merit Circle Suite 105
Laguna Hills, CA 92653

TEL: (949) 348-9389
FAX: (949) 348-9115
Acct #:

Field Sampler: D. Watts

16-May-09

	Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests: EPA 8151		
01	105533-001B / B21-0	Soil	5/15/2009 10:01:00 AM	4OZG	1		
02	105533-009B / B25-0	Soil	5/15/2009 9:35:00 AM	4OZG	1		
03	105533-017B / B29-0	Soil	5/15/2009 9:00:00 AM	4OZG	1		
04	105533-025B / B33-0	Soil	5/14/2009 3:30:00 PM	4OZG	1		
05	105533-033B / B37-0	Soil	5/14/2009 2:41:00 PM	4OZG	1		
06	105533-043B / B49-0	Soil	5/14/2009 12:50:00 PM	4OZG	1		

General Comments: Please email sample receipt acknowledgement to the PM.
Please use PO#: SC04586 Please fax results by:Normal TAT
Please send report to Diane Galvan

B-18 SOC

		Date/Time			Date/Time
Relinquished by:		5/16/09 9:46	Received by:		5/18/09 930
Relinquished by:		5/18/09 1203	Received by:		5-18-09 1605

CHAIN OF CL TODY RECORD

Advanced Technology Laboratories
3275 Walnut Avenue
Signal Hill, CA 90755
(562) 989-4045 • Fax (562) 989-4040

FOR LABORATORY USE ONLY:

P.O.#:

Logged By: Date: 5/16/09

Method of Transport: Client ☐ ATL ☐ CA OverN ☐ FEDEX ☐ Other: GSO

Sample Condition Upon Receipt (4.4 / MA)
1. CHILLED Y☑ N☐ 4. SEALED Y☐ N☑
2. HEADSPACE (VOA) Y☐ N☐ 5. # OF SPLS MATCH COC Y☑ N☐
3. CONTAINER INTACT Y☑ N☐ 6. PRESERVED Y☐ N☑

Client: GEOCON
Attn: C. MERRITT
Address: 6671 BRISA ST
City LIVERMORE State CA Zip Code 94550
TEL: (925) 371-5900
FAX: (") " 5915

Project Name: JAMESON CANYON Project #: E8481-06-01 Sampler: (Printed Name) D. WATTS (Signature) [signature]

Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
[signature]	5/15/09	1600	GSO	5/15/09	1600
			Marge [signature]	5/16/09	8:30

I hereby authorize ATL to perform the work indicated below:
Project Mgr / Submitter: D. WATTS 5/14/09 (Print Name / Date)
[signature] (Signature)

Send Report To: Attn: Co: SEE "CLIENT" Address City State Zip

Bill To: Attn: Co: Address City State Zip

Special Instructions/Comments:
SEE E8481-06-01 INSTRUCTIONS (12 MAY 2009)
PLEASE RETURN ALL GEOCON COOLERS

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample : $2.00 / sample / mo (after 45 days)
- Records : $1.00 / ATL workorder / mo (after 1 year)

Circle or Add Analysis(es) Requested: 8081A (Pesticides), 8082 (PCB), 8260B (Volatiles), 8270C (BNA), 6010B (Total Metal), 8015B (GRO) / 8020 (BTEX), 8015B (DRO), 8021 (BTEX), TITLE 22 / CAM 17 (6010 / 7000)

SPECIFY APPROPRIATE MATRIX: SOIL, WATER, GROUND WATER, WASTEWATER

QA/QC: RTNE ☐ CT ☒ SWRCB ☐ Logcode ____ OTHER ____

ITEM	LAB USE ONLY: Batch #: / Lab No.	Sample Description: Sample I.D. / Location	Date	Time	SOIL	TAT	Container(s) #	Container(s) Type	PRESERVATION	REMARKS
	105332-001	B21 - 0	5/15/09	1001	X	E	1	Tm	c	
	2	B21 - 1.5		1007						
	3	B22 - 0		0951						
	4	B22 - 1.5		0956						
	5	B23 - 0		0955						
	6	B23 - 1.5		1000						
	7	B24 - 0		0947						
	8	B24 - 1.5		0951						
	9	B25 - 0		0935						
	10	B25 - 1.5		0940						

• TAT starts 8 a.m. following day if samples received after 3 p.m.

TAT: A= Overnight ≤ 24 hr; B= Emergency Next workday; C= Critical 2 Workdays; D= Urgent 3 Workdays; E= Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=Hcl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

DISTRIBUTION: White with report, Yellow to folder, Pink to submitter.

CHAIN OF CUSTODY RECORD

Advanced Technology Laboratories
3275 Walnut Avenue
Signal Hill, CA 90755
(562) 989-4045 • Fax (562) 989-4040

FOR LABORATORY USE ONLY:

P.O.#: _____

Logged By: _____ Date: _____

Method of Transport: Client ☐ ATL ☐ CA OverN ☐ FEDEX ☐ Other: _____

Sample Condition Upon Receipt: 1. CHILLED Y☐ N☐ 2. HEADSPACE (VOA) Y☐ N☐ 3. CONTAINER INTACT Y☐ N☐ 4. SEALED Y☐ N☐ 5. # OF SPLS MATCH COC Y☐ N☐ 6. PRESERVED Y☐ N☐

Client:
Attn: SEE Pg 1
Address:
City State Zip Code
TEL: ( )
FAX: ( )
Project Name: SEE Pg 1
Project #:
Sampler: (Printed Name) (Signature)

Relinquished by: (Signature and Printed Name) [signature] Date: 5/15/09 Time: 1600 Received by: (Signature and Printed Name) [signature] Date: 5/15/09 Time: 1600
Relinquished by: (Signature and Printed Name) Date: Time: Received by: (Signature and Printed Name) [signature] Date: 5/16/09 Time: 9:30
Relinquished by: (Signature and Printed Name) Date: Time: Received by: (Signature and Printed Name) Date: Time:

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: SEE Pg 1
Print Name Date
Signature

Send Report To:
Attn: _____
Co: _____
Address _____
City _____ State _____ Zip _____

Bill To:
Attn: _____
Co: _____
Address _____
City _____ State _____ Zip _____

Special Instructions/Comments:

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample : $2.00 / sample / mo (after 45 days)
- Records : $1.00 / ATL workorder / mo (after 1 year)

Circle or Add Analysis(es) Requested: 8081A (Pesticides), 8082 (PCB), 8260B (Volatiles), 8270C (BNA), 6010B (Total Metal), 8015B (GRO) / 8020 (BTEX), 8015B (DRO), 8021 (BTEX), TITLE 22 / CAM 17 (6010 / 7000)

SPECIFY APPROPRIATE MATRIX: SOIL, WATER, GROUND WATER, WASTEWATER

QA/QC: RTNE ☐ CT ☒ SWRCB ☐ Logcode ____ OTHER ____

ITEM	LAB USE ONLY: Batch #: / Lab No.	Sample Description: Sample I.D. / Location	Date	Time	SOIL	TAT	Container(s) #	Container(s) Type	PRESERVATION	REMARKS
	105533- 11	B26 - 0	5/15/09	0918	X	E	1	T/m	C	
	12	B26 - 1.5		0921						
	13	B27 - 0		0920						
	14	B27 - 1.5		0925						
	15	B28 - 0		0907						
	16	B28 - 1.5		0911						
	17	B29 - 0		0900						
	18	B29 - 1.5		0905						
	19	B30 - 0	5/14/09	1609						
	20	B30 - 1.5		1611						

• TAT starts 8 a.m. following day if samples received after 3 p.m.

TAT: A= Overnight ≤ 24 hr; B= Emergency Next workday; C= Critical 2 Workdays; D= Urgent 3 Workdays; E= Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=Hcl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

DISTRIBUTION: **White** with report, **Yellow** to folder, **Pink** to submitter.

CHAIN OF CUSTODY RECORD

Advanced Technology Laboratories
3275 Walnut Avenue
Signal Hill, CA 90755
(562) 989-4045 • Fax (562) 989-4040

FOR LABORATORY USE ONLY:

P.O.#: _____

Logged By: _____ Date: _____

Method of Transport: Client ☐ ATL ☐ CA OverN ☐ FEDEX ☐ Other: _____

Sample Condition Upon Receipt:
1. CHILLED Y☐ N☐ 4. SEALED Y☐ N☐
2. HEADSPACE (VOA) Y☐ N☐ 5. # OF SPLS MATCH COC Y☐ N☐
3. CONTAINER INTACT Y☐ N☐ 6. PRESERVED Y☐ N☐

Client:
Attn: SEE Pg 1
Address:
City State Zip Code
TEL: ( )
FAX: ( )
Project Name: SEE Pg 1 Project #: Sampler: (Printed Name) (Signature)

Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
WHITE	5/15/09	1600	GSO	5/15/09	1600
			Mary Ann	5/16/09	8:30

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: SEE Pg 1
Print Name Date
Signature

Send Report To: Attn: Co: Address City State Zip

Bill To: Attn: Co: Address City State Zip

Special Instructions/Comments:

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample : $2.00 / sample / mo (after 45 days)
- Records : $1.00 / ATL workorder / mo (after 1 year)

Circle or Add Analysis(es) Requested: 6081A (Pesticides), 8082 (PCB), 8260B (Volatiles), 8270C (BNA), 6010B (Total Metal), 8015B (GRO) / 8020 (BTEX), 8015B (DRO), 8021 (BTEX), TITLE 22 / CAM 17 (6010 / 7000)

SPECIFY APPROPRIATE MATRIX: SOIL, WATER, GROUND WATER, WASTEWATER

QA/QC: RTNE ☐ CT ☒ SWRCB ☐ Logcode ____ OTHER ____

ITEM	LAB USE ONLY: Batch #: / Lab No.	Sample Description: Sample I.D. / Location	Date	Time	SOIL	TAT	Container(s) #	Container(s) Type	PRESERVATION	REMARKS
	105533 - 21	B31 - 0	5/14/09	1549	X	E	1	T	C	
	22	B31 - 1.5		1551						
	23	B32 - 0		1540						
	24	B32 - 1.5		1545						
	25	B33 - 0		1530						
	26	B33 - 1.5		1535						
	27	B34 - 0		1531						
	28	B34 - 1.5		1534						
	29	B35 - 0		1515						
	30	B35 - 1.5		1520						

• TAT starts 8 a.m. following day if samples received after 3 p.m.

TAT: A= Overnight ≤ 24 hr B= Emergency Next workday C= Critical 2 Workdays D= Urgent 3 Workdays E= Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=Hcl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

DISTRIBUTION: **White** with report, **Yellow** to folder, **Pink** to submitter.

CHAIN OF CL TODY RECORD

Advanced Technology Laboratories
3275 Walnut Avenue
Signal Hill, CA 90755
(562) 989-4045 • Fax (562) 989-4040

FOR LABORATORY USE ONLY:

P.O.#: _____

Logged By: _____ Date: _____

Method of Transport: Client ☐ ATL ☐ CA OverN ☐ FEDEX ☐ Other: _____

Sample Condition Upon Receipt: 1. CHILLED Y☐ N☐ 2. HEADSPACE (VOA) Y☐ N☐ 3. CONTAINER INTACT Y☐ N☐ 4. SEALED Y☐ N☐ 5. # OF SPLS MATCH COC Y☐ N☐ 6. PRESERVED Y☐ N☐

Client:
Attn: SEE Pg 1
Address:
City State Zip Code
TEL: ( )
FAX: ( )
Project Name: SEE Pg 1 Project #: Sampler: (Printed Name) (Signature)

Relinquished by: (Signature and Printed Name) [signature] Date: 5/15/09 Time: 1600 Received by: (Signature and Printed Name) GSO Date: 5/15/09 Time: 1600
Relinquished by: (Signature and Printed Name) Date: Time: Received by: (Signature and Printed Name) Marg [signature] Date: 5/16/09 Time: 8:30
Relinquished by: (Signature and Printed Name) Date: Time: Received by: (Signature and Printed Name) Date: Time:

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: SEE Pg 1
Print Name Date
Signature

Send Report To: Attn: Co: Address City State Zip

Bill To: Attn: Co: Address City State Zip

Special Instructions/Comments:

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample : $2.00 / sample / mo (after 45 days)
- Records : $1.00 / ATL workorder / mo (after 1 year)

Circle or Add Analysis(es) Requested: 8081A (Pesticides), 8082 (PCB), 8260B (Volatiles), 8270C (BNA), 6010B (Total Metal), 8015B (GRO) / 8020 (BTEX), 8015B (DRO), 8021 (BTEX), TITLE 22 / CAM 17 (6010 / 7000)

SPECIFY APPROPRIATE MATRIX: SOIL, WATER, GROUND WATER, WASTEWATER

Q A / Q C: RTNE ☐ CT ☒ SWRCB ☐ Logcode ____ OTHER ____

ITEM	LAB USE ONLY: Batch #: / Lab No.	Sample Description: Sample I.D. / Location	Date	Time	SOIL	TAT	Container(s) #	Container(s) Type	PRESERVATION	REMARKS
	105533-31	B36 - 0	5/14/09	1455	X	E	1	T m	a	
	32	B36 - 1.5		1500						
	33	B37 - 0		1441						
	34	B37 - 1.5		1444						
	35	B38 - 0		1430						
	36	B38 - 1.5		1435						
	37	B39 - 0		1421						
	38	B39 - 1.5		1424						
	39	B47 - 0		1339						
	40	B47 - 1.5		1341						

• TAT starts 8 a.m. following day if samples received after 3 p.m.

TAT: A= Overnight ≤ 24 hr B= Emergency Next workday C= Critical 2 Workdays D= Urgent 3 Workdays E= Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=HCl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

DISTRIBUTION: White with report, Yellow to folder, Pink to submitter.

E8481-06-01

Soil Sample Laboratory Analyses

The laboratory will be instructed to analyze the samples as outlined below and in Table 1, Soil Sample Analysis Matrix.

- The upper (~0) soil samples ~~collected from shallow soil borings~~ will be analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPHg), TPH as diesel (TPHd), and TPH as motor oil (TPHmo) using Environmental Protection Agency (EPA) Test Method 8015; benzene, toluene, ethylbenzene, and total xylenes (BTEX) and methyl tert-butyl ether (MTBE) using EPA Test Method 8021, and organochlorine pesticides using EPA Test Method 8081. Approximately 25 percent of the upper soil samples will be analyzed for herbicides using EPA Test Method 8151A, and for total California Assessment Manual (CAM) 17 metals using EPA Test Method 6010/7471.
- Based on the results of the upper soil samples, up to 50 percent of the deeper (~1.5) soil samples ~~collected from the shallow soil borings~~ may be analyzed for TPHg, TPHd, and TPHmo using EPA Test Method 8015; and BTEX and MTBE using EPA Test Method 8021.
- Approximately 25 percent of the deeper soil samples ~~collected from the shallow soil borings~~ will be analyzed for total CAM 17 metals using EPA Test Method 6010/7471.
- Soil samples with total metal concentrations greater than ten times their respective STLC concentrations will be further analyzed for soluble metals using the California Waste Extraction Test (WET) method and EPA Test Method 7420.
- Ten percent of all shallow soil samples (randomly selected ~~by the laboratory~~) will be analyzed for pH using EPA Test Method 9045.

Quality assurance/quality control (QA/QC) procedures will be performed for each method of analysis with specificity for each analyte listed in the test method's QA/QC. QA/QC measures will include the following:

- One method blank for every ten samples, batch of samples or type of matrix, whichever is more frequent.
- One sample analyzed in duplicate for every ten samples, batch of samples or type of matrix, whichever is more frequent.
- One spiked sample for every ten samples, batch of samples or type of matrix, whichever is more frequent, with spike made at ten times the detection limit or at the analyte level.

TABLE 1
Soil Sample Analysis Matix
Jameson Canyon (E8481-06-01)
Napa and Solano Counties, California

Sample Location	Sample No.	TPHg/BTEX/MTBE (EPA 8015/8021)	TPHd/mo (EPA 8015)	CAM 17 Metals (EPA 6010/7471)	Soluble Metals (WET/EPA 7420)	Pesticides (EPA 8081)	Herbicides (EPA 8151A)	pH (EPA 9045)
B1	0	1	1	1	as needed	1	1	1
B1	1.5	as needed	as needed	---	---	---	---	---
B2	0	1	1	---	---	1	---	---
B2	1.5	as needed	as needed	---	---	---	---	---
B3	0	1	1	---	---	1	---	---
B3	1.5	as needed	as needed	1	as needed	---	---	---
B4	0	1	1	---	---	1	---	---
B4	1.5	as needed	as needed	---	---	---	---	---
B5	0	1	1	1	as needed	1	1	---
B5	1.5	as needed	as needed	---	---	---	---	1
B6	0	1	1	---	---	1	---	---
B6	1.5	as needed	as needed	---	---	---	---	---
B7	0	1	1	---	---	1	---	---
B7	1.5	as needed	as needed	1	as needed	---	---	---
B8	0	1	1	---	---	1	---	---
B8	1.5	as needed	as needed	---	---	---	---	---
B9	0	1	1	1	as needed	1	1	---
B9	1.5	as needed	as needed	---	---	---	---	---
B10	0	1	1	---	---	1	---	1
B10	1.5	as needed	as needed	---	---	---	---	---
B11	0	1	1	---	---	1	---	---
B11	1.5	as needed	as needed	1	as needed	---	---	---
B12	0	1	1	---	---	1	---	---
B12	1.5	as needed	as needed	---	---	---	---	---
B13	0	1	1	1	as needed	1	1	---
B13	1.5	as needed	as needed	---	---	---	---	---

TABLE 1
Soil Sample Analysis Matix
Jameson Canyon (E8481-06-01)
Napa and Solano Counties, California

Sample Location	Sample No.	TPHg/BTEX/MTBE (EPA 8015/8021)	TPHd/mo (EPA 8015)	CAM 17 Metals (EPA 6010/7471)	Soluble Metals (WET/EPA 7420)	Pesticides (EPA 8081)	Herbicides (EPA 8151A)	pH (EPA 9045)
B14	0	1	1	---	---	1	---	---
B14	1.5	as needed	as needed	---	---	---	---	1
B15	0	1	1	---	---	1	---	---
B15	1.5	as needed	as needed	1	as needed	---	---	---
B16	0	1	1	---	---	1	---	---
B16	1.5	as needed	as needed	---	---	---	---	---
B17	0	1	1	1	as needed	1	1	---
B17	1.5	as needed	as needed	---	---	---	---	---
B18	0	1	1	---	---	1	---	---
B18	1.5	as needed	as needed	---	---	---	---	---
B19	0	1	1	---	---	1	---	1
B19	1.5	as needed	as needed	1	as needed	---	---	---
B20	0	1	1	---	---	1	---	---
B20	1.5	as needed	as needed	---	---	---	---	---
B21	0	1	1	1	as needed	1	1	---
B21	1.5	as needed	as needed	---	---	---	---	---
B22	0	1	1	---	---	1	---	---
B22	1.5	as needed	as needed	---	---	---	---	---
B23	0	1	1	---	---	1	---	---
B23	1.5	as needed	as needed	1	as needed	---	---	1
B24	0	1	1	---	---	1	---	---
B24	1.5	as needed	as needed	---	---	---	---	---
B25	0	1	1	1	as needed	1	1	---
B25	1.5	as needed	as needed	---	---	---	---	---
B26	0	1	1	---	---	1	---	---
B26	1.5	as needed	as needed	---	---	---	---	---

TABLE 1
Soil Sample Analysis Matix
Jameson Canyon (E8481-06-01)
Napa and Solano Counties, California

Sample Location	Sample No.	TPHg/BTEX/MTBE (EPA 8015/8021)	TPHd/mo (EPA 8015)	CAM 17 Metals (EPA 6010/7471)	Soluble Metals (WET/EPA 7420)	Pesticides (EPA 8081)	Herbicides (EPA 8151A)	pH (EPA 9045)
B27	0	1	1	---	---	1	---	---
B27	1.5	as needed	as needed	1	as needed	---	---	---
B28	0	1	1	---	---	1	---	1
B28	1.5	as needed	as needed	---	---	---	---	---
B29	0	1	1	1	as needed	1	1	---
B29	1.5	as needed	as needed	---	---	---	---	---
B30	0	1	1	---	---	1	---	---
B30	1.5	as needed	as needed	---	---	---	---	---
B31	0	1	1	---	---	1	---	---
B31	1.5	as needed	as needed	1	as needed	---	---	---
B32	0	1	1	---	---	1	---	---
B32	1.5	as needed	as needed	---	---	---	---	1
B33	0	1	1	1	as needed	1	1	---
B33	1.5	as needed	as needed	---	---	---	---	---
B34	0	1	1	---	---	1	---	---
B34	1.5	as needed	as needed	---	---	---	---	---
B35	0	1	1	---	---	1	---	---
B35	1.5	as needed	as needed	1	as needed	---	---	---
B36	0	1	1	---	---	1	---	---
B36	1.5	as needed	as needed	---	---	---	---	---
B37	0	1	1	1	as needed	1	1	1
B37	1.5	as needed	as needed	---	---	---	---	---
B38	0	1	1	---	---	1	---	---
B38	1.5	as needed	as needed	---	---	---	---	---
B39	0	1	1	---	---	1	---	---
B39	1.5	as needed	as needed	1	as needed	---	---	---

TABLE 1
Soil Sample Analysis Matix
Jameson Canyon (E8481-06-01)
Napa and Solano Counties, California

Sample Location	Sample No.	TPHg/BTEX/MTBE (EPA 8015/8021)	TPHd/mo (EPA 8015)	CAM 17 Metals (EPA 6010/7471)	Soluble Metals (WET/EPA 7420)	Pesticides (EPA 8081)	Herbicides (EPA 8151A)	pH (EPA 9045)
B40	0	1	1	---	---	1	---	---
B40	1.5	as needed	as needed	---	---	---	---	---
B41	0	1	1	1	as needed	1	1	---
B41	1.5	as needed	as needed	---	---	---	---	1
B42	0	1	1	---	---	1	---	---
B42	1.5	as needed	as needed	---	---	---	---	---
B43	0	1	1	---	---	1	---	---
B43	1.5	as needed	as needed	1	as needed	---	---	---
B44	0	1	1	---	---	1	---	---
B44	1.5	as needed	as needed	---	---	---	---	---
B45	0	1	1	1	as needed	1	1	---
B45	1.5	as needed	as needed	---	---	---	---	---
B46	0	1	1	---	---	1	---	1
B46	1.5	as needed	as needed	---	---	---	---	---
B47	0	1	1	---	---	1	---	---
B47	1.5	as needed	as needed	1	as needed	---	---	---
B48	0	1	1	---	---	1	---	---
B48	1.5	as needed	as needed	---	---	---	---	---
B49	0	1	1	1	as needed	1	1	---
B49	1.5	as needed	as needed	---	---	---	---	---
B50	0	1	1	---	---	1	---	---
B50	1.5	as needed	as needed	---	---	---	---	1
B51	0	1	1	---	---	1	---	---
B51	1.5	as needed	as needed	1	as needed	---	---	---
B52	0	1	1	---	---	1	---	---
B52	1.5	as needed	as needed	---	---	---	---	---

TABLE 1
Soil Sample Analysis Matix
Jameson Canyon (E8481-06-01)
Napa and Solano Counties, California

Sample Location	Sample No.	TPHg/BTEX/MTBE (EPA 8015/8021)	TPHd/mo (EPA 8015)	CAM 17 Metals (EPA 6010/7471)	Soluble Metals (WET/EPA 7420)	Pesticides (EPA 8081)	Herbicides (EPA 8151A)	pH (EPA 9045)
B53	0	1	1	1	as needed	1	1	---
B53	1.5	as needed	as needed	---	---	---	---	---
B54	0	1	1	---	---	1	---	---
B54	1.5	as needed	as needed	---	---	---	---	---
B55	0	1	1	---	---	1	---	1
B55	1.5	as needed	as needed	1	as needed	---	---	---
B56	0	1	1	---	---	1	---	---
B56	1.5	as needed	as needed	---	---	---	---	---
B57	0	1	1	1	as needed	1	1	---
B57	1.5	as needed	as needed	---	---	---	---	---
B58	0	1	1	---	---	1	---	---
B58	1.5	as needed	as needed	---	---	---	---	---
	TOTAL	**58**	**58**	**29**	**0**	**58**	**15**	**13**
		23	23	14		23	7	5
		12	12	6		12	2	3

May 29, 2009

ELAP No.: 1838
NELAP No.: 02107CA
NEVADA.: CA-401
CSDLAC No.: 10196

Workorder No.: 105533

Chris Merritt
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

TEL: (925) 371-5900
FAX: (925) 371-5915

RE: Jameson Canyon, E8481-06-01

Attention: Chris Merritt

Enclosed are the results for sample(s) received on May 16, 2009 by Advanced Technology Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

This is an addendum report. Please incorporate with documentation previously submitted.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (562)989-4045 if I can be of further assistance to your company.

Sincerely,

for Eddie F. Rodriguez
Laboratory Director

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories.

Advanced Technology Laboratories
3275 Walnut Avenue Signal Hill, CA 90755 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

ANALYTICAL RESULTS

Print Date: *29-May-09*

CLIENT: Geocon Consultants, Inc.
Project: Jameson Canyon, E8481-06-01
Lab Order: 105533

Lab ID: 105533-002 **Collection Date:** 5/15/2009 10:07:00 AM
Client Sample ID: B21-1.5 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090528A	QC Batch: 55573				PrepDate: 5/28/2009	Analyst: **CBR**
DRO	1.5	1.0		mg/Kg	1	5/29/2009 12:57 AM
ORO	6.8	1.0		mg/Kg	1	5/29/2009 12:57 AM
Surr: p-Terphenyl	104	30-130		%REC	1	5/29/2009 12:57 AM

Lab ID: 105533-004 **Collection Date:** 5/15/2009 9:56:00 AM
Client Sample ID: B22-1.5 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B(M)**		
RunID: GC16_090528A	QC Batch: 55573				PrepDate: 5/28/2009	Analyst: **CBR**
DRO	3.5	1.0		mg/Kg	1	5/29/2009 01:06 AM
ORO	13	1.0		mg/Kg	1	5/29/2009 01:06 AM
Surr: p-Terphenyl	72.1	30-130		%REC	1	5/29/2009 01:06 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **MB-55573** SampType: **MBLK** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/28/2009** RunNo: **109395**
Client ID: **PBS** Batch ID: **55573** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/28/2009** SeqNo: **1718140**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0									
ORO	ND	1.0									
Surr: p-Terphenyl	2.366		2.670		88.6	30	130				

Sample ID: **LCS-55573** SampType: **LCS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/28/2009** RunNo: **109395**
Client ID: **LCSS** Batch ID: **55573** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/28/2009** SeqNo: **1718141**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	23.676	1.0	33.00	0	71.7	35	124				
Surr: p-Terphenyl	2.425		2.670		90.8	30	130				

Sample ID: **105634-040AMS** SampType: **MS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/28/2009** RunNo: **109395**
Client ID: **ZZZZZZ** Batch ID: **55573** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/28/2009** SeqNo: **1718142**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	22.035	1.0	33.00	0	66.8	12	125				
Surr: p-Terphenyl	2.481		2.670		92.9	30	130				

Sample ID: **105634-040AMSD** SampType: **MSD** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/28/2009** RunNo: **109395**
Client ID: **ZZZZZZ** Batch ID: **55573** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/28/2009** SeqNo: **1718143**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	22.022	1.0	33.00	0	66.7	12	125	22.04	0.0590	20	
Surr: p-Terphenyl	2.257		2.670		84.5	30	130		0	0	

Sample ID: **105634-039ADUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/28/2009** RunNo: **109395**
Client ID: **ZZZZZZ** Batch ID: **55573** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/28/2009** SeqNo: **1718144**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

CLIENT: Geocon Consultants, Inc.
Work Order: 105533
Project: Jameson Canyon, E8481-06-01

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **105634-039ADUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **5/28/2009** RunNo: **109395**
Client ID: **ZZZZZZ** Batch ID: **55573** TestNo: **EPA 8015B(M EPA 3550B** Analysis Date: **5/28/2009** SeqNo: **1718144**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0						0	0	20	
ORO	ND	1.0						0	0	20	
Surr: p-Terphenyl	1.923		2.670		72.0	30	130		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

Advanced Technology Laboratories
3275 Walnut Avenue, Signal Hill, CA 90755 Tel: 562. 989.4045 Fax: 562.989.4040

Diane Galvan

From: Chris Merritt [merritt@geoconinc.com]
Sent: Wednesday, May 27, 2009 11:58 AM
To: Diane Galvan
Subject: RE: Results/EDD's - Jameson Canyon (105533)

Yes, please run them...

-----Original Message-----
From: Diane Galvan [mailto:Diane@atlglobal.com]
Sent: Wednesday, May 27, 2009 11:16 AM
To: Chris Merritt
Cc: livermore@geoconinc.com
Subject: RE: Results/EDD's - Jameson Canyon (105533)

Hi Chris,

The holding time expired yesterday for samples B9-1.5, B17-1.5, B55-1.5 and B58-1.5. Would you like us to proceed? Please advise.

Diane

From: Chris Merritt [mailto:merritt@geoconinc.com]
Sent: Tuesday, May 26, 2009 8:31 PM
To: Diane Galvan
Cc: livermore@geoconinc.com
Subject: RE: Results/EDD's - Jameson Canyon (105533)

For B9, B17, B21, B22, B55, B58

I'd like to get the 1.5-foot samples analyzed for TPHd/mo.

Thanks!

APPENDIX B

APPENDIX B
Arsenic, Vanadium and TPH Statistics

Sample ID	Arsenic	Vanadium
B1-0	10	41
B3-1.5	5.6	25
B5-0	8.2	42
B7-1.5	4.3	26
B9-0	5.8	30
B11-1.5	6.7	32
B13-0	6.2	33
B15-1.5	7.3	59
B17-0	4.0	47
B19-1.5	5.4	36
B21-0	6.0	37
B23-1.5	5.3	40
B25-0	4.1	28
B27-1.5	8.2	56
B29-0	4.5	31
B31-1.5	3.7	26
B33-0	6.3	48
B35-1.5	4.8	35
B37-0	4.5	30
B39-1.5	6.2	39
B41-0	5.9	33
B43-1.5	4.0	31
B45-0	4.4	32
B47-1.5	5.0	29
B49-0	6.7	44
B51-1.5	5.5	41
B53-0	4.2	34
B55-1.5	5.0	33
B57-0	6.6	35
Minimum	3.7	25
Maximum	10	59
Mean	5.7	36.3

Sample ID	TPHd	TPHmo
B1-0	0.5	3.2
B2-0	3.5	29
B3-0	33	150
B4-0	4.7	30
B5-0	3.3	14
B6-0	7.7	45
B7-0	1.8	5.8
B8-0	7.5	41
B9-0	130	610
B9-1.5	10	180
B10-0	9.2	60
B11-0	7.4	61
B12-0	0.5	1.2
B13-0	2.6	16
B14-0	19	140
B15-0	4.4	22
B16-0	6.9	44
B17-0	150	1,700
B17-1.5	53	470
B18-0	1.9	3.6
B19-0	5.8	40
B20-0	9.7	59
B21-0	120	890
B21-1.5	1.5	6.8
B22-0	110	590
B22-1.5	3.5	13
B23-0	2.2	10
B24-0	9.1	59
B25-0	1.2	3.8
B26-0	4.1	28
B27-0	2.4	16
B28-0	12	57
B29-0	9.9	52
B30-0	8.4	44
B31-0	18	120
B32-0	2.5	17
B33-0	5.3	29
B34-0	6.7	52
B35-0	11	62
B36-0	1.2	5.3
B37-0	16	94
B38-0	2.3	18
B39-0	20	93
B40-0	6.7	43
B41-0	9.0	63
B42-0	31	130
B43-0	3.2	10
B44-0	0.5	3.4
B45-0	0.5	4.5
B46-0	8.8	51
B47-0	8.7	53
B48-0	1.3	7.1
B49-0	2.4	13
B50-0	4.8	39
B51-0	2.3	27
B52-0	15	83
B53-0	12	48
B54-0	31	140
B55-0	100	420
B55-1.5	2.2	16
B56-0	20	93
B57-0	18	71
B58-0	190	750
B58-1.5	10	180
Minimum	0.5	1.2
Maximum	190	1,700
Mean	20.6	128.6

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

IN REPLY REFER TO:
81420-2008-F-0827

JAN 31 2008

Mr. James Richards
Attn: Christopher States
California Department Transportation
P.O. Box 23660
Oakland, California 94623-0660

Subject: Biological Opinion for the State Route 12/State Route 29 Interchange Improvement and State Route 12 Jameson Canyon Road Widening Projects, Solano and Napa Counties, California (Caltrans EA 04-287900 and 04-264100) on the Threatened California Red-legged Frog

Dear Mr. Richards:

This is in response to your July 31, 2007, request for formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed State Route 12/State Route 29 Interchange Improvement and State Route 12 Jameson Canyon Road Widening Projects, Solano and Napa Counties, California. Your request was received in this office on August 31, 2007, and included the request for formal consultation on the threatened California red-legged frog (*Rana aurora draytonii*). This document represents the Service's biological opinion on the effects of the proposed action on this listed species. This document has been prepared in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 *et seq.*)(Act).

Protocol level surveys have not been completed in the action area due to scheduling issues and access problems for the endangered showy Indian clover (*Trifolium amoenum*), endangered Contra Costa goldfields (*Lasthenia conjugans*), endangered Conservancy fairy shrimp (*Branchinecta conservatio*), endangered vernal pool tadpole shrimp (*Lepidurus packardii*), and the threatened vernal pool fairy shrimp (*Branchinecta lynchi*). Suitable habitat is located within the action area for all of these listed species and there are records of them from the vicinity of the project. At this time, based on the preliminary and incomplete information provided to the Service, we concur that the proposed project may affect, but is not likely to adversely affect these five listed species. At a meeting with the Service on November 5, 2007, and in a letter and electronic mail message to the Service dated January 31, 2008, Caltrans stated that they will complete protocol level surveys within the action area for all of these listed species prior to

groundbreaking and reinitiate consultation pursuant to section 7 if any or all of these taxa are found, with the understanding that the presence of any or all of these plants or animals could lead to additional conservation measures that will be determined in conjunction with the Service, project delays, project redesign, or other significant effects on the Jameson Canyon project.

This biological opinion is based on: (1) an August 2007 Biological Assessment; (2) additional project information provided by the California Department of Transportation (Caltrans) on November 5, 2007; (3) a December 7, 2007 meeting between the Service, the Solano Transportation Authority, Napa County Transportation and Planning Agency, and Gray-Bowen; (4) December 13, 2007, letter from Caltrans regarding the phasing of the compensation for the proposed project; (5) a letter from Caltrans to the Service regarding the draft biological opinion that was dated December 245, 2007, that was received on December 31, 2007; (6) a meeting between Caltrans, the Service, and Terry Bowen and Bill Gray of Gray-Bowen on January 7, 2008; (7) a telephone discussion between the Service and Caltrans on January 28, 2008; (8) a telephone discussion between the Service and Caltrans on January 30, 2008; (9) a letter from Caltrans that was dated January 31, 2008, and was received by us on January 31, 2008, that statedthey are willing to accept the biological opinion; (10) a January 31, 2008, electronic mail message from Caltrans to the Service that requested issuance of the draft biological opinion; (11) miscellaneous correspondence and electronic mail concerning the proposed action between the Service and Caltrans, Solano Transportation Authority, Napa County Transportation and Planning Agency, and Gray-Bowen; and (12) other information available to the Service.

Consultation History

August 31, 2007	The Service received a letter dated July 31, 2007, from Caltrans requesting formal consultation for the proposed State Route 12/State Route 29 Interchange Improvement and State Route 12 Jameson Canyon Road Widening Projects, Solano and Napa Counties, California. The request was accompanied by a Biological Assessment dated August 2007. In the Biological Assessment, Caltrans determined that the proposed project would have no effect on the endangered Contra Costa goldfields and the endangered showy Indian clover, is not likely to adversely affect the endangered Conservancy fairy shrimp and the endangered vernal pool tadpole shrimp and, may adversely affect the threatened vernal pool fairy shrimp and the threatened California red-legged frog.
September 27, 2007	The Service sent Caltrans a request for additional information to adequately review the determination of the effects of the project on listed species (Service File: 1-1-07-I-1688). The letter included concerns associated with the Caltrans approach given that they did not have access to much of the proposed action area in order to submit an adequate biological assessment of the affects on listed species.

November 5, 2007	The Service met with Caltrans, Solano Transportation Authority, Napa County Transportation and Planning Agency, and Gray-Bowen to discuss the proposed project. It was agreed that they will complete protocol level surveys within the action area for Contra Costa goldfields, showy indian clover, Conservancy fairy shrimp, vernal pool fairy shrimp and vernal pool tadpole shrimp in the action area prior to groundbreaking and reinitiate consultation pursuant to section 7 if any or all of these taxa are found, with the understanding that the presence of any or all of these plants or animals could lead to additional conservation measures that will be determined in conjunction with the Service, project delays, project redesign, or other significant effects on the Jameson Canyon project. Caltrans also provide their written response to the September 27, 2007 request for additional information. In their response, Caltrans initiated formal consultation on the vernal pool tadpole shrimp but did not provide a revised assessment of the effects to this endangered species.
November 21, 2007	The Service visited the action area to review remaining project issues with Caltrans. The Service was given the Supplemental Response to Comments for the Completion of Consultation for the State Route 12/State Route 29 Interchange Improvement and State Route 12 Jameson Canyon Road Widening Projects from Caltrans. The supplemental response letter was dated November 19, 2007.
December 3, 2007	The Service received a revised project description from Caltrans via an electronic mail message.
December 7, 2007	The Service met with the Solano Transportation Authority, Napa County Transportation and Planning Agency, and Gray-Bowen to discuss local issues.
December 14, 2007	The Service received a letter from Caltrans dated December 13, 2007, via an electronic mail message phasing of compensation for the two proposed projects.
December 14, 2007	The Service sent a draft of the biological opinion for the proposed project to Caltrans, Solano Transportation Authority, Napa County Transportation and Planning Agency, and Gray-Bowen (Service File: 81420-2008-F-0530).
December 31, 2007	The Service received a letter from Caltrans regarding the draft biological opinion dated December 24, 2007.

January 7, 2008	The Service, Caltrans, and Terry Bowen and Bill Gray of Gray-Bowen had a meeting regarding the Jameson Project.
January 28, 2008	The Service and Caltrans discussed the proposed project on the telephone.
January 30, 2008	The Service and Caltrans discussed the proposed project on the telephone.
January 31, 2008	The Service received a letter from Caltrans dated January 31, 2008, that stated they are willing to accept the draft biological opinion.
January 31, 2008	The Service received an electronic mail message from Caltrans requesting the Service issue the draft biological opinion.

BIOLOGICAL OPINION

Description of the Proposed Action

Caltrans proposes to improve the State Route 12 and State Route 29 interchange in Napa County and to improve safety and reduce traffic congestion on State Route 12 between the intersections with State Route 29 and Interstate 80 (Jameson Canyon Road). Caltrans proposes to minimize head-on accidents in the project area east of the interchange by constructing a concrete median barrier.

Caltrans advanced the level of design for the State Route 12 Jameson Canyon Road Widening and State Route 12/29 Interchange Improvement Project because it is part of the Corridor Mobility Improvement Account (CMIA). To qualify for these funds, Caltrans advanced the design to include layout sheets and typical cross-sections as well as specific designs for horizontal alignments, profiles, super elevations, and roadway cross sections. Caltrans is in the process of developing the hydraulic, storm water, and utility design. Caltrans will be required to reinitiate consultation on these projects when and if there are changes to the project description.

General Scope of Work

The projects discussed in this Biological Opinion consist of a State Route 12/ State Route 29 Interchange Improvement Project component and a State Route 12 Jameson Canyon Road Widening project component. The combined projects are located along State Route 12 in Napa and Solano Counties from the State Route 12/ State Route 29 Interchange in Napa County to Red Top Road in Solano County, approximately 1,000 ft west of Interstate 80. The proposed project is planned in three phases; construction of eastbound lanes primarily south of the existing Jameson Canyon Road, horizontal and vertical curve corrections to westbound Jameson Canyon Road, and construction of an interchange at State Route 12 and State Route 29.

Construction Schedule and Funding

The proposed project is planned in three phases. Federal, state and local funding is currently available for the first phase of the project. Construction for the first phase is anticipated to begin in October 2010 and be completed in July 2013. Funding sources for the ultimate project are contingent upon local governments approving tax measures to fund roadway projects.

Construction Activities

The key elements of the proposed project are summarized as follows:

1. Construction of two additional lanes for eastbound traffic along the Jameson Canyon portion of the project.

2. Vertical and horizontal corrections of the existing westbound lanes of traffic.

3. Improving the State Route 12/ State Route 29 interchange. Effects of the interchange have been identified using the Single Point design.

4. Construction of a median barrier with two traffic breaks and design features for wildlife crossings.

5. Culvert modification to accommodate some passage of federally threatened wildlife and other non-listed species.

6. Construction of cut and mechanically stabilized earthen (MSE) walls.

The project would create about 86.5 acres of new pavement. Earth fill is estimated to be approximately 510,264 cubic yards. Roadway excavation is estimated to be 433,187 cubic yards. Eighty three acres of partial right-of-way acquisition is required at an estimated cost of $24,381,000.

State Route 12/ State Route 29 Interchange Improvement

The proposed State Route 12/ State Route 29 Interchange Improvement Project site spans 1.3 mile (mi) of State Route 29 from Napa Post Mile (PM) 4.2 to Napa PM 5.5. Also included in the State Route 12/ State Route 29 Interchange Improvement Project are areas west of the interchange along Airport Boulevard, including an area north of Airport Boulevard along Devlin Road, and areas east of the interchange along State Route 12, including an area north of State Route 12 along North Kelly Road.

Caltrans has quantified potential effects associated with the "Single Point" interchange upgrade design alternative. This design alternative considers the maximum potential effect to federally listed species.

With the Single Point design, all interchange approach ramps would be positioned on either fill or bridge structures with State Route 12 elevated over State Route 29, with a possible two-span bridge over State Route 29, and would establish an auxiliary lane on southbound State Route 29 between the State Route 29/ State Route 221 and State Route 12/ State Route 29 interchanges. State Route 12 and Airport Boulevard will be realigned through the intersection with State Route 29, and the roadway profiles for Devlin and Kelly Roads may be raised. State Route 12 and State Route 29 would have minimum 4.9 foot wide inside shoulders and 9.8 foot wide outside shoulders. State Route 29 would retain its four existing through lanes, two in each direction. An approximately 29.5 foot retaining wall will be used in fill areas. During construction, a detour for east-west traffic on State Route 12 and Airport Boulevard will be required south of the existing intersection.

The ramps in the south quadrants would have one exit lane splitting off into two lanes and two entrance lanes merging into one lane. At the northwest location, two lanes (including one auxiliary lane) exit from southbound State Route 29, splitting off into four lanes. At the end of the off-ramp, one lane turns west onto Airport Blvd while the other three lanes turn east onto State Route 12, merging to two lanes east of Kelly Road. At the northeast location, two lanes exit from westbound State Route 12 to northbound State Route 29.

Widening of State Route 12 and State Route 29 will require relocation of utilities, specifically electricity, gas, telephone, water lines, an aqueduct, and a control cable. Caltrans is in the process of developing the utility design.

State Route 12 Jameson Canyon Road Widening

The State Route 12 Jameson Canyon Road Widening project site extends 5.9 miles along State Route 12 from Napa PM 0.25 to Solano Realignment (R) PM 2.6, just east of Red Top Road.

East of Kelly Road, the proposed State Route 12 road widening would expand the existing two-lane highway to a four-lane conventional highway. The westbound lanes will be primarily constructed on the existing alignment, and two additional lanes will be added for the eastbound direction. The westbound and eastbound lanes will be designed to highway standards, with a design speed of 55.9 miles per hour (mph). All travel lanes will be 11.8 ft wide. The median width will also be 11.8 feet. The concrete median barrier will be approximately 3.0 feet high.

Two median openings with acceleration and deceleration lanes are proposed, one in Napa County and one in Solano County. For Napa County the median opening will be located at the intersection of Lynch Road and State Route 12. The other median break will be approximately 2,625 feet east of the Solano/Napa County line. The median breaks will facilitate "U" turn

movements for the traffic along State Route 12. All inside shoulders throughout the projects will have a minimum width of 4.9 feet. For the westbound direction, the outside shoulders will be 7.9 feet. The eastbound direction will have 9.8 ft shoulders.

Caltrans is incorporating standard wildlife crossing design features into the median barrier. This includes a "concrete barrier wildlife passageway (Type S)" approximately every 300 feet and a "concrete barrier wildlife passageway (Type M) approximately every 1200 feet. These design features will allow small mammals or amphibians to cross through the concrete median barrier (Type S) or medium size animals, such as raccoons (Type M). The Type S opening for concrete barrier wildlife passageway is a 6 inch radius, and the Type M opening is approximately two-feet.

At several locations within the new eastbound roadway retaining walls will be constructed to reduce the overall footprint and to minimize disturbance of riparian areas. Two types of retaining walls will be constructed; cut walls (also known as soil nail walls) and fill or MSE walls. Eight retaining walls are proposed for the State Route 12 widening project; six will be MSE walls and two will be cut walls. In Napa County retaining walls will be constructed along the north side of State Route 12 near the interchange PM 0.00 to 0.24 and from PM 2.16 to 2.21. MSE walls are proposed for fill areas in Solano County on the south side of State Route 12 from PM 1.06 to 1.11, from PM 1.24 to 1.47, from PM 1.58 to 1.86, from PM 2.04 to 2.22, and from PM 2.28 to 2.37. Cut walls are proposed for areas in Solano County north of State Route 12 from PM 0.50 to 0.58 and from PM 1.27 to 1.65, with a stepped retaining wall with cuts of approximately 85.3 feet from PM 1.5 to 1.56. Each step wall will have a maximum height of approximately 49.2 feet and a maximum length of 0.43 miles.

There will be minor modifications to the existing intersections of State Route 12 and Kelly, Kirkland Ranch, and Lynch Roads. Improvements to the intersection at Red Top Road are not part of this project. These modifications are included in the scope of the Red Top Truck Climbing Lane Project, Service file # 1-1-07-F-0073.

A new right turn pocket will be constructed in the westbound direction of State Route 12 at the intersection of Kelly Road. In the eastbound direction, a right turn lane will be added at the intersection of Kelly Road that will conform to the design of the State Route 12/ State Route 29 Interchange. No profile change is proposed for this intersection.

At the intersection of Kirkland Ranch Road, a right turn pocket will be constructed in the east and westbound direction of State Route 12. A possible profile adjustment for Kirkland Ranch Road to State Route 12 is also proposed.

At the intersection of Lynch Road and State Route 12, a left turn pocket is proposed for left turn movements to both east and westbound directions. One right turn movement pocket is proposed into Lynch Road from State Route 12. A possible profile adjustment is also proposed for this

intersection. A median opening for "U" turn movements is within the proximity of this intersection area.

Driveways at stations 156+80 and 180 +60 will be relocated to accommodate proposed new structural retaining walls, however no left turn pockets will be accommodated for any private property access.

Culverts

Caltrans proposes to upsize nine culverts to 36 inches. Table 1 lists the culverts that Caltrans will modify to improve California red-legged frog passage. The table includes the station, approximate post mile, existing diameter, proposed diameter, and culvert type.

Table 1: Proposed culvert modifications for California red-legged frog passage

W→E number*	Station	Approximate Post Mile	Existing diameter (inches)	Proposed diameter (inches)	Type
1	31+60	Nap 29 5.57	30	36	RCB/CMP
3	17+60	Nap 29 4.56	24	36	RCP/APC
6	114+00	Nap 12 0.94	18	36	CMPA
7	126+40	Nap 12 1.71	24/18	36	CMP
11	142+60	Nap 12 2.69	24	36	CMP
13	154+40	Sol 12 0.35	18	36	CMP
14	158+40	Sol 12 0.54	18	36	CMP
17	184+40	Sol 12 2.14		New 36	APC
18	191+00	Sol 12 2.42		New 36	APC

CMP = corrugated steel pipe; CMPA = corrugated metal pipe arch; RCB = reinforced concrete box; RCP = reinforced concrete pipe; APC = alternative pipe culvert
*Identifies the locations of the culverts from west to east along the project area in the Appendix B maps

The increased size of these nine culverts along with the existing large culverts (Table 2) will improve the crossing potential for California red-legged frog across State Route 12 and State Route 29.

Table 2: Existing large culverts along Jameson Canyon and 12/29 interchange area. Caltrans will extend these culverts to accommodate the two-lane highway.

W→E number*	Station	Approximate Post Mile	Size	Type
2	24+20	Nap 29 5.02	8-foot	RCB
4	107+60	Nap 12 0.53	3-foot	CMPA
5	110+40	Nap 12 0.69	3-foot	RCB
8	129+40	Nap 12 1.91	6-foot	RCB
9	136+00	Nap 12 2.32	4-foot	RCB
10	140+20	Nap 12 2.55	4.8-foot	CMPA
12	146+60	Nap 12 2.94	5x10-foot	RCB
15	166+00	Sol 12 1.02	4-foot	RCB
16	171+40	Sol 12 1.31	6-foot	RCB

*see Table 1

Caltrans proposed culverts based on their proximity to wetland or riparian areas. Caltrans excluded culverts based on particular design features that limit the suitability of culverts for passage, such as, retaining walls, or steep slopes. The maximum distance between two of these large culverts is approximately 1500 feet.

A temporary drainage bypass system may be used to divert flows around work areas in Sheehy Creek, Fagan Creek, Jameson Canyon Creek, and associated tributaries. The use, installation, and removal of the temporary drainage bypass system will be restricted to the period from June 15 to October 15. If dewatering is required during summer construction, Caltrans will establish a coffer dam using clean gravel or sand bags and pump water to the downstream side of the construction (Caltrans 2007b).

According to the Caltrans' Initial Study with Proposed Mitigated Negative Declaration (CEQA) and Environmental Assessment (NEPA) prepared for the proposed projects, the planed Bay Area Ridge Trail will cross the action area but will not be part of the current action (Caltrans 2007c). A large State Route 12 undercrossing designed to accommodate hikers, mountain bicyclists, equestrians, and outdoor enthusiasts is also likely to be important for California red-legged frog and other wildlife passage depending on the location.

Staging Locations

The temporary construction easement, located between the cut and fill lines and the project footprint, can be used for staging areas and access roads. While this entire area will likely not be utilized, identifying this large area allows for maximum flexibility for the contractor. Caltrans surveyed the potential effect area beyond the cut and fill line that included temporary effects along the highway that the contractor may use for equipment storage or staging. However, the contractor may have specific locations for off-site facilities such as storage areas or disposal that

they used for other projects and may utilize for this project as well. As stated in the Caltrans Standard Specification (May 2006), before disposing of materials outside the State right of way, the Contractor shall furnish satisfactory evidence that the Contractor has entered into agreements with the property owner of the site involved and has obtained the permits, licenses and clearances.

Staging locations for both projects will be used for temporary storage of heavy construction equipment and various construction materials such as shotcrete (a mixture of concrete, fine aggregate, and water blown pneumatically through a hose), equipment maintenance shops, stockpile areas, and field offices. If necessary, an access road linking staging areas and the work area will be cleared, graded, and re-established using equipment such as excavators, bobcats, and/or bulldozers.

Roadbed

Roadway excavation will be conducted using equipment such as a front-end loader and motor grader to excavate the area to be paved to the required grade. Excavated material may be hauled off-site using dump trucks. The location and type of excavated material disposal will be determined by the contractor. The contractor will be required to obtain any necessary environmental clearances associated with the disposal or reuse of these materials. Once the roadbed has been excavated, the soil will be rolled and vibrated with a sheepsfoot or drum roller to 95 percent relative compaction.

Structural Section

The layers making up the structural section of the roadway will be placed in short lifts of less than 6 inches. The material will be hauled in, dumped, spread with a motor grader or asphalt-paving machine, and compacted.

Overlay

For failed sections of existing pavement only, overlay will be adjusted by digging out the existing asphalt concrete to a maximum of 6 inches. The asphalt concrete overlay then will be dumped and spread using an asphalt-paving machine, and then rolled with a steel-tired compactor.

Cut Walls

A cut wall consists of steel tiebacks or large rebar drilled into an excavated cut slope as the excavation proceeds. Cut walls are designed by the engineer based on the properties of the soil, steel bar, and groundwater conditions. After the first bench is cut using a backhoe or loader, a track-mounted drill rig will drill horizontal holes into the cut. Large epoxy-coated rebar (soil nails) will then be inserted into the holes and cement grout is placed into the drilled hole to surround the rebar and provide a bond between the soil nail and the surrounding ground. Each

soil nail is grouted in place at each level as the excavation proceeds downward to stabilize the slope.

Drainage fabric, usually steel wire mesh, and reinforcement will be placed along the excavated face, and will then be covered in shotcrete. This process continues to the bottom of the wall. After all the nails and shotcrete are in place, reinforcing steel will be placed and forms erected so that a smooth, decorative wall will cover the soil nail system.

Temporary drainage bypass system

A temporary drainage bypass system (e.g. coffer dam and flume or pump system) may be used to divert flows around work areas in creeks. Use, installation, and removal of the temporary drainage bypass system will be restricted to the period from June 15 to October 15.

Action Area

The project's action area is the combined area of direct and indirect effects to federally listed species. For this project, the area of direct effects corresponds to the areas within the proposed cut and fill and temporary construction as based upon the following criteria: (1) the cut and fill line was determined as the necessary area for project construction; (2) an additional 15 feet for right of way was identified for temporary construction access; (3) an additional 30 feet of temporary construction easement has been identified for utility relocation; and (4) Caltrans identified specific locations within the 12/29 Interchange Project area to be utilized as temporary construction areas for detours and staging. Indirect effects will be avoided through the implementation of BMP's and other measures. As project designs are refined, Caltrans will work to identify sensitive areas for avoidance during construction. Caltrans is working with utility companies to develop specific relocation plans such that Caltrans can reduce the project footprint and avoid additional biological resources. When Caltrans defines the reduced footprint, consultation with the Service will be reinitiated.

According to Caltrans the combined action area for the two projects is 310.62 acres. Excluding the existing 55.25 acres of State12 and State Route 29 hardscape, the combined action area is 255.37 acres (State Route 12 Jameson Canyon Road Widening Project = 176.37 acres and State Routes 29/12 Interchange Project =79.00 acres).

Permanent vs. Temporary Effects

Temporary effects are defined as those construction areas that are restored to baseline habitat values or higher within one year following the initial disturbance. Given that the action for the State Route 12/State Route 29 Interchange Improvement and State Route 12 Jameson Canyon Road Widening projects will each require more than one year of construction it is unlikely that any areas of effects will be temporary in nature. This includes areas used for staging. Given the scope and duration of the project, the entire proposed action area will be permanently affected by the proposed project, Caltans has the option of reinitiating consultation for the purposes of

revising the amount habitat compensation if it can be documented that portions of the action area subject to construction have been successfully restored as determined by the Service. The Service does not consider areas that will be subjected to ongoing maintenance as areas of temporary effects even if they are restored within one year following the initial disturbance.

Construction Site Restoration

Caltrans plans to restore areas of temporary ground disturbances, including storage and staging areas, and temporary roads. These areas will be re-contoured, if appropriate, and revegetated with seeds and/or cuttings of appropriate plant species to promote restoration of the area to pre-project conditions. Caltrans defines areas of "temporary" disturbance to be any area that is disturbed during the project, but that after project completion will not be subject to further disturbance and has the potential to be revegetated. Caltrans will be developing a restoration plan that will be submitted to the Service for approval prior to initial ground breaking. According to Caltrans, to the maximum extent practicable (i.e., presence of natural lands), topsoil will be removed, cached, and returned to the site according to successful restoration protocols. Loss of soil from run-off or erosion will be prevented with straw bales, straw wattles, or similar means provided they do not entangle, block escape or dispersal routes of listed animal species.

Equipment

The equipment expected to be used to construct the project is typical of roadway and interchange construction and may include cranes, excavators, bobcats, bulldozers, roadheaders, hydraulic excavators or backhoes, rubber-tired dump trucks, front-end loaders, load-haul-dumps (LHD's), drill jumbos, front-end loaders and motor graders, sheepsfoot or drum rollers, and asphalt-paving machines.

Temporary construction areas will be cleared, graded, and reestablished using equipment such as excavators, bulldozers, and/or bobcats.

Compliance with Local Habitat Conservation Plan

According to the Caltrans' Initial Study with Proposed Mitigated Negative Declaration (CEQA) and Environmental Assessment (NEPA) prepared for the proposed projects, widening of State Route 12 will be consistent with Solano Multi-Species Habitat Conservation Plan (HCP)/Natural Community Conservation Plan (NCCP) (Caltrans 2007c). The conservation goals, objectives, and measures stated in the draft Solano HCP for the California red-legged frog places special emphasis on the Jameson Canyon-Lower Napa River Core Recovery Area (SCWA 2007). According to the draft HCP, Plan Participants shall, to the maximum extent practicable, limit additional development with this core recovery area. The stated goals relevant to the State Route 12 Jameson Canyon Road Widening Project include:

1. Sub-Goal RLF 1.1. Maintain water quality standards to the maximum extent practicable such that waters within the Jameson Canyon-Lower Napa River Core Recovery Area are restored to and maintain their chemical, physical and biological integrity.

2. Sub-Goal RLF 1.2. Maintain interconnected blocks of habitat that support natural movement patterns and metapopulation dynamics.

3. Sub-Goal RLF 1.3. Minimize direct and indirect effects to California red-legged frogs from Covered Activities.

4. Sub-Goal RLF 1.4. Manage preserves and reserves in order to minimize the effects of negative pressures on California red-legged frogs.

5. Sub-Goal RLF 1.5. Restore and create new breeding habitat that will be protected and managed in perpetuity.

The stated objectives designed to achieve the above goals relevant to the State Route 12 Jameson Canyon Road Widening Project include:

6. Objective RLF 1.1. Develop and implement a coordinated watershed management plan for the Jameson Canyon-Lower Napa River Core Recovery Area within 5 years of adopting the HCP.

7. Objective RLF 1.2. Document the status of the California red-legged frog population within the Jameson Canyon-Lower Napa River Core Recovery Area through the establishment and implementation of a scientifically-acceptable population monitoring program that includes at minimum one average precipitation cycle (a period when annual rainfall includes averages to 35 percent above-average through greater than 35 percent below-average and back to average or greater).

8. Objective RLF 1.3. Limit the cumulative permanent development and other incompatible land uses within the Jameson Canyon-Lower Napa River Core Recovery Area to the maximum extent practicable.

9. Objective RSM 1.4. Avoid and minimize impacts to existing California red-legged frog habitat to the maximum extent practicable.

10. Objective RLF 1.5. Provide for a net increase in the quantity and quality of aquatic habitat for California red-legged frogs within the Plan Area for the HCP.

11. Objective RLF 1.6. Protect and maintain upland habitat between suitable California red-legged frog breeding habitat within Core Recovery Areas.

12. Objective RLF 1.7. Develop and implement best management practices to prevent or minimize adverse impacts to California red-legged frogs during operation and maintenance activities on existing facilities.

13. Objective RLF 1.8. Minimize activities associated with urban and agricultural land use development projects that could lead to expansion of predator (bullfrog, crayfish, and warm water fish) populations (range and numbers) into undeveloped areas in the remainder of the western portion of the County.

Relevant Conservation Measures designed to meet the objectives and species recovery goals include:

1. Conservation Measure RLF 4 Minimize Development within Core Recovery Areas. The Plan Participants shall monitor development within the Jameson Canyon-Lower Napa River Core Recovery Area and limit the cumulative permanent development and other incompatible land uses to the maximum extent practicable. In addition, the Plan Participants shall not annex additional lands for urban development within the Jameson Canyon-Lower Napa River Core Recovery Area.

2. Conservation Measures RLF 5 Baseline Survey Requirements. Applicants seeking permission for HCP Covered Activities that will result in the loss or conversion of California red-legged frog habitat within the Inner Coast Range shall conduct appropriately-timed surveys, consistent with the baseline survey requirements.

3. Conservation Measure RLF 6 Barriers. To the maximum extent practicable, minimize development and construction of new roads in areas found to support California red-legged frogs.

4. Conservation Measure RLF 7 Aquatic Habitat Buffers. Applicants for development projects seeking coverage under the HCP shall provide a minimum average 300-foot wide buffer of associated upland between suitable California red-legged frog aquatic breeding habitat and urban development/active open space recreation areas to provide for protection of aquatic breeding habitats to the maximum extent practicable. Minimum buffer distances shall be no less than 300 feet in width.

5. Conservation Measure RLF 8 Corridors. Any avoided or retained aquatic habitat shall have corridors connecting to suitable aquatic habitat within 0.7 miles. The corridors shall be a minimum of 1320 feet in width. If the corridor is bisected by a new or existing road that will have a predicted nighttime volume of 20 cars per hour or greater, design measures such as culverts, underpasses, and roadside barriers to facilitate movement of small animals across the roadway shall be implemented.

6. Conservation Measure 9 Prevent the "Perennialization" of Ponds and Intermittent Creeks. Minimize activities associated with urban and agricultural land use development projects that could lead to expansion of predator (bullfrog, crayfish, and warm water fish) populations (range and numbers) into undeveloped areas in the remainder of the western portion of Solano County. Development activities shall avoid establishment of perennial ponds and small lakes and urban runoff shall be controlled to prevent "perennialization" of intermittent creeks.

7. Conservation Measure RLF 10 Promote Open Space Corridors. Encourage open space elements for development proposals that protect wetlands, enhance frog aquatic and upland habitats and provide corridors linking onsite and offsite aquatic habitats consistent with HCP reserve design and management standards. No new perennial water sources or net increases in mid to late summer base flows of intermittent creeks shall be permitted.

The draft HCP guidance for California red-legged frog compensation includes the following:

1. Conservation Measure RLF 11 Mitigation for Upland Habitat within the Core Recovery Area. All development within California red-legged frog James Canyon-Lower Napa River Core Recovery Area that results in the conversion of upland habitats shall provide an impact fee based on the gross acreage of the impacted upland habitat. Collected fees will be pooled and administered by the Solano County Water Agency (SCWA) to provide funding for land acquisition, aquatic predator control, habitat enhancement, and other activities benefiting the California red-legged frog within the Recovery Area, consistent with criteria specified in the Watershed Management Plan. The fee shall be based the cost of land at a 3:1 ratio and an endowment fund or other approved funding source to implement management plans for preserved lands to restore and enhance aquatic and upland habitats for the California red-legged frog and control nonnative species such as bullfrog, warm water fish, and crayfish.

2. Conservation Measure RLF 12 Mitigation for impacts to riparian, in-stream, pond, and freshwater marsh habitats within Recovery Areas. Compensatory mitigation for unavoidable impacts to riparian, in-stream, pond, and freshwater marsh habitats within the Recovery Area shall be provided through the construction and/or restoration of similar habitats at a prescribed ratio of acres restored to acres impacted consistent with Riparian and Freshwater Marsh Conservation Measure RSM 11.

3. Conservation Measure RLF 12.1. Permanent impacts to suitable breeding and essential hydration habitat (pond, open water and marsh, springs and seeps, and channel habitats). Impacted habitats shall be replaced by constructing new breeding habitat at a minimum of 4:1 ratio. All habitat restoration or creation shall also occur within the Recovery Area. An endowment fund or other approved funding source for long-term operation and maintenance of the features shall also be provided.

4. Conservation Measure RLF 12.2. Permanent impacts to other non-breeding riparian and aquatic habitats. Impacts to other riparian and wetland/aquatic habitats will be mitigated at either a) a 2:1 ratio if the aquatic habitats are constructed or recreated or b) a 3:1 ratio where enhancement measures for existing habitat areas are implemented and the affected habitat is replaced (constructed) at a minimum 1:1 ratio. The restoration of suitable habitat or construction of new riparian and aquatic habitats shall occur within the Recovery Area. An endowment fund or other approved funding source for long-term operation and maintenance of the features shall also be provided.

5. Conservation Measure RLF 13. Temporary impacts to marsh, pond/aquatic, and riparian habitats. Temporary or short-term impacts associated with the removal of vegetation associated with ordinary channel operations and maintenance activities by Plan Participants in their facilities or construction/installation of permanent features (e.g., outfalls, bridges, utility lines), shall not require direct compensation for the temporary loss of herbaceous vegetation or woody vegetation less than 1 inch in diameter provided the activities comply with the following conditions:

    a. Appropriate erosion control measures and best management practices are implemented for all disturbed areas above the waterbody's ordinary high water mark consistent with conservation measures outlined in the Riparian and Freshwater Marsh Conservation Strategy.

    b. All work is conducted in compliance with avoidance and protection measures described in the Solano Operations and Maintenance Manual.

    c. All native, woody riparian vegetation greater than 1 inch in diameter is replaced by planting sufficient new native riparian vegetation to achieve a 3:1 replacement ratio of new riparian vegetation after 5 years. No compensation is required for removal of non-native trees and shrubs.

Proposed Conservation Measures

According to the Biological Assessments, November 2007 response, January 31, 2008, letter from Caltrans to the Service, January 31, 2008, electronic mail message from Caltrans to the Service, Caltrans proposes to avoid, minimize, and compensate for effects to listed species by implementing the following measures:

1. The effects to 255.37 acres of California red-legged frog habitat for both projects shall be compensated at a 3:1 ratio (766.11 acres) of occupied California red-legged frog habitat. The compensation can be phased to coincide with the initiate of the individual projects. The State Route 12 Jameson Canyon Road Widening Project will have effects to 176.37 acres of California red-legged frog habitat and the State Route 12/State Route 29

Interchange Improvement project will affect 79.0 acres of California red-legged frog habitat.

Caltrans will expend the funds to either purchase credits at a Service-approved approved conservation bank, contribute to habitat acquisition, or contribute to an in-lieu fee program that complies with FHWA policy for Federal aid participation.

Caltrans under the NEPA 404 Delegation is providing the proposed compensatory mitigation for the anticipated impacts to Vernal pool (Wetland Habitat) and associated Natural habitat under the statutory authority provide under 23 CFR part 710.513 and 23 CFR part 777 outlined by the U.S. Department of Transportation, Federal Highways Administration, Office of Chief Counsel, Memorandum – Dated march 10th, 2005, HEPN-30.

2. A Service-approved biologist will be designated for the project. The qualified biologist(s) will be on-site during all activities that may result in the take of listed species. The qualifications of the biologist(s) will be presented to the Service for review and written approval prior to ground-breaking at the project site. The biologist(s) will be given the authority, through the Resident Engineer to stop any work that may result in take of listed species. Should the biologist(s) exercise this authority, the Service and the California Department of Fish and Game will be notified by telephone and electronic mail within one working day. The Service contact will be Chris Nagano, Deputy Assistant Field Supervisor, Endangered Species Program at the Sacramento Fish and Wildlife Office at telephone 916/414-6600.

3. The resident engineer will halt work immediately and contact the Service-approved, project biologist and the Service in the event that a California red-legged frog gains access to a construction zone. The resident engineer will suspend all constriction activities in the immediate construction zone until the animal leaves the site voluntarily or is removed by the biologist to a release site using Service-approved transportation techniques.

4. A qualified biologist will conduct employee education training for construction employees working on ground disturbing activities that may result in the take of listed species. All constriction crews will be required to attend a presentation that addresses listed species that have the potential to occur within the project limits, avoidance and minimization measures, terms of the biological opinion, and other related matters. The program will consist of a brief presentation by persons knowledgeable about Contra Costa goldfields, showy indian clover, listed branchiopods, and the California red-legged frog. The program will included the following: a description of the species and their habitat needs; photographs of these species; an explanation of the legal status of these species and their protection under the Act; and a list of measures taken to reduce effects to these species during project construction.

5. Caltrans will avoid effects to pools beyond the project footprint by employing permanent and temporary best management practices (BMPs), including a storm water pollution prevention plan (SWPPP), and erosion control BMPs. In areas that flow hydrologically from the project footprint to vernal pool crustacean and California red-legged frog habitat, Caltrans will erect linear sediment barriers (such as silt fences or coir rolls) to prevent effects to vernal pools. Caltrans intends this measure to limit effects to vernal pool crustacean and California red-legged frog aquatic habitat within 300 feet of the project footprint (Caltrans 2007b).

6. To minimize temporary disturbances, all project-related vehicle traffic will be restricted to established roads, construction areas, and other designated areas. These areas also should be included in pre-construction surveys and, to the maximum extent possible, should be established in locations disturbed by previous activities to prevent further adverse effects. Project-related vehicles will observe a 20-mile per hour speed limit within construction areas, except on County roads, and State and Federal highways; this is particularly important at night when the California red-legged frog is most active. To the maximum extent possible, night-time construction will be minimized. Off-road traffic outside of designated project areas will be prohibited.

7. Dust control measures will be implemented during construction, consisting of regular thick watering of constriction access areas and disturbed soil areas with the use of organic soil stabilizers to minimize airborne dust and soil particles generated from graded areas. Regular truck watering will be a requirement of the construction contract. In addition, for disturbed soil areas, an organic tackifier to control dust emissions blowing off of the right-of-way or out of the construction area during construction will be included in the contract special provisions. Watering guidelines for trick watering will be established to avoid any excessive nun-off that may flow into contiguous areas. Any material stockpiles will be watered, sprayed with tackifier, or covered, to minimize dust production and wind erosion.

8. Project employees will be provided with written guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.

9. To eliminate an attraction to predators of the California red-legged frog, all food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed at least once a day from the entire project site.

10. To avoid injury or death of the California red-legged frog, no firearms will be allowed on the project site except for those carried by authorized security personnel, or local, State, or Federal law enforcement officials.

11. To prevent harassment, injury or mortality of the California red-legged frog or destruction of their burrows by dogs or cats, no canine or feline pets will be permitted in the action area.

12. All fueling and maintenance of vehicles and other equipment will occur at least 65 feet from any riparian habitat or aquatic habitat.

13. All grindings and asphaltic-concrete waste will be stored within previously disturbed areas absent of habitat and at a minimum of 250 feet from any culvert, or drainage feature.

14. For seasonal avoidance of the California red-legged frog, construction will not occur from November 1 through March 31 to the extent practicable. If any work remains to be completed after November 1, exclusion fencing will be placed in those areas where construction needs to be completed. Exclusionary fencing will consist of taut silt fabric; 24 inches in height, stacked at 10-foot intervals, with the bottom buried 6 inches below grade. Exclusion fencing will be maintained so that it is intact during rain events and 24 hours after any rain event.

15. The construction area will be delineated with high visibility temporary fencing at least four feet in height, flagging, or other barrier to prevent encroachment of construction personnel and equipment onto any sensitive areas during project work activities. Such fencing will be inspected and maintained daily by the on-site biologist until completion of the project. The fencing will be removed only when all construction equipment is removed from the site. Actions within the project area will be limited to vehicle and equipment operation on existing roads. No project activities will occur outside the delineated project construction area.

16. If requested, before, during, or upon completion of ground breaking and construction activities, Caltrans will allow access by Service and/or California Department of Fish and Game personnel to the project site to inspect project effects to listed species and their habitats. Due to safety concerns, Service staff will check in with the Resident Engineer and Biological Monitor prior to accessing the construction site.

17. No more than twenty (20) working days prior to any ground disturbance, pre-construction surveys shall be conducted by a Service-approved biologist for the California red-legged frog. These surveys shall consist of walking surveys of the project limits and adjacent areas accessible to the public to determine presence of the species. The Service-approved biologists must investigate all potential California red-legged frog cover sites. This includes full investigation of mammal burrows. The entrances shall be collapsed following investigation.

18. Only Service-approved biologist(s) who are familiar with the biology and ecology of the California red-legged frog will capture or handle the species.

19. California red-legged frogs will be relocated outside of the environmentally sensitive area/silt fence within the same riparian area or watershed by the approved biological monitor. If relocation of the frog outside the fence is not feasible (i.e., there are too many frogs observed per day), the approved biological monitor will relocate frogs to a pre-approved location determined by Caltrans, the Service, and local agencies. Prior to construction, Caltrans will obtain approval of the relocation protocol from the Service in the event that California red-legged frogs are encountered and need to be relocated away from the immediate project area (Caltrans 2007b).

20. All California red-legged frogs encountered in the action area shall be relocated to a Service-approved location. Caltrans shall submit a written plan for translocating California red-legged frogs to the Service for review and approval prior to the date of initial groundbreaking at the proposed project.

21. Biologists will take precautions to prevent introduction of amphibian diseases to the action area by disinfecting equipment and clothing as directed in the October 2003 California tiger salamander survey protocol titled, Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander and the recommended equipment decontamination procedures within the Service's California Red-Legged Frog Survey Guidance. Both items are available at the Service's Sacramento office website (http://www.fws.gov/sacramento/es/protocol.htm). Disinfecting equipment and clothing is especially important when biologists are coming to the action area to handle salamanders or frogs after working in other aquatic habitats.

22. To prevent inadvertent entrapment of California red-legged frogs during construction, all excavated, steep-walled holes or trenches more than 2 feet deep will be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they must be thoroughly inspected for trapped animals. If at anytime a trapped listed animal is discovered, the on-site biologist will immediately place escape ramps or other appropriate structures to allow the animal to escape, or the Service and/or California Department of Fish and Game will be contacted by telephone for guidance. The Service will be notified of the incident by telephone and electronic mail within one working day.

23. Plastic mono-filament netting (erosion control matting) or similar material will not be used at the project site because California red-legged frog may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

24. Construction fabric and a layer of gravel will protect the original contour of all wetland pools that cannot be avoided within identified temporary effect areas adjacent or within the right-of-way, minimizing potential effects from compaction or other disturbance. After construction, gravel and fabric will be removed.

25. Injured California red-legged frogs will be cared for by a licensed veterinarian or other qualified person such as the on-site biologist; dead individuals of any listed species will be preserved according to standard museum techniques and held in a secure location. The Service and the California Department of Fish and Game will be notified within one (1) working day of the discovery of death or injury to a listed species that occurs due to project related activities or is observed at the project site. Notification will include the date, time, and location of the incident or of the finding of a dead or injured animal clearly indicated on a USGS 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information. Dead individual animals shall be placed in a Zip-Lock® plastic bag with a piece of paper containing information on where and when the animal was found along with the name of the person who found it, the bag shall be frozen in a freezer located in a secure location until instructions are received from the Service regarding the disposition of the specimen or the Service takes custody of the specimen. The Service contacts are Chris Nagano, Deputy Assistance Field Supervisor, Endangered Species Program at the Sacramento Fish and Wildlife Office (916/414-6600), and Scott Heard, Resident Agent-in-Charge of the Service's Law Enforcement Division at 916/414-6660. The California Department of Fish and Game contact is Mr. Ron Schlorff at 1416 9th Street, Sacramento, California 95814, (916) 654-4262.

26. Caltrans will submit a post-construction compliance report prepared by the on-site biologist to the Sacramento Fish and Wildlife Office within forty (40) working days following project completion or within sixty calendar days of any break in construction activity lasting more than forty (40) working days. This report will detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting compensation and other conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on listed species, if any; (v) occurrences of incidental take of any listed species; (vi) documentation of employee environmental education; and (vii) other pertinent information. The reports will be addressed to the Deputy Assistant Field Supervisor of the Endangered Species Program, Sacramento Fish and Wildlife Office.

27. Caltrans shall report to the Service any information about take or suspected take of listed wildlife species not authorized by this biological opinion. Caltrans must notify the Service via electronic mail and telephone within twenty-four (24) hours of receiving such information. Notification must include the date, time, location of the incident or of the finding of a dead or injured animal, and photographs of the specific animal. The Service contacts are Chris Nagano, Deputy Assistant Field Supervisor, Endangered Species

Program, Sacramento Fish and Wildlife Office at (916) 414-6600, and Special Agent Scott Heard of the Service's Law Enforcement Division at (916) 414-6660

A Service-approved biologist shall be onsite to monitor the initial ground disturbance activities for the road construction and restoration projects. The biologist shall perform a clearance survey immediately prior to the initial ground disturbance. Safety permitting, the Service-approved biologist(s) must investigate areas of disturbed soil for signs of listed species within thirty (30) minutes following the initial disturbance of that given area.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the proposed action, the action area includes all lands associated with the approximately 72.2 acre (29.2 hectare) project footprint and roads (except for County roads, and State and Federal highways) and other areas accessed by project vehicles.

Status of the Species and Environmental Baseline

The California red-legged frog was listed as a threatened species on May 23, 1996 (Service 1996). Please refer to the final rule and the *Recovery Plan for the California Red-Legged Frog (Rana aurora draytonii)* (Service 2002) for additional information on this species.

This threatened species is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 2003). The abdomen and hind legs of adults are largely red, while the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have lighter centers (Stebbins 2003) and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 0.6 to 3.1 inches in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

Red-legged frogs have paired vocal sacs and vocalize in air (Hayes and Krempels 1986). Female frogs deposit egg masses on emergent vegetation, allowing the egg mass floats on the surface of the water (Hayes and Miyamoto 1984). Red-legged frogs breed from November through March with earlier breeding records occurring in southern localities (Storer 1925). Individuals occurring in coastal drainages are active year-round (Jennings *et al.* 1992), whereas those found in interior sites are normally less active during the cold season.

The historic range of the red-legged frog extended coastally from the vicinity of Elk Creek in Mendocino County, California, and inland from the vicinity of Redding, Shasta County, California, southward to northwestern Baja California, Mexico (Fellers 2005; Jennings and Hayes 1985; Hayes and Krempels 1986). The species historically was documented in 46 counties but the taxa now remains in 238 streams or drainages within 23 counties. This

represents a loss of 70 percent of its former range (Service 2002). Red-legged frogs are still locally abundant within portions of the San Francisco Bay area and the central coast. Within the remaining distribution of the species, only isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse Ranges. This listed amphibian is believed to be extirpated from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico (California Department of Fish and Game 2004).

Adult California red-legged frogs prefer dense, shrubby or emergent riparian vegetation closely associated with deep (>2.3 feet [0.7 meters]), still, or slow-moving water (Hayes and Jennings 1988). However, frogs also have been found in ephemeral creeks and drainages and in ponds that may or may not have riparian vegetation. The largest densities of red-legged frogs currently are associated with deep pools with dense stands of overhanging willows (*Salix* species) and an intermixed fringe of cattails (*Typha latifolia*) (Jennings 1988). Red-legged frogs disperse upstream and downstream of their breeding habitat to forage and seek sheltering habitat.

According to Feller and Kleeman (2007), non-breeding dry season habitat includes several characteristics: 1) sufficient moisture to allow the frogs to survive throughout the non-breeding season that may be up to 11 months long ; 2) sufficient cover to moderate temperatures during the warmest and coldest times of the year; and 3) protection (e.g., deep pools in a stream, or complex cover such as root masses or thick vegetation) from predators such as hawks and owls, herons, and small carnivores.

During other parts of the year, habitat includes nearly any area within 1-2 miles (1.6-3.2 kilometers) of a breeding site that stays moist and cool through the summer (Fellers 2005). According to Fellers (2005), this can include vegetated areas with coyote bush (*Baccharis pilularis*), California blackberry thickets (*Rubus ursinus*), and root masses associated with willow (*Salix* species) and California bay trees (*Umbellularia californica*). Sometimes the non-breeding habitat used by red-legged frogs is extremely limited in size. For example, non-breeding red-legged frogs have been found in a 6-foot (1.8-meter) wide coyote bush thicket growing along a tiny intermittent creek surrounded by heavily grazed grassland (Fellers 2005). Sheltering habitat for red-legged frogs is potentially all aquatic, riparian, and upland areas within the range of the species and includes any landscape features that provide cover, such as existing animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris. Agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay stacks may also be used. Incised stream channels with portions narrower and depths greater than 18 inches (45.7 centimeters) also may provide important summer sheltering habitat. Accessibility to sheltering habitat is essential for the survival of red-legged frogs within a watershed, and can be a factor limiting frog population numbers and survival.

Red-legged frogs do not have a distinct breeding migration (Fellers 2005). Adult frogs are often associated with permanent bodies of water. Some frogs remain at breeding sites all year while others disperse. Dispersal distances are typically less than 0.5 mile (0.8 kilometers), with records of a few individuals moving up to 1-2 miles (1.6-3.2 kilometers) (Fellers 2005). Movements are

typically along riparian corridors, but some individuals, especially on rainy nights, move directly from one site to another through normally inhospitable habitats, such as heavily grazed pastures or oak-grassland savannas (Fellers 2005). Dispersing frogs in northern Santa Cruz County traveled distances from 0.25 miles (0.4 kilometers) to more than 2 miles (3.2 kilometers) without apparent regard to topography, vegetation type, or riparian corridors (Bulger *et al.* 2003). Fellers and Kleeman (2007) and Bulger et al. (2003) found that California red-legged frog migration corridors can be less "pristine" (e.g., closely grazed fields, plowed agricultural lands) than breeding or non-breeding habitats. Bulger et al. (2003) observed that this listed ranid did not avoid or prefer any landscape feature or vegetation type. They tracked individuals that crossed agricultural land, including recently tilled fields and areas with mature crops. The threats facing migrating California red-legged frogs during their movements include being run over by vehicles on roads (Gibbs 1998; Vos and Chardon 1998), degradation of habitat (Vos and Stumpel 1995; Findlay and Houlahan 1997; Gibbs 1998), predation (Gibbs 1998), and dessication (Rothermel and Semlistch 2002; Mazerolle and Desrochers 2003).

Egg masses contain about 2,000 to 5,000 moderate sized (0.08 to 0.11 inches [0.2 to 0.3 centimeters] in diameter), dark reddish brown eggs and are typically attached to vertical emergent vegetation, such as bulrushes (*Scirpus* species) or cattails (Jennings *et al.* 1992). Red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Eggs hatch in 6 to 14 days (Jennings 1988). In coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity (Jennings *et al.* 1992). Eggs exposed to salinity levels greater than 4.5 parts per thousand results in 100 percent mortality (Jennings and Hayes 1990). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis 3.5 to 7 months after hatching (Storer 1925; Wright and Wright 1949; Jennings and Hayes 1990). Of the various life stages, larvae probably experience the highest mortality rates, with less than 1 percent of eggs laid reaching metamorphosis (Jennings *et al.* 1992). Sexual maturity normally is reached at 3 to 4 years of age (Storer 1925; Jennings and Hayes 1985). Red-legged frogs may live 8 to 10 years (Jennings *et al.* 1992). Populations of red-legged frogs fluctuate from year to year. When conditions are favorable red-legged frogs can experience extremely high rates of reproduction and thus produce large numbers of dispersing young and a concomitant increase in the number of occupied sites. In contrast, red-legged frogs may temporarily disappear from an area when conditions are stressful (e.g., drought).

The diet of red-legged frogs is highly variable. Hayes and Tennant (1985) found invertebrates to be the most common food items. According to their data, vertebrates, such as Pacific tree frogs and California mice (*Peromyscus californicus*) represent over half the prey mass eaten by larger frogs (Hayes and Tennant 1985). Hayes and Tennant (1985) found juvenile frogs to be active diurnally and nocturnally, whereas adult frogs were largely nocturnal. The diet of red-legged frogs is not well studied, but their diet is likely similar to other ranid frogs that feed on algae, diatoms, and detritus by grazing on the surface of rocks and vegetation (Fellers 2005; Kupferberg 1996a, 1996b).

Several researchers in central California have noted the decline and eventual local disappearance of California and northern red-legged frogs in systems supporting bullfrogs (Jennings and Hayes 1990; Twedt 1993), red swamp crayfish (*Procambarus clarkii*), signal crayfish (*Pacifastacus leniusculus*), and several species of warm water fish including sunfish (*Lepomis* species), goldfish (*Carassius auratus*), common carp (*Cyprinus carpio*), and mosquitofish (L. Hunt, in litt. 1993; S. Barry, in litt. 1992; S. Sweet, in litt. 1993). Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the red-legged frog throughout its range.

Several researchers in central California have noted the decline and eventual disappearance of red-legged frog populations once bullfrogs became established at the same site (L. Hunt, in litt. 1993; S. Barry, in litt. 1992; S. Sweet, in litt. 1993). This has been attributed to predation, competition, and reproduction interference. Twedt (1993) documented bullfrog predation of juvenile northern red-legged frogs (*Rana aurora aurora*), and suggested that bullfrogs could prey on subadult northern red-legged frogs as well. Bullfrogs may also have a competitive advantage over red-legged frogs. For instance, bullfrogs are larger and possess more generalized food habits (Bury and Whelan 1984). In addition, bullfrogs have an extended breeding season (Storer 1933) during which an individual female can produce as many as 20,000 eggs (Emlen 1977). Further more, bullfrog larvae are unpalatable to predatory fish (Kruse and Francis 1977). Bullfrogs also interfere with red-legged frog reproduction. Both California and northern red-legged frogs have been observed in amplexus (mounted on) with both male and female bullfrogs (Jennings and Hayes 1990; Twedt 1993; M. Jennings, in litt.1993; R. Stebbins in litt. 1993). Thus bullfrogs are able to prey upon and out-compete red-legged frogs, especially in sub-optimal habitat.

The urbanization of land within and adjacent to red-legged frog habitat has also adversely affected red-legged frogs. These declines are attributed to channelization of riparian areas, enclosure of the channels by urban development that blocks red-legged frog dispersal, and the introduction of predatory fishes and bullfrogs. The conversion and isolation of perennial pool habitats resulting from urbanization is an ongoing impact to red-legged frogs.

The California red-legged frog may be susceptible to many of the same pathogens, fungi, water mold, bacteria, and viruses have been known to adversely affect tiger salamander species or other amphibians. As with the California tiger salamander, Chytridiomycosis and ranaviruses may be a particular developing concern for California red-legged frog populations. Mao *et al.* (1999 cited in Fellers 2005) reported northern red-legged frogs infected with an iridovirus, which was also presented in sympatric three-spined sticklebacks (*Gasterosteus aculeatus*) in northwestern California. Ingles (1932a, 1932b, and 1933 cited in Fellers 2005) reported four species of trematodes from red-legged frogs, but he later synonymized two of them (found them to be the same as the other two). Nonnative species, such as bullfrogs and nonnative tiger salamanders, are both located within the range of the California red-legged frog and have been identified as potential carriers of these diseases. Human activities can facilitate the spread of disease by encouraging the further introduction of non-native carriers and by acting as carriers themselves

(i.e. contaminated boots or fishing equipment). Human activities can also introduce stress by other means, such as habitat fragmentation, that results in red-legged frogs being more susceptible to the effects of disease. Disease will likely become a growing threat because of the relatively small, fragmented remaining California red-legged frog breeding sites, the many stresses on these sites due to habitat losses and alterations, and the many other potential disease-enhancing anthropogenic changes which have occurred both inside and outside the species' range.

The recovery plan for red-legged frogs identifies eight Recovery Units (Service 2002). The establishment of these Recovery Units is based on the Recovery Team's determination that various regional areas of the species' range are essential to its survival and recovery. The status of the red-legged frog will be considered within the smaller scale of Recovery Units as opposed to the overall range. These Recovery Units are delineated by major watershed boundaries as defined by U.S. Geological Survey hydrologic units and the limits of the range of the California red-legged frog. The goal of the draft recovery plan is to protect the long-term viability of all extant populations within each Recovery Unit. Within each Recovery Unit, core areas have been delineated and represent contiguous areas of moderate to high red-legged frog densities that are relatively free of exotic species such as bullfrogs. The goal of designating core areas is to protect metapopulations that, combined with suitable dispersal habitat, will allow for the long term viability within existing populations. This management strategy will allow for the recolonization of habitat within and adjacent to core areas that are naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of red-legged frogs.

The State Route 12/State Route 29 Interchange Improvement and State Route 12 Jameson Canyon Road Widening Projects are within Recovery Unit 3 (North Coast and North San Francisco Bay) (Service 2002). The action area falls within Core Area #15 (Jameson Canyon Lower Napa River) of that Recovery Unit (Service 2002). The conservation needs for the Fagan-Jameson Canyon-Lower Napa River core area are: (1) protecting existing populations from current and future urbanization; (2) create and manage alternative breeding habitats; and (3) protecting dispersal corridors.

The State Route 12/State Route 29 Interchange Improvement and State Route 12 Jameson Canyon Road Widening Projects bisect the Fagan-Jameson Canyon-Lower Napa River core recovery area. Other than agricultural development adjacent to State Route 12/State Route 29 intersection, the land adjacent to the existing State Route 12 roadway through Jameson Canyon is characterized by a continuous mosaic of upland grassland dispersal, cover, and foraging habitat as well as seasonal wetlands, riparian habitat, and numerous ephemeral and perennial creek crossings. According to the Biological Assessment, the project intersects seven perennial creeks and numerous ephemeral creeks. Caltrans discounts developed lands, vineyards, and disked fields as suitable upland habitat, however these areas can be subject to temporal use by dispersing frogs (Caltrans 2007a).

Although the action area does not contain designated critical habitat for the California red-legged frog, the action area was located within the proposed Unit 11 (American Canyon Unit) in the proposed rule issued on April 13, 2004 (Service 2004). The definition of the formerly proposed critical habitat unit specifically included the watersheds of Fagan Creek and Jameson Canyon.

The lack of species occurrence records in the California Natural Diversity Database likely is the result of a lack of survey efforts in Jameson Canyon (CDFG 2007) because the majority of the land adjacent to the action area is in private ownership that has been used for grazing for a long period of time. As directed by the draft Solano HCP, surveys will be conducted for California red-legged frogs within the Jameson Canyon-Lower Napa River Core Recovery Area within two years of adopting the HCP and will continue every five years for the live of the HCP (SCWA 2007). There are two individual red-legged frog records less than 0.25 miles north of the action area near the intersection of State Route 12 and Redtop Road (CDFG 2007). The records are from 2004 and 2003 and are the result of surveys conducted for another road project.

All undeveloped areas of the action area are within 1.0 mile of. suitable California red-legged frog breeding habitat and therefore the undeveloped upland areas are considered potential foraging, aestivation, and movement habitat (Caltrans 2007a); the action area includes 255.37 acres of California red-legged frog habitat (Caltrans 2007a). This includes breeding, non-breeding aquatic, and upland California red-legged frog habitat. Therefore, the Service has determined it is reasonable to conclude the California red-legged frog inhabits and has the potential to be encountered within 255.37 acres of the action area, based on the biology and ecology of the species, the presence of suitable habitat, and the recent records of this species.

Effects of the Proposed Action

The proposed project could have adverse effects on the threatened California red-legged frog through mortality, injury, harassment, and harm of individual juveniles and adults. Using data provided by Caltrans, the proposed actions will adversely affect 255.37 acres of California red-legged frog habitat (Caltrans 2007b). This includes 176.37 acres of habitat for the State Route 12 Jameson Canyon Road Widening Project and 79.00 acres of habitat for the State Route 12/State Route 29 Interchange Improvement.

The proposed project likely will result in adverse effects to the feeding, resting, aestivation, movement, and other essential behaviors of the California red-legged frog, and also eliminate or reduce its ability to move across Jameson Canyon. It will result in the loss, degradation, and fragmentation of habitat, and also the significant reduction or elimination of a movement corridor for this species that likely will result in long-term adverse effects to the species in the Cordelia Hills. Any further reduction in the north-south movement corridor in Jameson Canyon by the proposed project will increase the potential for the loss of this population of the California red-legged frog due to a constellation of factors including disease, predation, fire, competition, and genetic problems. Construction and maintenance of properly sized and located culverts likely

will minimize this adverse effect of the threatened California red-legged frog (see Rodriguez *et al.* 1996; Yanes *et al.* 1905).

Construction activities associated with the proposed project would remove vegetation and other materials necessary for cover and aestivation, fill or crush burrows or crevices, and potentially reduce the prey base for the California red-legged frog. Because this listed amphibian uses small mammal burrows and soil crevices for shelter, individuals may be crushed, buried, or otherwise injured during construction activities. California red-legged frogs also may be run over by construction equipment or other vehicles accessing the construction areas. Disturbance caused by construction activities may cause frogs to disperse into areas of unsuitable habitat, increase the risk of predation or other sources of mortality. Siltation, fill, or spill of petroleum products or other chemicals could cause loss of prey items in or adjacent to the project area. Construction activities are likely to result in the direct disturbance, displacement, injury, and/or morality of California red-legged frogs. Individuals likely are to be killed or injured by construction equipment or other vehicles accessing the construction site. There is a likelihood of direct injury or mortality to the animal from injury or death due to pet cats or dogs owned by construction related personnel, poisoning by pesticides, injury or death due to predators attracted to food or trash at the site, and harassment from night-lighting, noise, and vibration. Implementation of certain types of erosion control materials, such as plastic netting, could result in the entanglement and death of California red-legged frogs within these materials due to exposure or predators (Bartin and Kinkead 2005; Stuart *et al.* 2001). Disturbance from construction activities may also cause individuals to move into or across areas of unsuitable habitat where they may be prone to higher rates of mortality from vehicles and predation.

Range-wide habitat loss, fragmentation, and degradation from multiple factors are the primary threats to the California red-legged frog (Service 1996, 2004). Loss of natural lands continues to occur further reducing the habitat available for this listed animal. However, the amount of historical and current habitat loss directly attributable to road loss has not been calculated, but the effect of habitat fragmentation on the California red-legged frog is significant. Fragmentation can reduce access to habitat as well as habitat suitability, increase mortality of animals that are moving between habitat patches due to increased risk of predation, and disrupt movements, dispersal, and gene flow. As barriers to movement for the California red-legged frog, roads create smaller patches of habitat and increase patch isolation. Smaller populations of animals are at greater risk of extinction by chance from demographic, genetic, and environmental stochastic events (Wilcox and Murphy 1985; Schoener and Spiller 1992). Isolated populations also have a higher chance of extinction without the demographic and genetic input of immigrants and a lower chance of colonization after extinction (Lande 1988; Sjogren-Gulve 1994).

The proposed project will reduce or eliminate the ability of the California red-legged frog to move along and across Jameson Canyon over the short and long term. The loss of individuals due to traffic mortality can have an effect on two levels: reduced population sizes and reduced movement between complementary resources and conspecifics populations (Carr *et al.* 2000). The short term temporal effect will occur when suitable habitat is lost when riparian and other

vegetation vegetation is removed for construction of the highway, and also due to the improved ability of predators to hunt the listed amphibian. Hilty and Merender (2004) found that, in contrast to native species, non-native mammalian predators were more active in narrow and denuded riparian corridors and in large expanses of agricultural land (vineyards) far from core habitat. The increased width of the highway along with higher numbers of vehicles and speed of the cars and trucks likely will discourage or prevent movement by the California red-legged frog. The inhibition of animal movements caused by roads and other similar structures produces a significant effect by fragmenting habitats and populations (Mader 1984; Joly and Morand 1997; Yates *et al.* 1995).

The necessity of moving between multiple habitats and breeding ponds means that many amphibian species, such as the California red-legged frog are especially vulnerable to roads in the landscape. Van Gelder (1973) and Cooke (1995) have examined the effect of roads on amphibians; and found that because of their activity patterns, population structure, and preferred habitats, aquatic breeding amphibians are more vulnerable to traffic mortality than some other species.

The construction of the proposed project likely will restrict or block access for the California red-legged frog and wildlife between the Coast Range and the Cordelia Hills. This phenomenon is likely to increase with the larger road size and higher traffic volumes. The presence of vehicular traffic and the continuous linear nature of roads can be a significant physical barrier for many species, including the threatened California red-legged frog (small mammals: Oxley *et al.* 1974; Garland and Bradley 1984; Mader 1984; Merriam *et al.* 1989; snails: Baur and Baur 1990; arthropods: Mader *et al.* 1990). For example, over two years, 32,000 amphibians, reptiles, birds and mammals were found as roadkill on the 2.4 mile Long Point causeway adjacent to the Big Creek Wetland at Lake Erie in Ontario, Canada (Ashley and Robinson 1996). Ehman and Cogger (1985) estimated that road traffic killed 5.48 million reptiles and frogs in Australia each year.

Fahrig *et al.* (1995) found that high traffic two-lane paved roads had a much larger effect on frog abundance than low traffic two-lane roads. Mortality rates for anurans on high traffic roads are higher than on low traffic roads (Hels and Buchwald 2001). Vos and Chardon (1998) found a significant negative effect of road density on the occupation probability of ponds by the moor frog (*Rana arvalis*) in the Netherlands. In addition, incidences of very large numbers of road-killed frogs are well documented (e.g., Asley and Robinson 1996), and studies have shown strong population level effects of traffic density (Carr and Fahrig 2001) and high traffic roads on these amphibians (Van Gelder 1973; Vos and Chardon 1998). Most studies regularly count road kills from slow moving vehicles (Hansen 1982; Rosen and Lowe 1994; Drews 1995; Mallick *et al.* 1998) or by foot (Munguira and Thomas 1992). These studies assume that every victim is observed, which may be true for large conspicuous mammals, but it certainly is not true for small animals, such as the California red-legged frog. Amphibians appear especially vulnerable to traffic mortality because they readily attempt to cross roads, are slow-moving and small, and thus can not easily be avoided by drivers (Carr and Fahrig 2001).

The direction and type of habitat used by dispersing animals is especially important in fragmented environments (Forys and Humphrey 1996). Models of habitat patch geometry predict that individual animals will exit patches at more "permeable" areas (Buechner 1987; Stamps *et al.* 1987). A landscape corridor may increase the patch-edge permeability by extending patch habitat (La Polla and Barrett 1993), and allow individuals to move from one patch to another. The geometric and habitat features that constitute a "corridor" must be determined from the perspective of the animal (Forys and Humphrey 1996).

Caltrans plans to upsize six culverts to a 36 inch diameter and install two new 36 inch diameter culverts under State Route 12 available for frogs to use to move across road, however, it is doubtful if frogs will use long corregated culverts across a 80-foot or wider roadway that are not day-lighted, do not have a natural bottom, and do not have regular maintenance to prevent filling with sediment and debris. The dimension of the tunnels is considered one of the most important variables in the design of passage ways for vertebrates (Yanes *et al.* 1995; Rodriguez *et al.* 1996); although no studies have determined a minimum width for the California red-legged frog, passages made for other small vertebrates, such as salamanders, must be wide and tall enough to enable animals to clearly see to the opposite end of the culvert, or there is lighting along the culvert provided by overhead grates. Ng *et al.* (2004) note that culverts typically are installed to accommodate water flow, the installation of such passage ways solely for listed species and wildlife, especially across major roadways, is justified if no other passages or crossings exist and there is suitable habitat. It is also important that the crossing attract target listed species and wildlife; fencing or other measures be incorporated into a wildlife crossing to guide animals to the preferred crossing; the crossing be placed strategically to enhance habitat connectivity; and that the adjacent land use be conducive to long-term habitat protection (Portland State University 2003). The 36-inch culverts proposed by the California Department of Transportation may not adequately minimize the reduction or elimination of the movement of the California red-legged frog. The long term viability of any designated wildlife crossing is questionable unless crossing locations and the habitat on both sides of the crossing are permanently set aside as open space or have a conservation easement or some other designation that limits development. In addition, hog wire apparently will not be placed on the bottom one foot of the highway perimeter fence to deter frogs from entering the roadway and guide them towards safe crossings. The culverts may not be high enough to allow the animals to see through them to the other side of the roadway, improper placement in areas where the animals will not use them, and the uncertainty of maintenance and silt removal at drainage-associated culverts could eliminate their potential use by the frogs. The lack of hog wire will result in individuals crossing the roadway where they are more likely to be killed by vehicles.

Larger culverts, e.g. at least 72 inches tall, grates placed midway on the culvert to allow lighting to encourage the animals to use them, placement in areas where the animals are moving through, and regular, e.g. at least once a year, maintenance and silt removal, and the use of properly sized hog wire along the bottom of the highway perimeter fence to guide the California red-legged frog to the culverts should increase the potential for these animals to move between the Coast Range and Cordelia Hills.

Road studies suggest that properly designed culverts can significantly reduce wildlife, including frog. mortality (Dodd *et al.* 2004). The town of Amherst in the State of Massachusetts installed two culverts with guiding fences to facilitate spotted salamander (*Ambystoma maculatum*) migration from their wintering burrows during the spring. Before the placement of these culverts under Henry Street, a two-lane street, salamander mortality was high. After installation, approximately 75.9% of animals that reached the tunnel entrances successfully passed through them (Jackson 1996).

The installation of a concrete median will present a definitive barrier to California red-legged frog movement over the road. Caltrans plans to include a 6 inch radius hole in the concrete median every 300 feet and a one foot wide opening in the barrier every 1200 feet. Given the amount of traffic on State Route 12 it is unlikely that frogs will be able to successfully cross the road even if they do manage to find these openings. Construction of this barrier is likely to adversely affect the population within Fagan-Jameson Canyon-Lower Napa River core recovery area and will reduce or possibly eliminate the north-south population continuity, opportunities to recolonize formerly occupied habitat, and overall population viability. The barrier may also compromise the recovery goals for this California red-legged frog core recovery unit.

Though the intent of wildlife culverts and crossings are to ensure safe passage of listed species and wildlife, they are also a benefit to human safety (Aleshire 2007; Ruediger and DiGiorgio undated; Sherwood 2007). Deer-automobile collisions, estimated by the Insurance Information Institute to occur at a rate of 500,000 per year, result in over $1 billion worth of vehicular damages, 29,000 human injuries, and 200 human fatalities each year (Cornell University). Culverts large enough to accommodate species such as deer (*Odocoileus* species) and mountain lion (*Felis concolor*), while maintaining substrates for the California red-legged frog and smaller wildlife, could reduce roadway collisions for a variety of species. For example, wildlife crossings of the Trans-Canada Highway in Canada's Banff National Park have reduced wildlife road mortality by 80%, and as much as 96% for ungulates (Robbins 2003).

California red-legged frog crossing of State Route 12 via culverts should be designed and sited to enhance movement of this listed species. Recent conservation and minimization measures for this amphibian and other listed species (East Contra Costa County Habitat Conservation Plan Association 2006) has included:

1. Crossing Frequency. Large wildlife crossings will be placed approximately once every mile along new or substantially expanded roads that cross wildlife movement routes and small wildlife crossings should be placed approximately every 1,000 feet along new or substantially expanded roads. Within these parameters, undercrossings should be placed where wildlife are most likely to use them, rather than evenly spaced.

2. Culvert Designs. Tunnels or culverts must be the minimum length, height, and width necessary to provide safe passage under the road. Culvert designs will be based on the best available data at the time. Culverts should be as wide as possible. Culverts should,

when feasible, provide a natural substrate on which wildlife can travel (e.g., open bottom). It is also recommended that wildlife undercrossings using tunnels or culverts use grating on the inactive part of the roadbed (e.g., road shoulders) to allow filtration of ambient light and moisture but minimize noise intrusion. Artificial lighting inside tunnels or culverts is not recommended; these devices have not been shown to be effective and may deter nocturnal wildlife.

3. Fencing Design. Fencing will be used along the roadway to direct wildlife to undercrossings and minimize their access to the road. Fencing designs will be customized for the wildlife expected to use the undercrossing and will be based on the best available data at the time. Fencing must be continuous along the road and must be attached to the undercrossing to facilitate its use. Fencing must also extend well beyond the target undercrossing to reduce the chance of wildlife moving around the fence.

   Fencing must be monitored regularly by the applicant and repairs made promptly to ensure effectiveness. Wildlife undercrossings must be at the same or similar elevation as the fencing (e.g., along elevated roadways) to increase chances of their use. Vegetation must be managed along small mammal and amphibian fencing to reduce the opportunity for these species to climb the fence. Fencing designed for small mammal or amphibian exclusion must be installed at least 8 inches deep into the soil to prevent small mammal burrows providing access under the fence.

Because their habitats have been fragmented, many endangered and threatened species exist as metapopulations (Verboom and Apeldom 1990; Verboom *et al.* 1991). A metapopulation is a collection of spatially discrete subpopulations that are connected by the dispersal movements of the individuals (Levins 1970; Hanski 1991). For metapopulations of listed species, a prerequisite to recovery is determining if unoccupied habitat patches are vacant due to the attributes of the habitat patch (food, cover, and patch area) or due to patch context (distance of the patch to other patches and distance of the patch to other features). Subpopulations on patches with higher quality food and cover are more likely to persist because they can support more individuals. Large populations have less of a chance of extinction due to stochastic events (Gilpin and Soule 1986). Similarly, small patches will support fewer individuals, increasing the rate of extinction. Patches that are near occupied patches are more likely to be recolonized when local extinction occurs and may benefit from emigration of individuals via the "rescue" effect (Hanski 1982; Gotelli 1991; Holt 1993; Fahrig and Merriam 1985). For the metapopulation to persist, the rate of patches being colonized must exceed the rate of patches going extinct (Levins 1970). If some subpopulations go extinct regardless of patch context, recovery actions should be placed on patch attributes. Patches could be managed to increase the availability of food and/or cover. Movements and dispersal corridors likely are critical to California red-legged frog population dynamics, particularly because the animals likely currently persist as metapopulations with disjunct population centers. Movement and dispersal corridors are important for alleviating over-crowding and intraspecific competition, and also they are important for facilitating the recolonization of areas where the animal has been extirpated. Movement between population

centers maintains gene flow and reduced genetic isolation. Genetically isolated populations are at greater risk of deleterious genetic effects such as inbreeding, genetic drift, and founder effects. The survival of wildlife species in fragmented habitats may ultimately depend on their ability to move among patches to access necessary resources, retain genetic diversity, and maintain reproductive capacity within populations (Hilty and Merenlender 2004; Petit *et al.* 1995; Buza *et al.* 2000).

Most metapopulation or meta-population-like models of patchy populations do not directly include the effects of dispersal mortality on populations dynamics (Hanski 1994; With and Crist 1995; Lindenmayer and Possingham 1996). Based on these models, it has become a widely held notion that more vagile species have a higher tolerance to habitat loss and fragmentation than less vagile species. But models that include dispersal mortality predict exactly the opposite: more vagile species should be more vulnerable to habitat loss and fragmentation becase they are more susceptible to dispersal mortality (Fahrig 1998; Casagrandi and Gatto 1999). This prediction is supported by Gibbs (1998), who examined the presence-absence of five amphibian species across a gradient of habitat loss. He found that species with low dispersal rates are better able than more vagile species top persist in landscapes with low habitat cover. Gibbs (1998) postulated that the land between habitat serves as a demographic "drain" for many amphibians. Furthermore, Bonnet *et al.* (1999) found that snake species that use frequent long-distance movements have higher mortality rates than do sedentary species.

The construction activities at the proposed project could result in the introduction of chemical contaminants to the site. Substances used in road building materials or could leach out or wash out of the soil into adjacent habitat. Vehicles may leak hazardous substances such as motor oil and antifreeze. A variety of substances could be introduced during accidental spills of materials. Such spills can result from leaks in vehicles, small containers falling off vehicles, or from accidents resulting in whole loads being spilled. Large spills may be partially or completely mitigated by clean-up efforts, depending on the substance. California red-legged frogs using these areas could be exposed to any contaminants that are present at the site. Exposure pathways could include inhalation, dermal contact, direct ingestion, or ingestion of contaminated soil or plants. Exposure to contaminants could cause short- or long-term morbidity, possibly resulting in reduced productivity or mortality. Carcinogenic substances could cause genetic damage resulting in sterility, reduced productivity, or reduced fitness among progeny. Little information is available on the effects of contaminants on the California red-legged frog. The effects may be difficult to detect. Morbidity or mortality likely would occur after the animals had left the contaminated site, and more subtle effects such as genetic damage could only be detected through intensive study and monitoring.

Preconstruction surveys and the relocation of individual red-legged frogs may reduce injury or mortality. However, the capturing and handling of red-legged frogs to remove them from a work area may result in the harassment, mortality or injury of individuals. Stress, injury, and mortality may occur as a result of improper handling, containment, and transport of individuals. Death and injury of individual red-legged frogs could occur at the time of relocation or later in time

subsequent to their release. Although survivorship for translocated red-legged frogs has not been estimated, survivorship of translocated wildlife, in general, is lower because of intraspecific competition, lack of familiarity with the location of potential breeding, feeding, and sheltering habitats, and increased risk of predation. Improper handling, containment, or transport of individuals would be reduced or prevented by use of a Service-approved biologist, by limiting the duration of handling, and requiring the proper transport.

Biologists, construction workers, and construction equipment working in different areas and with different species may transmit diseases by introducing contaminated equipment. The chance of a disease being introduced into a new area is greater today than in the past due to the increasing occurrences of disease throughout amphibian populations in California and the United States. It is possible that chytrid fungus may exacerbate the effects of other diseases on amphibians or increase the sensitivity of the amphibian to environmental changes (e.g., water pH) that reduce normal immune response capabilities (Bosch *et al.* 2001). Implementation of the "Declining Amphibian Populations Task Force Fieldwork Code of Practice" during any aquatic survey activity will likely prevent transfer of diseases through contaminated equipment or clothing.

Construction of roads can facilitate the invasion and establishment by species not native to the area (Gelbard and Belnap 2003) or are native and are better competitors than the California red-legged frog, such as the bullfrog, that could feed on or compete with, the listed amphibian or its food sources. Disturbance and alteration of habitat adjacent to roads may create favorable conditions for non-native plants and animals. These exotic species can spread along roadsides and then into adjacent habitat. Non-native animals may use modified habitats adjacent to road to disperse into California red-legged frog habitat. These animals could compete with the listed ranid for resources such as food or cover, or directly injure or kill the amphibians. Non-native plants and animals may reduce habitat quality for the threatened frog, and reduce the productivity or the local carrying capacity for the animals. Introductions of non-native species could cause California red-legged frogs to alter behavioral patterns by avoiding or abandoning areas near road.

Disturbed areas adjacent to roads provide favorable habitat conditions for a number of non-native plant species. Some of these taxa are aggressively invasive and they can alter natural communities and potentially affect habitat quality. A problematic species within the range of the California red-legged frog is yellow star thistle (*Centaurea melitensis*). Dense stands of this plant can form along roadsides and then spread into adjacent habitat. This plant displaces native vegetation, competes with native plants for resources, and it may be difficult for the animals to move through due the plant's numerous sharp spines. Other species that may disperse along roads and invade adjacent riparian habitats include mustards (*Brassica* species) and Russian thistle (*Salsola tragus*) (Tellman 1997). Disturbed soils and reduced competition from native plants are some of the conditions that facilitate invasion along roads by non-native plant species. Negative effects to wildlife populations from roads may extend some distance from the actual road, as the proposed project. The phenomenon can result from any of the effects already described in this biological opinion, such as vehicle-related mortality, habitat degradation, and

invasive exotic species. Forman and Deblinger (1998) described the area affected as the "road effect" zone. Along a 4-lane road in Massachusetts, they determined that this zone extend for an average of approximately 980 feet to either side of the road for an average total zone width of approximately 1970 feet. However, in places they detected an effect > 0.6 mile from the road. Rudolph *et al* (1999) detected reduced snake abundance up to 2790 feet from roads in Texas. They estimated snake abundance out to 2790 feet, so the effect may have been greater. Extrapolating to a landscape scale, they concluded the effect of roads on snake populations in Texas likely was significant, given that approximately 79% of the land area of the Lone Star State is within 1640 feet of a road. The "road-zone" effects can be subtle. Van der Zandt *et al.* (1980) reported that lapwings (*Vanellus vanellus*) and black-tailed godwits (*Limosa limosa*) feeding at 1575 feet-6560 feet from roads were disturbed by passing vehicles. The heart rate, metabolic rate and energy expenditure of female bighorn sheep (*Ovis canadensis*) increases near roads (MacArthur *et al.* 1979). Trombulak and Frossell (2000) described another type of "road-zone' effect. Heavy metal concentrations from vehicle exhaust were greatest within 66 feet of roads, by elevated levels of metals in both soil and plants were detected at 660 feet of roads. The "road-zone" apparently varies with habitat type and traffic volume. Based on responses by birds, Forman (2000) estimated the effect zone along primary roads of 1000 feet in woodlands, 1197 feet in grasslands, and 2657 feet) in natural lands near urban areas. Along secondary roads with lower traffic volumes, the effect zone was 656 feet. The "road zone" and the California red-legged frog have not been adequately investigated.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

A number of on-going and proposed projects could contribute to adverse affects to vernal pool crustaceans within Solano and Napa counties. In most cases, however, these actions would be subject to Federal review and would, therefore, not be considered cumulative to the proposed project. These projects will contribute to the loss and degradation of habitats of listed species across their range. These activities may alter vernal pool crustacean habitats and can potentially harass, harm, injure, or kill these species. Because these activities have a Federal nexus, the Service will analyze these projects to determine if they will result in the jeopardy of federally-listed species and/or adverse modification and destruction of critical habitat for these species. An undetermined number of future projects that alter the habitat of vernal pool crustaceans, however, could go forward without the need for a Corps 404 permit. Activities that would potentially affect listed vernal pool crustaceans include development associated with urban, water, flood control, highway/roadway and utility projects, application of herbicides/pesticides, conversion to agricultural use, and indirect effects of adjacent development such as urban run-off altering the hydrologic regime.

Numerous non-Federal activities continue to negatively affect the California red-legged frog in Solano and Napa Counties. Habitats are lost or degraded as a result of road and utility construction and maintenance, overgrazing, agricultural expansion, and water irrigation and storage projects that may not be funded, permitted, or constructed by a Federal agency. Other threats include contamination, poisoning, increased predation, and competition from non-native species associated with human development. Small private actions that may impact listed species, such as conversion of land, small mammal population control, mosquito control, and residential development, may occur without consultation with or authorization by the Service or the California Department of Fish and Game pursuant to their respectively Endangered Species Act.

According to the Environmental Assessment prepared for the State Route 12 Jameson Canyon Road Widening & State Routes 29/12 Interchange Project, areas adjacent to the State Route 12 widening are projected to remain zoned as rural and agricultural (Caltrans 2007c). However, the interchange is within an unincorporated area known as the South Napa County Business Park or the Napa Airport Industrial Planning Area. This area is projected to become a major regional employment center with industrial and low density commercial uses (Caltrans 2007c). Much of the former open grassland habitat adjacent to the intersection had already been cleared for development at the time of the November 21, 2007 site visit (John Cleckler, Service, personal observation). The Service is unaware of formal or informal section 10 or section 7 consultations initiated for the development of these properties.

According to the Environmental Assessment, Napa County is expected to gain 12,030 households between 2005 and 2030, and the State Route 29 corridor will dominate the county's growth (Caltrans 2007c). State Route 12 will continue to be the primary link between Napa and Sonoma Counties. Although housing growth is expected to increase in Napa and Sonoma Counties, Jameson Canyon will continue to experience major traffic due to residents of the more affordable Sonoma County commuting to work in Napa County (Caltrans 2007c).

As urban development continues, it will likely adversely affect upland areas that serve as dispersal and aestivation habitat for red-legged frogs. Continued development and maintenance of roadways to serve expanding urban areas may further fragment and isolate populations of red-legged frogs from other nearby populations. Increased predation associated with domesticated pets or feral animals generally accompanies urban expansion. As urban development encroaches on rural areas, the need increases for mosquito abatement programs that may introduce exotic fish into ponds used for breeding by red-legged frogs, thus impacting the reproductive success of this species.

Increased levels of vehicles and increased vehicle speeds could lead to an increased mortality level for the California red-legged frog. The cumulative local development will result in temporary and permanent habitat fragmentation. The results of fragmentation are inhibition of genetic exchange between populations and impediments to recolonization of habitats from which populations have been extirpated. Small, isolated populations are substantially more vulnerable

to stochastic events (e.g., aberrant weather patterns, fluctuations in availability of food) and may exhibit reduced adaptability to environmental (natural or anthropogenic) changes.

There is a continued demand for new housing and commercial development in Solano and Napa counties and other road and development projects have been recently completed or are planned along the State Route 12, Interstate 80, State Route 101, and State Route 29. These developments and further infill will eliminate the habitat connectivity between listed species habitat remaining habitat in the action area vicinity and the local region. Development of adjacent wildlife habitat will continue to result in the loss of not only breeding, resting, and foraging habitat, but the loss of dispersal corridors between breeding populations, thereby further isolating and fragmenting wildlife populations. Additionally, development of small reservoirs or water bodies, such as golf course hazards, and water diversions may occur which may pose further threats such as disruption of dispersal corridors for terrestrial species, and competition or predation from with non-native species such as bullfrogs for aquatic species.

Cumulative effects to the California red-legged frog include continuing and future conversion of suitable breeding, foraging, sheltering, and dispersal habitat resulting from urban development. Additional urbanization can result in road widening and increased traffic on roads that bisect habitat, thereby increasing road-kill while reducing in size and further fragmenting remaining habitats.

Cattle-grazing is a common land use practice in rural Solano and Napa Counties. Overgrazing results in degradation and loss of riparian vegetation, increased water temperatures, streambank and upland erosion, and decreased water quality in streams. Livestock operations may also degrade water quality with pesticides and nutrient contamination. However, light to moderate livestock grazing is generally thought to be compatible with continued successful use of rangelands by the red-legged frog and other listed species, provided the grazed areas do not also have intensive burrowing rodent control efforts (T. Jones, in litt. 1993; Shaffer et al. 1993). The shorter vegetation associated with grazed areas may make the habitat more suitable for ground squirrels whose burrows are utilized by red-legged frogs. Rodent control in rural areas in Solano and Napa Counties could contribute to the decline of red-legged frogs in the region, as well as other sensitive species that utilize burrows created by burrowing rodents.

Agricultural development, impoundments, and irrigation can reduce stream flows, resulting in the loss of aquatic habitat during the summer for red-legged frogs. Discing is a common practice on agricultural lands which can result in substantial losses of upland habitat for red-legged frogs. Significant conversion of rural, undeveloped land to agricultural land, particularly vineyards, is currently occurring in Solano and Napa Counties, resulting in loss of upland habitat for listed species.

California red-legged frogs likely are exposed to a variety of pesticides and other chemicals throughout their ranges. This amphibian species could also die from starvation due to the loss of their prey base. Hydrocarbon and other contamination from oil production and road runoff; the

application of numerous chemicals for roadside maintenance; urban/suburban landscape maintenance; and rodent and vector control programs may all have negative effects on red-legged frog populations. In addition, red-legged frogs may be harmed through increased road kill due to the construction and use of new roads and increased traffic in the overall region and collection by amphibian enthusiast and others.

Further habitat fragmentation; additional non-native species introduction; and increased access to aquatic habitat could facilitate or increase the spread of amphibian diseases within the range of the California red-legged frog. The global mass extinction of amphibians primarily due to chytrid fungus continues to be of significant concern (Norris 2007; Skerratt *et al* 2007).

The global average temperature has risen by approximately 0.6 degrees Celsius during the 20th Century (IFPC 2001, 2007; Adger *et al* 2007). There is an international scientific consensus that most of the warming observed has been caused by human activities (IFPC 2001, 2007; Adger *et al.* 2007), and that it is "very likely" that it is largely due to manmade emissions of carbon dioxide and other greenhouse gases (Adger *et al.* 2007). Ongoing climate change (Anonymous 2007; Inkley *et al.* 2004; Adger *et al.* 2007; Kanter 2007) likely imperils the California red-legged frog, and the resources necessary for their survival. Since climate change threatens to disrupt annual weather patterns, it may result in a loss of their habitats and/or prey, and/or increased numbers of their predators, parasites, and diseases. Where populations are isolated, a changing climate may result in local extinction, with range shifts precluded by lack of habitat.

Conclusion

After reviewing the current status of the California red-legged frog, the environmental baseline for the action area; the effects of the proposed State Route 12/State Route 29 Interchange Improvement and State Route 12 Jameson Canyon Road Widening Projects and the cumulative effects; it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of this listed species. We based these determinations on the following: (1) pre-construction surveys will be conducted for California red-legged frogs and individuals found in the project work area will be relocated to suitable habitat; (2) a Service-approved biologist will monitor all activities that may result in the take of listed species; (3) a compensation package has been developed that provides in-perpetuity management for 766.11 acres of habitat and design features that will benefit the California red-legged frog, (4) other conservation measures, as described in the Project Description of this biological opinion, that will be fully implemented by Caltrans. Critical habitat for the California red-legged frog have been designated, however none is located in the action area, and therefore none will be affected by the proposed project.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is

defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by Caltrans so that they become binding conditions of any grant or permit issued to Caltrans as appropriate, in order for the exemption in section 7(o)(2) to apply. Caltrans has a continuing duty to regulate the activity covered by this Incidental Take Statement. If Caltrans (1) fails to require Caltrans to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect because when California red-legged frogs are not in their breeding ponds, they inhabit the burrows of ground squirrels or other rodents; they may be difficult to locate due to their cryptic appearance and behavior; the juvenile and adult animals may be located a distance from the breeding ponds; the migrations occur on a limited period during rainy nights in the fall, winter, or spring; and the finding of an injured or dead individual is unlikely because of their relatively small body size. Recent project monitoring suggests that California red-legged frogs are difficult to find during preconstruction clearance surveys that include excavation of potential upland salamander refugia in close proximity to breeding ponds and other aquatic habitat. Losses of California red-legged frogs may also be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, changes in water regime at their breeding ponds, or additional environmental disturbances. Due to the difficulty in quantifying the number of California red-legged frogs that will be taken as a result of the proposed action, the Service is quantifying take incidental to the project as all of the California red-legged frogs inhabiting or utilizing the 255.37 acres of habitat identified within the action area. The incidental take is expected to be in the form of harm, harassment, injury, and mortality to adult California red-legged frogs from habitat loss/degradation, construction-related disturbance, and capture and relocation.

Upon implementation of the following reasonable and prudent measures incidental take associated with the proposed action described above for the California red-legged frog will become exempt from the prohibitions described under section 9 of the Act.

Effect of the Take

The Service has determined that this level of anticipated take for the California red-legged frog is not likely to jeopardize the continued existence of this species. Critical habitat for the California red-legged frog have been designated, however none is located in the action area, and therefore none will be affected by the proposed project.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the effect of the proposed action on the California red-legged frog:

1. Caltrans will implement the conservation measures in the project description as described in the August 2007, Biological Assessment, the November 21, 2007 revised project description, and this biological opinion.

2. Caltrans shall minimze adverse effects to the California red-legged frog.

3. Caltrans shall ensure their compliance with this biological opinion.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, Caltrans shall ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

1. The following Terms and Conditions implement Reasonable and Prudent Measure one (1):

    a. Caltrans shall minimize the potential for harm, harassment, or killing of federally listed wildlife species resulting from project related activities by implementation of the conservation measures as described in the August 2007, Biological Assessment, the November 21, 2007 revised project description, January 31, 2008, letter from Caltrans to the Service, January 31, 2008, electronic mail message from Caltrans to the Service, and appearing in the *Project Description* of this biological opinion.

    b. Caltrans shall include Special Provisions that include the Conservation Measures and the Terms and Conditions of this biological opinion in the solicitation for bid

information. In addition, Caltrans shall educate and inform contractors involved in the project as to the requirements of the biological opinion.

c. The applicant shall prepare a relocation plan for moving California red-legged frogs that will be submitted to the Service for review ad approval at least thirty (30) calendar days prior to the date of groundbreaking.

2. The following Terms and Conditions implement Reasonable and Prudent Measure two (2):

a. The Resident Engineer or their designee shall be responsible for implementing the conservation measures and Terms and Conditions of this biological opinion and shall be the point of contact for the project. The Resident Engineer or their designee shall maintain a copy of this biological opinion onsite whenever construction is taking place. Their name and telephone number shall be provided to the Service at least thirty (30) calendar days prior to groundbreaking at the project. Prior to ground breaking, the Resident Engineer must submit a letter to the Service verifying that they posses a copy of this biological opinion and have read the Terms and Conditions.

b. A qualified biologist(s) shall be onsite during all activities that may result in the take of the California red-legged frog. The qualifications of the biologist(s) must be presented to the Service for review and written approval prior to ground-breaking at the project site. Prior to approval, the biologist(s) must submit a letter to the Service verifying that they posses a copy of this biological opinion and understand its Terms and Conditions. The biologist(s) will keep a copy of this biological opinion in their possession when onsite. The biologist(s) shall be given the authority to stop any work that may result in take of these listed animal species. If the biologist(s) exercises this authority, the Service and the California Department of Fish and Game shall be notified by telephone and electronic mail within one (1) working day. The Service contact is Chris Nagano, Deputy Assistant Field Supervisor, Endangered Species Program at the Sacramento Fish and Wildlife Office at telephone (916) 414-6600 or e-mail at Chris_Nagano@fws.gov.

c. The Caltrans biologist shall have oversight over implementation of all the Terms and Conditions in this biological opinion, and shall have the authority to stop project activities, through communication with the Resident Engineer or their designee, if any of the requirements associated with these Terms and Conditions are not being fulfilled. If biologist/construction liaison has requested a stop work due to take of any of the listed species the Service and the California Department of Fish and Game will be notified within one (1) working day via email or telephone.

d. No more than thirty (30) calendar days prior to any ground disturbance, pre-construction surveys shall be conducted by a Service-approved biologist for the

California red-legged frog for the road construction. These surveys shall consist of walking surveys of the project limits and adjacent areas accessible to the public to determine presence of the species. Biologist should investigate all potential California red-legged frog cover sites. This includes thorough investigation of mammal burrows. The entrances should be collapsed following investigation.

e. Only Service-approved biologist(s) who are familiar with the biology and ecology of the California red-legged frog shall capture or handle this listed species.

f. To control erosion during and after implementation of the project, the applicant will implement best management practices (BMPs). Erosion control measures and BMPs, which retain soil or sediment, runoff from dust control, and hazardous materials on the construction site and prevent these from entering the vernal pool complexes, will be placed, monitored, and maintained throughout the construction operations. These measures and BMPs may include, but are not limited to, silt fencing, sterile hay bales, vegetative strips, hydroseeding, and temporary sediment disposal.

g. Nets or bare hands may be used to capture California red-legged frogs. Service-approved biologists will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two hours before and during periods when they are capturing and relocating red-legged frogs. To avoid transferring disease or pathogens between aquatic habitats during the course of surveys or handling of red-legged frogs, Service-approved biologists will follow the Declining Amphibian Populations Task Force's "Code of Practice." Service-approved biologists will limit the duration of handling and captivity of red-legged frogs. While in captivity, individual frogs shall be kept in a cool, moist, aerated environment, such as a bucket containing a damp sponge. Containers used for holding or transporting adults shall not contain any standing water.

h. Biologists shall take precautions to prevent introduction of amphibian diseases to the action area by disinfecting equipment and clothing as directed in the October 2003, California tiger salamander survey protocol titled, Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander and the recommended equipment decontamination procedures within the Service's California Red-Legged Frog Survey Guidance. Both items are available at the Service's Sacramento office website (http://www.fws.gov/sacramento/es/protocol.htm). Disinfecting equipment and clothing is especially important when biologists are coming to the action area to handle salamanders or frogs after working in other aquatic habitats.

i. A biologist should be onsite to monitor the initial ground disturbance activities. The biologist should perform a clearance survey immediately prior to the initial ground disturbance. The biological monitor should also investigate areas of disturbed soil for

signs of listed species within 30 minutes following the initial disturbance of that given area.

j. All California red-legged frogs encountered in the action area should be relocated to a Service-approved location. The relocation site must be approved for the State Route 12/State Route 29 Interchange Improvement and State Route 12 Jameson Canyon Road Widening Projects prior to California red-legged frogs.

k. An employee education program covering the California red-legged frog must be conducted before groundbreaking for the State Route 12/State Route 29 Interchange Improvement and State Route 12 Jameson Canyon Road Widening Projects. The program should consist of a brief presentation by the on-site biologist to explain endangered species concerns to all contractors, their employees, and agency personnel involved in the project. The program should include a description of the California red-legged frog and their habitat needs; an explanation of the status of these species and their protection under the Endangered Species Act; associated consequences of noncompliance with this opinion; and a description of the measures being taken to reduce effects to these species during project construction and implementation. An outline of the training program shall be submitted to the Deputy Assistant Field Supervisor of the Endangered Species Program at the Sacramento Fish and Wildlife Office within twenty (20) working days prior to the start of construction. Documentation of the training, including individual signed affidavits, will be kept of file and available on request.

l. Project employees shall be provided with written guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.

m. Permanent and temporary disturbances and other types of project-related disturbance to the habitats of the California red-legged frog shall be minimized to the maximum extent practicable by Caltrans. To minimize temporary disturbances, all project-related vehicle traffic shall be restricted to established roads, construction areas, and other designated areas. These areas also should be included in pre-construction surveys and, to the maximum extent possible, should be established in locations disturbed by previous activities to prevent further adverse effects.

n. The construction area shall be delineated with high visibility temporary fencing at least 4 feet in height, flagging, or other barrier to prevent encroachment of construction personnel and equipment onto any sensitive areas during project work activities. Such fencing shall be inspected and maintained daily by the on-site biologist until completion of the project. The fencing will be removed only when all construction equipment is removed from the site. Actions within the project area shall be limited to vehicle and equipment operation on existing roads. No project activities will occur outside the delineated project construction area.

o. To prevent inadvertent entrapment of California red-legged frogs during construction, all excavated, steep-walled holes or trenches more than 2 feet (0.61 meters) deep shall be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they must be thoroughly inspected for trapped animals. If at any time a trapped listed animal is discovered, the on-site biologist should immediately place escape ramps or other appropriate structures to allow the animal to escape, or the Service and/or California Department of Fish and Game shall be contacted by telephone for guidance. The Service shall be notified of the incident by telephone and electronic mail within one working day.

p. Project-related vehicles shall observe a 20-mile per hour speed limit within construction areas, except on County roads, and State and Federal highways; this is particularly important at night when California red-legged frogs are most active. To the maximum extent possible, night-time construction should be minimized. Off-road traffic outside of designated project areas shall be prohibited.

q. All grindings and asphaltic-concrete waste shall be stored within previously disturbed areas absent of habitat and at a minimum of 150 feet from any culvert, or drainage feature.

r. To eliminate an attraction to predators of the California red-legged frog all food-related trash items such as wrappers, cans, bottles, and food scraps must be disposed of in closed containers and removed at least once every day from the entire project site.

s. To avoid injury or death of the California red-legged frog, no firearms shall be allowed on the project site except for those carried by authorized security personnel, or local, State, or Federal law enforcement officials.

t. To prevent harassment, injury or mortality of California red-legged frog or destruction of their burrows by dogs or cats, no canine or feline pets shall be permitted in the action area.

u. Plastic mono-filament netting (erosion control matting) or similar material shall not be used at the project site because California red-legged frogs may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

3. The following Terms and Conditions implement Reasonable and Prudent Measure three (3):

   a. If requested, before, during, or upon completion of ground breaking and construction activities, Caltrans shall allow access by Service and/or California Department of Fish and Game personnel to the project site to inspect project effects to the California red-legged frog, and its habitat.

   b. Caltrans shall submit a post-construction compliance report prepared by the on-site biologist to the Sacramento Fish and Wildlife Office within 60 calendar days following project completion or within 60 calendar days of any break in construction activity lasting more than 60 calendar days. This report shall detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting compensation and other conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the California red-legged frog, if any; (v) occurrences of incidental take of any of this species; (vi) documentation of employee environmental education; and (vii) other pertinent information. The reports shall be addressed to the Deputy Assistant Field Supervisor of the Endangered Species Program, Sacramento Fish and Wildlife Office.

   c. Caltrans shall report to the Service any information about take or suspected take of listed wildlife species not authorized by this biological opinion. Caltrans must notify the Service via electronic mail and telephone within 24 hours of receiving such information. Notification must include the date, time, location of the incident or of the finding of a dead or injured animal, and photographs of the specific animal. The individual animal shall be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen or the Service takes custody of the specimen. The Service contacts are Chris Nagano, Deputy Assistant Field Supervisor, Endangered Species Program, Sacramento Fish and Wildlife Office at (916) 414-6600, and Resident Agent-in-Charge Scott Heard of the Service's Law Enforcement Division at (916) 414-6660.

Reporting Requirements

Injured California red-legged frogs must be cared for by a licensed veterinarian or other qualified person such as the on-site biologist; dead individuals must be placed in a sealed plastic bag with the date, time, location of discovery, and the name of the person who found the animal; the carcass should be kept in a freezer; and held in a secure location. The Service and the California Department of Fish and Game must be notified within one (1) working day of the discovery of death or injury to a California red-legged frog that occurs due to project related activities or is observed at the project site. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal clearly indicated on a USGS 7.5 minute quadrangle and other maps at a finer scale, as requested by the Service, and any other pertinent information.

The Service contacts are Chris Nagano, Deputy Assistant Field Supervisor, Endangered Species Program at the Sacramento Fish and Wildlife Office (916/414-6600), and Scott Heard, Resident Agent-in-Charge of the Service's Law Enforcement Division at 916/414-6660. The California Department of Fish and Game contact is Mr. Scott Wilson at telephone (707) 944-5563. Sightings of any listed or sensitive animal species should be reported to the California Natural Diversity Database of the California Department of Fish and Game.

Caltrans shall submit a post-construction compliance report prepared by the on-site biologist to the Sacramento Fish and Wildlife Office within sixty (60) calendar days of the date of the completion of construction activity. This report shall detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting compensation and other conservation measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the California red-legged frog, if any; (v) occurrences of incidental take to any listed species, if any; (vi) documentation of employee environmental education; and (vii) other pertinent information.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and data bases.

The Service requests notification of the implementation of any conservation recommendations in order to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats. We propose the following conservation recommendations:

1. Caltans, Solano Transportation Authority, and the Napa County Transportation and Planning Agency should include properly sized culverts to enable black-tailed deer (*Odocoileus hemionus*), mountain lion, bobcat (*Felis rufus*), gray fox (*Urocyon cinereoargenteus*), badger (*Taxidea taxus*), long-tailed weasel (*Mustela frenata*), and other wildlife to safely cross Highway 12. A culvert that allows safe crossing by black-tailed deer also can be used by hikers and horseback riders.

2. Caltans, Solano Transportation Authority, and the Napa County Transportation and Planning Agency should place hog wire along the bottom portion of the perimeter fence along State Route 12/State Route 29 Interchange Improvement and State Route 12 Jameson Canyon Road Widening Projects. The perimeter fence should guide California red-legged frogs and wildlife to the culverts in an attempt to ensure their safe passage across the roadway.

3. Caltans, Solano Transportation Authority, and the Napa County Transportation and Planning Agency should assist the Service in implementing recovery actions identified in the *Recovery Plan for the California Red-legged Frog* (Service 2002).

4. Caltans should consider participating in the planning for a regional habitat conservation plan for the California red-legged frog, other listed species, and sensitive species.

5. Caltans, Solano Transportation Authority, and the Napa County Transportation and Planning Agency should consider establishing functioning preservation and creation conservation banking systems to further the conservation of the California red-legged frog, and other appropriate species. Such banking systems also could possibly be utilized for other required mitigation (i.e., seasonal wetlands, riparian habitats, etc.) where appropriate. Efforts should be made to preserve habitat along roadways in association with wildlife crossings.

6. Roadways can constitute a major barrier to critical wildlife movement. Therefore, Caltans, Solano Transportation Authority, and the Napa County Transportation and Planning Agency should incorporate culverts, tunnels, or bridges on highways and other roadways that allow safe passage by California red-legged frog, other listed animals, and wildlife. Photographs, plans, and other information in to the biological assessments if "wildlife friendly" crossings are incorporated into projects. Efforts should be made to establish upland culverts designed specifically for wildlife movement rather than accommodations for hydrology. Transportation agencies should also acknowledge the value of enhancing human safety by providing safe passage for wildlife in their early project design.

7. Caltans should continue to pursue multifaceted compensation packages such as the one developed for the proposed U.S. Interstate 580/Isabel Avenue Interchange Construction Project on future formal consultations with the Service.

8. Caltrans should continue to develop and implement their Early Statewide Biological Mitigation Planning Project that has been developed by the University of California at Davis, Road Ecology Center through Caltrans funding.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed and/or proposed species or their habitats, the Service requests notification of the implementation of these recommendations.

REINITIATION--CLOSING STATEMENT

This concludes formal consultation on the proposed State Route 12/State Route 29 Interchange Improvement and State Route 12 Jameson Canyon Road Widening Projects, Solano and Napa Counties, California. As provided in 50 CFR §402.16 and in the terms and conditions of this biological opinion, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and

if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have questions concerning this opinion on the proposed State Route 12/State Route 29 Interchange Improvement and State Route 12 Jameson Canyon Road Widening Projects, Solano and Napa Counties, California, please contact John Cleckler or Chris Nagano at the letterhead address or at (916) 414-6600.

Sincerely,

Chris Nagano

for Cay C. Goude
Acting Field Supervisor

cc:
Scott Wilson, California Department of Fish and Game, Yountville, California
Greg Martinelli, California Department of Fish and Game, Yountville, California
Anna Holmes, California Department of Fish and Game, Yountville, California
Janet Adams, Solano Transportation Authority, Suisun City, California
Jim Leddy, Napa County Transportation and Planning Agency, Napa, California
John Ponte, Napa County Transportation and Planning Agency, Napa, California
Terry Bowen, Gray-Bowen, Walnut Creek, California
Bill Gray, Gray-Bowen, Walnut Creek, California
Jonathan Mates-Muchin, California Department of Transportation, Oakland, California
Dale Jones, California Department of Transportation, Sacramento, California

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State Route 12/Jameson Canyon Widening
Solano County, California
EA 04-264144
October 2010

Storm Water Information Handout

Prepared for:

Prepared by:

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Table of Contents

1 Overview 5
1.1 Intent of This Document 5
1.2 Summary of New Requirements 5

2 General Project Information 6
2.1 Location 6
2.2 Major Engineering Features 7
2.3 Receiving Water Bodies 7
2.4 Creek Crossings 7
2.5 Climate and Rainfall 8
2.6 Topography 10
2.7 Soils and Geology 10
2.8 Hazardous Waste 10
2.9 Existing (Pre-Construction) Control Practices 10

3 Construction General Permit 11
3.1 Risk Assessment 11
3.1.1 Sediment Risk 11
3.1.2 Receiving Water Body Risk 15
3.2 Notice of Termination (NOT) 16

4 Run-on Discharges 17

5 Project registration Documents 18
5.1 General Information Included 19
5.2 Storm Water Pollution Prevention Plan 19
5.3 Notice of Intent (NOI) 19
5.4 Site Maps 20

Figures

Figure 1. Vicinity Map 6
Figure 2. Intensity-Duration-Frequency Data 9
Figure 3. Rainfall Runoff Erosivity Factor (R) 12
Figure 4. Soil Erodibility Factor (K) 13
Figure 5. Length Slope Factor (LS) 13
Figure 6. Sediment Risk Assessment 14
Figure 7. Receiving Water Risk Assessment 15
Figure 8. Combined Risk Level Assessment 15

Tables

Table 1. Project Location 6
Table 2. Creek Crossing Locations 8
Table 3. Run-On Discharge Calculations 17

Appendices

- Appendix A Notice of Intent (NOI)
- Appendix B Layout Plans
- Appendix C Drainage Plans
- Appendix D Sampling Location Plans
- Appendix E Off-Site Watershed Plans

Disclaimer

A "Disclaimer" is required specifying that the information provided in the Storm Water Information Handout is just a guideline and is to be used for information purposes only and should not be considered a sole source document to adhere to the requirements of the new National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP), Number CAS000002, adopted on September 2, 2009. The contractor is required to provide water quality monitoring, sampling and implement best management practices (BMPs) based on standard industry operations, field conditions and conditions encountered based on the contractor's means and methods. The information in this handout is not to be construed in any way as a waiver of the provisions in the CGP. Bidders and contractors are cautioned to make independent investigations and examinations as they deem necessary to satisfy the conditions encountered in performance of work, with respect to the following: sampling and monitoring locations, distribution of watershed areas for sizing of BMPs, and selection of BMPs in order to conform to the requirement of the contract documents and the CGP.

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1 OVERVIEW

1.1 Intent of This Document

The objectives of this Water Quality Information Handout are: to summarize general water quality information of the Project; to summarize updated requirements per the new Construction General Permit (CGP) adopted on September 2, 2009; to provide general guidelines for contractors to bid on the project; to aid in developing the Storm Water Pollution Prevention Plan (SWPPP) of the project; and, to highlight information necessary to file Project Registration Documents (PRDs) to the State Water Resources Control Board via the Stormwater Multi Application Reporting and Tracking System (SMARTS) and file the Notice of Intent at the start of construction.

1.2 Summary of New Requirements

A new CGP was adopted on September 2, 2009 and has been effective starting July 1, 2010. This revised "National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities" (NPDES Number CAS000002) regulates discharges from construction activities within the Project area.

The new CGP is based on a risk level (RL) permitting approach. There are 3 levels of risk, RL 3 being the highest. RL is calculated by 1) project sediment risk, and 2) receiving water risk. RL 1 projects will be subject to minimum BMP implementation and visual monitoring requirements, RL 2 projects will be subject to Numeric Action Levels (NALs) and some additional monitoring requirements, and RL 3 projects will be subject to Numeric Effluent Limitations (NELs), and more rigorous monitoring requirements such as receiving water monitoring and, in some cases bioassessments. All projects will have to upload storm water data into SMARTS, such as Notice of Intents (NOIs), SWPPPs, annual reports, and monitoring data, as applicable.

A risk assessment was done for the State Route 12 (SR 12)/Jameson Canyon Widening Project (Project) in Solano County, and based on a number of factors set forth in the CGP, it was determined to be RL 2. See the risk assessment calculations in Section 3.1 of this document for details.

2 GENERAL PROJECT INFORMATION

This section summarizes the Project location, features, site information, and site impacts.

2.1 Location

The Project is located in Solano County, starting at the Napa/Solano County line (PM 0.0) and ending at Red Top Road in Solano County (PM R2.6). A vicinity map for the Project is included as Figure 1. The map shows the location of the Project and the receiving water bodies.

Table 1. Project Location

County	Route	Begin	End
Solano	State Route 12	Napa/Solano County Line (PM 0.0)	Red Top Road in Solano Co. (PM R2.6)

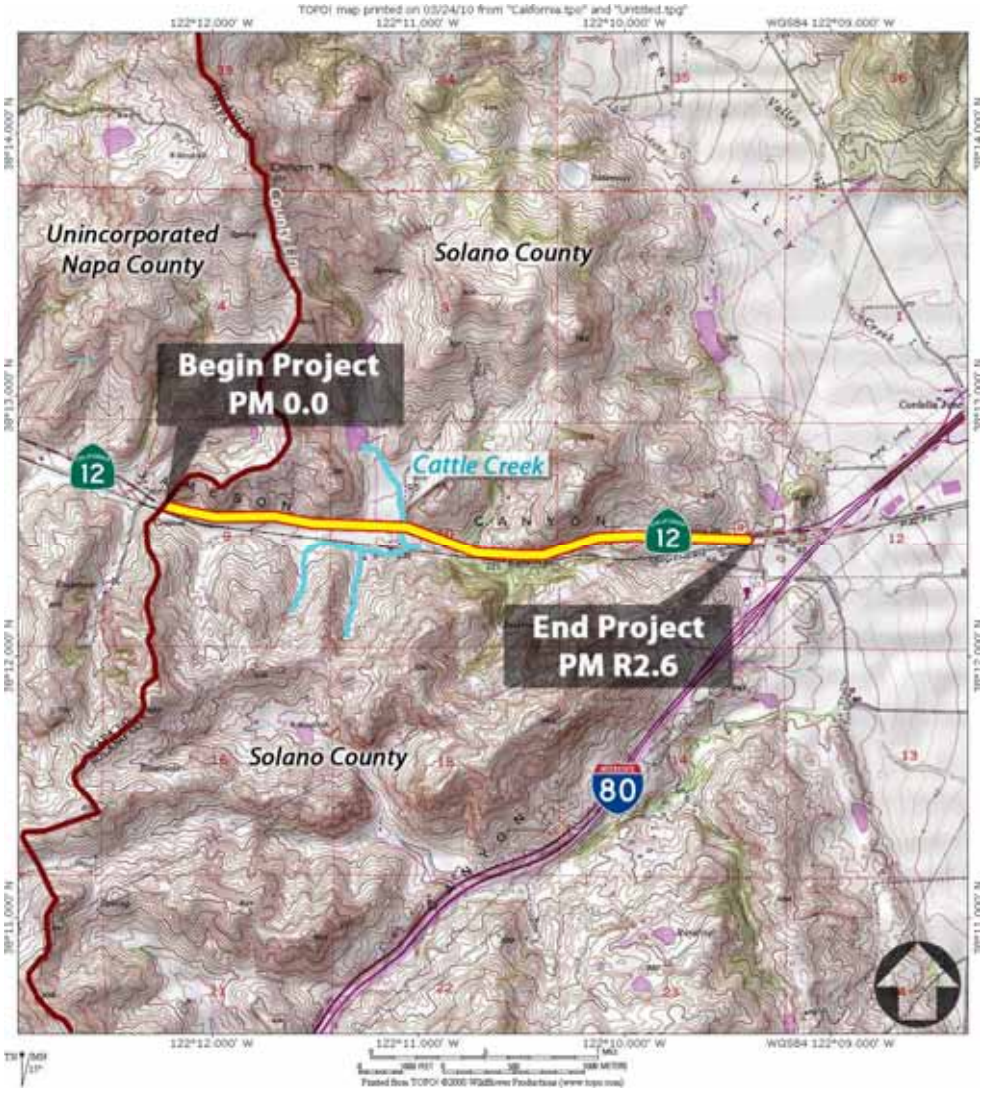

Figure 1. Vicinity Map

2.2 Major Engineering Features

The Project proposes to widen State Route 12 (SR 12)/Jameson Canyon Road from a two-lane to a four-lane rural highway. The existing roadway has 12 foot (ft) lanes with shoulders varying from 2 ft to 8 ft. The Project proposes to construct 5-ft inside shoulders and 8-ft side shoulders. A concrete barrier will separate eastbound and westbound traffic. One median opening with acceleration and deceleration lanes is proposed. The median opening will be 2,200 ft east of the Solano/Napa county line.

Retaining walls will be constructed at multiple locations throughout the Project. The tallest wall, 3,620 ft long and 120 ft high, will be 5,000 ft west of Red Top Road and constructed in three tiers.

2.3 Receiving Water Bodies

Runoff from the Project directly discharges to various creeks that cross or parallel SR 12 within the Project limits; the only named creek that crosses SR 12 within the Project limits is Cattle Creek, which crosses SR 12 via a box culvert at approximately Station 310+00 (see Figure 1). Many of these creek crossings, including Cattle Creek, are identified as Waters of the United States. These water bodies drain to multiple tributaries of Suisun Slough, which eventually joins Suisun Bay.

Per Section 303(d) of the 1972 Clean Water Act, California has developed a list of water quality limited segments. None of the direct receiving water bodies within the Project area are on the 303(d) List. Suisun Slough is an indirect receiving water body that is approximately 1.5 mi east of the Solano Project area and is listed as impaired for Diazinon. Given the distance from the Project, impacts to water quality from the Project will be minimal.

There are no drinking water reservoirs or recharge facilities, listed beneficial uses, total maximum daily loads (TMDLs) or effluent limits for any of the direct receiving water bodies. Suisun Slough has the following existing beneficial uses: SPWN, WARM, WILD, REC1, REC2, and NAV.

The Project will maintain the overall existing drainage pattern of the area. This is achieved by having drainage systems directly outfall to existing cross culverts or by conveying runoff to these existing crossings through the use of dikes and ditches. New outfalls utilize flared end sections, tees, and rock slope protection to dissipate the energy of the runoff and prevent erosion. The proposed on-site drainage was designed to meet the drainage design criteria set forth in the Caltrans HDM.

2.4 Creek Crossings

Cattle Creek and one other unnamed tributary cross SR 12 within the Project limits. Both are identified as Waters of the U.S. These creeks receive water primarily from off-site sources. Both creeks and other unnamed tributaries of the Suisun Slough drain to Suisun Bay, located approximately 13 mi southeast from the Project end post mile.

Table 2. Creek Crossing Locations

Creek Crossing	Station	Pipe Size
Cattle Creek	310+00	4 ft x 4 ft reinforced concrete box (RCB)
Tributary of Cattle Creek	328+00	Two (2) 6 ft x 3 ft RCB and a 48-in. riser

2.5 Climate and Rainfall

The climate is in the mid 60s (ºF) in the summer and in the 40s (ºF) during the winter, with the warmest month being July and coldest month being December. The average annual precipitation is approximately 26.5 inches (in).

The rainfall from the 25-year, 24-hour event is 4.152 in. The rainfall intensity for a 2-year, 1-hour event is 0.480 in./hour. See
Figure 2 for intensity-duration-frequency (IDF) data.

```
                    SR12_RG1_Solano.txt
*************** HYDRO - Version 6.1 ***************
*  HEC19 / Design Event vs Return Period Program  *
*              Date of Run: 09-02-2008            *
                                                Page No  1
                IDF SR12 JamesonCanyon_NAPA

--- Input File: C:\HYDRO\SR12_NAP.HDO

 IDF  SR12_NAPA IDF

 === IDF CURVE Option Selected ...

 CAL  rain95.asc

 === File Read from Intermediate Directory: rain95.asc

 LOC  38 13 122 13

--- The Latitude is 38 degrees, 13 minutes.
--- The Longitude is 122 degrees, 13 minutes.

 STN  E302933000


 RPD  25

--- The Selected Return Period is   25 years.


 +++ End of HYDRO Command File


--- The Following Station(s) Will Be Used in Determining the Sites Intensity:
    Station ID   Elev. (ft)   Lat/Long (dec. deg.)  Distance from Site (miles)

    E302933000    110           38.283  122.033                10.8

    Notice:  A Station Elevation of -999 Indicates A Missing Value.


              ***** HYDRO ***** (Version 6.1) *****        Date 09-02-2008
                                                            Page No  2
                IDF SR12 JamesonCanyon_NAPA

                ------------------------------------
                IDF Curve for Various Return Periods
                ------------------------------------
                        Intensities (in/h)

 Duration       25 Yr     2 Yr      10 Yr      50 Yr     100 Yr   10000 Yr
 ---------------------------------------------------------------------------
  5 min        3.731     1.846      3.115      4.192      4.654      7.423
 10 min        2.561     1.268      2.139      2.878      3.195      5.096
 15 min        2.056     1.018      1.717      2.311      2.565      4.091
 30 min        1.412      .699      1.179      1.587      1.762      2.810
 60 min         .970      .480       .810      1.090      1.210      1.930
120 min         .666      .330       .556       .749       .831      1.326
  4 h           .458      .226       .382       .514       .571       .910
  8 h           .314      .156       .262       .353       .392       .625
 16 h           .216      .107       .180       .243       .269       .429
 24 h           .173      .086       .145       .195       .216       .345
```

Figure 2. Intensity-Duration-Frequency Data

2.6 Topography

The existing terrain within the Project area varies from flat to rolling terrain. The maximum elevation within the Project area is 335 ft near the county line, with the roadway elevations varying from 80 ft at the western end of the Project to 110 ft at the eastern end. Sections of the slopes along the north end of the alignment consist of exposed bedrock, and rock slopes vary from 3:1 (H:V) to 1:1 (H:V). Localized areas of nearly vertical cut faces were also noted in the *Geotechnical Design & Materials Report* by Parikh Consultants (2009).

2.7 Soils and Geology

The geology and soil information provided in the *Geotechnical Design & Materials Report* is based on 49 borings drilled along SR 12. The borings varied from 5 ft to 150 ft below the existing grade. Based on the borings, the Project subsoils can be generally described as stiff clay at the top underlain by bedrock. The log of test borings is included in the appendices of the *Geotechnical Design & Materials Report.*

Jameson Canyon lies between the Green Valley Fault Zone and the West Napa Fault Zone. The canyon is within the Eocene Markley Formation. The Markley Formation is folded, with fold axes tending northwest. This formation, exposed in the cut slopes, consists of inter-bedded gray siltstone and fine to medium grained micaceous, arkosic sandstone. At some locations the inter-bedded clay layers act as aquitards, and sliding occurs within the clay layers parallel to bedding planes. Older alluvium deposits are located on the western end of the Project limits, as described in the Caltrans Storm Water Data Report for EA 04-264100 (December 2007).

2.8 Hazardous Waste

A Caltrans memo from the Office of Design, dated December 18, 2007, noted in the *Hazardous Site Investigation Report* (prepared by Caltrans in September 2002), that the soil within the Project area could be classified as non-hazardous and could be reused on-site without restrictions.

2.9 Existing (Pre-Construction) Control Practices

There are no existing Treatment BMPs within the Project limits and no known existing erosion control or water pollution control BMPs.

3 CONSTRUCTION GENERAL PERMIT

To minimize the potential effects of construction runoff on the quality of the receiving water bodies, the State requires that any construction activity affecting one acre or more must obtain coverage under the CGP. Permit applicants are required to prepare a Storm Water Pollution Prevention Plan (SWPPP) and implement BMPs to reduce construction effects on receiving water quality.

Because this Project disturbs 26.01 ac of soil, a SWPPP is required to be submitted by the Contractor.

3.1 Risk Assessment

The new CGP requirements include a risk assessment to determine the Project's impact risk to receiving water bodies. The risk assessment uses measurements of the Project's potential sediment risk and the sensitivity of the receiving water bodies to sediment to determine the RL of the Project. This Project has a High Site Sediment Risk Factor and a Low Receiving Water Risk Factor; the combined risk is Level 2. The risk factors are detailed in the following sections.

3.1.1 Sediment Risk

The sediment risk is based on the following equation from the CGP "Fact Sheet" (Section J.1.a pg. 28):

Equation 1. Sediment Risk Equation

$$A = (R)(K)(LS)(C)(P)$$

Where:

R = Runoff erosivity factor
K = Soil erodibility factor
LS = Length-slope
C = Cover
P = Management operations and support practices
A = Rate of sheet and rill erosion (tons per acre)

The rainfall runoff erosivity factor (R) was determined from the United States Environmental Protection Agency (EPA) "Rainfall Erosivity Factor Calculator for Small Construction Sites." The erosivity index value for the Project was determined to be 88 (see Figure 3).

The soil erodibility factor (K) was determined from the United States Department of Agriculture Natural Resources Conservation Services "Web Soil Survey." The weighed average K value was calculated to characterize the soils within the limits of the Project; this value is 0.32 (see Figure 4).

The length-slope factor (LS) was determined by examining the original grade delineated on the Typical Cross Sections included in the Contract Project Plans. Using these cross sections an LS value of 4.86 was derived (see Figure 5).

The cover factor (C) and management operations and support practices (P) are given values of 1.0 by the adopted NPDES permit to simulate bare ground conditions.

Based on these factors, the rate of sheet and rill erosion (A) is 137 tons per acre. Because this value is above 75 tons per acre, the Project is classified as having a high sediment risk.

Figure 6 shows the assessment of the Project Sediment Risk.

Rainfall Erosivity Factor Calculator for Small Construction Sites

Facility Information

Facility Name: EA 04-26414 SR-12/Jameson Solano
Start Date: 05/01/2011
End Date: 04/30/2013
Latitude: 38.2084
Longitutde: -122.1840

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF **88** HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **05/01/2011 - 04/30/2013**.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements**.

Figure 3. Rainfall Runoff Erosivity Factor (R)

Source: US EPA (http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm)

K Factor, Rock Free— Summary by Map Unit — Napa County, California				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
DbEso	Dibble-Los Osos loams, 9 to 30 percent slopes	.37	0.2	0.4%
Subtotals for Soil Survey Area			0.2	0.4%
Totals for Area of Interest			43.9	100.0%

K Factor, Rock Free— Summary by Map Unit — Solano County, California				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CeB	Clear Lake clay, 2 to 5 percent slopes	.17	0.6	1.5%
DbE	Dibble-Los Osos loams, 9 to 30 percent slopes	.37	13.4	30.4%
DbF2	Dibble-Los Osos loams, 30 to 50 percent slopes, eroded	.37	12.2	27.8%
HaF	Hambright loam, 15 to 40 percent slopes	.24	3.0	6.8%
RoC	Rincon clay loam, 2 to 9 percent slopes	.24	14.5	33.1%
Subtotals for Soil Survey Area			43.8	99.6%
Totals for Area of Interest			43.9	100.0%

Figure 4. Soil Erodibility Factor (K)

Source: USDA NRCS (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx)

	Average Watershed Slope (%)											
Sheet Flow Length (ft)	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0	30.0	40.0	50.0
<3	0.23	0.26	0.32	0.35	0.36	0.38	0.39	0.41	0.45	0.48	0.53	0.58
6	0.23	0.26	0.32	0.37	0.41	0.45	0.49	0.56	0.64	0.72	0.85	0.97
9	0.23	0.26	0.32	0.38	0.45	0.51	0.56	0.67	0.80	0.91	1.13	1.31
12	0.23	0.26	0.32	0.39	0.47	0.55	0.62	0.76	0.93	1.08	1.37	1.62
15	0.23	0.26	0.32	0.40	0.49	0.58	0.67	0.84	1.04	1.24	1.59	1.91
25	0.31	0.36	0.45	0.57	0.71	0.85	0.98	1.24	1.56	1.86	2.41	2.91
50	0.46	0.54	0.70	0.91	1.15	1.40	1.64	2.10	2.67	3.22	4.24	5.16
75	0.58	0.69	0.91	1.20	1.54	1.87	2.21	2.86	3.67	4.44	5.89	7.20
100	0.68	0.82	1.10	1.46	1.88	2.31	2.73	3.57	4.59	5.58	7.44	9.13
150	0.86	1.05	1.43	1.92	2.51	3.09	3.68	4.85	6.30	7.70	10.35	12.75
200	1.02	1.25	1.72	2.34	3.07	3.81	4.56	6.04	7.88	9.67	13.07	16.16
250	1.16	1.43	1.99	2.72	3.60	4.48	5.37	7.16	9.38	11.55	15.67	19.42
300	1.28	1.60	2.24	3.09	4.09	5.11	6.15	8.23	10.81	13.35	18.17	22.57
400	1.51	1.90	2.70	3.75	5.01	6.30	7.60	10.24	13.53	16.77	22.95	28.60
600	1.91	2.43	3.52	4.95	6.67	8.45	10.26	13.94	18.57	23.14	31.89	39.95
800	2.25	2.89	4.24	6.03	8.17	10.40	12.69	17.35	23.24	29.07	40.29	50.63
1000	2.55	3.30	4.91	7.02	9.57	12.23	14.96	20.57	27.66	34.71	48.29	60.84

LS Factors for Construction Sites. *Table from Renard et. al., 1997.*

Figure 5. Length Slope Factor (LS)

Source: Adopted NPDES No. CAS000002

	A	B	C
1	**Sediment Risk Factor Worksheet**		**Entry**
2	**A) R Factor**		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5	**R Factor Value**		88
6	**B) K Factor (weighted average, by area, for all site soils)**		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9	**K Factor Value**		0.32
10	**C) LS Factor (weighted average, by area, for all slopes)**		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13	**LS Factor Value**		4.86
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**	137	
16	**Site Sediment Risk Factor**	**High**	
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			

Figure 6. Sediment Risk Assessment

3.1.2 Receiving Water Body Risk

A receiving water body can be classified as either low or high risk. The risk receiving water body is classified as high if it is on the 303(d) List as impaired for sediment or has the beneficial uses of SPWN, COLD and MIGR.

As stated in Section 2.3 the direct receiving water bodies for this Project is Cattle Creek and various unnamed tributaries. None of these direct receiving water bodies are listed on the 303(d) List for sediment nor do they have any beneficial uses identified on the 2007 "Water Quality Control Plan" (Basin Plan) for the San Francisco Bay Basin. Therefore, the Project receiving water risk is designated as low, see Figure 7.

Receiving Water (RW) Risk Factor Worksheet	**Entry**	**Score**
A. Watershed Characteristics	**yes/no**	
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment**? For help with impaired waterbodies please check the attached worksheet or visit the link below: 2006 Approved Sediment-impared WBs Worksheet http://www.waterboards.ca.gov/water_issues/programs/tmdl/303d_lists2006_epa.shtml **OR** A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? http://www.ice.ucdavis.edu/geowbs/asp/wbquse.asp	**No**	**Low**

Figure 7. Receiving Water Risk Assessment

Figure 8 shows the matrix for determining the combined RL using the Sediment Risk and Receiving Water Risk.

Combined Risk Level Matrix

Receiving Water Risk	Sediment Risk: Low	Sediment Risk: Medium	Sediment Risk: High
Low	Level 1	Level 2	
High	Level 2		Level 3

Project Sediment Risk: High
Project RW Risk: Low
Project Combined Risk: Level 2

Figure 8. Combined Risk Level Assessment

3.2 Notice of Termination (NOT)

The CGP provides both revised and new requirements for completion and approval of the NOT. The NOT requirements are presented in Section II.D of the new CGP permit "Order." These requirements include demonstrating through photos, computational proof or other "custom methods," such as results of testing and analysis, that the terms of the NOT have been satisfied.

While these methods of demonstrating compliance are at the option of the contractor, should the RWQCB determine that the visual photos do not adequately show compliance, further computational efforts may be required. This computational proof is obtained through the use of the Revised Universal Soil Loss Equation 2 (RUSLE2) program.

4 RUN-ON DISCHARGES

Run-on discharges are off-site storm water flows that can potentially run onto the site. The calculations are based on the rainfall from the 25-year, 24-hour event and a rainfall intensity for a 2-year, 1-hour event. The calculations use the watershed delineations provided in the off-site watershed plans, which are included in Appendix E. These discharge calculations are used to design storm water BMPs during construction. Table 3 shows the calculations.

Table 3. Run-On Discharge Calculations

Computation Sheet for Determining Run-on Discharges
Existing Site Conditions

Q = CiA

C = Area Runoff Coefficient
i = Area Rainfall Intensity (in/hr)
A = Drainage Area (ac)
Q = Site Area Run-on Discharge (cfs)
i = 0.48 in/hr

Area ID	Station	Side	C	I (in/hr)	A (acres)	Q (cfs)
S-1	27209	Lt	0.62	0.48	8.27	2.46
S-2	28010	Lt	0.56	0.48	27.87	7.49
S-2-1		Lt	0.56	0.48	14.34	3.85
S-3	28495	Lt	0.54	0.48	30.17	7.82
S-4	29076	Lt	0.58	0.48	10.56	2.94
S-5	29730	Lt	0.6	0.48	8.61	2.48
S-6	30213	Lt	0.6	0.48	8.98	2.59
S-6-1		Lt	0.6	0.48	4.91	1.41
S-7	31006	Lt	0.59	0.48	615.24	174.24
S-7-1		Lt	0.59	0.48	5.28	1.50
S-7-2		Lt	0.59	0.48	3.56	1.01
S-7-3		Lt	0.59	0.48	7.95	2.25
S-8	31993	Lt	0.58	0.48	12.36	3.44
S-9	32777	Lt	0.52	0.48	315.27	78.69
S-9-1		Lt	0.52	0.48	8.14	2.03
S-9-2		Lt	0.52	0.48	4.94	1.23
S-10	33562	Lt	0.63	0.48	8.66	2.62
S-11	34255	Lt	0.56	0.48	9.79	2.63
S-12	34636	Lt	0.72	0.48	1.71	0.59
S-13	36054	Lt	0.59	0.48	56.41	15.98
S-13-1		Lt	0.59	0.48	5.19	1.47
S-14	36975	Lt	0.54	0.48	13.52	3.50
S-15	37659	Lt	0.58	0.48	18.65	5.19
S-16	38203	Lt	0.6	0.48	13.49	3.89
S-17	39024	Lt	0.57	0.48	8.8	2.41

5 PROJECT REGISTRATION DOCUMENTS

To obtain permit coverage under the CGP, all dischargers must electronically file PRDs, NOTs, changes of information, sampling and monitoring information, annual reporting, and other compliance documents required by this CGP through the SWRCB's SMARTS. The contractor will have to coordinate these submittals with Caltrans within the timeframe allotted in the contract special provisions and as specified in the permit. SMARTS is found under the following website:

https://smarts.waterboards.ca.gov/smarts/faces/SwSmartsLogin.jsp

PRDs include the following information:

1. Notice of Intent (NOI)
2. Site Map(s) Includes:
    a. The project's surrounding area (vicinity)
    b. Site layout
    c. Construction site boundaries
    d. Drainage areas
    e. Discharge locations
    f. Sampling locations
    g. Areas of soil disturbance (temporary or permanent)
    h. Active areas of soil disturbance (cut or fill)
    i. Locations of all runoff BMPs
    j. Locations of all erosion control BMPs
    k. Locations of all sediment control BMPs
    l. Active Treatment System (ATS) location (if applicable)
    m. Locations of sensitive habitats, watercourses, or other features which are not to be disturbed
    n. Locations of all post-construction BMPs
    o. Locations of storage areas for waste, vehicles, service, loading/unloading of materials, access (entrance/exits) points to construction site, fueling and water storage, water transfer for dust control and compaction practices

3. SWPPPs

4. Risk Assessment

a. The Standard Risk Assessment includes utilization of the following:
    i. Receiving water Risk Assessment interactive map
    ii. EPA Rainfall Erosivity Factor Calculator Website
    iii. Sediment Risk interactive map
    iv. Sediment sensitive water bodies list

b. The Site-Specific Risk Assessment includes the completion of the hand calculated R value Risk Calculator

5. **Post-Construction Water Balance Calculator (if applicable)**
The post-construction requirements of the CGP are not applicable because the Project area is currently within the Solano County Phase II Municipal Separate Storm Sewer (MS4) and all work within the Project limits is within Caltrans' Phase I MS4. Dischargers that are subject to this requirement or chose to comply with this requirement shall complete the Water Balance Calculator in accordance with the instructions in Appendix 2 of the CGP.

6. **ATS Design Document and Certification (if applicable)**
Currently the design does not include the use of an ATS. If the contractor decides to utilize an ATS, then it must be approved by the Engineer. Furthermore, all dischargers using ATS must submit electronically to SMARTS their system design (as well as any supporting documentation) and proof that the system was designed by a qualified ATS design professional, see Attachment F of the CGP.

5.1 General Information Included

The following is a list of information included in this Storm Water Information Handout that can be used for the PRDs:

- Vicinity Map
- Risk Assessment

5.2 Storm Water Pollution Prevention Plan

The contractor for the Project is required to prepare a SWPPP because the Project involves disturbing more than 1 ac of soil. The SWPPP must include the following information:

- Active areas of cut and fill
- Areas of soil disturbance (temporary and permanent)
- Locations of storage areas for waste, vehicles, access, etc.
- Locations of all runoff BMPs
- Locations of all erosion control BMPs
- Locations of all sediment control BMPs

The SWPPP should be submitted with the PRDs and will be forthcoming from the Contractor.

5.3 Notice of Intent (NOI)

The NOI must be submitted once the contractor submits the SWPPP. A draft of the NOI is included in Appendix A. The NOI must be updated with the Project contractor's information, once a contractor has been selected for this Project.

5.4 Site Maps

Registration requirements can be met by the inclusion of the following plans, which can be found in the appendices.

- Layout Plans (Appendix B)
  - Site layout with construction boundaries
  - ESA locations

- Drainage Plans (Appendix C)
  - Drainage areas

- Sampling Plan (Appendix D)
  - Discharge Locations (Subject to changes by the Contractor and approved by the Engineer)
  - Sampling locations (Subject to changes by the Contractor and approved by the Engineer)

- Off-site Watershed Map (Appendix E)

Appendix A Notice of Intent (NOI)

Attachment 2

State Water Resources Control Board

NOTICE OF INTENT

TO COMPLY WITH THE TERMS OF THE
GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH CONSTRUCTION ACTIVITY (WQ ORDER No. 99-08-DWQ)

I. NOI STATUS (SEE INSTRUCTIONS)

MARK ONLY ONE ITEM 1. ☐ New Construction 2. ☐ Change of Information for WDID#

II. PROPERTY OWNER

Name	Contact Person		
California Department of Transportation	Kelly Hirschberg		
Mailing Address	Title		
111 Grand Avenue	Regional Project Manager		
City	State	Zip	Phone
Oakland	CA	94612	(510) 286-4925

Owner Type (*check one*) 1.[ ] Private Individual 2.[ ]Business 3.[ ]Municipal 4.[ ]State 5.[ ]Federal 6.[ ]Other

III. DEVELOPER/CONTRACTOR INFORMATION

Developer/Contractor	Contact Person		
Mailing Address	Title		
City	State	Zip	Phone

IV. CONSTRUCTION PROJECT INFORMATION

Site/Project Name	Site Contact Person		
State Route 12 / Jameson Canyon			
Physical Address/Location	Latitude	Longitude	County
Intersection of SR 12 and Red Top Road	38.21 °	-122.18 °	Solano
City (or nearest City)	Zip	Site Phone Number	Emergency Phone Number
American Canyon	94503		

A. Total size of construction site area: 51.16 Acres

B. Total area to be disturbed: 26.01 Acres (% of total 51)

C. Percent of site imperviousness (including rooftops):
Before Construction: 31 %
After Construction: 58 %

D. Tract Number(s): _____, _____

E. Mile Post Marker: 0.0/R2.6

F. Is the construction site part of a larger common plan of development or sale?
☒ YES ☐ NO

G. Name of plan or development: SR 12/Jameson Canyon Widening

H. Construction commencement date: 05/ 01 / 11

I. % of site to be mass graded: _____

J. Projected construction dates:
Complete grading: ____/____/____ Complete project: 04/ 30 / 13

K. Type of Construction (Check all that apply):

1. ☐ Residential 2. ☐ Commercial 3. ☐ Industrial 4. ☐ Reconstruction 5. ☒ Transportation

6. ☐ Utility Description: _____ 7. ☐ Other (Please List): _____

V. BILLING INFORMATION

SEND BILL TO:	Name	Contact Person	
☒ OWNER (as in II. above)			
☐ DEVELOPER (as in III. above)	Mailing Address	Phone/Fax	
☐ OTHER (enter information at right)	City	State	Zip

VI. REGULATORY STATUS

A. Has a local agency approved a required erosion/sediment control plan? ☒ YES ☐ NO

Does the erosion/sediment control plan address construction activities such as infrastructure and structures? ☒ YES ☐ NO

Name of local agency: California Department of Transportation Phone: (510) 286-5664

B. Is this project or any part thereof, subject to conditions imposed under a CWA Section 404 permit of 401 Water Quality Certification? ☒ YES ☐ No

If yes, provide details: Hydromodification Report submitted, awaiting review by RWQCB

VII. RECEIVING WATER INFORMATION

A. Does the storm water runoff from the construction site discharge to (Check all that apply):

1. ☒ **Indirectly to waters of the U.S.**
2. ☒ **Storm drain system - Enter owner's name:** California Department of Transportation
3. ☒ **Directly to waters of U.S. (e.g. , river, lake, creek, stream, bay, ocean, etc.)**

B. Name of receiving water: (river, lake, creek, stream, bay, ocean): Cattle Creek, Unnamed Creek(s)

VIII. IMPLEMENTATION OF NPDES PERMIT REQUIREMENTS

A. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) (check one)

☐ A SWPPP has been prepared for this facility and is available for review: Date Prepared: ____/____/____ Date Amended: ____/____/____

☐ A SWPPP will be prepared and ready for review by (enter date): ____/____/____

☒ A tentative schedule has been included in the SWPPP for activities such as grading, street construction, home construction, etc.

B. MONITORING PROGRAM

☐ A monitoring and maintenance schedule has been developed that includes inspection of the construction BMPs before anticipated storm events and after actual storm events and is available for review.

If checked above: A qualified person has been assigned responsibility for pre-storm and post-storm BMP inspections to identify effectiveness and necessary repairs or design changes. ☐ YES ☐ NO

Name: _____ Phone: _____

C. PERMIT COMPLIANCE RESPONSIBILITY

A qualified person has been assigned responsibility to ensure full compliance with the Permit, and to implement all elements of the Storm Water Pollution Prevention Plan including:

1. Preparing an annual compliance evaluation. ☐ YES ☐ NO

Name: _____ Phone: _____

2. Eliminating all unauthorized discharges. ☐ YES ☐ NO

IX. VICINITY MAP AND FEE (must show site location in relation to nearest named streets, intersections, etc.)

Have you included a vicinity map with this submittal? ☒ YES ☐ NO

Have you included payment of the annual fee with this submittal? ☐ YES ☐ NO

X. CERTIFICATIONS

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. In addition, I certify that I have read the entire General Permit, including all attachments, and agree to comply with and be bound by all of the provisions, requirements, and prohibitions of the permit, including the development and implementation of a Storm Water Pollution Prevention Plan and a Monitoring Program Plan will be complied with."

Printed Name: _____

Signature: _____ **Date:** _____

Title: _____

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Appendix B Layout Plans

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER 04/15/10 DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER RICHARD K. TANAKA No. 23233 Exp. 12/31/11 CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

MARK THOMAS & COMPANY, INC.
1960 ZANKER ROAD
SAN JOSE, CA 95112

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

LEGEND:

- OVERLAY EXISTING PAVEMENT
- COLD PLANE AC PAVEMENT
- CONFORM COLD PLANE AC PAVEMENT
- REMOVE BASE AND SURFACING
- REPLACE AC SURFACING
- ESA
- (No.) CURVE DATA
- [No.] PAVEMENT STRUCTURAL SECTION, SEE TYPICAL SHEET X-1
- (S,M) WILDLIFE PASSAGEWAY, TYPE S, S Mod, M, OR M Mod (SEE SHEET C-22 AND C-23)
- C/F CUT/FILL LINE
- DRAINAGE EASEMENT
- BRIDLE TRAIL EASEMENT
- PTE
- SOIL NAIL WALL EASEMENT
- TCE
- CONCRETE BARRIER (TYPE K)
- IRRIGATION SLEEVE
- VEGETATION CONTROL (MINOR CONCRETE)

ABBREVIATIONS:

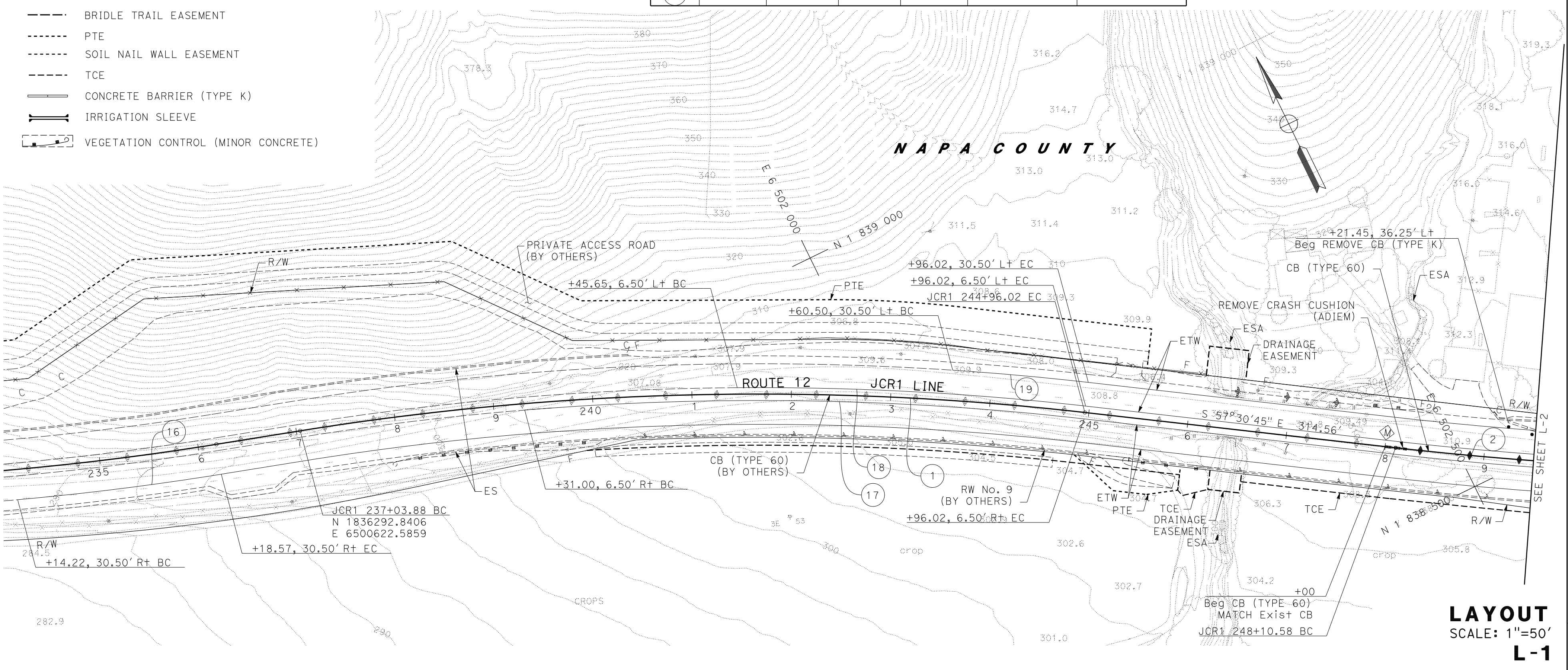
AFTS	ALTERNATIVE FLARED TERMINAL SYSTEM
AITS	ALTERNATIVE IN-LINE TERMINAL SYSTEM
ESA	ENVIRONMENTALLY SENSITIVE AREA
MVP	MAINTENANCE VEHICLE PULLOUT
PTE	PERMIT TO ENTER AND CONSTRUCT
TCE	TEMPORARY CONSTRUCTION EASEMENT

NOTES:

1. COORDINATE VALUES SHOWN ARE CCS 1983 ZONE 2.
2. THE EXACT LOCATION OF COLD PLANE AC PAVEMENT CONFORMS TO BE DETERMINED BY THE ENGINEER.
3. ADJACENT CONTRACT 04-264134 TO CONSTRUCT ROUTE 12 UP TO STATION JC 262+50 EXCEPT FOR THE MEDIAN BARRIER (TYPE 60) BETWEEN STATION 248+00 AND 250+50.

CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
1	2900.00′	15°39′02″	398.55′	792.15′	1836292.8406	6500622.5859
2	3500.00′	19°14′18″	593.18′	1175.20′	1841522.3360	6504325.4665
16	2930.50′	04°02′15″	103.30′	206.51′	1841868.9169	6502220.9130
17	2893.50′	11°09′48″	282.77′	563.76′	1836292.8406	6500622.5859
18	2906.50′	06°55′21″	175.79′	351.16′	1836292.8406	6500622.5859
19	2930.50′	02°40′39″	68.49′	136.95′	1836292.8406	6500622.5859



LAYOUT
SCALE: 1″=50′
L-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: RICHARD TANAKA
CALCULATED-DESIGNED BY: THANH NGUYEN
CHECKED BY: JOHN KENYON
REVISED BY: TN
DATE REVISED: 04/15/10

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => vluchessi
DGN FILE => 426414ea001.dgn
CU 04264
EA 264141
LAST REVISION 04-15-10
DATE PLOTTED => 05-OCT-2010
TIME PLOTTED => 11:22

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER 12/22/09 DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER RICHARD K. TANAKA No. 23233 Exp. 12/31/11 CIVIL STATE OF CALIFORNIA

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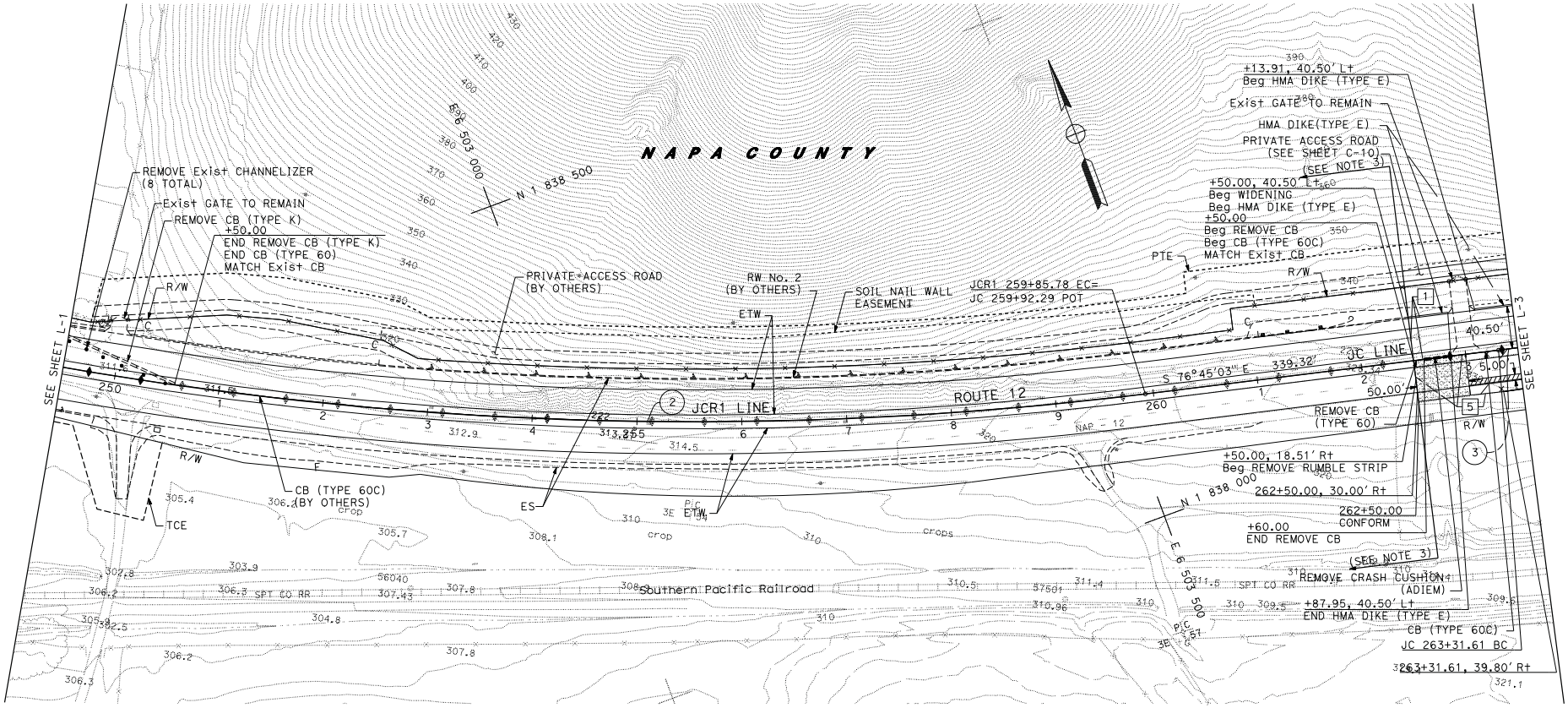
MARK THOMAS & COMPANY, INC.
1960 ZANKER ROAD
SAN JOSE, CA 95112

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
2	3500.00′	19°14′18"	593.18′	1175.20′	1841522.3360	6504325.4665
3	2900.00′	14°00′02"	356.09′	708.63′	1840860.5396	6504518.2371



FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET L-1

LAYOUT
SCALE: 1"=50′
L-2

REVISED BY	DATE REVISED
THANH NGUYEN	
JOHN KENYON	

CALCULATED-DESIGNED BY	CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR: RICHARD TANAKA

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION 12-22-09 | DATE PLOTTED => 05-OCT-2010 TIME PLOTTED => 11:22

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => vluchessi DGN FILE => 426414ea002.dgn | CU 04264 | EA 264141

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
3	2900.00′	14°00′02″	356.09′	708.63′	1840860.5396	6504518.2371

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

RICHARD K. TANAKA — No. 23233 — Exp. 12/31/11 — CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

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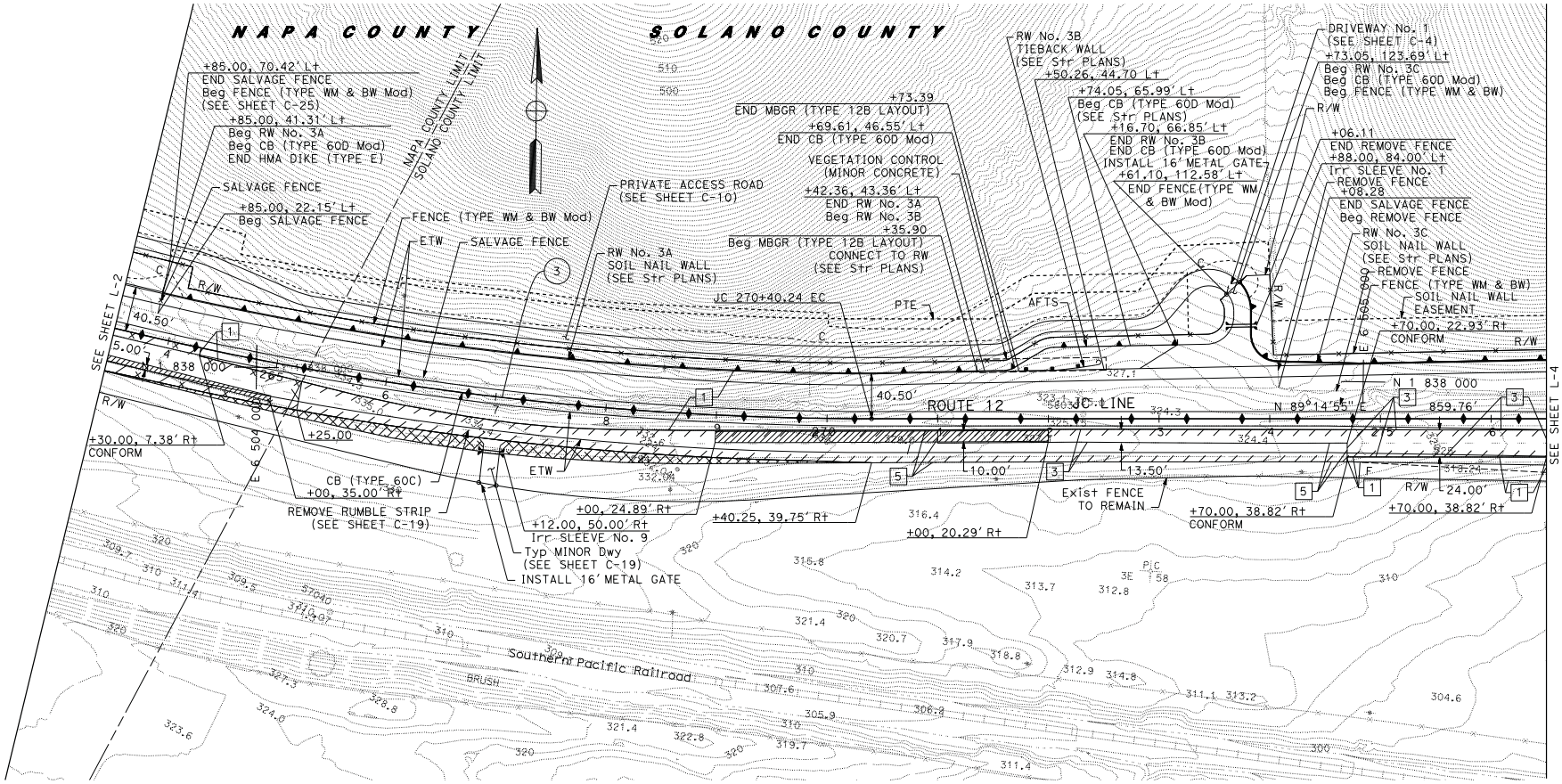
1960 ZANKER ROAD
SAN JOSE, CA 95112

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585



FOR NOTES, ABBREVIATIONS
AND LEGEND, SEE SHEET L-1

LAYOUT
SCALE: 1″=50′
L-3

REVISED BY	DATE REVISED
TN	04/15/10

CALCULATED-DESIGNED BY	CHECKED BY
THANH NGUYEN	JOHN KENYON

CONSULTANT FUNCTIONAL SUPERVISOR: RICHARD TANAKA

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

LAST REVISION 04-15-10 — DATE PLOTTED => 05-OCT-2010 — TIME PLOTTED => 11:22

BORDER LAST REVISED 4/11/2008 — RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 — USERNAME => vluchessi — DGN FILE => 426414ea003.dgn — CU 04264 — EA 264141

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
10	3000.00′	07°55′20"	207.74′	414.81′	1834972.9925	6505506.5323
20	987.00′	10°33′25"	91.19′	181.86′	1838984.2475	6506008.1692
21	70.00′	60°23′12"	40.73′	73.78′	1837863.8485	6506257.5958
22	110.00′	40°35′59"	40.69′	77.95′	1837898.4118	6506277.7298
23	990.00′	17°32′56"	152.81′	303.22′	1836816.4064	6506475.8821
24	60.00′	60°33′58"	35.04′	63.42′	1837937.0725	6506226.4938

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — RICHARD K. TANAKA — No. 23233 — Exp. 12/31/11 — CIVIL — STATE OF CALIFORNIA

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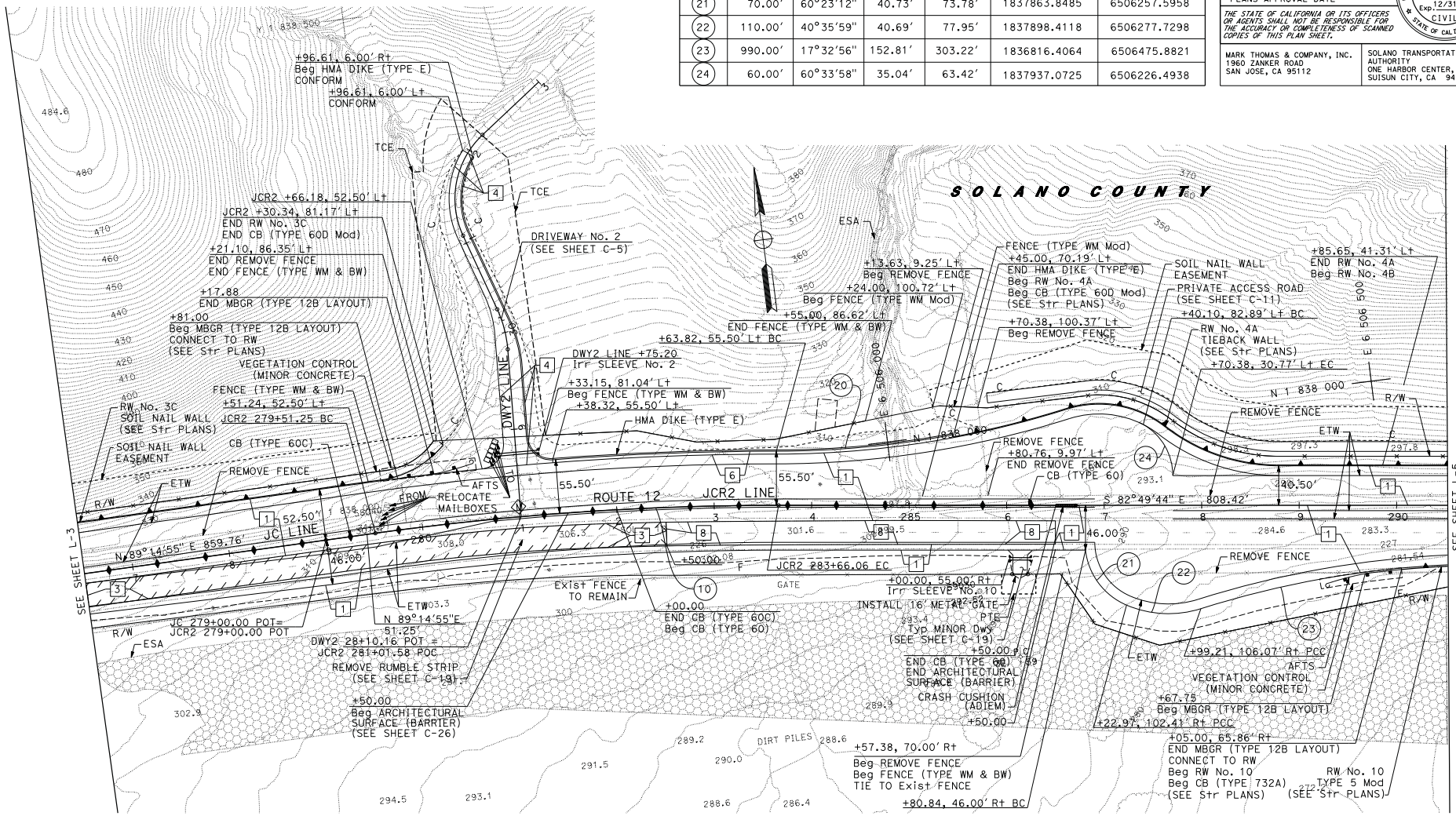
SAN JOSE, CA 95112

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585



FOR NOTES, ABBREVIATIONS
AND LEGEND, SEE SHEET L-1

LAYOUT
SCALE: 1"=50′
L-4

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	REVISED BY
Caltrans	RICHARD TANAKA	CHECKED BY	THANH NGUYEN
			JOHN KENYON
			DATE REVISED
			04/15/10

LAST REVISION 04-15-10
DATE PLOTTED => 05-OCT-2010
TIME PLOTTED => 11:22

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => vluchessi DGN FILE => 426414ea004.dgn | CU 04264 | EA 264141

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
11	5000.00′	06°27′09″	281.84′	563.09′	1842809.4999	6507307.2813
23	990.00′	17°32′56″	152.81′	303.22′	1836816.4064	6506475.8821

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

RICHARD K. TANAKA No. 23233 Exp. 12/31/11 CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

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SAN JOSE, CA 95112

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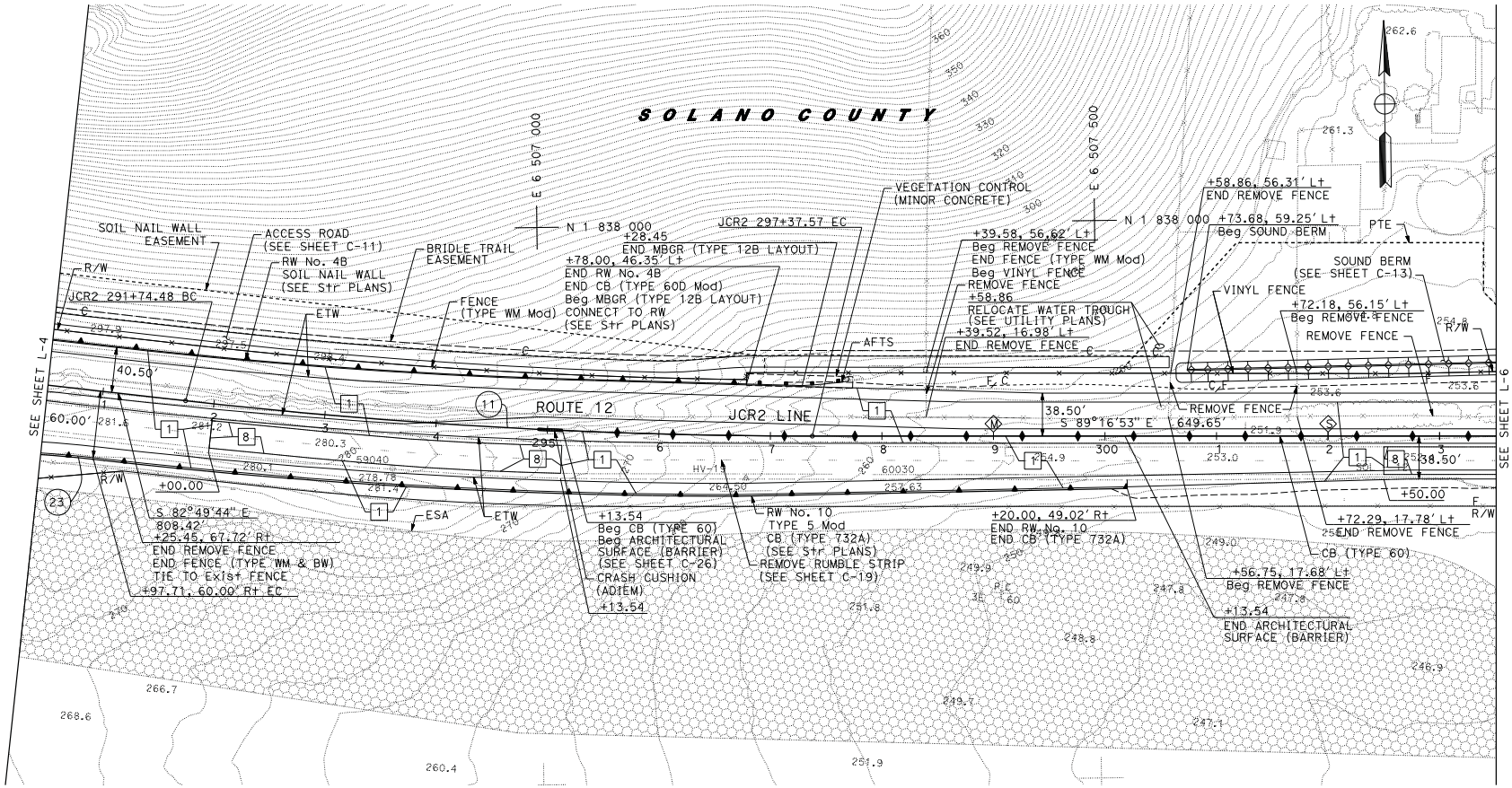
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585



FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET L-1

LAYOUT
SCALE: 1″=50′
L-5

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	CHECKED BY	REVISED BY	DATE REVISED
Caltrans	RICHARD TANAKA	THANH NGUYEN	JOHN KENYON	TN	04/15/10

LAST REVISION 04-15-10 | DATE PLOTTED => 05-OCT-2010 TIME PLOTTED => 11:22

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => vluchessi DGN FILE => 426414ea005.dgn | CU 04264 | EA 264141

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
12	2900.00′	19°14′46″	491.70′	974.13′	1834901.9744	6507857.8177

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — RICHARD K. TANAKA — No. 23233 — Exp. 12/31/11 — CIVIL — STATE OF CALIFORNIA

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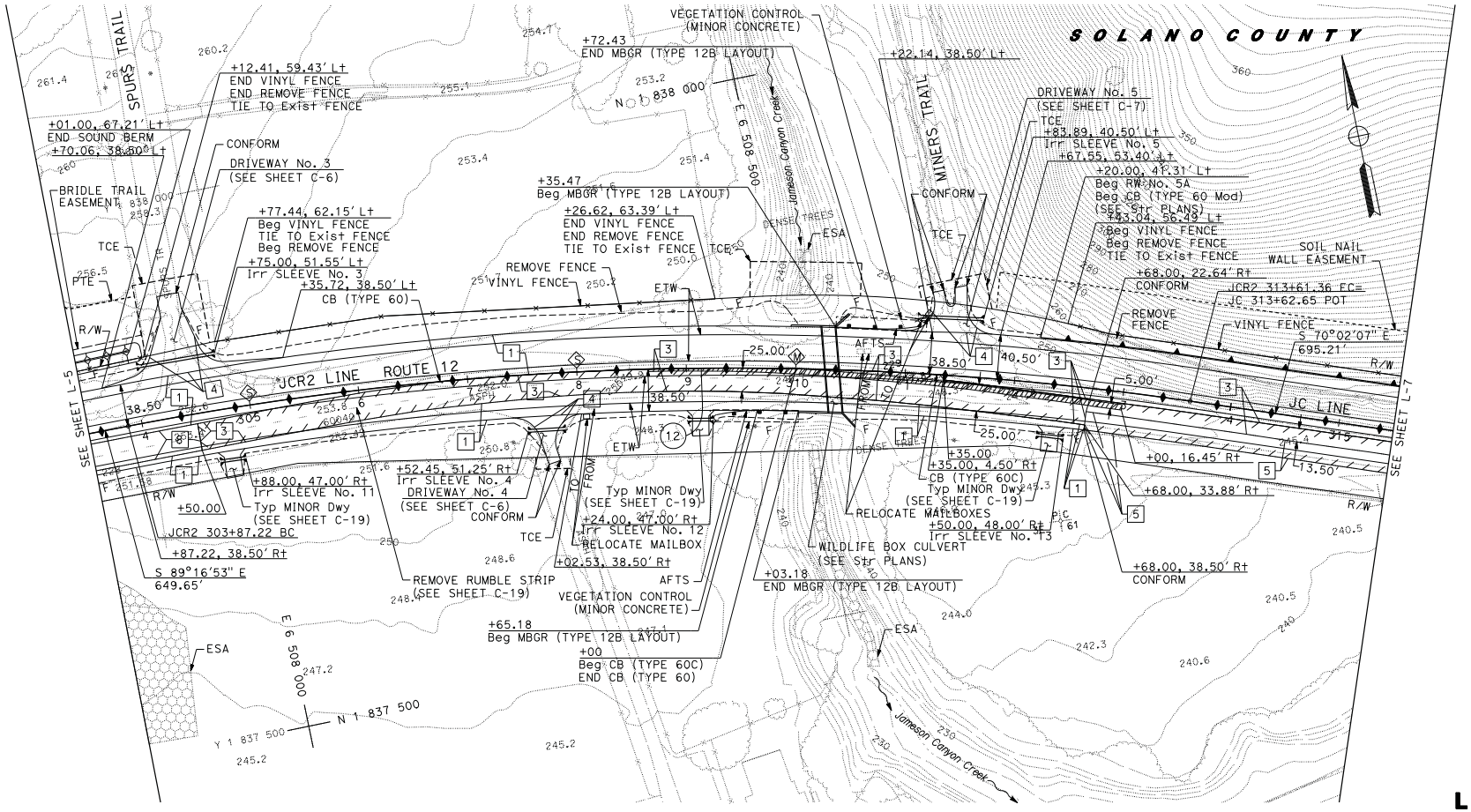
1960 ZANKER ROAD
SAN JOSE, CA 95112

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585



FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET L-1

LAYOUT
SCALE: 1″=50′
L-6

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR: RICHARD TANAKA	CALCULATED-DESIGNED BY: THANH NGUYEN	REVISED BY: TN
Caltrans	CHECKED BY: JOHN KENYON		DATE REVISED: 04/15/10

LAST REVISION 04-15-10 — DATE PLOTTED => 05-OCT-2010 TIME PLOTTED => 11:22

BORDER LAST REVISED 4/11/2008 — RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 — USERNAME => vluchessi DGN FILE => 426414ea006.dgn — CU 04264 — EA 264141

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 09/30/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — RICHARD K. TANAKA — No. 23233 — Exp. 12/31/11 — CIVIL — STATE OF CALIFORNIA

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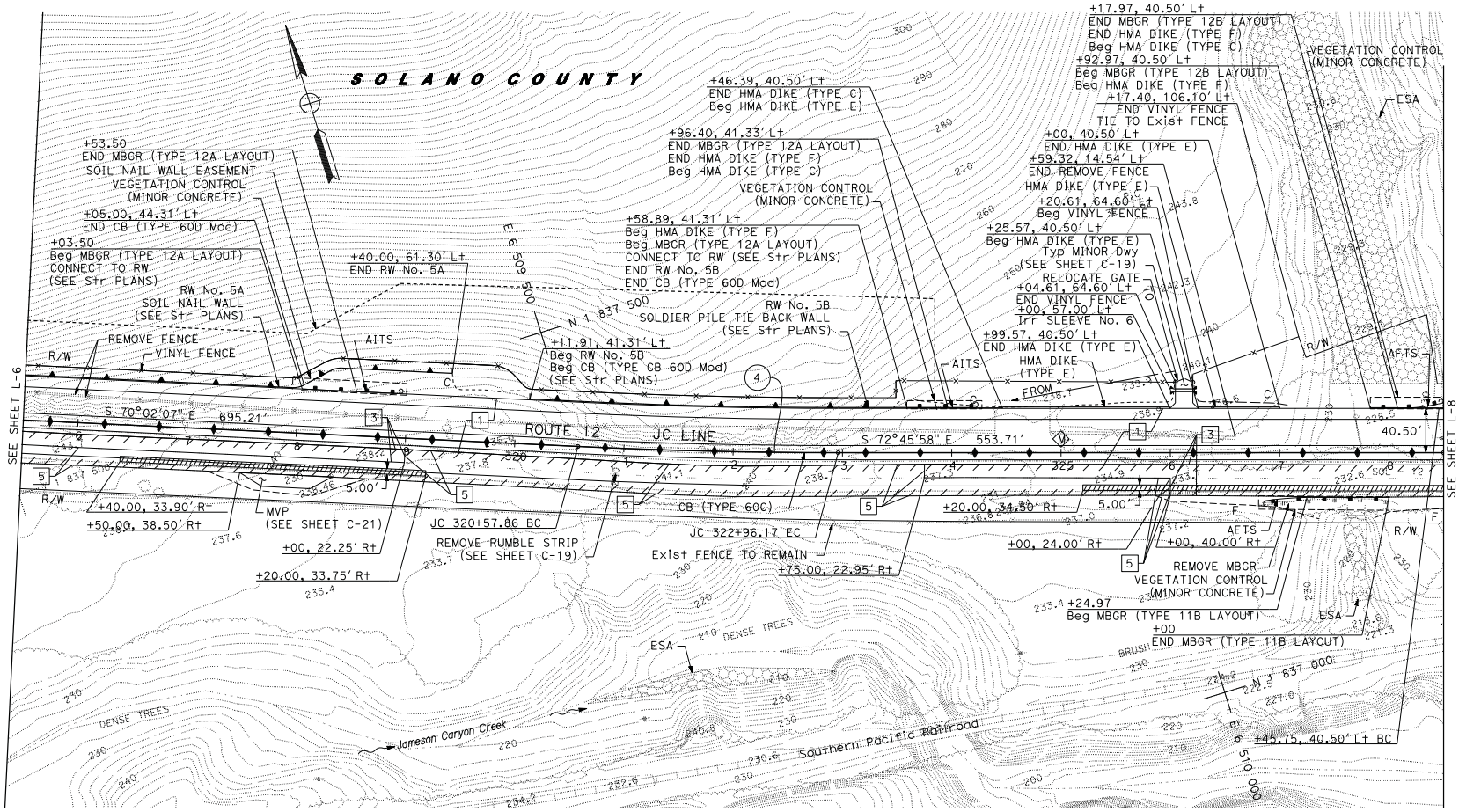
MARK THOMAS & COMPANY, INC.
1960 ZANKER ROAD
SAN JOSE, CA 95112

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
4	5000.00′	02°43′51″	119.18′	238.31′	1842089.8373	6511208.6310



FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET L-1

LAYOUT
SCALE: 1″=50′
L-7

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	REVISED BY
Caltrans	RICHARD TANAKA	THANH NGUYEN	TN
		CHECKED BY	DATE REVISED
		JOHN KENYON	04/15/10
			VAL 09/30/10

LAST REVISION 09-30-10 | DATE PLOTTED => 05-OCT-2010 | TIME PLOTTED => 11:22

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => vluchessi | DGN FILE => 426414ea007.dgn | CU 04264 | EA 264141

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

RICHARD K. TANAKA No. 23233 Exp. 12/31/11 CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

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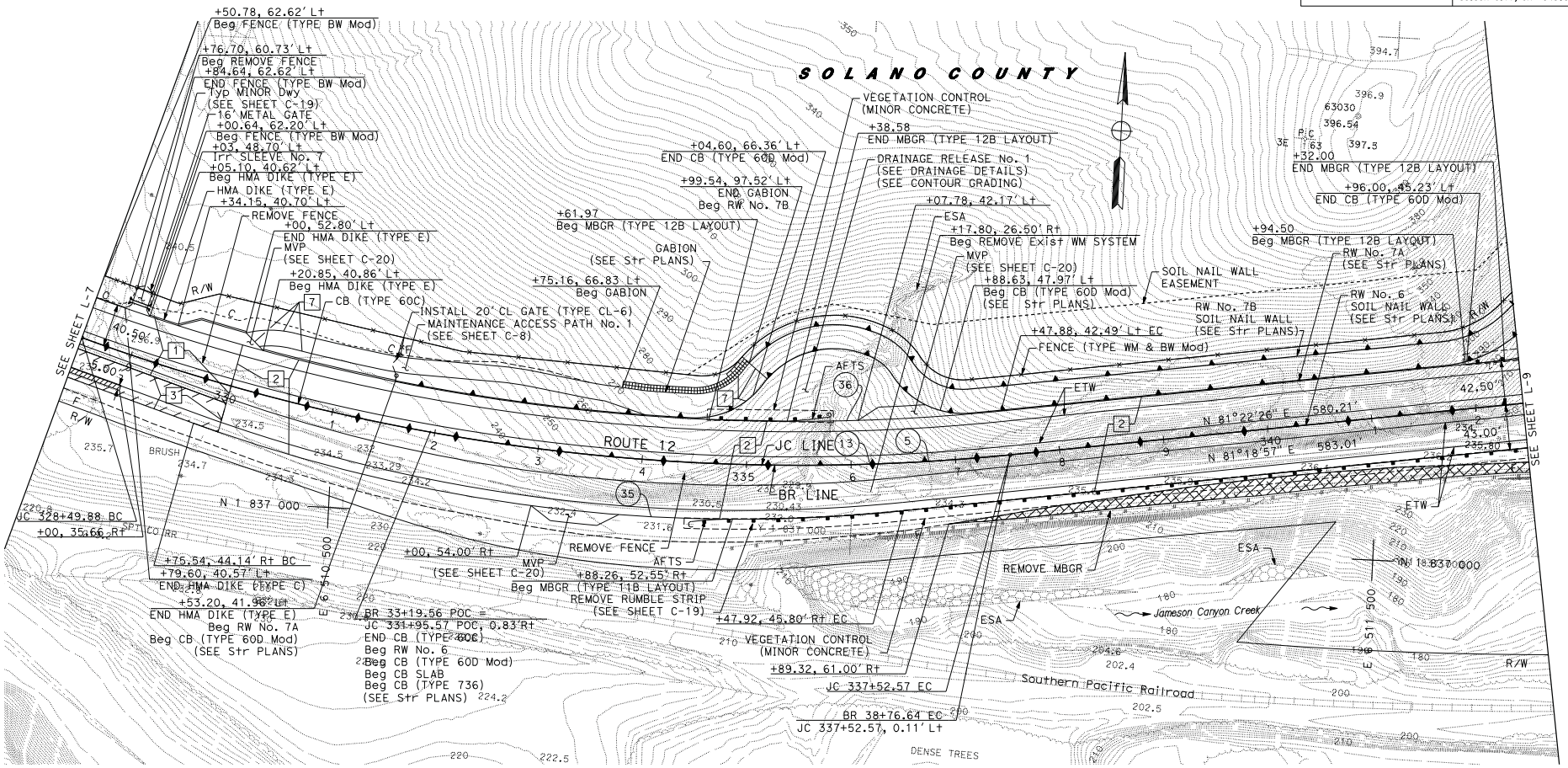
MARK THOMAS & COMPANY, INC.
1960 ZANKER ROAD
SAN JOSE, CA 95112

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
5	2000.00′	25°51′36″	459.16′	902.69′	1839060.4774	6510848.6661
13	2010.00′	15°52′47″	280.34′	557.08′	1839070.1682	6510845.1362
35	1532.00′	25°40′05″	349.02′	686.32′	1838538.6554	6510815.8696
36	1957.50′	25°51′36″	449.41′	883.50′	1839059.7897	6510844.1327



FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET L-1

LAYOUT
SCALE: 1″=50′
L-8

REVISED BY	DATE REVISED
TN	04/15/10

THANH NGUYEN — JOHN KENYON

CALCULATED-DESIGNED BY — CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR: RICHARD TANAKA

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

LAST REVISION 04-15-10 — DATE PLOTTED => 05-OCT-2010 — TIME PLOTTED => 11:22

BORDER LAST REVISED 4/11/2008 — RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 — USERNAME => vluchessi — DGN FILE => 426414ea008.dgn — CU 04264 — EA 264141

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
6	2900.00′	08°59′27"	228.00′	455.07′	1840037.3212	6511287.3249
7	2900.00′	18°26′25"	470.74′	933.34′	1834587.3266	6513288.3131
14	2930.00′	08°48′43"	225.76′	450.62′	1840067.6500	6511282.5562
15	2900.00′	06°10′11"	156.29′	312.28′	1834585.2961	6513282.5293
40	2865.00′	18°10′33"	458.28′	908.86′	1834587.3266	6513288.3131

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER 04/15/10 DATE

PLANS APPROVAL DATE

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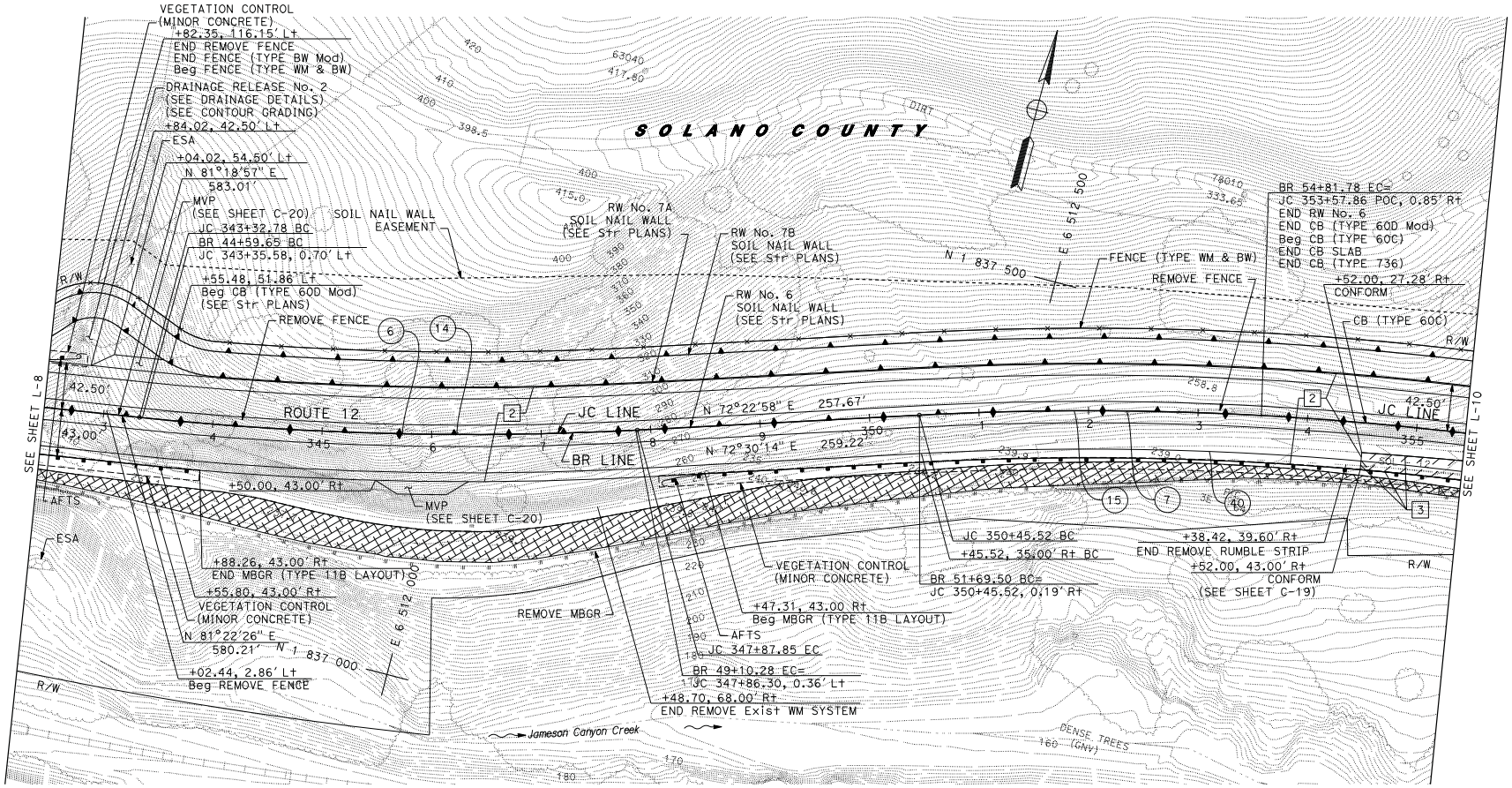
REGISTERED PROFESSIONAL ENGINEER RICHARD K. TANAKA No. 23233 Exp. 12/31/11 CIVIL STATE OF CALIFORNIA

MARK THOMAS & COMPANY, INC.
1960 ZANKER ROAD
SAN JOSE, CA 95112

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585



FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET L-1

LAYOUT
SCALE: 1"=50′
L-9

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	CHECKED BY	REVISED BY	DATE REVISED
Caltrans	RICHARD TANAKA	THANH NGUYEN	JOHN KENYON	TN	04/15/10

LAST REVISION 04-15-10 | DATE PLOTTED => 05-OCT-2010 TIME PLOTTED => 11:22

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => vluchessi DGN FILE => 426414ea009.dgn | CU 04264 | EA 264141

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
7	2900.00′	18°26′25"	470.74′	933.34′	1834587.3266	6513288.3131
8	20000.00′	00°45′51"	133.39′	266.78′	1857472.9634	6514452.6751
40	2865.00′	18°10′33"	458.28′	908.86′	1834587.3266	6513288.3131
42	19993.50′	01°40′36"	292.56′	585.07′	1857474.8754	6514357.8815

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — RICHARD K. TANAKA — No. 23233 — Exp. 12/31/11 — CIVIL — STATE OF CALIFORNIA

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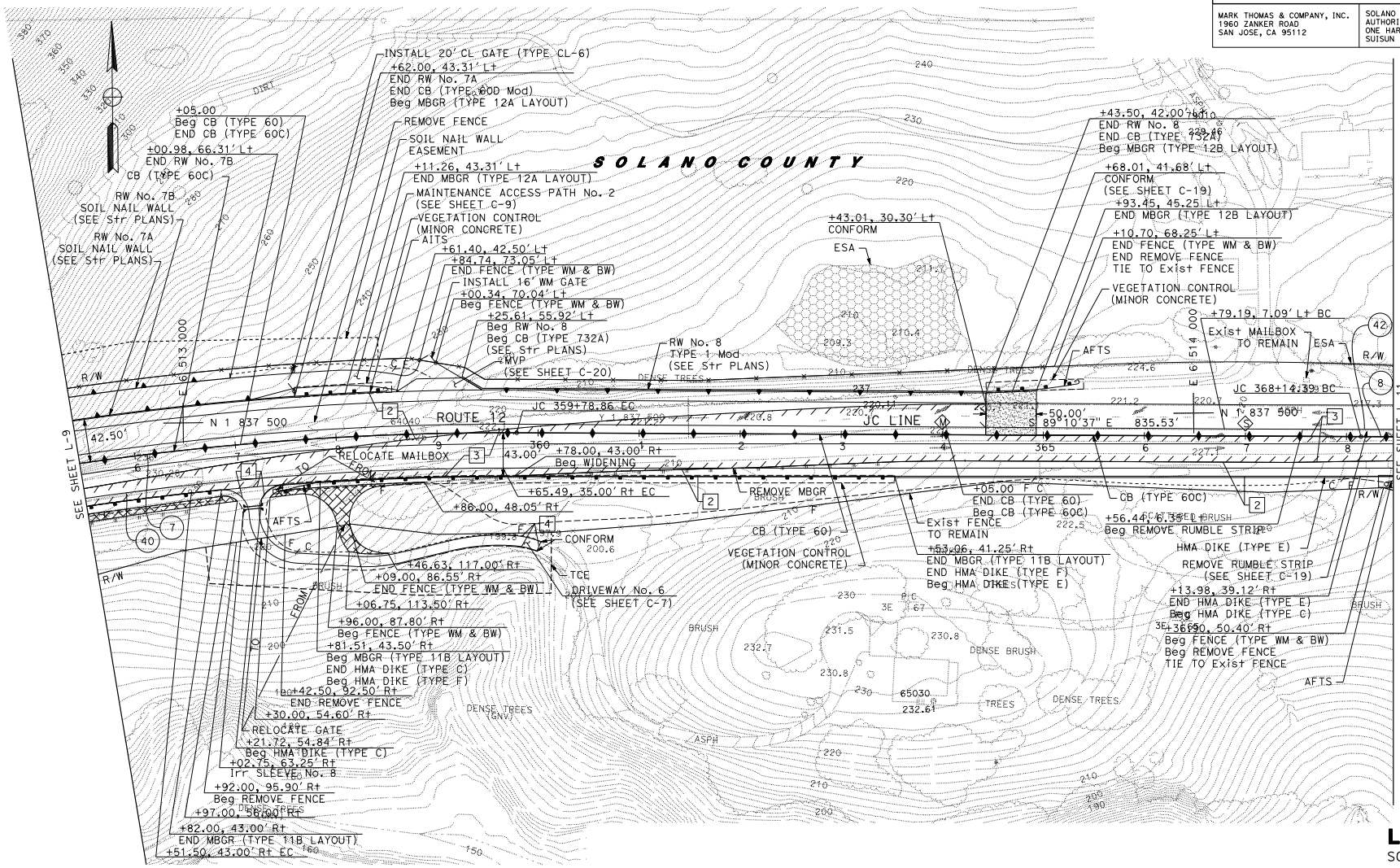
MARK THOMAS & COMPANY, INC.
1960 ZANKER ROAD
SAN JOSE, CA 95112

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585



FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET L-1

LAYOUT
SCALE: 1"=50′
L-10

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: RICHARD TANAKA
CALCULATED-DESIGNED BY: THANH NGUYEN
CHECKED BY: JOHN KENYON
REVISED BY: TN
DATE REVISED: 04/15/10

LAST REVISION 04-15-10
DATE PLOTTED => 05-OCT-2010
TIME PLOTTED => 11:22

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => vluchessi
DGN FILE => 426414ea010.dgn
CU 04264
EA 264141

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER 04/15/10 DATE

PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER RICHARD K. TANAKA No. 23233 Exp. 12/31/11 CIVIL STATE OF CALIFORNIA

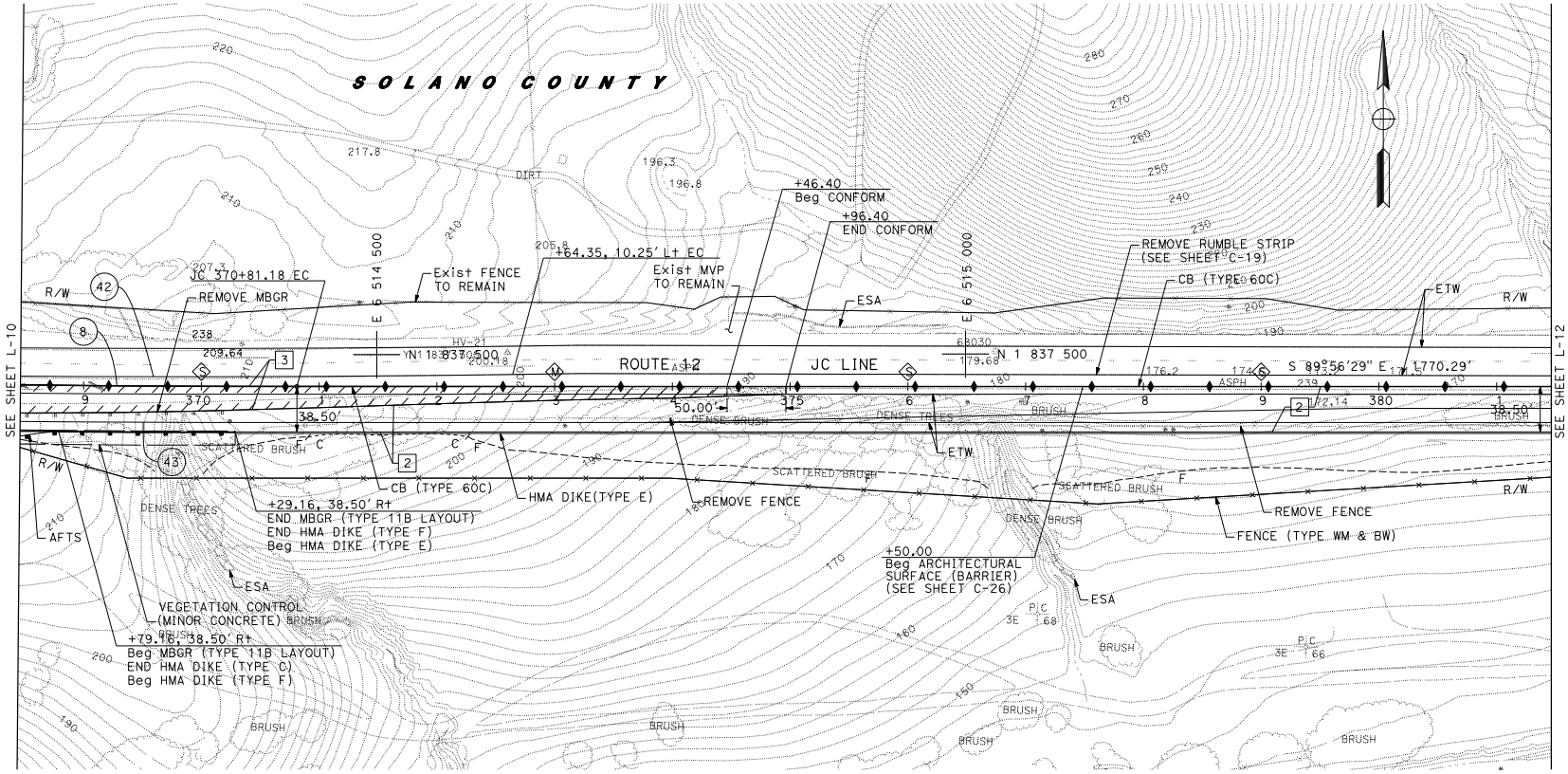
MARK THOMAS & COMPANY, INC.
1960 ZANKER ROAD
SAN JOSE, CA 95112

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
8	20000.00′	00°45′51"	133.39′	266.78′	1857472.9634	6514452.6751
42	19993.50′	01°40′36"	292.56′	585.07′	1857474.8754	6514357.8815
43	20030.50′	00°30′00"	87.40′	174.80′	1857473.0107	6514406.5486



FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET L-1

LAYOUT
SCALE: 1"=50′
L-11

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	THANH NGUYEN	REVISED BY	TN
Caltrans	RICHARD TANAKA	CHECKED BY	JOHN KENYON	DATE REVISED	04/15/10

LAST REVISION 04-15-10 | DATE PLOTTED => 05-OCT-2010 TIME PLOTTED => 11:22

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

RICHARD K. TANAKA No. 23233 Exp. 12/31/11 CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

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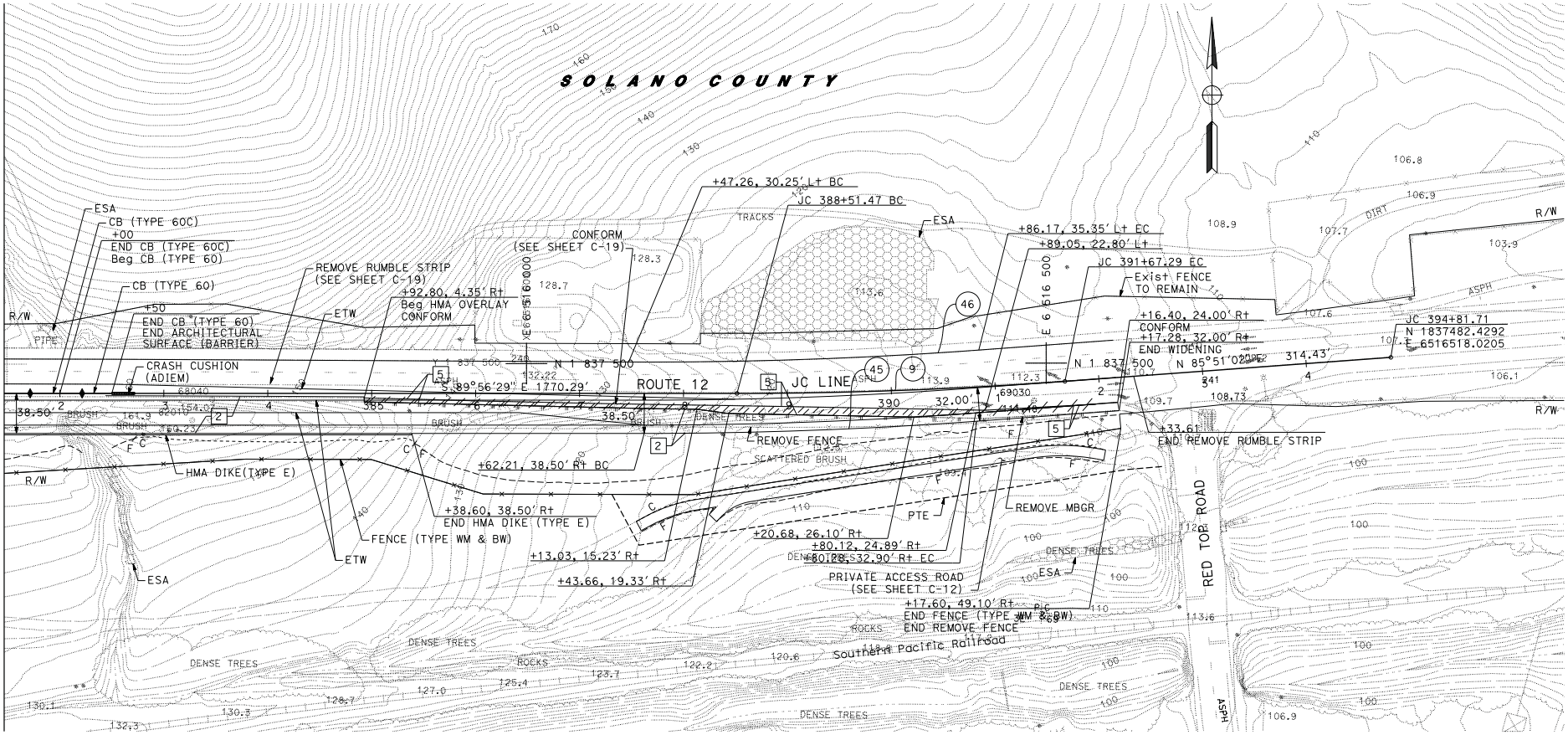
MARK THOMAS & COMPANY, INC.
1960 ZANKER ROAD
SAN JOSE, CA 95112

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

CURVE DATA

No.	R	Δ	T	L	N-COORDINATE	E-COORDINATE
9	4300.00′	04°12′29"	157.98′	315.82′	1841771.1578	6516206.8828
45	4357.00′	04°12′29"	160.07′	320.00′	1841789.7493	6516117.6415
46	4289.00′	04°30′14"	168.66′	337.14′	1841790.4170	6516125.3551



FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET L-1

LAYOUT
SCALE: 1"=50′
L-12

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR: RICHARD TANAKA	CALCULATED-DESIGNED BY: THANH NGUYEN	REVISED BY: TN
Caltrans		CHECKED BY: JOHN KENYON	DATE REVISED: 04/15/10

LAST REVISION 04-15-10 — DATE PLOTTED => 05-OCT-2010 — TIME PLOTTED => 11:22

BORDER LAST REVISED 4/11/2008 — RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 — USERNAME => vluchessi — DGN FILE => 426414ea012.dgn — CU 04264 — EA 264141

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Appendix C Drainage Plans

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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LEGEND:

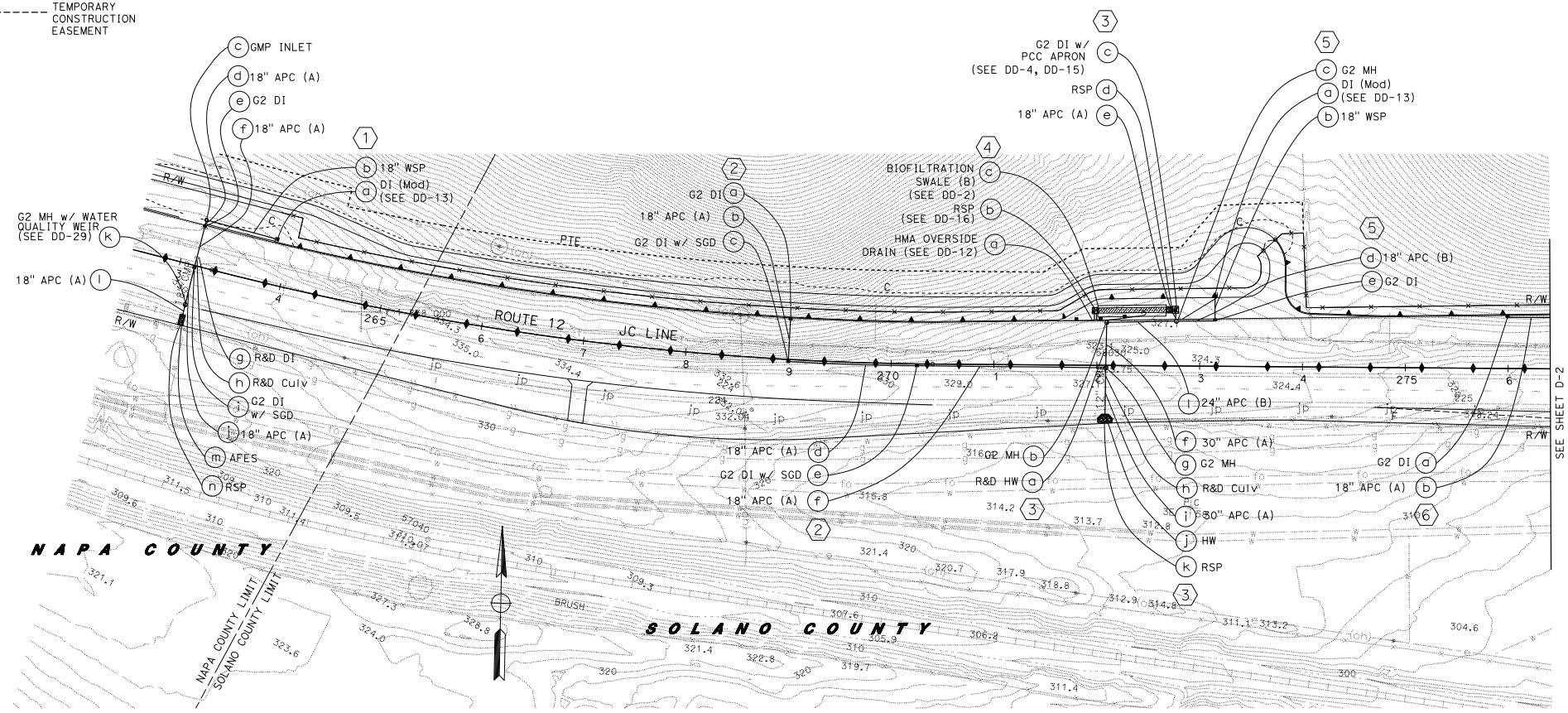
- DRAINAGE SYSTEM No.
- DRAINAGE UNIT
- UNLINED DITCH
- LINED DITCH
- GRADE TO DRAIN
- RSP
- ESA
- TEMPORARY CONSTRUCTION EASEMENT
- BIOFILTRATION SWALE
- PCC LINING
- DRAINAGE INLET
- CSP RISER
- STORM DRAIN MANHOLE
- (E) DRAINAGE INLET
- (E) STORM DRAIN MANHOLE

ABBREVIATIONS:

SGD	STANDARD GUTTER DEPRESSION
TFESA	TEMPORARY FENCE (TYPE ESA)
w/	WITH
GMP	GALVANIZED METAL PIPE
DRCB	REINFORCED CONCRETE DOUBLE BOX CULVERT

NOTES:

1. FOR UTILITIES, SEE UTILITY PLANS.
2. FOR FINISHED GRADE ELEVATIONS, SEE PROFILES, AND CONSTRUCTION DETAILS.
3. STATION AND OFFSET TIES TO DRAINAGE STRUCTURES ARE MEASURED AS SHOWN IN THE DETAILS SHEETS.
4. LOCATIONS OF EXISTING DRAINAGE FACILITIES ARE APPROXIMATE. VERIFY LOCATION AND ELEVATION OF EXISTING DRAINAGE FACILITIES PRIOR TO MODIFYING.
5. TOP OF GRATE ELEVATION INCLUDES STANDARD GUTTER DEPRESSION, WHERE SGD IS SPECIFIED, SEE PROFILE SHEETS.



DRAINAGE PLAN

SCALE: 1"=50'

D-1

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

REVISED BY	DATE REVISED
VAL	04/15/10

CALCULATED-DESIGNED BY: RAJA PERIKETI — CHECKED BY: ANALETTE OCHOA

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

LAST REVISION 04-15-10 — DATE PLOTTED => 05-OCT-2010 — TIME PLOTTED => 11:25

BORDER LAST REVISED 4/11/2008 — RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 — USERNAME => vluchessi — DGN FILE => 426414ia001.dgn — CU 04264 — EA 264141

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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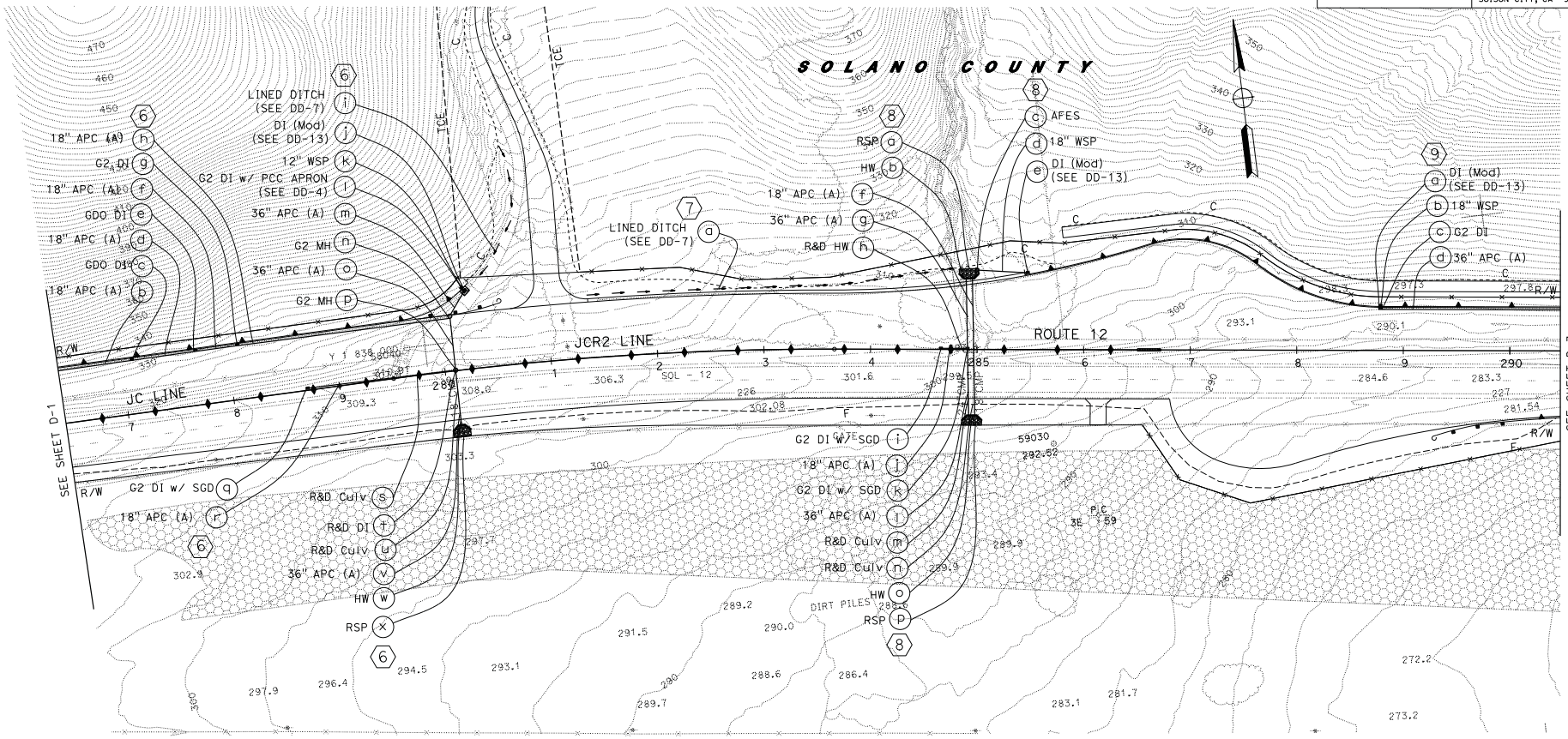

FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET D-1

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

DRAINAGE PLAN

SCALE: 1"=50'

D-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	CHECKED BY	REVISED BY	DATE REVISED
Caltrans	HAN-BIN LIANG	RAJA PERIKETI	ANALETTE OCHOA	VAL	04/15/10

LAST REVISION 04-15-10 | DATE PLOTTED => 05-OCT-2010 | TIME PLOTTED => 11:25

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => vluchessi | DGN FILE => 426414lo002.dgn | CU 04264 | EA 264141

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — 09/30/10 DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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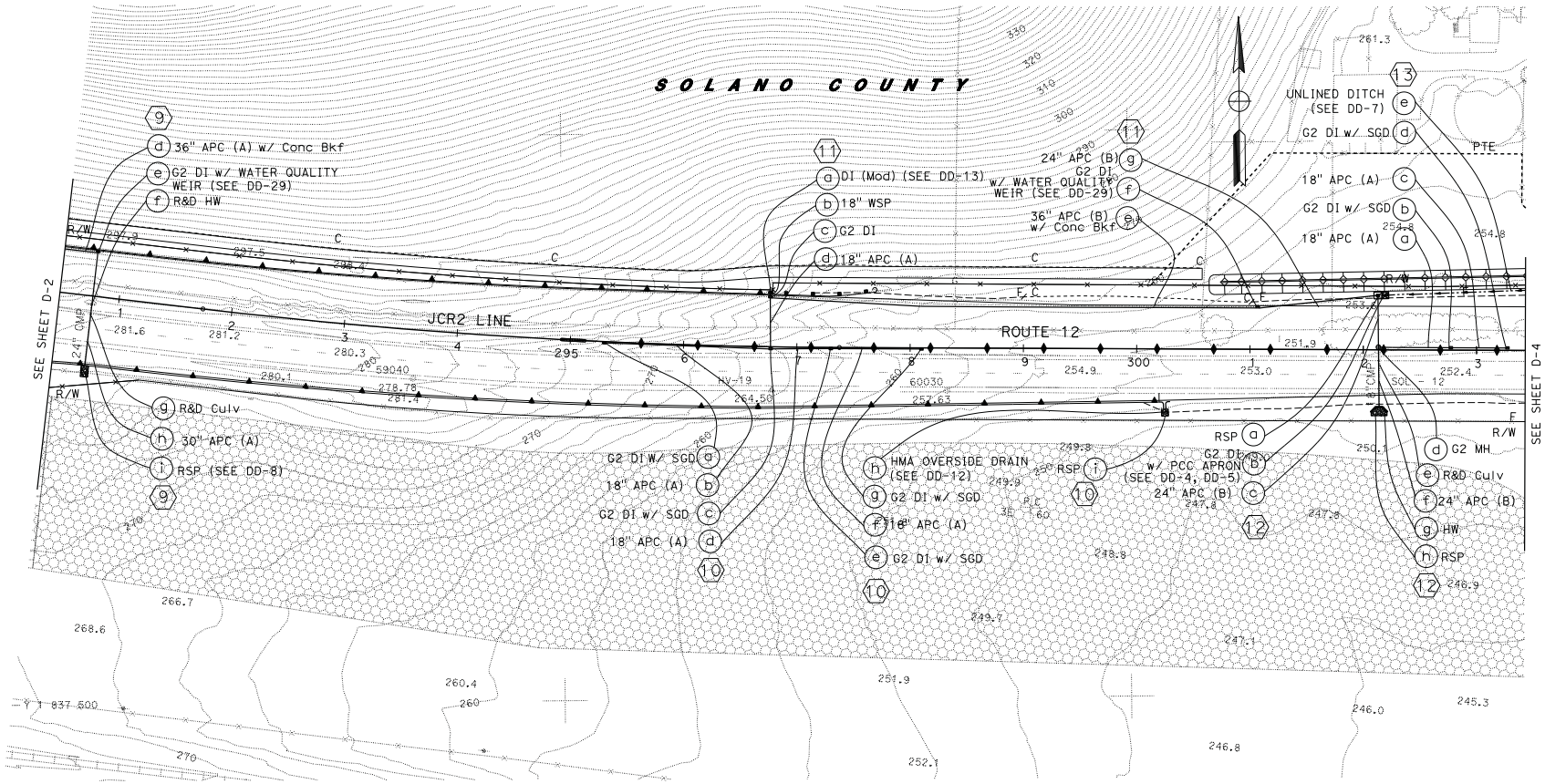

FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET D-1

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

DRAINAGE PLAN

SCALE: 1"=50'

D-3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	CHECKED BY	REVISED BY	DATE REVISED	
Caltrans	HAN-BIN LIANG	RAJA PERIKETI	ANALETTE OCHOA	TN	04/15/10	VAL 09/30/10

LAST REVISION 09-30-10 | DATE PLOTTED => 05-OCT-2010 | TIME PLOTTED => 11:25

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => vluchessi | DGN FILE => 426414i0003.dgn | CU 04264 | EA 264141

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — 04/15/10 DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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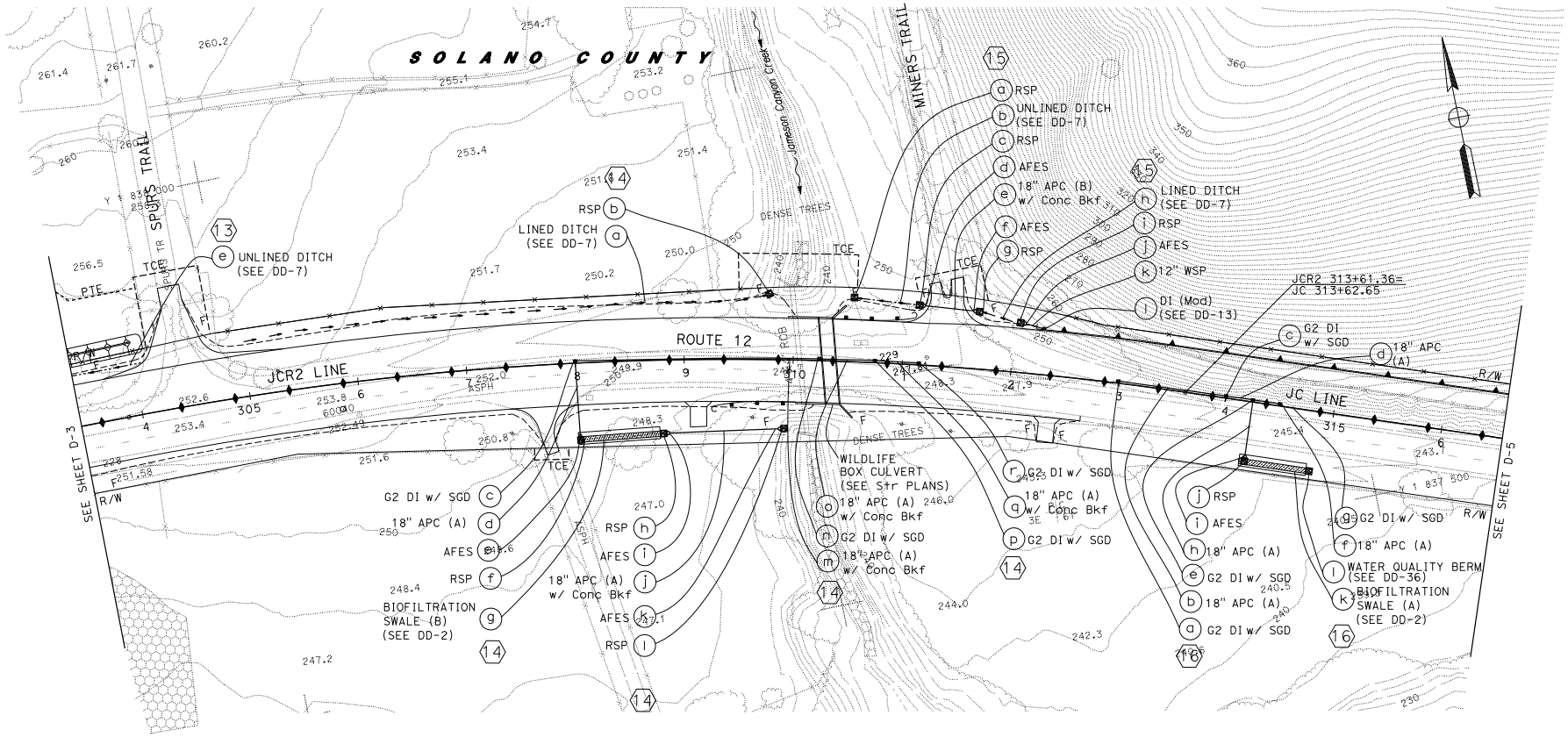

FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET D-1

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

DRAINAGE PLAN

SCALE: 1"=50'

D-4

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG

CALCULATED-DESIGNED BY: RAJA PERIKETI — REVISED BY: VAL

CHECKED BY: ANALETTE OCHOA — DATE REVISED: 04/15/10

LAST REVISION 04-15-10 — DATE PLOTTED => 05-OCT-2010 — TIME PLOTTED => 11:25

BORDER LAST REVISED 4/11/2008 — RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 — USERNAME => vluchessi — DGN FILE => 426414i0004.dgn — CU 04264 — EA 264141

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 09/30/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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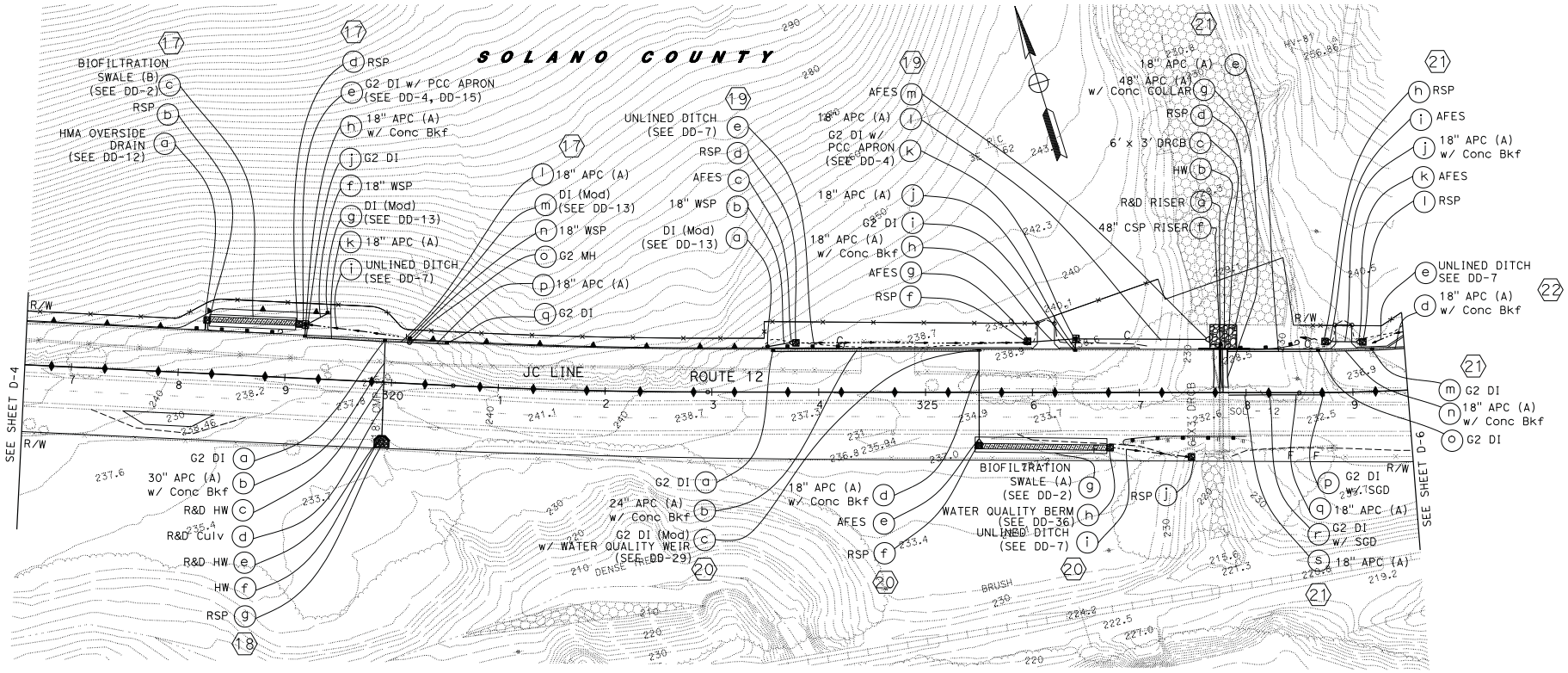

FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET D-1

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

DRAINAGE PLAN

SCALE: 1"=50'

D-5

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	REVISED BY
Caltrans	HAN-BIN LIANG	CHECKED BY	DATE REVISED
		RAJA PERIKETI	TN
		ANALETTE OCHOA	04/15/10
			VAL
			09/30/10

LAST REVISION 09-30-10 — DATE PLOTTED => 05-OCT-2010 — TIME PLOTTED => 11:25

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FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 12/22/09

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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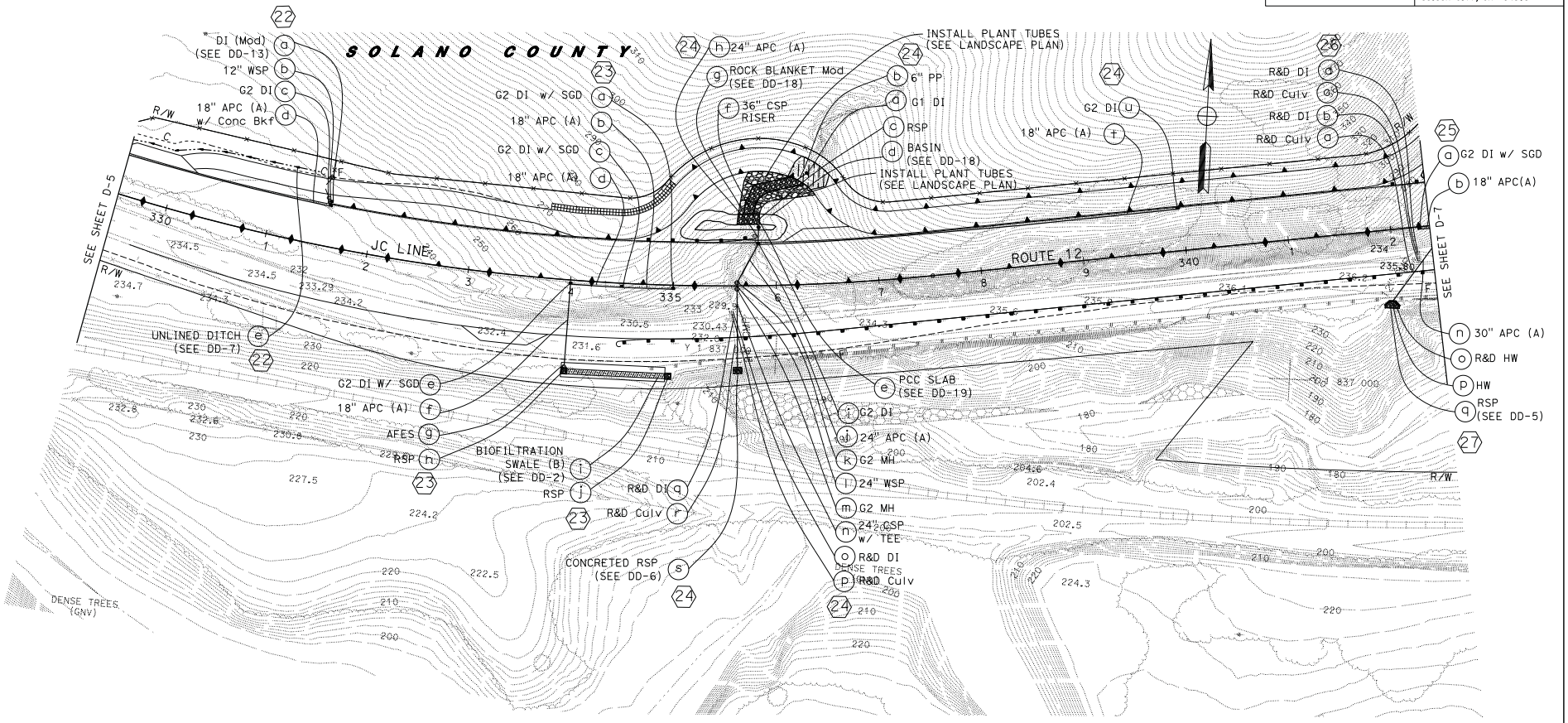

FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET D-1

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

DRAINAGE PLAN

SCALE: 1"=50'

D-6

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG

CALCULATED-DESIGNED BY: RAJA PERIKETI — CHECKED BY: ANALETTE OCHOA

REVISED BY — DATE REVISED

LAST REVISION 12-22-09 — DATE PLOTTED => 05-OCT-2010 — TIME PLOTTED => 11:25

BORDER LAST REVISED 4/11/2008 — RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 — USERNAME => vluchessi — DGN FILE => 426414ia006.dgn — CU 04264 — EA 264141

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 12/22/09

PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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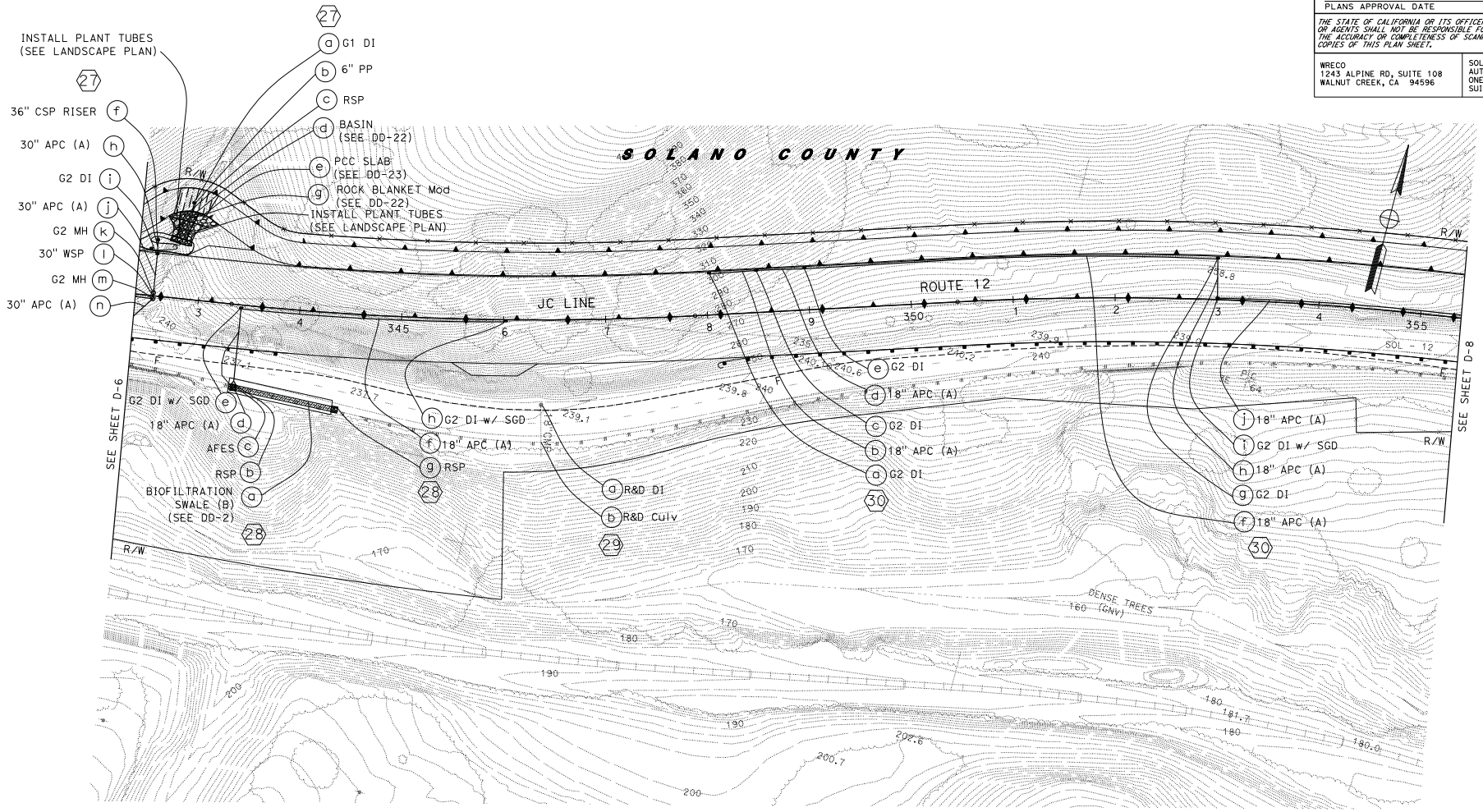
SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET D-1

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

DRAINAGE PLAN

SCALE: 1"=50'

D-7

REVISED BY	RAJA PERIKETI
DATE REVISED	ANALETTE OCHOA
CALCULATED-DESIGNED BY	
CHECKED BY	
CONSULTANT FUNCTIONAL SUPERVISOR	HAN-BIN LIANG

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

LAST REVISION 12-22-09 — DATE PLOTTED => 05-OCT-2010 — TIME PLOTTED => 11:25

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FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 12/22/09

PLANS APPROVAL DATE

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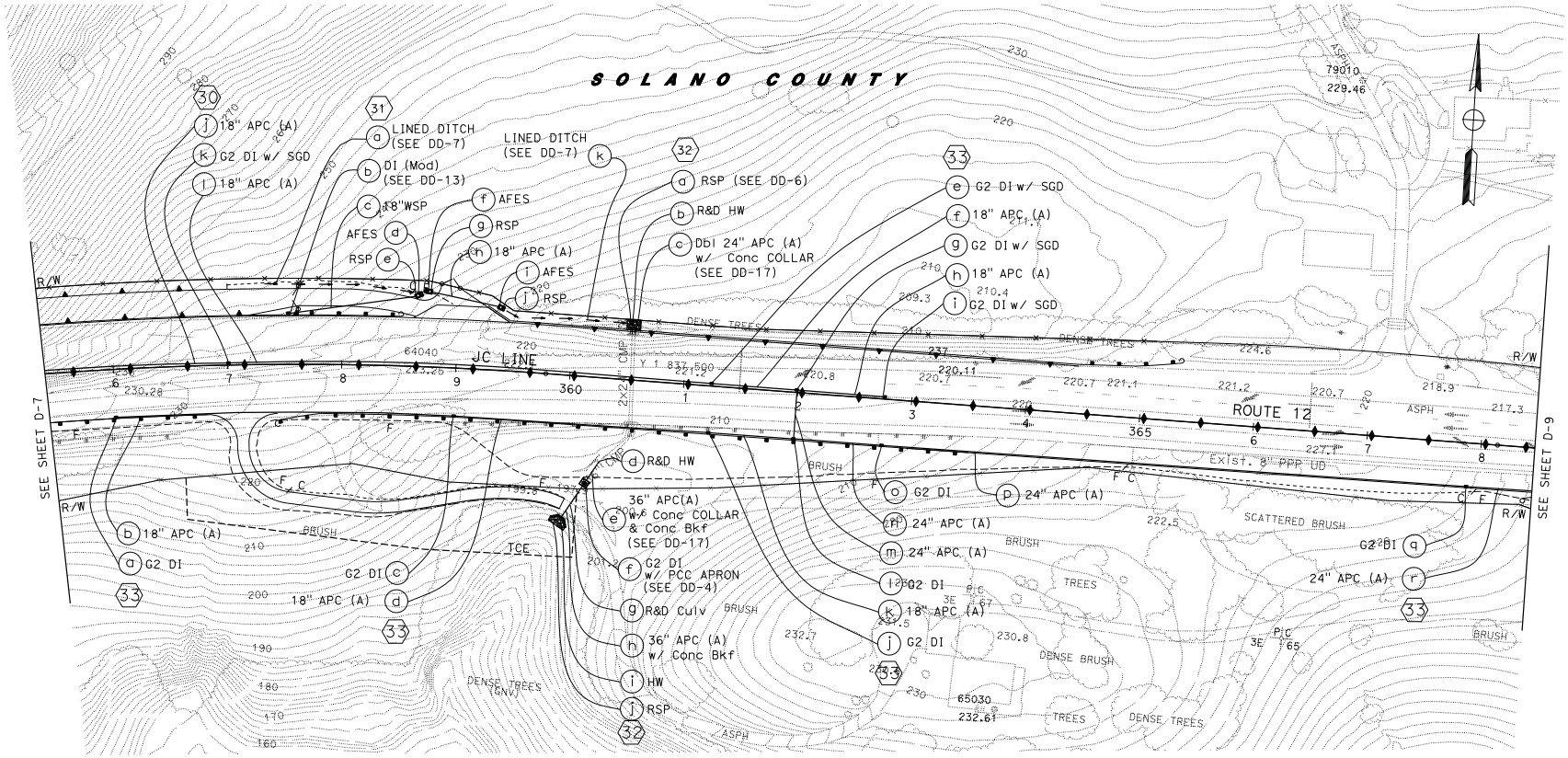
SUISUN CITY, CA 94585



FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET D-1

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

DRAINAGE PLAN

SCALE: 1"=50'

D-8

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG

CALCULATED-DESIGNED BY: RAJA PERIKETI — CHECKED BY: ANALETTE OCHOA

REVISED BY — DATE REVISED

LAST REVISION 12-22-09 — DATE PLOTTED => 05-OCT-2010 — TIME PLOTTED => 11:25

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FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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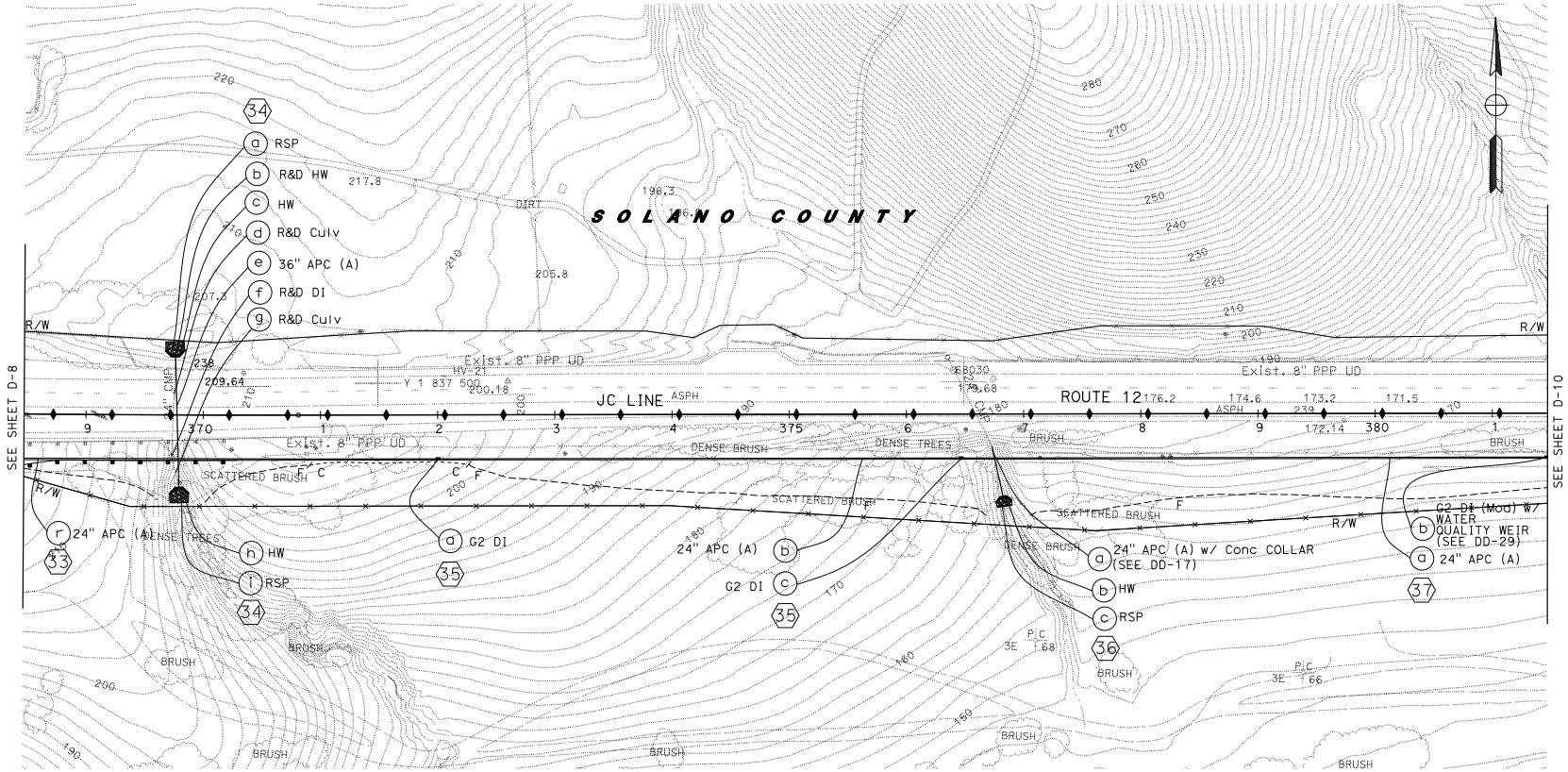

FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET D-1

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

DRAINAGE PLAN

SCALE: 1"=50'

D-9

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	REVISED BY
Caltrans	HAN-BIN LIANG	CHECKED BY	DATE REVISED
		RAJA PERIKETI	TN
		ANALETTE OCHOA	04/15/10

LAST REVISION 04-15-10 | DATE PLOTTED => 05-OCT-2010 | TIME PLOTTED => 11:25

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => vluchessi | DGN FILE => 426414ia009.dgn | CU 04264 | EA 264141

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap,Sol	12	2.8/3.3, 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

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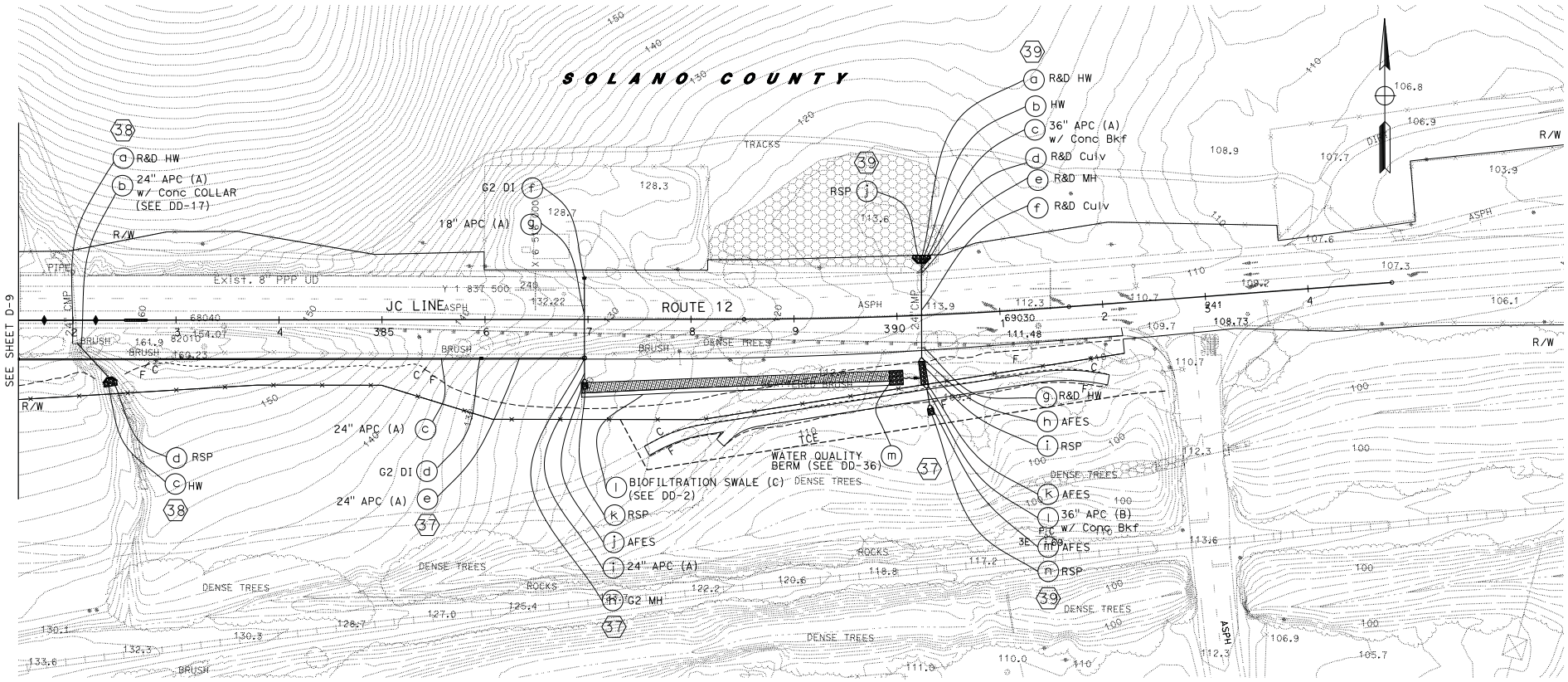

FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET D-1

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

DRAINAGE PLAN

SCALE: 1"=50'

D-10

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	Caltrans
CONSULTANT FUNCTIONAL SUPERVISOR	HAN-BIN LIANG
CALCULATED-DESIGNED BY	RAJA PERIKETI
CHECKED BY	ANALETTE OCHOA
REVISED BY	TN
DATE REVISED	04/15/10

LAST REVISION 04-15-10 | DATE PLOTTED => 05-OCT-2010 | TIME PLOTTED => 11:25

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => vluchessi | DGN FILE => 426414ia010.dgn | CU 04264 | EA 264141

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Appendix D Sampling Location Plans

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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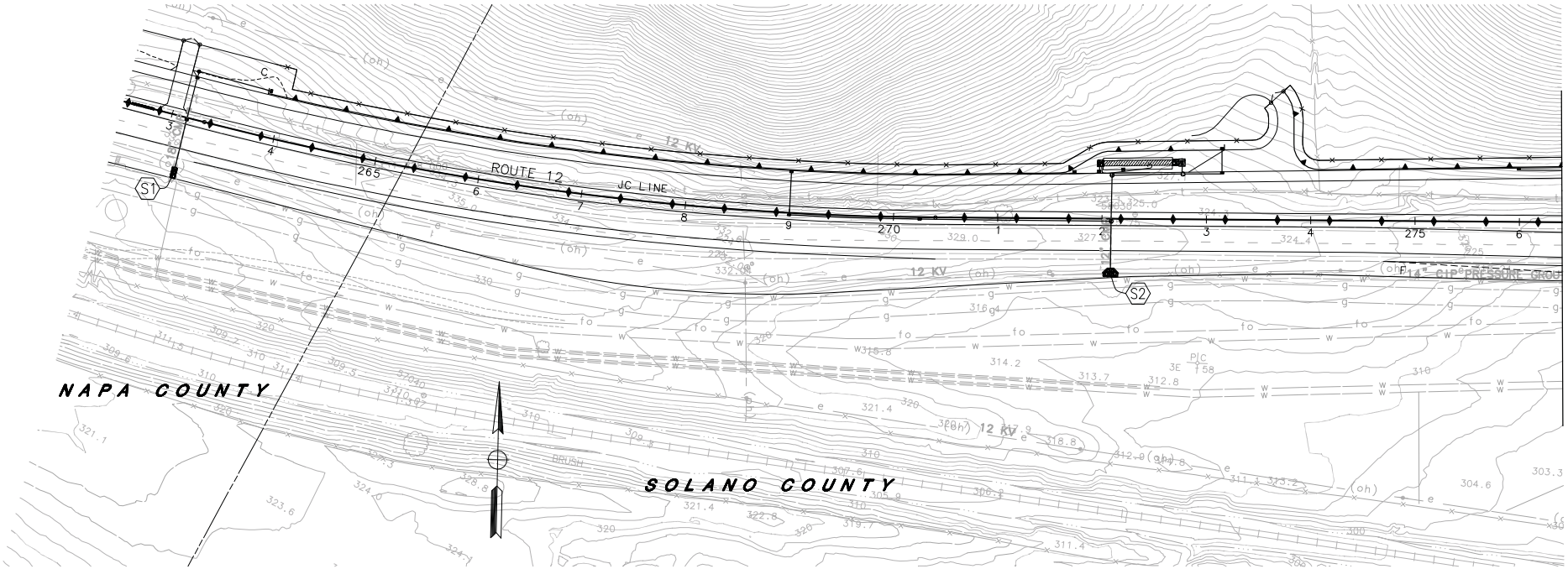
FOR ACCURATE RIGHT OF WAY DATA,
CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

LEGEND:

S# SAMPLING LOCATION

C# CONTROL POINT



SAMPLING PLAN

SCALE: 1"=50'

S-1

THIS PLAN ACCURATE FOR SAMPLING AND MONITORING WORK ONLY.

JT	04/15/10		
REVISED BY	DATE REVISED		
JEFF TUDD	ANALETTE OCHOA		
CALCULATED-DESIGNED BY	CHECKED BY		
CONSULTANT FUNCTIONAL SUPERVISOR	HAN-BIN LIANG		

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

LAST REVISION 12-11-09 — DATE PLOTTED => 4/09/10 — TIME PLOTTED => 2:07pm

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => jeff_tudd | DGN FILE => 426414sp001.dwg | CU 04264 | EA 264141

FOR ACCURATE RIGHT OF WAY DATA,
CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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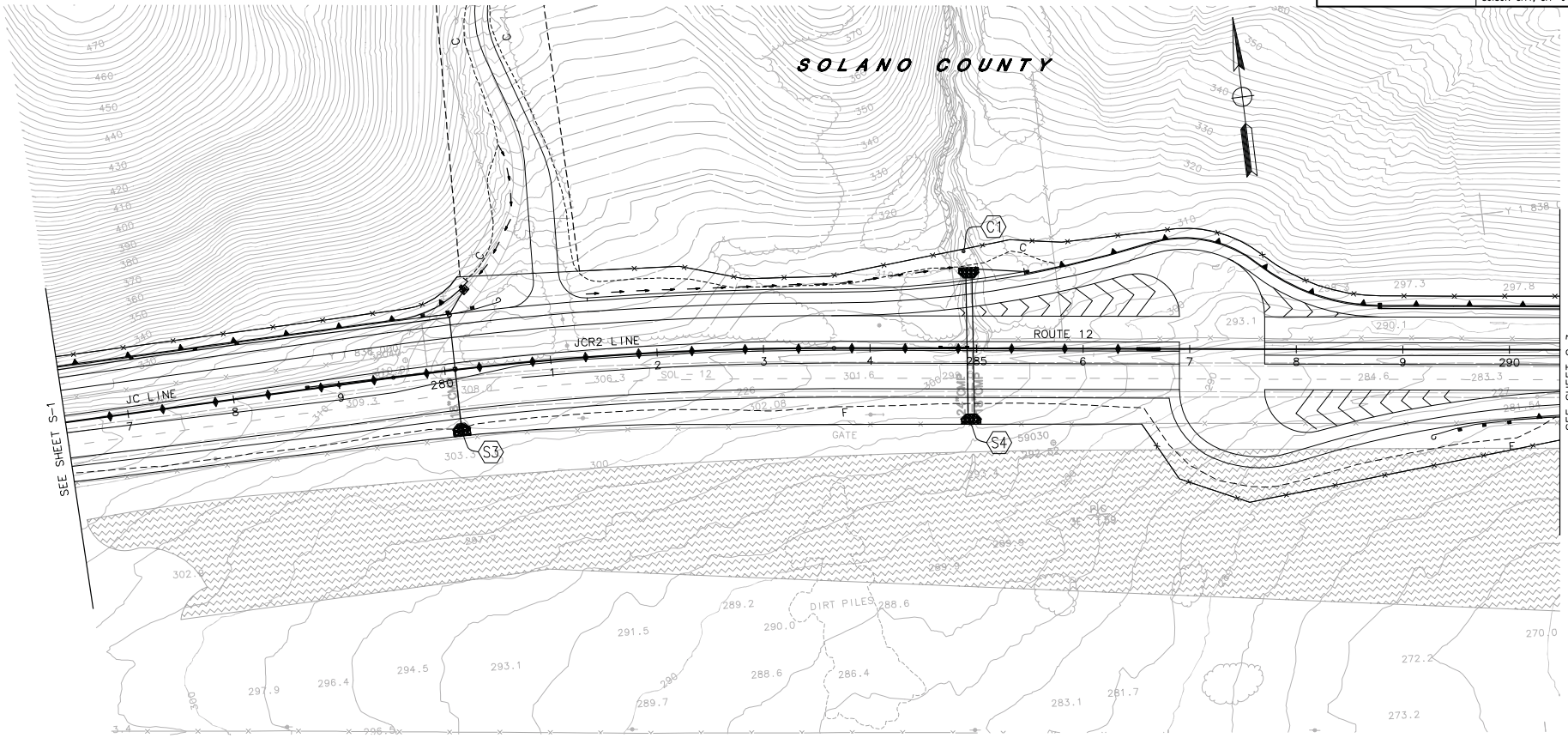
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585



FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET S-1

THIS PLAN ACCURATE FOR SAMPLING AND MONITORING WORK ONLY.

SAMPLING PLAN

SCALE: 1"=50'

S-2

CALCULATED-DESIGNED BY	JEFF TUDD
CHECKED BY	ANALETTE OCHOA
REVISED BY	JT
DATE REVISED	04/15/10
CONSULTANT FUNCTIONAL SUPERVISOR	HAN-BIN LIANG

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

LAST REVISION 12-11-09 — DATE PLOTTED => 4/09/10 — TIME PLOTTED => 2:11pm

BORDER LAST REVISED 4/11/2008 — RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 — USERNAME => jeff_tudd — DGN FILE => 426414sp002.dwg — CU 04264 — EA 264141

FOR ACCURATE RIGHT OF WAY DATA,
CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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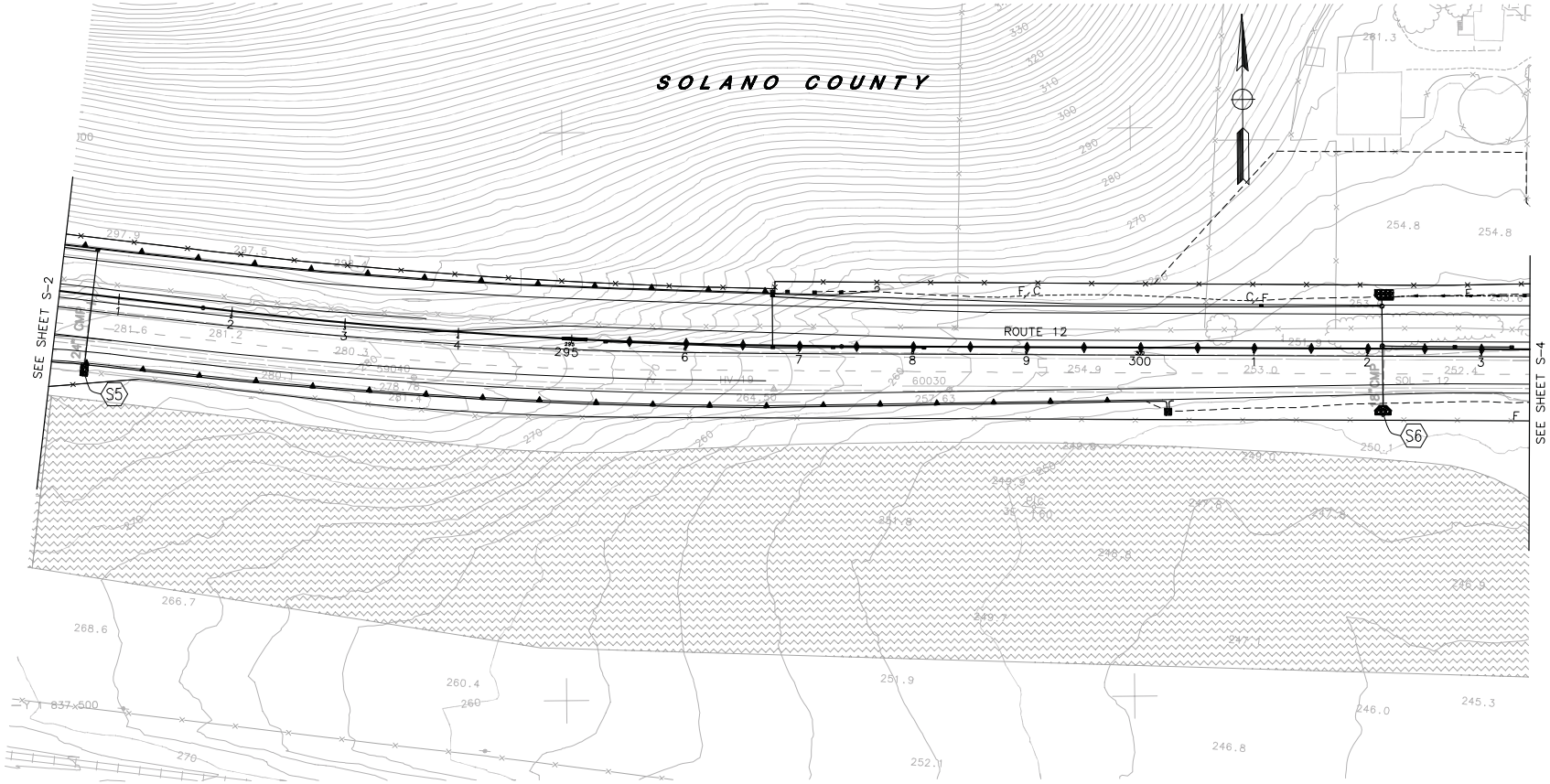
1243 ALPINE RD, SUITE 108
WALNUT CREEK, CA 94596

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585



FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET S-1

THIS PLAN ACCURATE FOR SAMPLING AND MONITORING WORK ONLY.

SAMPLING PLAN

SCALE: 1"=50'

S-3

JT	04/15/10		
REVISED BY	DATE REVISED		
JEFF TUDD	ANALETTE OCHOA		
CALCULATED-DESIGNED BY	CHECKED BY		
CONSULTANT FUNCTIONAL SUPERVISOR			
HAN-BIN LIANG			

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

LAST REVISION 12-11-09 — DATE PLOTTED => 4/09/10 — TIME PLOTTED => 2:12pm

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => jeff_tudd | DGN FILE => 426414sp003.dwg | CU 04264 | EA 264141

FOR ACCURATE RIGHT OF WAY DATA,
CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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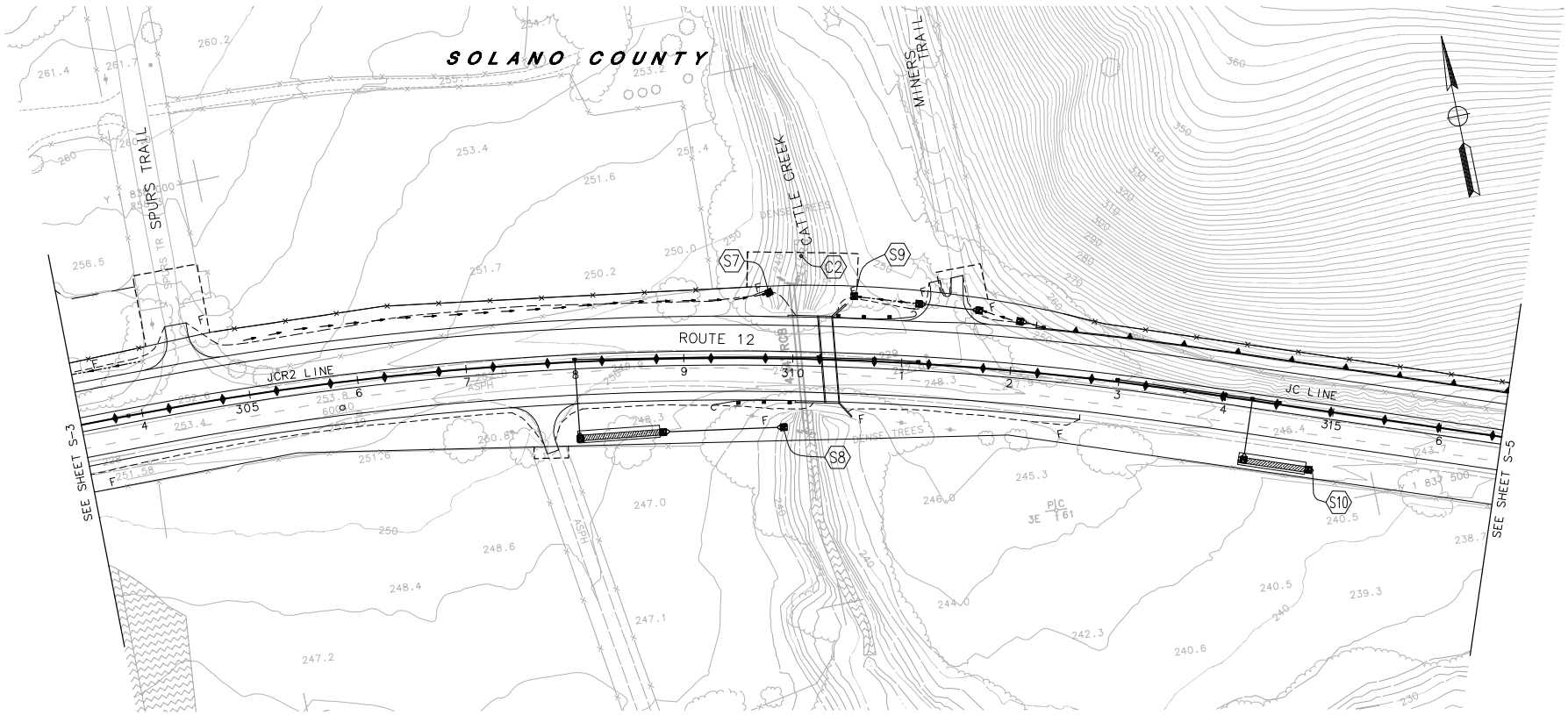
WALNUT CREEK, CA 94596

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585



FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET S-1

THIS PLAN ACCURATE FOR SAMPLING AND MONITORING WORK ONLY.

SAMPLING PLAN

SCALE: 1"=50'

S-4

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG

CALCULATED-DESIGNED BY: JEFF TUDD — CHECKED BY: ANALETTE OCHOA

REVISED BY: JT — DATE REVISED: 04/15/10

LAST REVISION 12-11-09 — DATE PLOTTED => 4/09/10 — TIME PLOTTED => 2:17pm

BORDER LAST REVISED 4/11/2008 — RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 — USERNAME => jeff_tudd — DGN FILE => 426414sp004.dwg — CU 04264 — EA 264141

FOR ACCURATE RIGHT OF WAY DATA,
CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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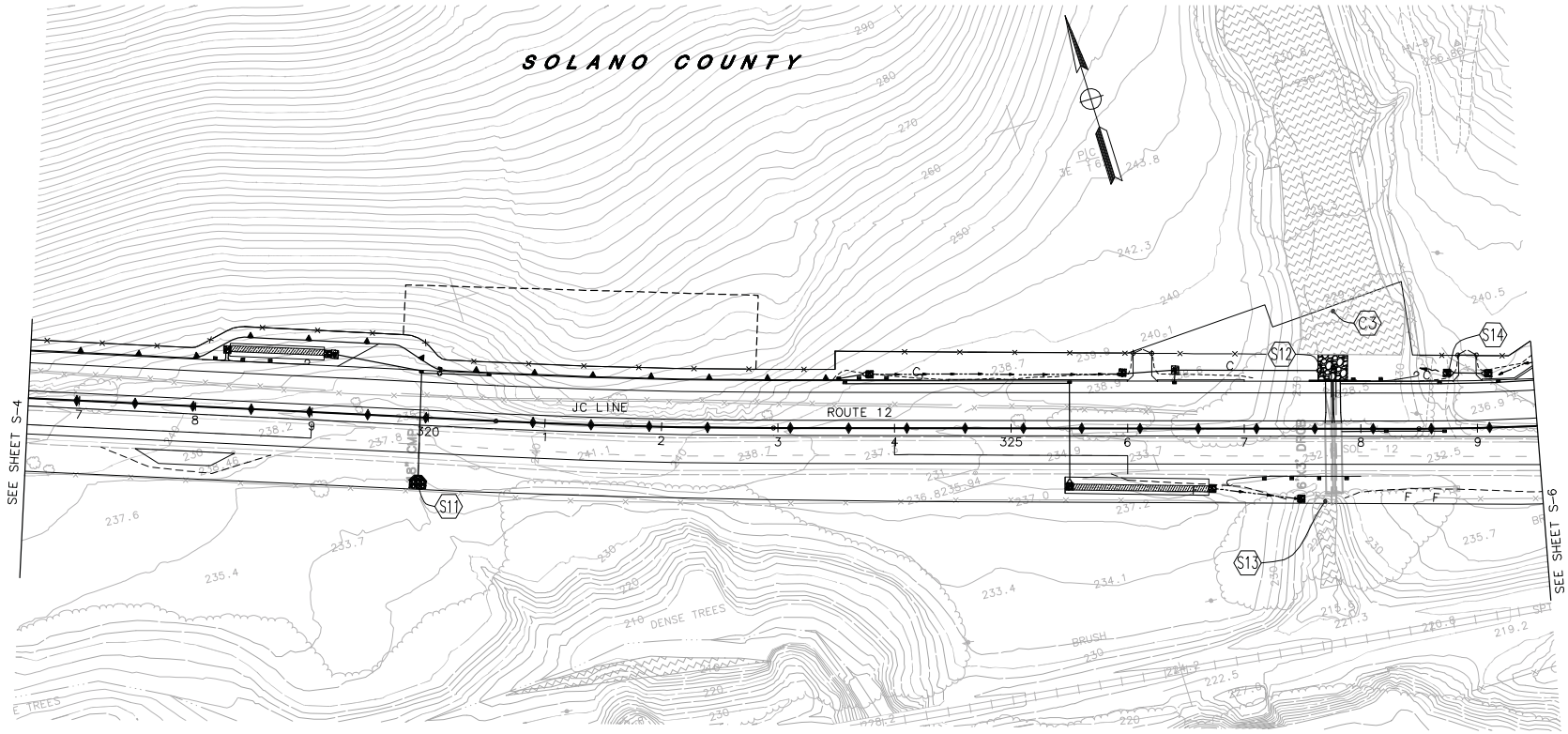
1243 ALPINE RD, SUITE 108
WALNUT CREEK, CA 94596

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585



SAMPLING PLAN

SCALE: 1"=50'

S-5

FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET S-1

THIS PLAN ACCURATE FOR SAMPLING AND MONITORING WORK ONLY.

	REVISED BY	DATE REVISED
	JT	04/15/10

CALCULATED-DESIGNED BY	CHECKED BY
JEFF TUDD	ANALETTE OCHOA

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

LAST REVISION 12-11-09 — DATE PLOTTED => 4/09/10 — TIME PLOTTED => 1:47pm

BORDER LAST REVISED 4/11/2008 — RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 — USERNAME => jeff_tudd — DGN FILE => 426414sp005.dwg — CU 04264 — EA 264141

FOR ACCURATE RIGHT OF WAY DATA,
CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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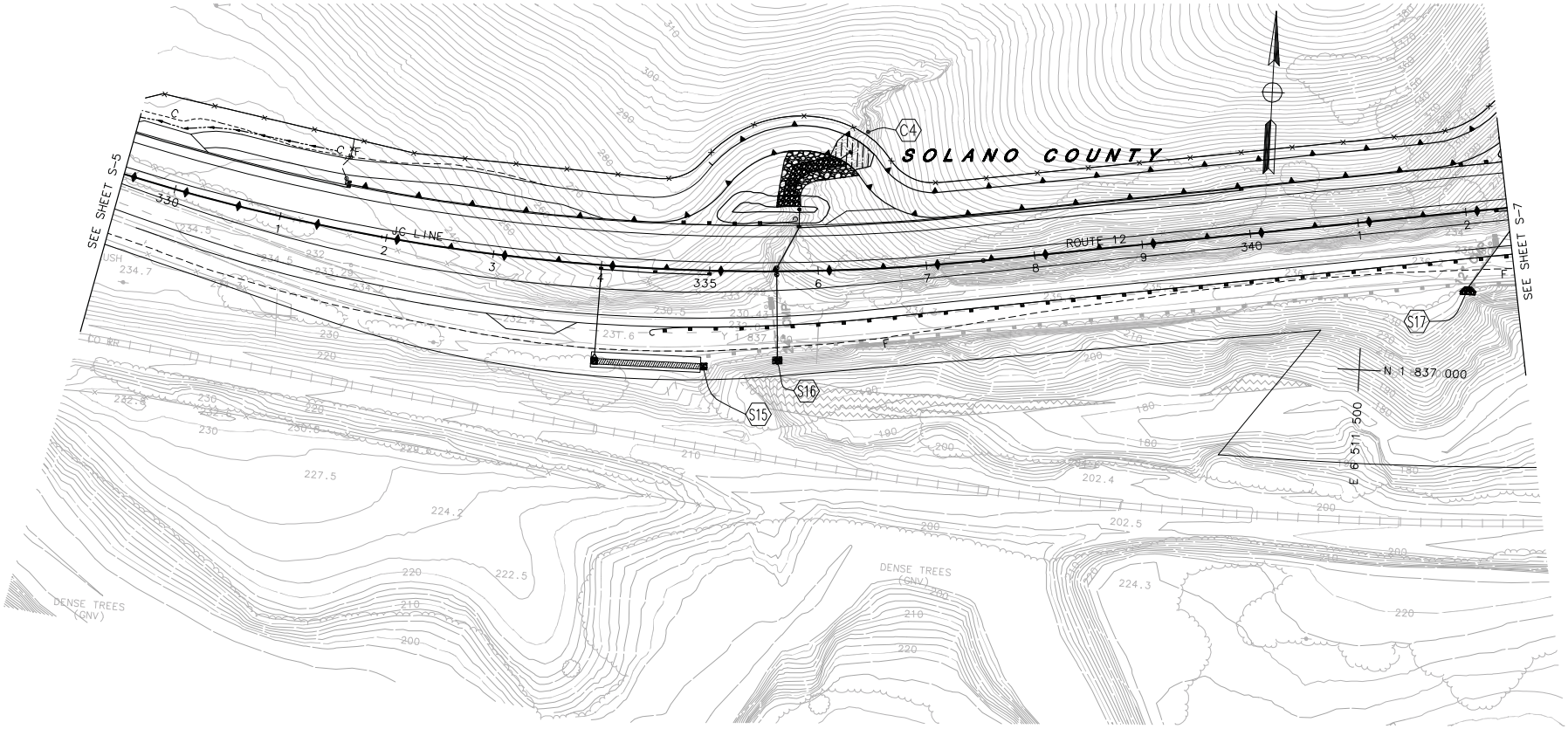
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585



SAMPLING PLAN

SCALE: 1"=50'

S-6

FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET S-1

THIS PLAN ACCURATE FOR SAMPLING AND MONITORING WORK ONLY.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG

CALCULATED-DESIGNED BY: JEFF TUDD — CHECKED BY: ANALETTE OCHOA

REVISED BY: JT — DATE REVISED: 04/15/10

LAST REVISION 12-11-09 — DATE PLOTTED => 4/09/10 — TIME PLOTTED => 1:53pm

BORDER LAST REVISED 4/11/2008 — RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 — USERNAME => jeff_tudd — DGN FILE => 426414sp006.dwg — CU 04264 — EA 264141

FOR ACCURATE RIGHT OF WAY DATA,
CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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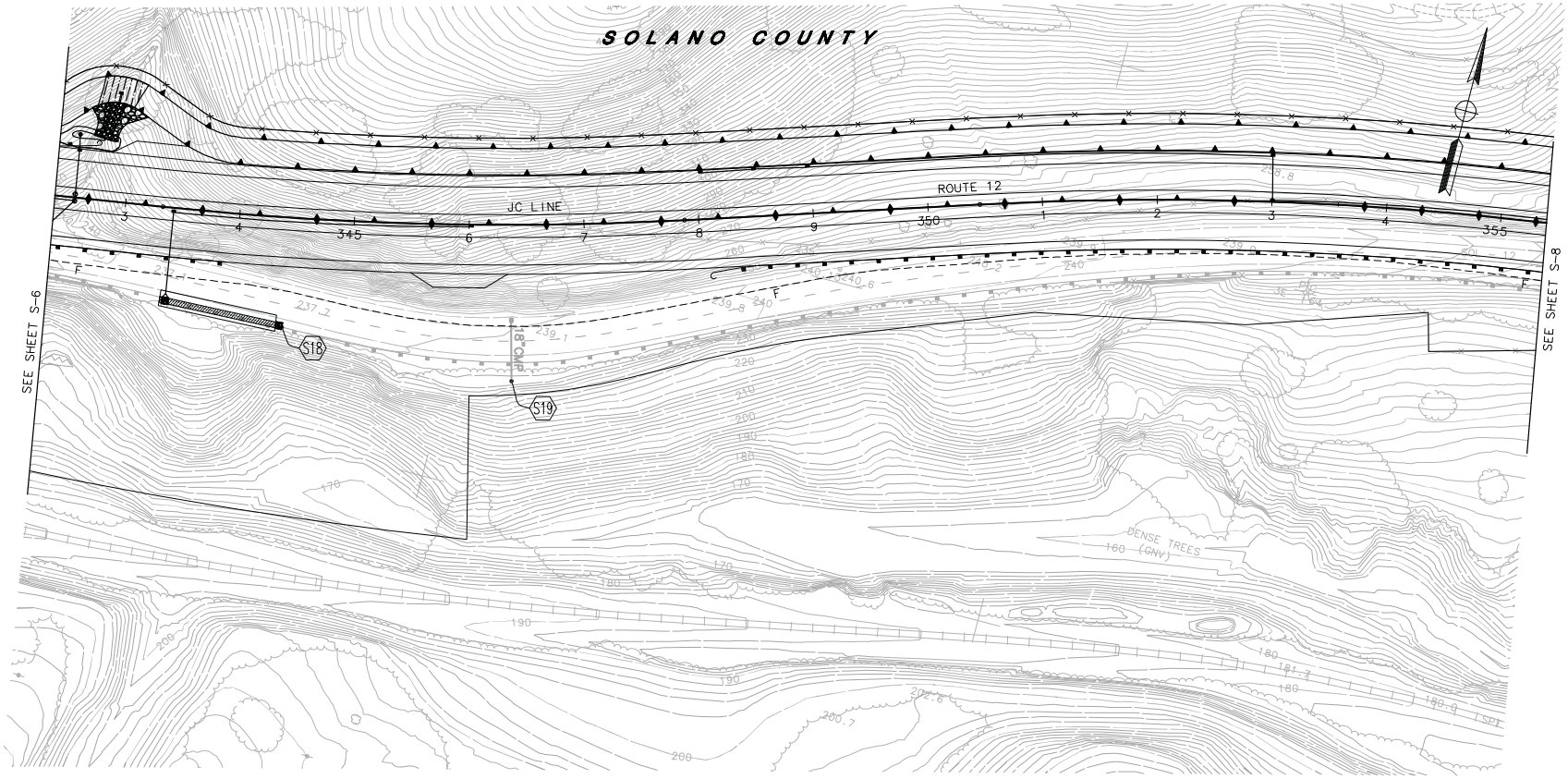
WALNUT CREEK, CA 94596

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585



SAMPLING PLAN

SCALE: 1"=50'

S-7

FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET S-1

THIS PLAN ACCURATE FOR SAMPLING AND MONITORING WORK ONLY.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	JEFF TUDD	REVISED BY	JT
Caltrans	HAN-BIN LIANG	ANALETTE OCHOA	DATE REVISED	04/15/10
	CALCULATED-DESIGNED BY			
	CHECKED BY			

LAST REVISION 12-11-09 — DATE PLOTTED => 4/09/10 — TIME PLOTTED => 1:57pm

BORDER LAST REVISED 4/11/2008 — RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 — USERNAME => jeff_tudd — DGN FILE => 426414sp007.dwg — CU 04264 — EA 264141

FOR ACCURATE RIGHT OF WAY DATA,
CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

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WALNUT CREEK, CA 94596

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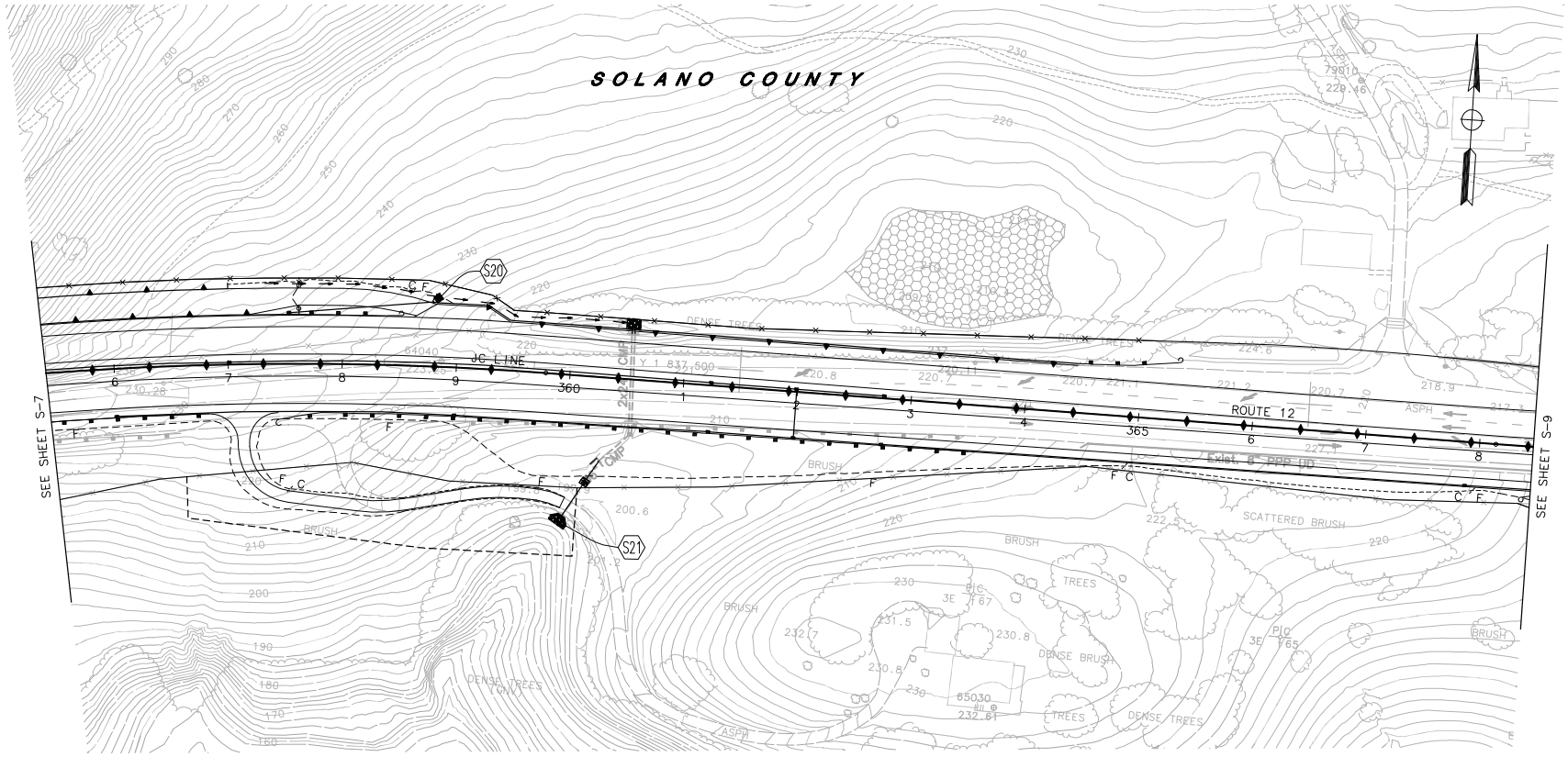
SUISUN CITY, CA 94585



FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET S-1

THIS PLAN ACCURATE FOR SAMPLING AND MONITORING WORK ONLY.

SAMPLING PLAN

SCALE: 1"=50'

S-8

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	JEFF TUDD	REVISED BY JT
Caltrans	HAN-BIN LIANG	ANALETTE OCHOA	DATE REVISED 04/15/10
	CALCULATED-DESIGNED BY		
	CHECKED BY		

LAST REVISION 12-11-09 — DATE PLOTTED => 4/09/10 — TIME PLOTTED => 2:06pm

BORDER LAST REVISED 4/11/2008 — RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 — USERNAME => jeff_tudd — DGN FILE => 426414sp008.dwg — CU 04264 — EA 264141

FOR ACCURATE RIGHT OF WAY DATA,
CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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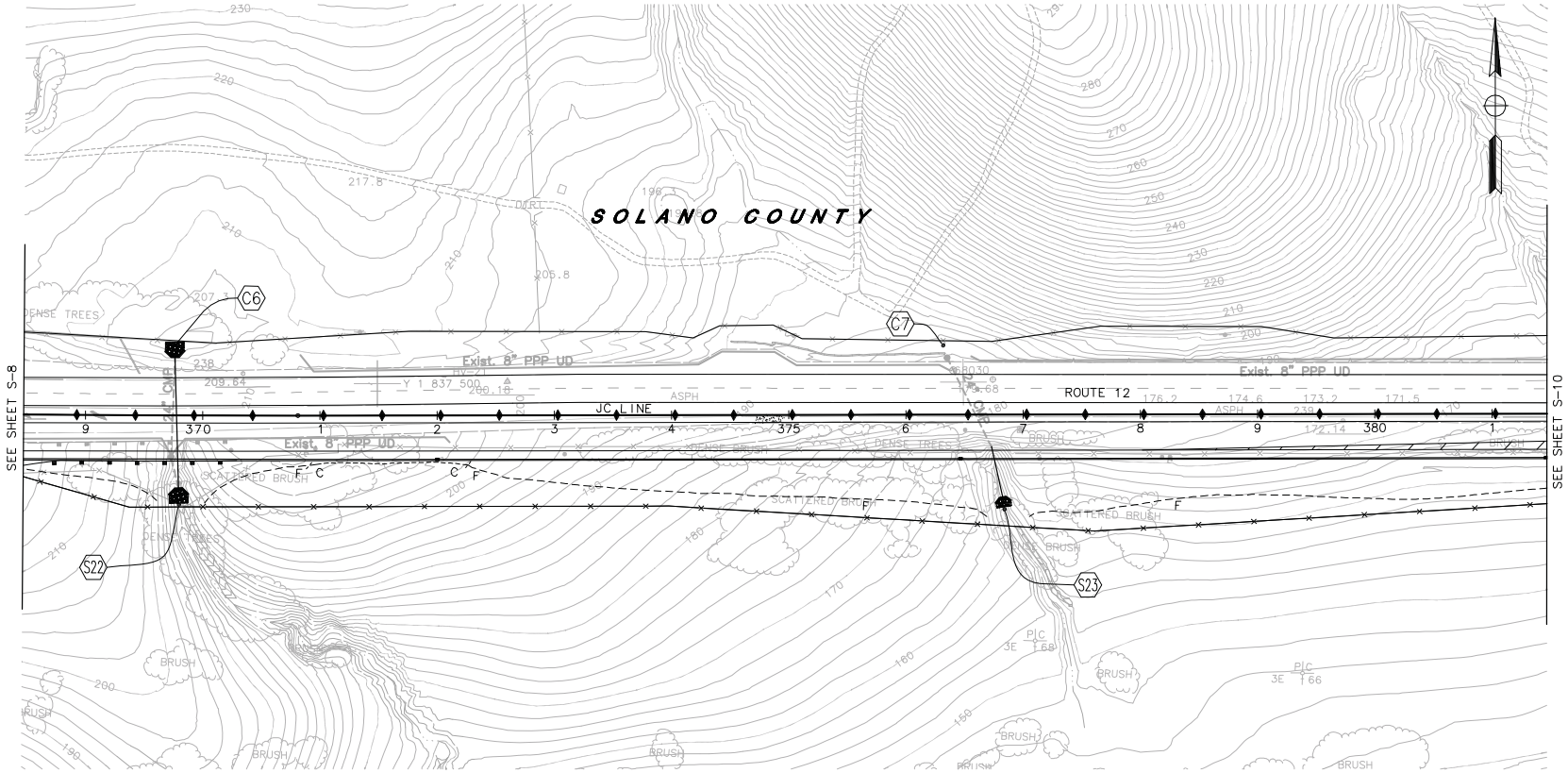
1243 ALPINE RD, SUITE 108
WALNUT CREEK, CA 94596

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585



SAMPLING PLAN

SCALE: 1"=50'

S-9

FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET S-1

THIS PLAN ACCURATE FOR SAMPLING AND MONITORING WORK ONLY.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG

CALCULATED-DESIGNED BY: JEFF TUDD — CHECKED BY: ANALETTE OCHOA

REVISED BY: JT — DATE REVISED: 04/15/10

LAST REVISION 12-11-09 — DATE PLOTTED => 4/09/10 — TIME PLOTTED => 2:03pm

BORDER LAST REVISED 4/11/2008 — RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 — USERNAME => jeff_tudd — DGN FILE => 426414sp009.dwg — CU 04264 — EA 264141

FOR ACCURATE RIGHT OF WAY DATA,
CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER — DATE 04/15/10

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — ANALETTE OCHOA — No. 55279 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

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WALNUT CREEK, CA 94596

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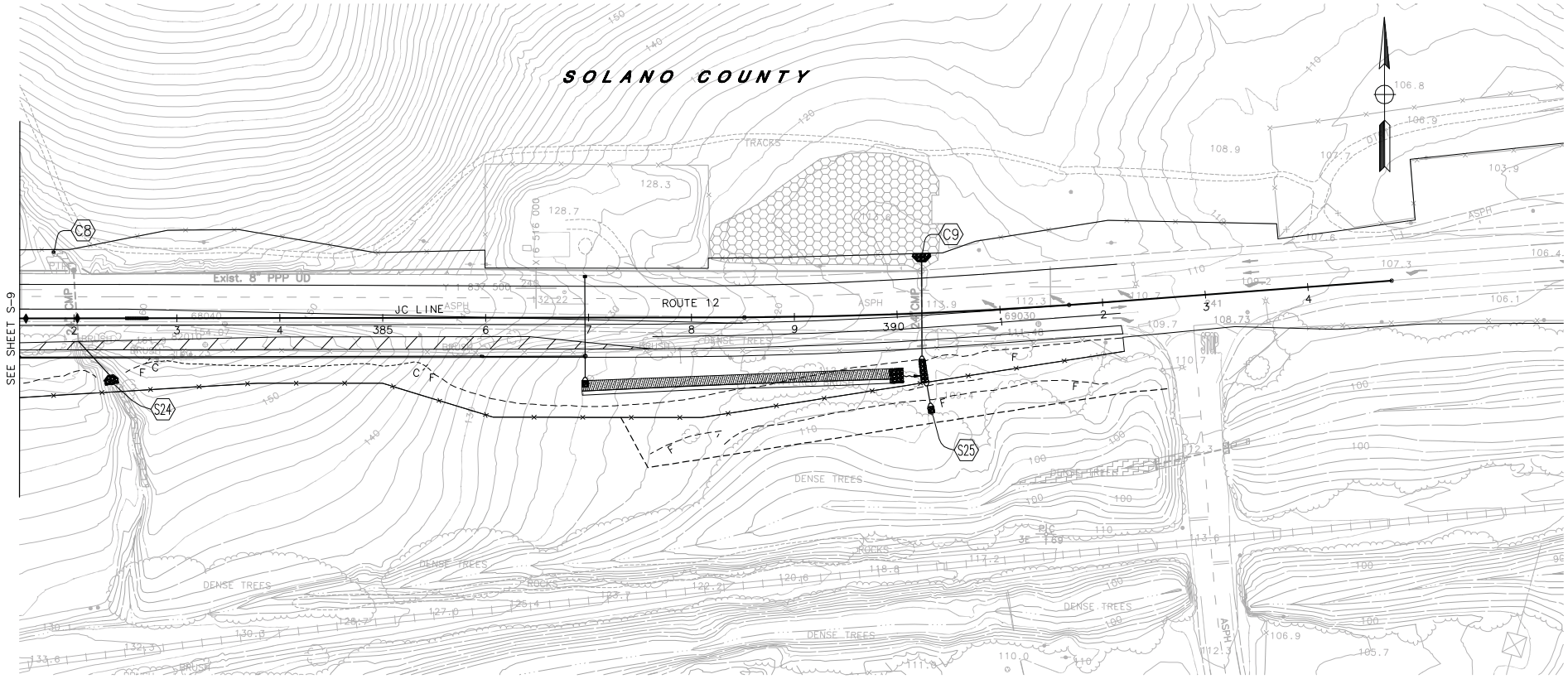
SUISUN CITY, CA 94585



FOR NOTES, ABBREVIATIONS & LEGEND, SEE SHEET S-1

THIS PLAN ACCURATE FOR SAMPLING AND MONITORING WORK ONLY.

SAMPLING PLAN

SCALE: 1"=50'

S-10

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	REVISED BY
Caltrans	HAN-BIN LIANG	JEFF TUDD	JT
		CHECKED BY	DATE REVISED
		ANALETTE OCHOA	04/15/10

LAST REVISION 12-11-09 — DATE PLOTTED => 4/09/10 — TIME PLOTTED => 2:05pm

BORDER LAST REVISED 4/11/2008 — RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 — USERNAME => jeff_tudd — DGN FILE => 426414sp010.dwg — CU 04264 — EA 264141

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Appendix E Off-Site Watershed Plans

FOR ACCURATE RIGHT OF WAY AND ACCESS DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

LEGEND

- UNLINED DITCH
- LINED DITCH
- GRADE TO DRAIN
- BIOFILTRATION SWALE
- ON-SITE WATERSHED BOUNDARY
- OFF-SITE WATERSHED BOUNDARY
- RSP
- PCC LINING
- DRAINAGE INLET
- GMP INLET
- MANHOLE
- (E) DRAINAGE INLET
- (E) MANHOLE

ABBREVIATIONS:

ac ACRE

BASIN NAME
area

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER ANALETTE OCHOA No. 55279 Exp. 12/31/10 CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

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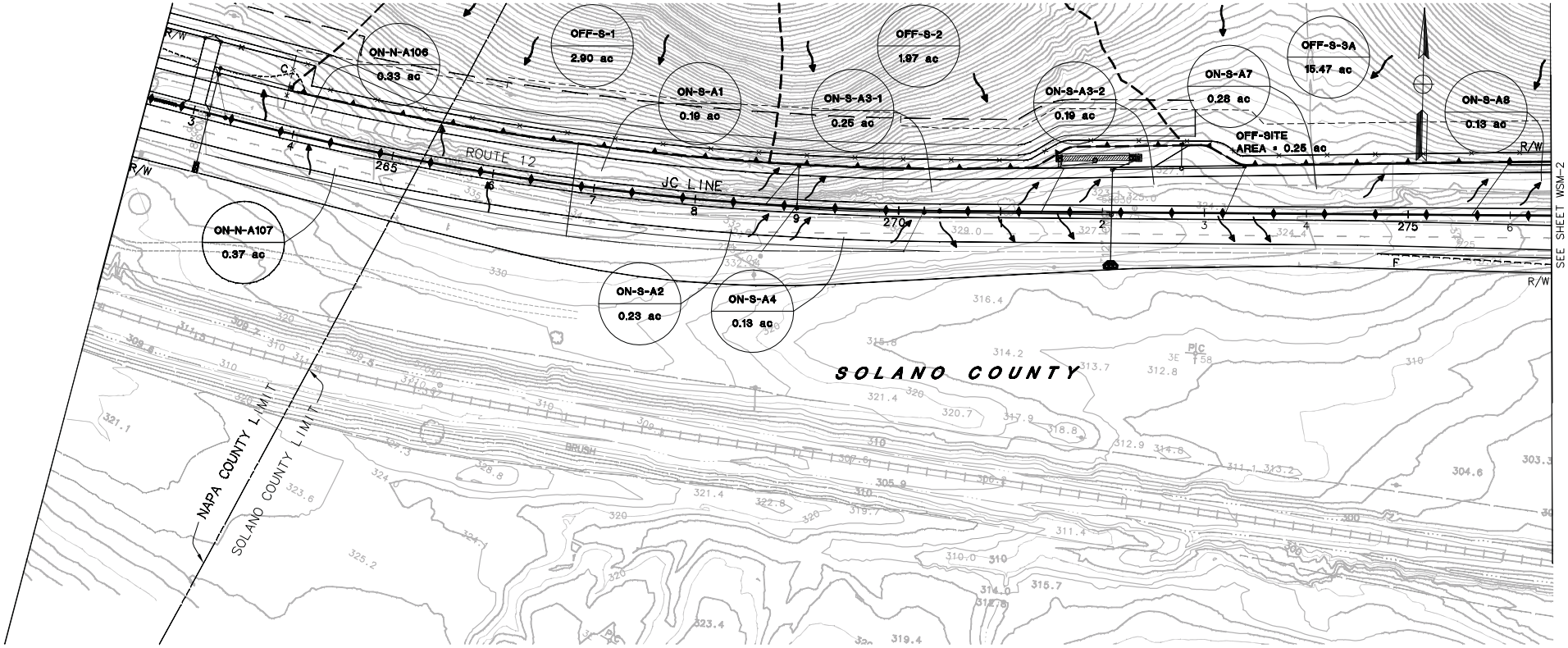
WALNUT CREEK, CA 94596

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585



WATERSHED MAP

SCALE: 1"=50'

WSM-1

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG
CALCULATED-DESIGNED BY: RAJA PERIKETI
CHECKED BY: ANALETTE OCHOA
REVISED BY: RP
DATE REVISED: 09/15/09

LAST REVISION 09-15-09
DATE PLOTTED => 11/03/09
TIME PLOTTED => 9:46am

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => HongChao_Yu
DGN FILE => wsm-1.dwg
CU 04264
EA 264141

FOR ACCURATE RIGHT OF WAY AND ACCESS DATA,
CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

FOR NOTES, LEGEND & ABBREVIATIONS, SEE SHEET WSM-1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER ANALETTE OCHOA No. 55279 Exp. 12/31/10 CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

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1243 ALPINE RD, SUITE 108
WALNUT CREEK, CA 94596

SOLANO TRANSPORTATION AUTHORITY
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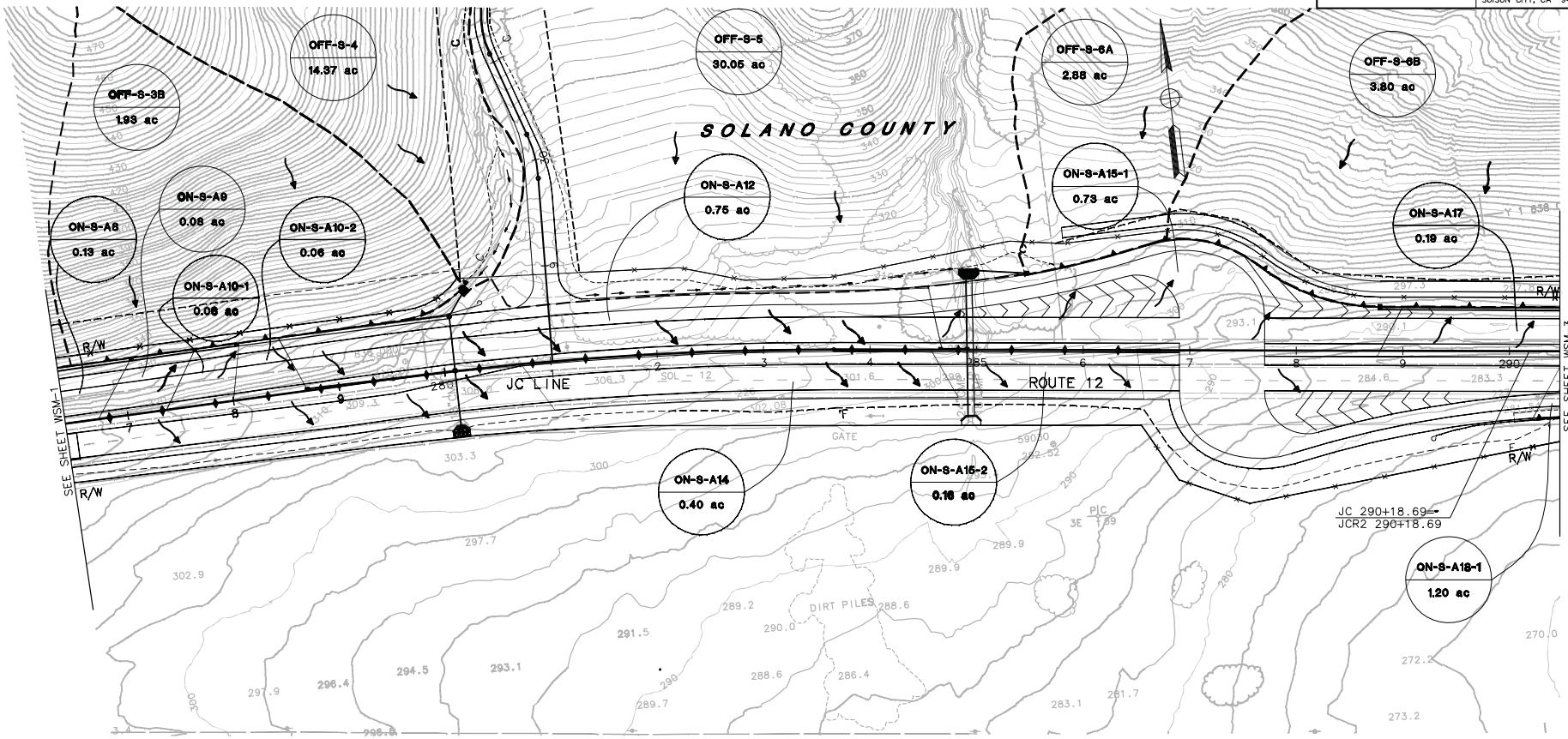
SUISUN CITY, CA 94585



WATERSHED MAP

SCALE: 1"=50'

WSM-2

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG

CALCULATED-DESIGNED BY: RAJA PERIKETI
CHECKED BY: ANALETTE OCHOA

REVISED BY: RP
DATE REVISED: 09/15/09

LAST REVISION 09-15-09
DATE PLOTTED => 11/03/09
TIME PLOTTED => 9:44am

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => HongChao_Yu
DGN FILE => wsm-2.dwg

CU 04264

EA 264141

FOR ACCURATE RIGHT OF WAY AND ACCESS DATA,
CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

FOR NOTES, LEGEND & ABBREVIATIONS, SEE SHEET WSM-1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
ANALETTE OCHOA
No. 55279
Exp. 12/31/10
CIVIL
STATE OF CALIFORNIA

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WALNUT CREEK, CA 94596

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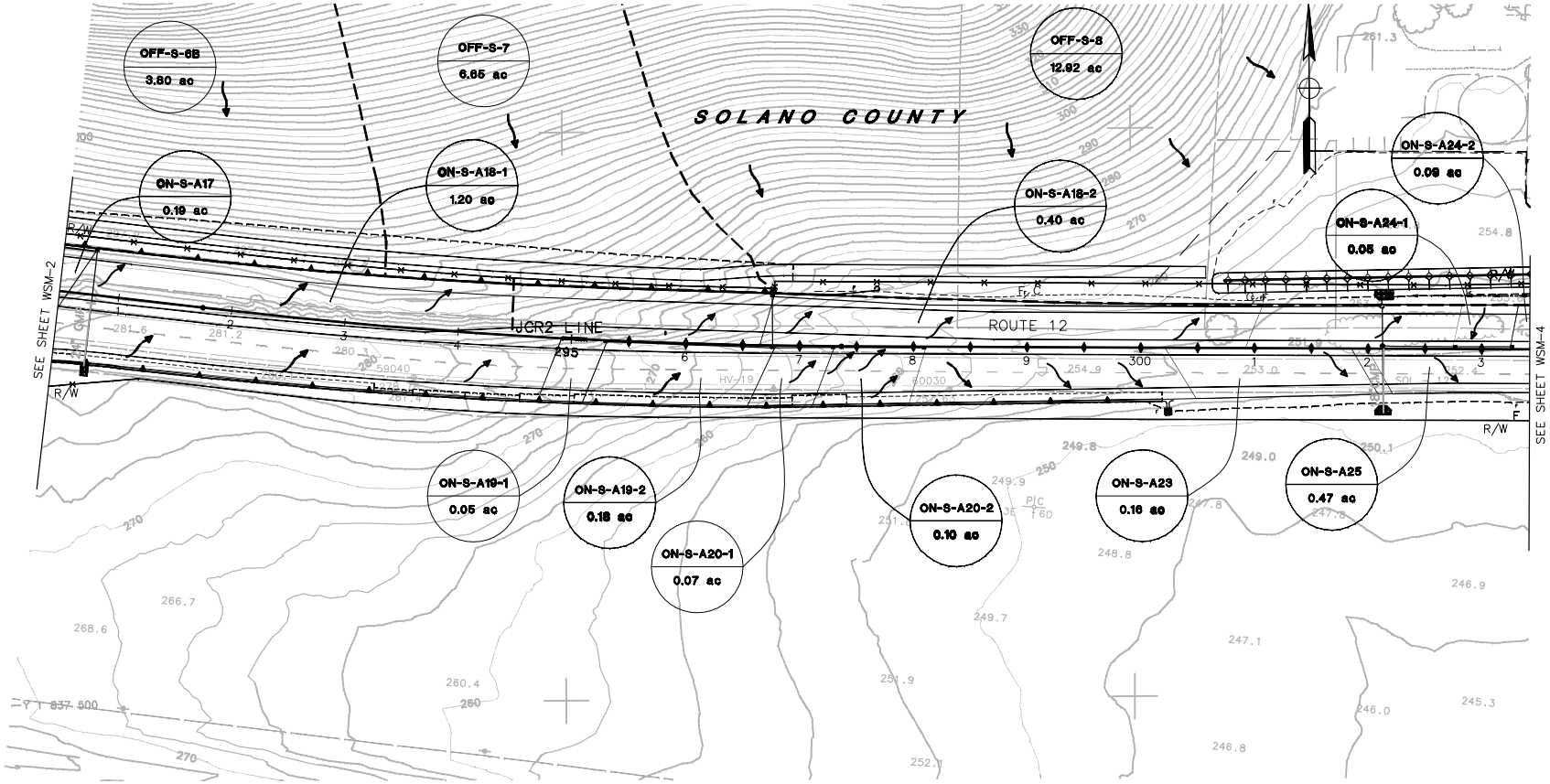

WATERSHED MAP

SCALE: 1"=50'

WSM-3

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	REVISED BY	DATE REVISED
HAN-BIN LIANG	RAJA PERIKETI	RP	09/15/09
	ANALETTE OCHOA		
	CHECKED BY		

LAST REVISION 09-15-09
DATE PLOTTED => 11/03/09
TIME PLOTTED => 9:42am

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => HongChao_Yu
DGN FILE => wsm-3.dwg

CU 04264

EA 264141

FOR ACCURATE RIGHT OF WAY AND ACCESS DATA,
CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

FOR NOTES, LEGEND & ABBREVIATIONS, SEE SHEET WSM-1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER ANALETTE OCHOA No. 55279 Exp. 12/31/10 CIVIL STATE OF CALIFORNIA

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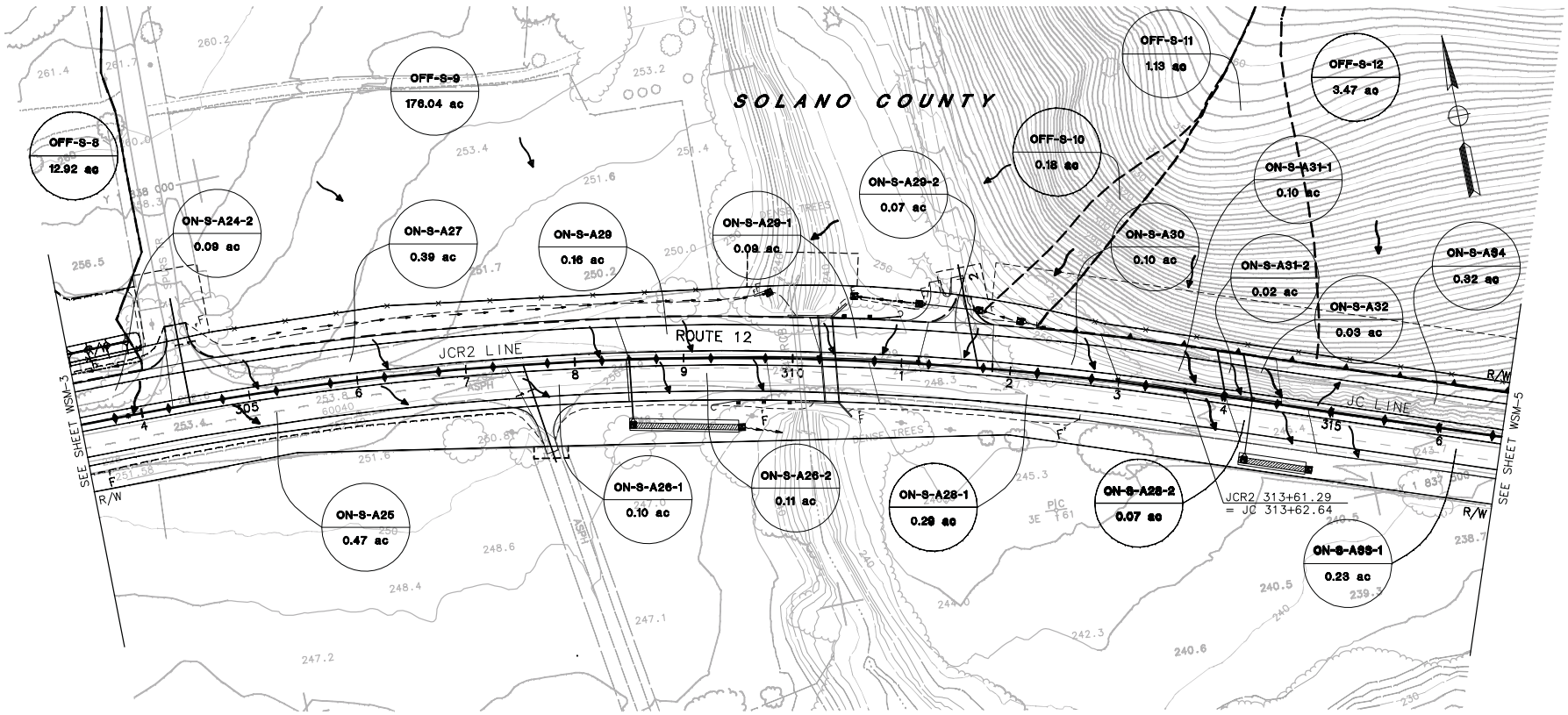
WALNUT CREEK, CA 94596

SOLANO TRANSPORTATION AUTHORITY
ONE HARBOR CENTER, SUITE 130
SUISUN CITY, CA 94585



WATERSHED MAP

SCALE: 1"=50'

WSM-4

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG
CALCULATED-DESIGNED BY: RAJA PERIKETI
CHECKED BY: ANALETTE OCHOA
REVISED BY: RP
DATE REVISED: 09/15/09

LAST REVISION 09-15-09
DATE PLOTTED => 11/03/09
TIME PLOTTED => 9:39am

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => HongChao_Yu
DGN FILE => wsm-4.dwg

CU 04264

EA 264141

FOR ACCURATE RIGHT OF WAY AND ACCESS DATA,
CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

FOR NOTES, LEGEND & ABBREVIATIONS, SEE SHEET WSM-1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
ANALETTE OCHOA
No. 55279
Exp. 12/31/10
CIVIL
STATE OF CALIFORNIA

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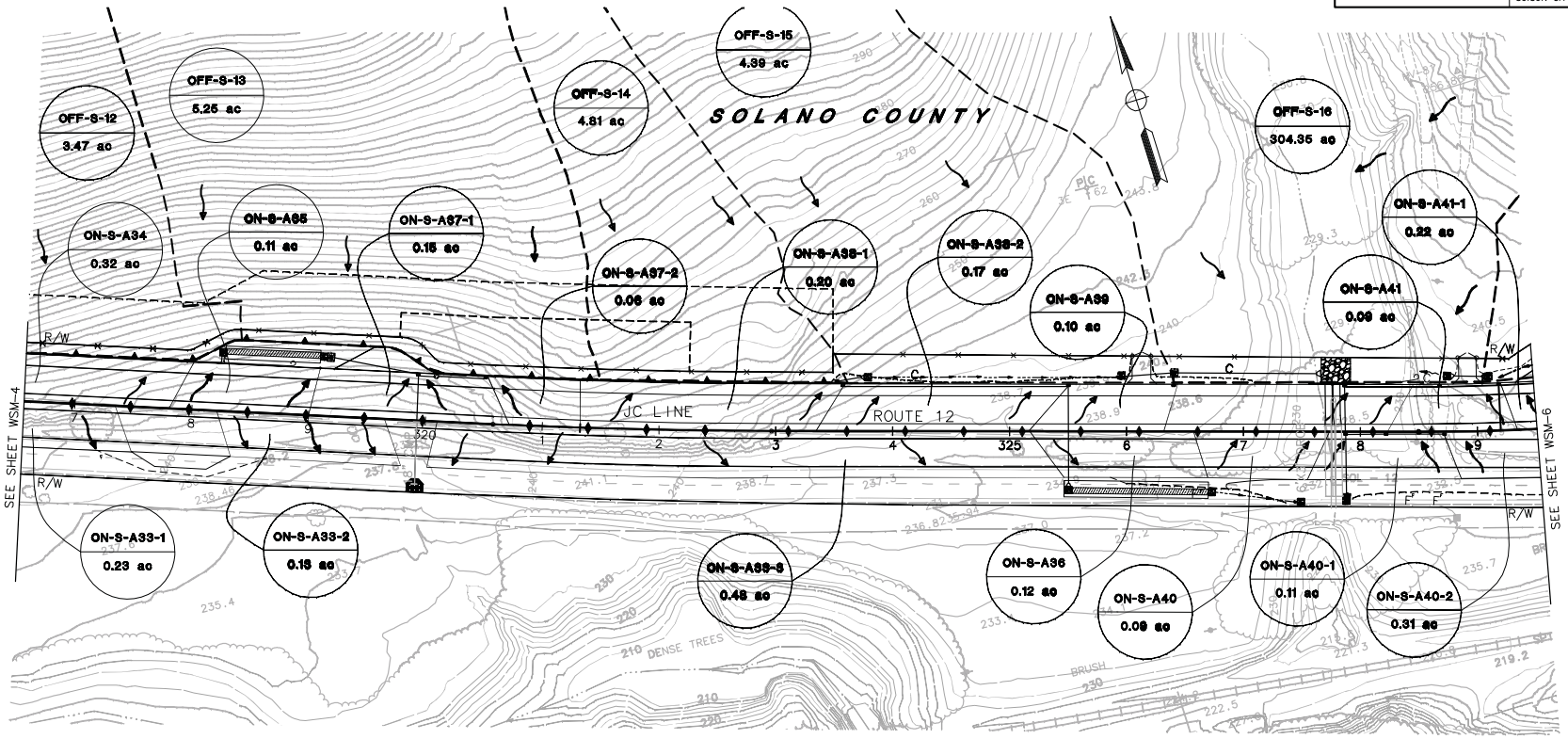

WATERSHED MAP

SCALE: 1"=50'

WSM-5

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

CALCULATED-DESIGNED BY	RAJA PERIKETI	REVISED BY	RP
CHECKED BY	ANALETTE OCHOA	DATE REVISED	09/15/09
CONSULTANT FUNCTIONAL SUPERVISOR	HAN-BIN LIANG		

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION 09-15-09 | DATE PLOTTED => 11/03/09 | TIME PLOTTED => 9:38am

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => HongChao_Yu | DGN FILE => wsm-5.dwg | CU 04264 | EA 264141

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
ANALETTE OCHOA
No. 55279
Exp. 12/31/10
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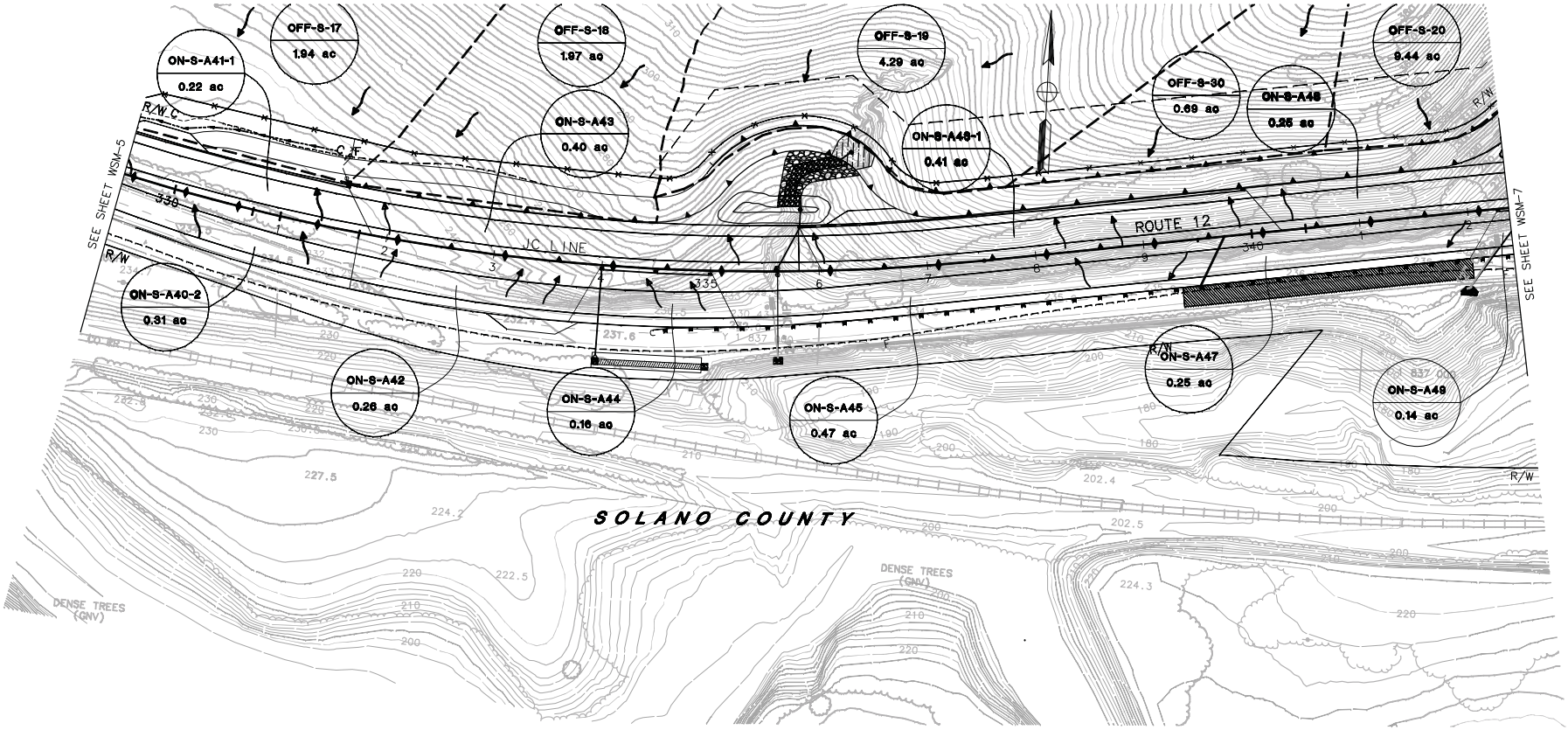

WATERSHED MAP

SCALE: 1"=50'

WSM-6

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG

CALCULATED-DESIGNED BY: RAJA PERIKETI
CHECKED BY: ANALETTE OCHOA

REVISED BY: RP
DATE REVISED: 09/15/09

LAST REVISION 09-15-09
DATE PLOTTED => 11/03/09
TIME PLOTTED => 10:12am

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => HongChao_Yu
DGN FILE => wsm-6.dwg

CU 04264

EA 264141

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FOR NOTES, LEGEND & ABBREVIATIONS, SEE SHEET WSM-1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
ANALETTE OCHOA
No. 55279
Exp. 12/31/10
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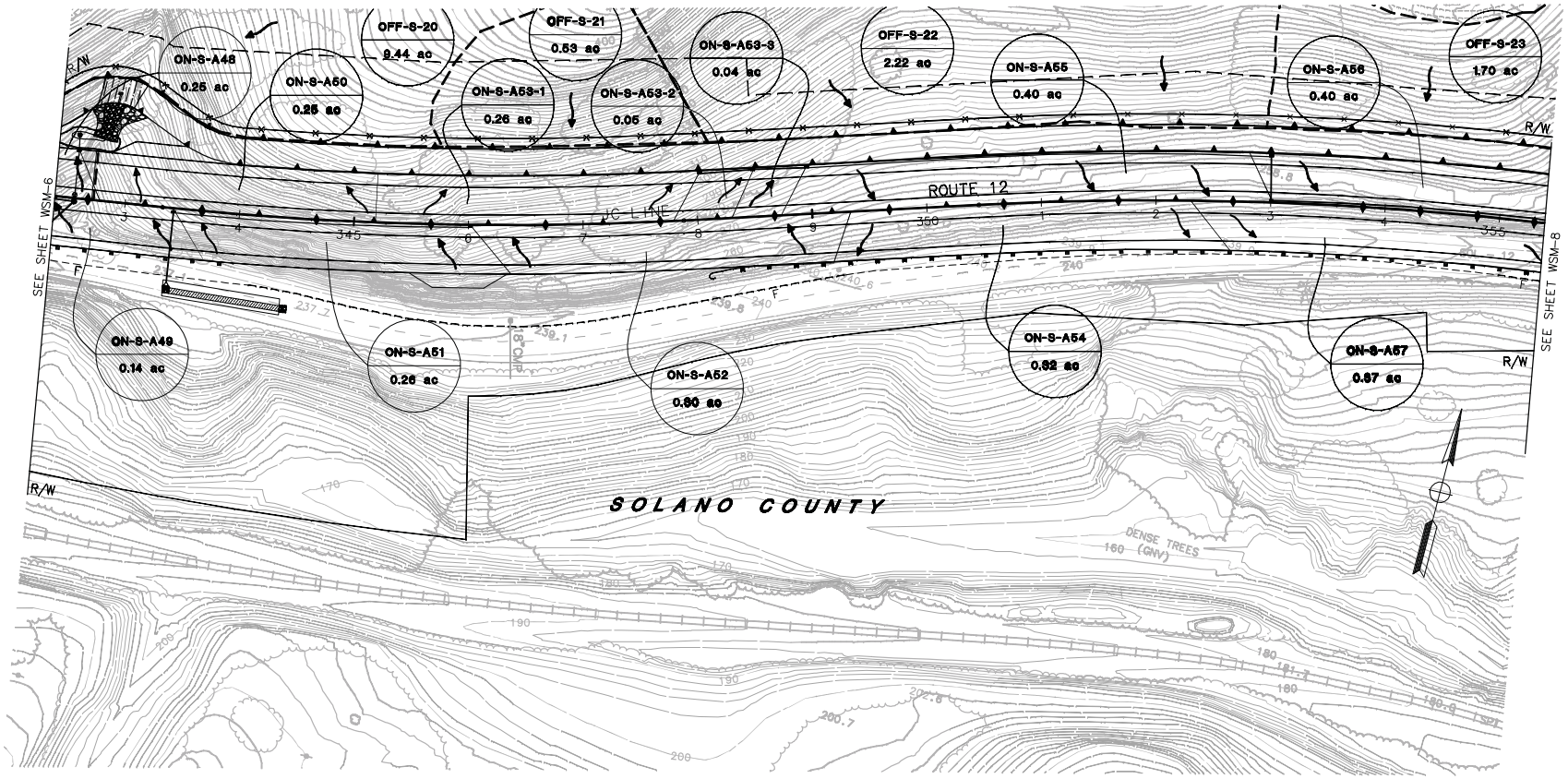

WATERSHED MAP

SCALE: 1"=50'

WSM-7

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	HAN-BIN LIANG
	CALCULATED-DESIGNED BY	RAJA PERIKETI
	CHECKED BY	ANALETTE OCHOA
	REVISED BY	RP
	DATE REVISED	09/15/09

LAST REVISION 09-15-09 | DATE PLOTTED => 11/03/09 | TIME PLOTTED => 10:18am

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => HongChao_Yu | DGN FILE => wsm-7.dwg | CU 04264 | EA 264141

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FOR NOTES, LEGEND & ABBREVIATIONS, SEE SHEET WSM-1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
ANALETTE OCHOA
No. 55279
Exp. 12/31/10
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STATE OF CALIFORNIA

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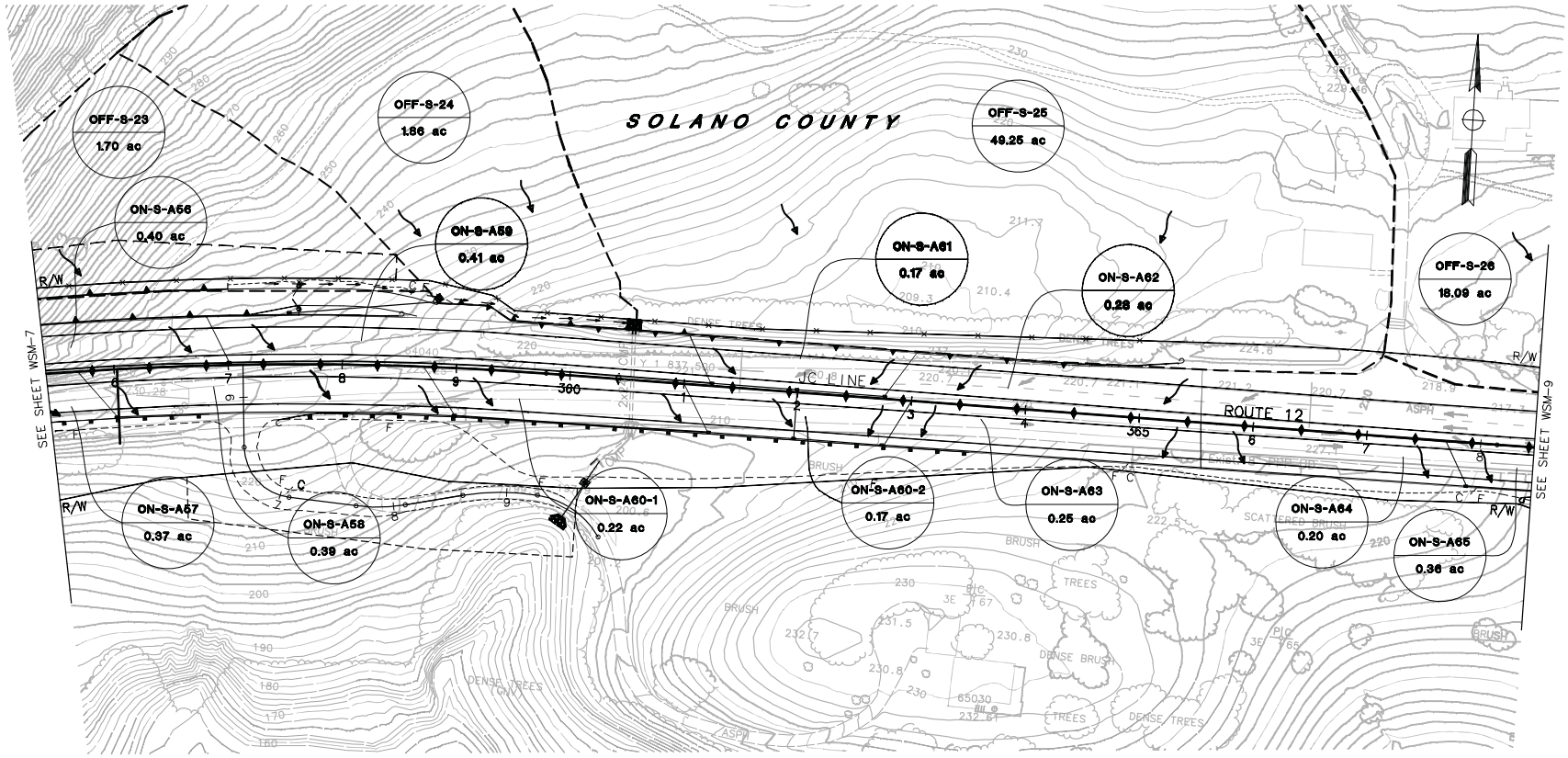

WATERSHED MAP

SCALE: 1"=50'

WSM-8

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

CALCULATED-DESIGNED BY	RAJA PERIKETI
CHECKED BY	ANALETTE OCHOA
REVISED BY	RP
DATE REVISED	09/15/09
CONSULTANT FUNCTIONAL SUPERVISOR	HAN-BIN LIANG

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION 09-15-09
DATE PLOTTED => 11/03/09
TIME PLOTTED => 10:19am

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FOR NOTES, LEGEND & ABBREVIATIONS, SEE SHEET WSM-1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER ANALETTE OCHOA No. 55279 Exp. 12/31/10 CIVIL STATE OF CALIFORNIA

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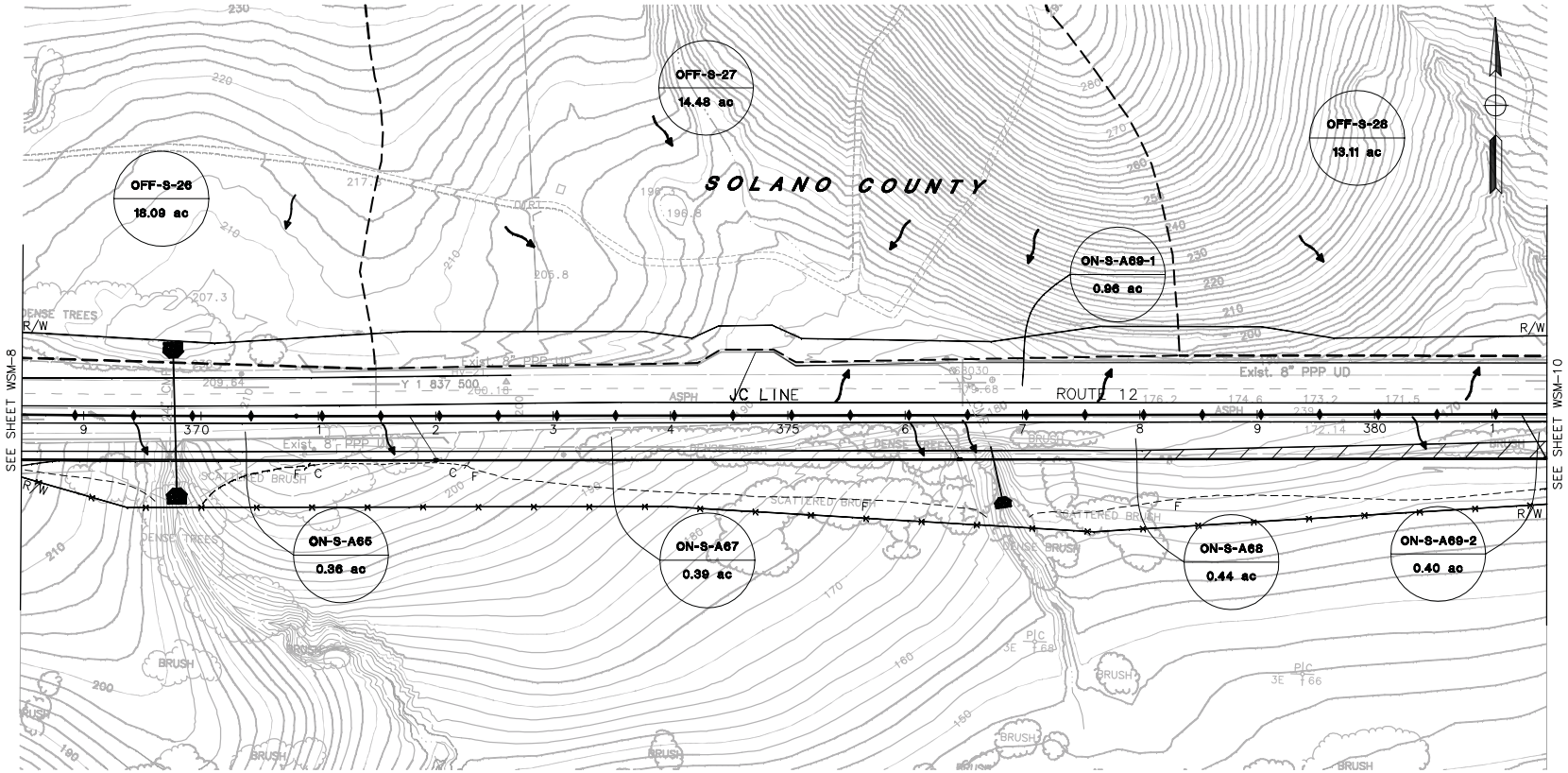

WATERSHED MAP

SCALE: 1"=50'

WSM-9

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

CONSULTANT FUNCTIONAL SUPERVISOR: HAN-BIN LIANG

CALCULATED-DESIGNED BY: RAJA PERIKETI

CHECKED BY: ANALETTE OCHOA

REVISED BY: RP

DATE REVISED: 09/15/09

LAST REVISION 09-15-09

DATE PLOTTED => 11/03/09

TIME PLOTTED => 10:32am

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => HongChao_Yu
DGN FILE => wsm-9.dwg

CU 04264

EA 264141

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CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

FOR NOTES, LEGEND & ABBREVIATIONS, SEE SHEET WSM-1

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap Sol	12	2.8/3.3 0.0/2.6		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
ANALETTE OCHOA
No. 55279
Exp. 12/31/10
CIVIL
STATE OF CALIFORNIA

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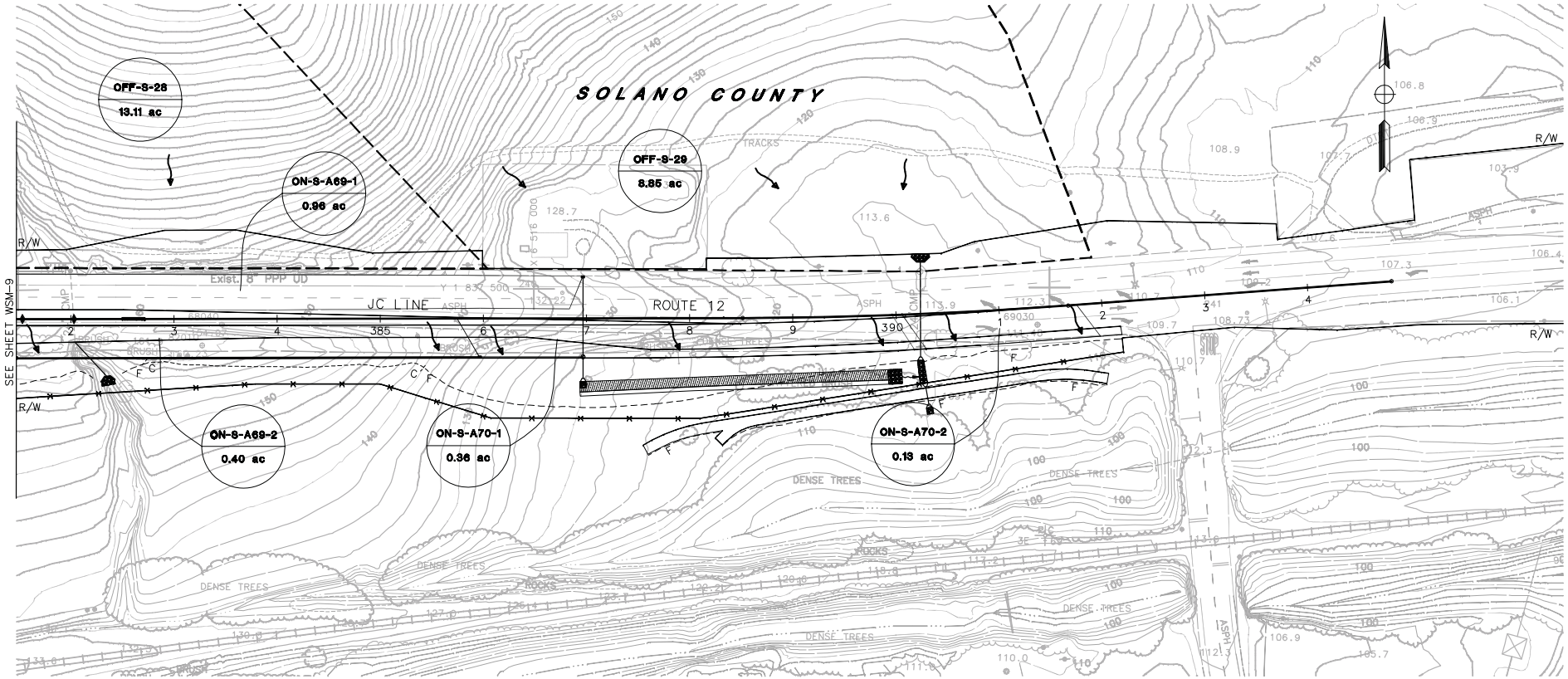

WATERSHED MAP

SCALE: 1"=50'

WSM-10

THIS PLAN ACCURATE FOR DRAINAGE WORK ONLY.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	HAN-BIN LIANG
	CALCULATED-DESIGNED BY	RAJA PERIKETI
	CHECKED BY	ANALETTE OCHOA
	REVISED BY	RP
	DATE REVISED	09/15/09

LAST REVISION 09-15-09
DATE PLOTTED => 11/03/09
TIME PLOTTED => 10:37am

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => HongChao_Yu
DGN FILE => wsm-10.dwg

CU 04264

EA 264141

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Materials Sources for "Sonoma Field Stone"

Lyngso Garden Materials
19 Seaport Blvd
Redwood City, Ca 94063
(650) 364-1730
http://www.lyngsogarden.com

Marin Landscape Materials
7596 Redwood Blvd
Novato, CA 94945
(415) 897-1337
http://www.coloredgravel.com

Graniterock
350 Technology Drive
Watsonville, CA 95076-2488
(831) 768-2000
http://www.graniterock.com