6.6 Chemical Monitoring

The following section describes the chemical monitoring program for surface water and groundwater quality, which includes the following topics:

- Pre-application monitoring supporting general water quality and baseline environmental water quality is presented in Chapter 2 and Chapter 3. Baseline water quality conditions are discussed in Subsection 2.3.3.
- Construction/preoperational monitoring that will evaluate potential impacts from site preparation and construction of STP 3 & 4. This monitoring will establish a baseline for identifying and assessing environmental impacts from operation of the new units.
- Operational monitoring that will identify impacts from operation of STP 3 & 4.

6.6.1 Pre-Application Monitoring

The objective of the pre-application monitoring program is to provide information that supports the assessment of potential impacts resulting from construction and operation of the new units. The pre-application monitoring program is composed of the ongoing Texas Pollutant Discharge Elimination System (TPDES) #WQ0001908000 permit-mandated (Reference 6.6-1) surface water monitoring programs, water treatment monitoring programs, and historical STP water quality data.

6.6.1.1 Chemical Surface Water Monitoring

Table 6.6-1 lists the effluent or wastewater parameters currently being monitored as part of compliance with the TPDES permit for STP 1 & 2. Figure 6.6-1 depicts the sampling locations. The Texas Administrative Code (TAC), at 30 TAC §305 and 319, addresses requirements concerning sampling frequency, sample preservation, analytical methods, calibration methods, quality assurance procedures, and any required statistical methodology for sample analysis. These requirements are stipulated in the TPDES permit.

6.6.1.2 Chemical Groundwater Monitoring

STP withdraws groundwater for, among other uses, potable water. STP operates and maintains two registered, independent public potable water systems (Public Water System [PWS] #1610051 and #1610103) that are non-transient/noncommunity systems. These systems supply water to buildings and facilities used by the employees at the station. Each potable water system is comprised of its groundwater source(s), pumping station, and associated distribution system. Each system's pumping station consists of storage tank(s), a pressurization facility and transfer pumps. Raw water is disinfected with liquid sodium hypochlorite before entering the storage tank(s). Monitoring of water intended for public use (drinking water) is in accordance with 30 TAC §290, which addresses sampling requirements, analysis, and reporting. STP currently samples groundwater at various frequencies, based on the requirements for the parameter monitored. Table 6.6-2 summarizes the parameters monitored. No groundwater quality monitoring, other than drinking water requirements as previously discussed, is required or deemed necessary at the STP site. Additional

groundwater monitoring was conducted during the site investigation phase for STP 3 & 4 in the fall of 2006. Table 6.6-3 summarizes the monitoring locations and monitored parameters. Figure 6.6-2 depicts the sampling locations. Subsection 2.3.3 discusses the results of the groundwater and effluent or wastewater quality monitoring.

6.6.1.3 Chemical Storm Water Monitoring

Storm water is monitored and sampled according to the STP Industrial Storm Water Pollution Prevention Plan (SWPPP), and in accordance with the TPDES Multi-Sector General Permit (MSGP) (Reference 6.6-2). The objectives of the SWPPP are to ensure that potential sources are evaluated and that appropriate measures are designed and implemented to prevent/control the discharge of pollutants in storm water. Outfalls A, E, F, and G are monitored for iron and total suspended solids, as deemed necessary, during precipitation events, in accordance with the SWPPP. Figure 6.6-2 depicts the location of the outfalls.

6.6.2 Construction and Preoperational Monitoring

The required effluent or wastewater, storm water quality monitoring, and groundwater (i.e., drinking water only) monitoring programs for STP 1 & 2 will be used to monitor the effects of construction of STP 3 & 4. These ongoing monitoring programs provide the data necessary to assess potential changes in groundwater and surface water quality associated with construction of the new units. Historical monitoring results provide a baseline for the identification and measurement of water quality impacts from operation of the new units. Additional storm water monitoring will be conducted to assess surface runoff from the construction site to ensure protection of onsite wetlands and to minimize potential for offsite effects of storm water runoff.

The results of groundwater monitoring will be evaluated and trended during construction of STP 3 & 4. If anomalies are noted during data review, an investigation will be conducted to determine the cause. STPNOC will use best management practices to protect the water supply aquifer from impact during the construction process, such as controls for wellhead protection, cross connection, etc. In the event impacts to groundwater resources are discovered via monitoring or other means, and these impacts are significantly different from those previously analyzed by the NRC, this information will be evaluated and provided to the NRC and the cognizant state agencies, that is the Texas Commission on Environmental Quality (TCEQ) and the Coastal Plains Groundwater Conservation District, for review, as appropriate.

6.6.3 Operational Monitoring

An operational monitoring program will be implemented to identify changes in water quality that may result from the operation of the new units and to assess the effectiveness of the related effluent treatment systems. Chemical monitoring for both effluent or wastewater and drinking water at STP 3 & 4 will be based on TCEQ requirements. Specifically, the monitoring for total suspended solids, oil and grease, metals, and biochemical oxygen demand will likely be necessary at several locations, in accordance with TAC §305 and 319. Storm water monitoring will also be implemented at any new or upgraded collection and/or discharge points. The SWPPP would be revised as necessary to include the additional monitoring. In addition, it will

be necessary to monitor drinking water at the new units in a similar method to what is currently performed at STP 1 & 2. The specific elements of the operational monitoring program will be developed in consultation with TCEQ during the process to amend or modify the existing TPDES permit and other permits as required.

6.6.4 References

6.6-1 Texas Commission on Environmental Quality, Permit to Discharge Wastes under provisions of Section 402 of the Clean Water Act and Chapter 26 of the Texas Water Code – Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0001908000, Austin, Texas, July 27, 2005 (expires December 1, 2009).

6.6-2 Texas Commission on Environmental Quality, Multi-Sector Permit– Permit No. TXR050000, Austin, Texas, August 20, 2001.

Table 6.6-1 Existing Effluent/Wastewater Monitoring Program

Monitoring Location (STP 1 & 2)	Constituents (units)	Frequency	Sample Type
001 (Final Plant Discharge combined waste streams from STP 1 & 2)	Total residual chlorine (mg/L)	1/week [1]	Grab
101 (Units 1 and 2 low volume waste sources/metal cleaning waste system discharge)	Total suspended solids (mg/L)	1/week	Grab
	Oil and grease (mg/L)	1/week	Grab
201 (Units 1 and 2 low volume waste discharges and storm water)	Total suspended solids (mg/L)	1/week	Grab
	Oil and grease (mg/L)	1/week	Grab
401 (Units 1 and 2 sanitary waste, car wash discharge, and air conditioning condensate)	Biochemical oxygen demand (mg/L)	1/week	Grab
	Total suspended solids (mg/L)	1/week	Grab
501 (Units 1 and 2 metal cleaning waste)	Iron, total (mg/L)	1/week [1]	Grab
	Copper, total (mg/L)	1/week [1]	Grab
601 (Units 1 and 2 sanitary sewage, air conditioning condensate, and HVAC blowdown)	Biochemical oxygen demand (mg/L)	1/week	Grab
	Total suspended solids (mg/L)	1/week	Grab

[1] When discharge occurs

Source - Reference 6.6-1

Table 6.6-2 Drinking Water Monitoring Program Parameters

Parameter Monitored	Frequency
Disinfectant residual	Daily
Microbiological contaminants	Monthly
Pb/Cu [1]	Triennial
$MINO_3$ [2]	Triennial
All Metal [3]	6-Year
NO_3	Annual
HAA5/TTHM [4]	Triennial
VOC	6-Year/Annual [5]
TTHM	Triennial

Ref: 30 TAC §290

[1] Lead and Copper are sampled at multiple sampling locations
[2] Mineral = calcium, chloride, fluoride, magnesium, total nitrate, sodium, sulfate, total hardness, conductivity, total alkalinity, bicarbonate, carbonate, dissolved solids, Calcium Carbonate
[3] Metals – Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Nickel, Selenium, Silver, Sodium, Thallium, Zinc
[4] HAA5/TTHM= haloacetic acids /total trihalomethanes
[5] Dependent on system

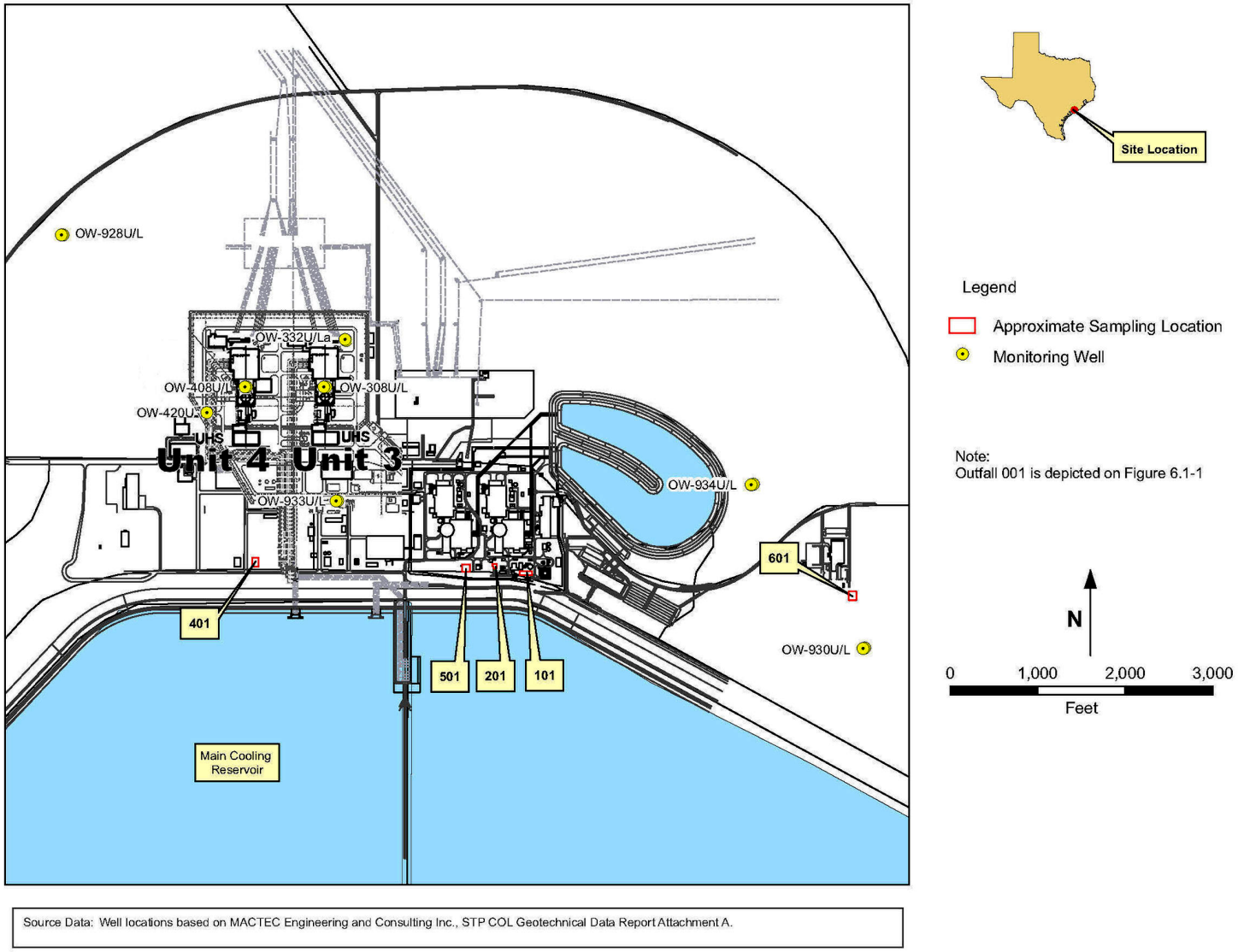
Chemical monitoring frequency is subject to change. Monitoring may be increased or reduced by the State based on chemical sampling history or other factors.

Table 6.6-3 Groundwater Pre-Application/Operational Monitoring

	Parameters Monitored							
Well ID	Field Parameters [1]	Total Dissolved Solids	Inorganic ions	Cations	Alkalinity	Ammonia	Nitrate/ Nitrite	Cation/ anion balance
OW-308 U/L	√	√	√	√	√	√	√	√
OW-332 U/L	√	√	√	√	√	√	√	√
OW-408 U/L	√	√	√	√	√	√	√	√
OW-420 U	√	√	√	√	√	√	√	√
OW-928 U/L	√	√	√	√	√	√	√	√
OW-930 U/L	√	√	√	√	√	√	√	√
OW-933 U/L	√	√	√	√	√	√	√	√
OW-934 U/L	√	√	√	√	√	√	√	√

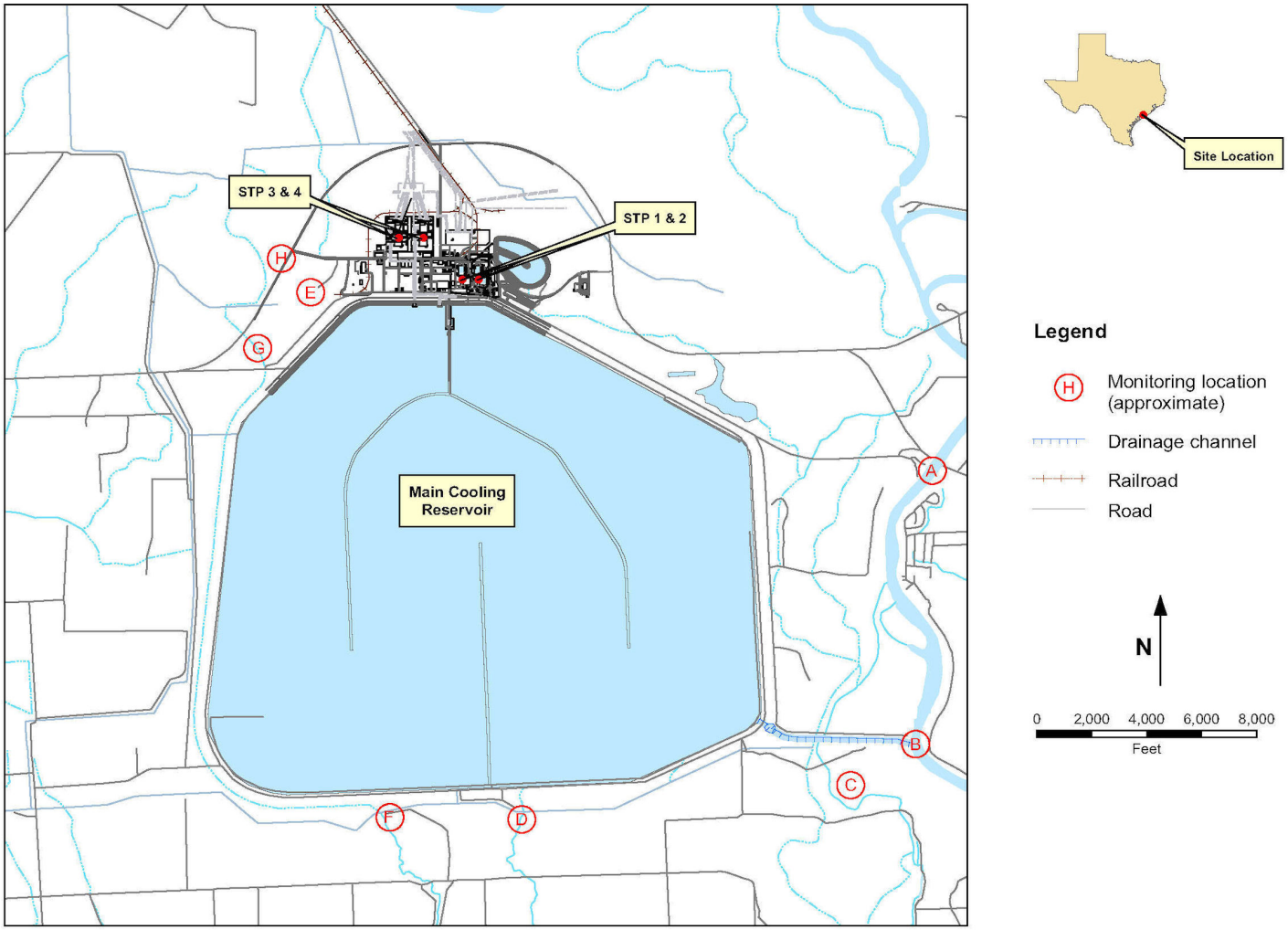
*[1]*Temperature, pH, electrical conductivity, turbidity, oxidation-reduction potential, dissolved oxygen

U –Upper aquifer
L –Lower aquifer



Source Data: Well locations based on MACTEC Engineering and Consulting Inc., STP COL Geotechnical Data Report Attachment A.

Figure 6.6-1 Existing Effluent/Groundwater Monitoring Locations



Source Data: ESRI, Data & Maps and StreetMap USA, 2005

Figure 6.6-2 Storm Water Monitoring Locations