Class V Underground Injection Control Inspection Report

Inspection Date/Time: 3/12/14, 1:10 p.m. – 3:28 p.m.

EPA Inspector: Jennifer Parker

Facility Name: Upper Skagit Indian Tribe Water Reclamation Facility
Facility Address: 5984 North Darrk Lane, Bow, Washington 98232
Facility Phone Number: 360-661-0932
Latitude: 48.56633
Longitude: -122.34506
Facility Participants: Bob Hayden, Upper Skagit Indian Tribe Project Manager
Brian Walker, Water and Wastewater Services
Jeff Christner, Wilson Engineering

Additional Participant: Jason Schneider, Indian Health Service

Inspection Comments

On March 3, 2014, I contacted Mr. Hayden to pre-announce this inspection. During a telephone call that same day we scheduled the inspection for March 12, 2014, starting at 1:00 pm. On March 12, 2014, I met Mr. Hayden and the other participants at the Upper Skagit Indian Tribe (USIT) Water Reclamation Facility. At 1:10 p.m., I presented my inspector credentials and provided the written Notice of Inspection to Mr. Hayden (carbon copy attached).

Injection Wells

Two injection wells were constructed to receive effluent from the water reclamation facility. The injection wells are located east of the treatment plant.

According to the facility representatives, well 1 was the only injection well in active use during this inspection. They told me that well 2 was taken offline about a year and a half ago because sand had entered the well and caused fluids to back up. They explained that they fully rehabilitated the well by removing the sand and a video investigation was also conducted. However, it has not yet been turned back on to receive the effluent. They also told me that since the two wells are of the same design they are actively checking well 1 to see if it has the same sand infiltration issues by continuously monitoring the water level and checking it every quarter to see if sand is entering it, but to date they have not identified any signs of sand infiltration in well 1.

I observed the injection well caps above the ground surface.

Photo: Injection wells 1 and 2. The active well (well 1) is in the foreground.

Water Reclamation Facility

The facility representatives provided a tour of the facility and described their operation and management of the treatment system. The information I received about the water reclamation facility is summarized as follows:

The USIT Water Reclamation Facility utilizes a membrane bioreactor (MBR) and UV disinfection to treat wastewater generated by USIT facilities. The facility representatives explained that the wastewater that enters the treatment system consists of sanitary waste only from the USIT casino, gas station, and hotel; no stormwater enters the system. Disposal of the treated effluent in the facility's injection wells began on October 24, 2011.

The treatment system is operated by Water and Wastewater Services. Brian Walker is a level four operator and he is the lead operator for this system, but three other Water and Wastewater Services operators also take turns operating this facility. One operator is on site at the plant three days a week. Water and Wastewater Services is on call at all other times and they are able to run the treatment system by remote control when they are not on site. I asked the facility representatives to describe the types of alarms that are built into the system that would generate calls to the operators at any hour of the day and they told me that they include alarms for equipment failure, shutdown, high levels, and lift station failures.

The facility representatives told me that the volume of effluent produced by the plant is currently lower than the plant capacity and so only half of the treatment plant is online at this time (one of the treatment trains is turned off). They told me that the flow rate has ranged from 30,000 – 70,000 gallons per day and it was running at approximately 50,000 gallons on the day of this inspection. They also told me that the flow volume is expected to increase in the future with additional development and the design maximum daily flow is 350,000 gallons. The idle membranes in the tank that has been turned off are maintained by the operators and they are currently available for use in case of additional flow or as a replacement in case of a tear in one of the active membranes.

The facility representatives told me that no changes have been made to the treatment system since the last EPA inspection during October 2012 and they have no current plans to make any changes to the

plant. Mr. Walker mentioned they have not had any inflow and infiltration problems. He also told me that the operators have only needed to clean the membranes twice since startup, whereas similar plants typically require cleanings twice a year. In addition, Mr. Walker told me that the computers are backed up and an emergency generator exists and worked as planned during a recent power outage.

The facility representatives described how the treatment system operation and effluent quality are monitored. They told me that system operation is monitored inline for turbidity, flow in the influent and effluent, pressure in the membrane tanks, flux rates, and transmembrane pressure. Mr. Walker told me that turbidity is typically <1 NTU. I observed a turbidimeter reading of 0.073-0.074 NTU during this inspection.

The facility representatives showed me the sampling port from which they collect effluent samples for laboratory analyses.

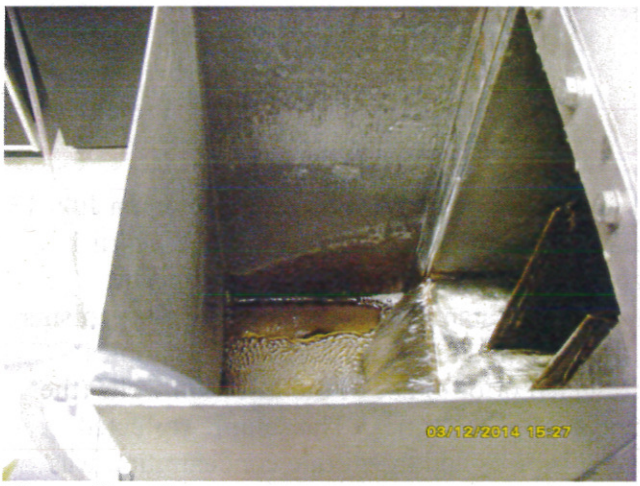

Photo: Sampling port.

Although the sampling port is located after the UV disinfection, Mr. Walker pointed out that they collect both pre- and post-UV samples for fecal coliforms testing. Mr. Walker told me that effluent quality is tested according to the following schedule: filterability is monitored every day, biological oxygen demand and fecal coliforms are monitored once a week, total suspended solids are monitored twice a week, and nitrate is monitored once a month. In addition, effluent samples are sent to an offsite laboratory twice a year for testing for all primary drinking water parameters. Mr. Walker told me that they have not detected any exceedances of maximum contaminant levels or anything else of concern in any of the in-house sampling. Mr. Walker also mentioned that they switched to monitoring nitrate once a month instead of once a week because the treatment plant is successfully denitrifying without any chemical additions and the nitrate concentrations have all been less than 10 mg/L.

Mr. Walker showed me the bench sheets in the onsite laboratory on which the operators track sampling and monitor readings. The bench sheets for the current month are hanging on a wall in the laboratory, while the completed bench sheets are stored in a file cabinet in the same room. I looked at the bench sheets and noted that they include forms for documenting biological oxygen demand tests, weekly inspections, nitrate probe calibration and results, ammonia probe calibration and results, plant monitoring reports, total suspended solids and coarse suspended solids readings, filter test results, and fecal coliforms results. They also have a biosolids tracking log.

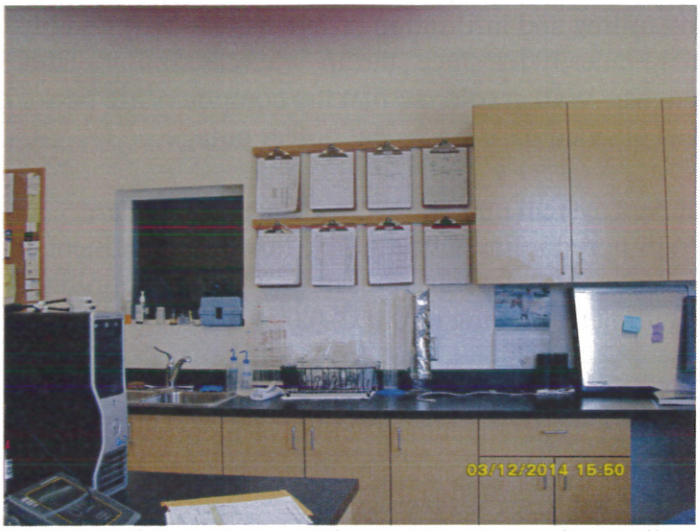

Photo: Bench sheets in use by operators to track sampling and record monitor readings.

Effluent (Injectate) Quality

The facility representatives showed me laboratory data reports for effluent samples collected on July 13, 2011, August 24, 2011, January 25, 2012, April 30, 2012, July 30, 2012, October 24, 2012, April 1, 2013, and October 28, 2013. The samples were analyzed at Edge Analytical Laboratories. The laboratory analyses are conducted for the primary drinking water standards, including microorganisms, inorganic chemicals, organic chemicals, radionuclides, and disinfection byproducts. The samples collected on July 13, 2011 and August 24, 2011 were collected prior to use of the injection wells (the effluent was still routed to the City of Burlington sewer system at the time). The sample collected during July 2011 did not contain detectable fecal or total coliforms and the nitrate concentration was 1.12 mg/L, but di(2-ethylhexyl)phthalate was detected at 8.4 ug/L in the sample. The sample collected during August 2011 did not have any exceedances of maximum contaminant levels and the nitrate concentration was 3.36 mg/L. Since injection began in October 2011, the laboratory analyses have not detected any exceedances of maximum contaminant levels in the injectate samples. In particular, total and fecal coliforms were not detected in any of the samples and the nitrate concentrations ranged from <1 mg/L – 2.01 mg/L.

Groundwater Monitoring

The USIT conducts groundwater monitoring to identify unintended impacts to the aquifer from the injection activities. Mr. Hayden and Mr. Christner showed me a report by Associated Earth Sciences (AES), dated February 25, 2014, which summarizes the last five years of monitoring data. They also showed me a map of the monitoring well locations (the same map they provided to the EPA during the October 2012 inspection). According to the AES report, water levels are monitored and the most recent samples were collected on March 27, June 25, September 18, and December 18, 2013. The samples were sent to Edge Analytical Laboratories and analyzed for iron, manganese, arsenic, chloride, nitrate, total dissolved solids, total and fecal coliforms, pH, conductivity, salinity, and turbidity. The following is a summary of the information and data associated with analyses for the primary drinking water parameters as presented in the AES report.

According to the AES report, Monitoring Well 2B, the monitoring well in closest proximity to the injection wells, was first sampled on March 22, 2012. Prior to that date, water was not observed in the well. Analyses of the samples collected in Monitoring Well 2B did not detect total and fecal coliforms

above the method detection level and nitrate was detected at concentrations ranging from 1.68-3.06 mg/L.

A former drinking water well (DW-1) located southeast of the injection site is no longer used to supply potable water but it is still used as a monitoring point. According to the information in the report, all of the parameters in the samples from this well were non-detect or below maximum contaminant levels. The nitrate concentrations in samples from well DW-1 ranged from 0.61 to 0.85 mg/L.

Analyses of samples collected from Monitoring Well 5, located southeast of DW-1, detected total coliforms at 2 MPN/100 mL in the sample collected on June 29, 2010, and total coliforms at 2.2 MPN/100 mL in the sample collected on December 31, 2011, but did not detect total coliforms in any other samples. No fecal coliforms were detected in any of the samples. According to the report, nitrate ranged from <0.1-0.12 mg/L in samples from Monitoring Well 5.

Analyses of samples collected from Monitoring Well 3, located southeast of the injection wells but further north than DW-1 or Monitoring Well 5, did not detect total and fecal coliforms above the method detection levels and nitrate ranged from <0.1 – 0.13 mg/L.

Samples collected from Monitoring Well 4, located south of the injection wells, contained nitrate <1 mg/L. In the sample collected on June 25, 2013, total coliforms were detected at >23 MPN/100 mL but no result was reported for fecal coliforms on the same date. In the sample collected on September 18, 2013, total coliforms were detected at 17 MPN/100 mL, but fecal coliforms were <1.8 MPN/100 mL. In the sample collected on December 18, 2013, total coliforms were detected at >23 MPN/100 mL but fecal coliforms were reported at <1.1 MPN/100 mL in the results for the same date.

Monitoring Well 1 is located to the east, near Friday Creek. Analyses of the sample collected on September 22, 2011, detected total coliforms at 1.8 MPN/100 mL, but results for fecal coliforms for the the same day were reported at <1.8 MPN/100 mL. Analyses of the sample collected on December 13, 2011, detected total coliforms at >23 MPN/100 mL, but results for fecal coliforms for the same day were reported at <1.1 MPN/100 mL. Analyses of the sample collected on March 22, 2012, detected total coliforms at 4.5 MPN/100 mL, but results for fecal coliforms for the same day were reported at <1.8 MPN/100 mL. According to the report, there were no other detections of total or fecal coliforms above method detection levels and the nitrate concentration in samples from Monitoring Well 1 has ranged from <0.1-0.29 mg/L.

Photo Log:

Photo Number	Description
SI850817.JPG	MBR tank.
SI850818.JPG	Photo taken by mistake.
SI850819.JPG	Injection wells 1 and 2, with monitoring wells in the background. Injection well 1 is closest to the photographer.
SI850820.JPG	Equalization tank. Influent screens are in the structure in the background.
SI850821.JPG	UV disinfection system.
SI850822.JPG	Post-UV effluent sampling port.
SI850823.JPG	Post-UV effluent sampling port.
SI850824.JPG	Bench sheets used by operators to track sampling and record monitor readings.

Inspection Photos:

SI#50817

SI#50818

SI#50819

SI#50820

SI#50821

SI#50822

SI#50823

SI#50824

Report prepared by: Jennifer Parker

Date completed: 5/5/14