

2 Site Process, Equipment & Configuration

2.1 Site Process Description

The site accepts produced water and drilling fluids generated by the oil & gas industry in the region. Produced water has trace hydrocarbons suspended in the water and the less soluble hydrocarbons can be removed through phase separation. These recovered hydrocarbons are known as condensate and the overall goal of the facility's process train is condensate recovery/removal. The general process, from off-loading to an evaporation pond, is described below. Off-load pumping equipment is integral to the transport vehicle, after which the produced water moves through the system by gravity flow or by pumping.

1. Eight (8) 500-barrel tanks have been installed in the receiving area to receive produced water off-loaded from trucks. These tanks provide initial oil/water phase separation of the produced water and condensate and also act as surge protection to provide a more uniform flow to downstream processes and equipment. Separated water from the tanks flows to the concrete secondary phase separation vaults (see item 2), while condensate is sent to the condensate recovery tanks (see item 4), and off-gasses are collected and treated in the thermal oxidizer and gas scrubber unit (see item 6). Currently, four (4) 500-barrel receiving tanks are in place, with the final four (4) scheduled to be installed by the end of 2011.
2. From the primary separation tanks, the produced water flows into a series of three (3) concrete secondary phase separation vaults where further phase separation occurs. The three (3) concrete vaults are operated in two parallel sets, making a total of six (6) concrete vaults. Any condensate that might accumulate in the vaults is vacuumed off and transferred to the condensate recovery tanks. From the vaults, the water moves to a settling pond for tertiary separation. The vaults are covered with a vapor recovery system. Vapors collected from the vaults are routed to the thermal oxidizer for treatment.
3. The evaporation ponds receive all water treated through the primary separation tanks and concrete vaults. When the ponds are filled to freeboard elevation, they will have a maximum evaporation capacity of 2,598,850 barrels annually (see evaporative capacity calculations, Appendix B).
4. Five (5) 400-barrel tanks have been installed adjacent to the receiving tanks to store recovered condensate that is sold back to industry for refining. These tanks receive oil/condensate from the primary phase separation tanks (the Generation IV tank system) or the concrete vaults. Recovered condensate is off-loaded onto trucks and transported to a refining facility. Off-gases are routed to the thermal oxidizer for treatment (see item 5).
5. A thermal oxidizer and gas scrubber receive off-gases from the receiving tanks, concrete vaults and condensate tanks. The thermal oxidizer will achieve a minimum percent removal rate of Volatile Organic Compounds (VOCs) and Hazardous Air Pollutants (HAPs) of 98%. The gas scrubber uses water to scrub the exhaust gases from the thermal oxidizer. The water used is obtained on-site from the evaporation ponds and stored in one of two scrubber water storage

tanks. Scrubber water is evaporated in the scrubber unit with a maximum throughput of 210 barrels per day. Any sediment accumulated is periodically collected and shipped off-site for proper disposal at a permitted facility. The facility is not claiming any emission reduction through the use of the scrubber, since the unit is a prototype, although fully operational.

2.2. Site Equipment

The following equipment is in use at the site.

- Four (4) 500 bbl Receiving Tanks.
- Six (6) 410 bbl Concrete Vaults.
- Five (5) 400 bbl Condensate Storage Tanks.
- Two (2) 500 bbl Scrubber Water Storage Tanks.
- One (1) Thermal Oxidizer manufactured by Purestream Technologies (fully operational prototype unit), rated for 1,400 degrees Fahrenheit and 98% destruction efficiency.
- One (1) Gas Scrubber manufactured by Purestream Technologies (fully operational prototype unit).
- One (1) MQ DCA-25SSIU2 Portable Power Generator with 36 hp Isuzu AA-4LE2 diesel engine.
- One (1) MQ DCA-125USJ Portable Power Generator with 165 hp John Deere 6068TF275 diesel engine.
- One (1) Bobcat S250 Skidsteer Loader with 75 hp Kubota V3300 diesel engine.
- One (1) Terex AL4000 Portable Light Tower with 13.6 hp Kubota SKBXL01.3BCC diesel engine.
- Two (2) Global Pump 4GSTAP Portable Pumps with 36 hp diesel engine.
- One (1) Godwin CD150M Portable Pump with 97.2 hp diesel engine.
- One (1) 225 KW Natural Gas Turbine Generator.
- Eleven (11) NATCO Model SB16-18 Natural Gas Fired Process Tank Heaters with a heat rating of 500,000 BTU/hr. These heaters are located in the four (4) receiving tanks, the five (5) condensate storage tanks, and the two (2) scrubber water storage tanks.