

Sampling and Analysis Plan (SAP)

Wastewater Effluent Sampling & Monitoring

The purpose of sampling and monitoring of the wastewater treatment system is to demonstrate compliance with regulatory standards and to evaluate system performance.

Samples are obtained from these points in the water system: (1) from the Septic Tank effluent [STE], (2) from the Recirculation Tank effluent [RTE], and (3) from the water level control box for the subsurface wetlands [SWE].

- To sample from STE, an assistant will collect effluent samples in the septic tank at the downstream end.
- To sample from RTE, an assistant will need to manually activate the effluent pumps in the recirculation tank, flush the line for 20 seconds, and take the sample to ensure a representative sample is obtained.
- To sample from SWE, simply hold a sample collection container under the overflow pipe to capture the sample without moving or disturbing the adjustable pipe; if the pipe has been disturbed, wait for 10 minutes for the effluent to stabilize before sampling.

The samples are collected in laboratory-provided containers as instructed and delivered to the laboratory for analysis using EPA test methods. Check with the laboratory in advance for direction on sample volumes required, preservation techniques, and handling prior to analysis. Submit the sampling results to the Engineer.

Wastewater effluent must be sampled for the parameters listed below:

Parameter	Unit	Sample location		
		STE	RTE	SWE
Biochemical oxygen demand, BOD	mg/L	Monthly	Monthly	Monthly
Chemical oxygen demand, COD	mg/L	Monthly	Monthly	Monthly
Total suspended solids, TSS	mg/L	Monthly	Monthly	Monthly
Total dissolved solids, TDS	mg/L	Monthly	Monthly	Monthly
Total coliform	No./100 mL	Monthly	Monthly	Monthly
Total nitrogen, TN ⁽¹⁾	mg/L as N	Monthly	Monthly	Monthly
Ammonium, NH ₄	mg/L as N	Monthly	Monthly	Monthly
Nitrite, NO ₂	mg/L as N	–	Monthly	Monthly

Nitrate, NO ₃	mg/L as N	–	Monthly	Monthly
pH	unit	Monthly	Monthly	Monthly
Alkalinity	mg/L as CaCO ₃	Monthly	Monthly	Monthly
Temperature	°F	Monthly	Monthly	Monthly
Dissolved oxygen	mg/L	–	Monthly	–

⁽¹⁾ Total Nitrogen will be broken out to nitrate-nitrite, total Kjeldahl nitrogen, and ammonia

Groundwater Sampling and Monitoring

Perform the following on a quarterly basis and submit the information to the Engineer quarterly:

1. Groundwater Elevation and Gradient

Determine the groundwater elevation with respect to mean sea level for each monitoring well prior to purging for sampling.

2. Purging

- a. Collect groundwater samples after either of the following: (1) an amount of water equal to three times the amount of water within the well casing has been removed, or (2) the temperature, electrical conductivity, and pH measurements of the water in the well have stabilized to approximately +10 percent for successive measurements after a minimum of one well volume has been removed. For each purging method, the groundwater elevation must recover before the sample is collected.
- b. If a monitoring well is purged and does not appear to be recovering to pre-purging elevations, document the amount of time allowed for the well to recover, the volume of water removed, and the groundwater elevation at the time of the sample collection. If the monitoring well does not recover within one hour after purging, document the volume of water removed and return the next day and attempt to collect the sample from the well without further purging. Measurements of temperature, electrical conductivity, and pH during purging must be reported with the results of groundwater analyses.
- c. Well casing diameter, well depth, depth to groundwater, and total volume purged prior to sampling must also be reported with the groundwater monitoring results.

3. Groundwater Sampling

Groundwater monitoring wells must be sampled quarterly for the parameters listed below:

Parameter	Units	Analysis
Temperature	F	Field procedures ²
Specific Conductance/ Electrical conductivity	$\mu\text{S}/\text{cm}$ or $\mu\text{mho}/\text{cm}^2$	Field procedures ²
Dissolved oxygen	mg/L	Field procedures ²
pH	pH units	Field procedures ²
Nitrate as Nitrogen	mg/L	Laboratory ¹
Total Nitrogen ³	mg/L	Laboratory ¹
Chloride	mg/L	Laboratory ¹
Total Coliform	MPN/100mL	Laboratory ¹

¹ Laboratory – the analysis will be conducted by a California certified laboratory (ELAP) using EPA test methods.

² Field procedures –the analysis will be conducted by field staff in the field with handheld meters that are used in accordance with and calibrated to manufacturer’s specifications.

³ Total Nitrogen will be broken out to nitrate-nitrite, and total kjeldahl nitrogen.

4. Groundwater Direction and Gradient

Using groundwater elevation data, determine the groundwater flow direction and gradient beneath the Facility and present it on a scaled map in each quarterly monitoring report.

General Reporting

Report on any maintenance, repairs, or operational problems that occur throughout the sampling and reporting period, such as:

1. Any additions, repairs, or replacements to the subsurface disposal systems.
2. A description of any operational problem(s) and corrective action(s) taken to address the problem(s).
3. The date and quantity of sludge removed from the septic tank. The name of the company removing the material must also be reported, in addition to the name and location of the facility receiving the material. If no sludge is removed, a statement that no sludge was removed must be included in the report.
4. Review the effluent data collected and self-report any violation.
5. Review the groundwater data collected and identify any violation of a receiving water limitation.