Draft Public Notice Version April 2019. The findings, determinations and assertions contained in the document are not final and subject to change following the public comment period.

GROUND WATER QUALITY DISCHARGE PERMIT UGW470005

STATEMENT OF BASIS

Uintah Advantage, LLC
Industrial Waste Water Evaporation Ponds
Uintah County, UT

April 2019

Introduction

The Division of Water Quality (DWQ) under the authority of the Utah Ground Water Quality Protection Rules[1] (Ground Water Rules) issues ground water discharge permits to facilities which have a potential to discharge contaminants to ground water[2]. As defined by the Ground Water Rules, such facilities include lined ponds.[3] The Ground Water Rules are based on an anti-degradation strategy for ground water protection as opposed to non-degradation; therefore, discharge of contaminants to ground water may be allowed provided that current and future beneficial uses of the ground water are not impaired and the other requirements of Rule 317-6-6.4.A are met.[4] Following this strategy, ground water is divided into classes based on its quality[5]; and higher-quality ground water is given greater protection[6] due to the greater potential for beneficial uses.

DWQ has developed permit conditions consistent with R317-6 and appropriate to the nature of the stored material, facility operations, maintenance, best available technology[7] (BAT) and the hydrogeologic and climatic conditions of the site, to ensure that the operation would not contaminate ground water.

Basis for Permit Issuance

Under Rule 317-6-6.4A, DWQ may issue a ground water discharge permit if:

1) The applicant demonstrates that the applicable class TDS limits, ground water quality standards protection levels and permit limits established under R317-6-6.4E will be met;
2) The monitoring plan, sampling and reporting requirements are adequate to determine compliance with applicable requirements;
3) The applicant is using best available technology to minimize the discharge of any pollutant; and

[1] Utah Admin. Code Rule 317-6
[2] https://deq.utah.gov/ProgramsServices/programs/water/groundwater/docs/2008/08Aug/GWQP_PermitInfo.pdf
[3] Utah Admin Code Rule 317-6-6.1A
[4] Preamble to the Ground Water Quality Protection Regulations of the State of Utah, sec. 2.1, August, 1989
[5] Utah Admin. Code Rule 317-6-3
[6] Utah Admin. Code Rule 317-6-4
[7] Utah Admin. Code Rule 317-6-1(1.3)

4) There is no impairment of present and future beneficial uses of ground water.

Purpose

Uintah Advantage, LLC is constructing a crude oil upgrading facility in Uintah County, Utah at a site located on the Leland Bench located approximately 10 miles south of Fort Duchesne (Figure 1). The Project entails the construction and operation of a crude oil upgrading facility that will process locally-produced yellow and black wax crude into naphtha, pitch, lube-oil base, low-sulfur diesel and other refined petroleum products. Process water that cannot be recycled will be stored for evaporation in double-lined ponds with a combined operating volume of approximately 240 acre-feet. The proposed evaporation pond will be located on land owned by the Uintah Advantage.

Ground Water Discharge Permit UGW470005 will be issued to authorize the construction of the two (2), 10-acre industrial waste water evaporation ponds. Uintah Advantage, LLC is the owner and operator of the processing facility and the evaporation ponds.

New Facilities

The following new facilities will be regulated under this Permit including the associated Best Available Technology (BAT) and requirements for monitoring: Two (2) Industrial Waste Water Evaporation Ponds (Figure 2).

Each industrial waste water evaporation pond will cover an area of approximately 10 acres. Process water stored in the ponds will be generated from the crude petroleum processing operation. The primary contaminant is the process water is anticipated to be total dissolved solids (TDS) with some dissolved petroleum constituents and process chemicals. Before discharge to the evaporation ponds, process water will be treated at an onsite water treatment plant and, when possible, water will be recycled. Excess process water will be sent to the evaporation ponds.

The pond basins will be constructed using a combination of excavation into the ground surface and the construction of elevated berms. The ponds have been designed to be an average of approximately twelve feet deep with two feet of additional freeboard. The ponds will be constructed with composite liner systems consisting of a 45-mil reinforced linear low-density polyethylene (RLLDPE) primary (upper) liner and a 45-mil RLLDPE secondary (lower) liner. The liners will be separated by a geonet geomembrane layer drainage gap between the primary and secondary RLLDPE liners to route leakage to a pond leak collection and recovery sump (LCRS) constructed at the low-point of each pond.

A pump will be installed in each LCRS (as necessary), and leakage water will be pumped back to the pond if more than one foot of fluid head is observed above the secondary liner elevation. The ponds are designed as zero-discharge systems; the leak detection sumps

and pumps are designed to capture and return the maximum calculated leakage flow rate back to the surface of the evaporation ponds.

Due to the estimated depth to groundwater (deep) and relatively low groundwater quality is facility area, groundwater monitoring well installation and monitoring is not require unless a BAT failure indicates a potential discharge to the subsurface; in which case groundwater monitoring wells, compliance monitoring, and remedial action may be required. The LCRS will be the primary compliance point.

The groundwater discharge permit application submitted by Uintah Advantage describes a storm water holding pond (542,000 gallon) that will be installed to temporarily hold storm water draining from the process equipment area; however, no process water will be discharged to the holding pond. Water held in the storm water holding pond will be pumped to the water treatment plant and recycled, or discharged to the evaporation ponds. Based on DWQ's understanding of this process and water, the storm water that accumulates in the storm water holding pond will regulated under the Utah Pollutant Discharge Elimination System (UPDES) permit system and not under this ground water discharge permit.

BAT Performance Monitoring

Best available technology monitoring will include minimum vertical freeboard and maximum allowable leakage rate monitoring. These performance standards are based on the precedence of previous ground water discharge permits and *Action Leakage Rates For Leak Detection Systems* (USEPA, Office of Solid Waste, January 1992).

Minimum Vertical Freeboard. A minimum of 24 inches of vertical freeboard in each pond shall be maintained to ensure total containment of the industrial waste water.

Maximum Allowable Leakage Rate. The LCRS are the primary compliance monitoring points because they are the early warning system that demonstrates protection of ground water quality. Based on an individual pond areas of approximately 10 acres, the calculated maximum allowable leakage rate through each primary RLLDPE pond liner is 3.8 gallons per minute (5,528 gallons per day).

The pond elevations will also be recorded on a daily basis. A drop in pond elevation that exceeds the calculated pond evaporation rate will also indicate an exceedance of the maximum allowable leakage rate.

Maximum Allowable Head. Based on EPA guidance for BAT performance monitoring, the maximum allowable hydraulic head imposed on the secondary RLLDPE liners (measured in the leak detection sump) will be one foot of fluid head above the secondary liner in the LCRS. Fluids collected in the leak detection sump will be pumped back to the temporary evaporation pond to ensure that less than one foot of hydraulic head above the secondary liner in each LCRS is maintained.

As long as the LCRS complies with the BAT performance standards of the permit, the facility is compliant. In the event that the LCRS has flows or fluid head that exceed the BAT performance standards of the permit, a BAT failure exists and the permittee will be required to regain BAT by a number of solutions including identifying and repairing the BAT failure, such as a liner leak, or conducting groundwater compliance monitoring to demonstrate that ground water quality is protected despite the exceedance of BAT performance standards.

Potential Impacts to Ground Water

Potential impacts to ground water will be minimized by employing best available technology for the waste water evaporation ponds. The Division of Water Quality will provide periodic onsite inspections during construction and operation of the facilities described above. The pond will be monitored and inspected daily to assess conditions and identify any problems that may result in a groundwater discharge.

Geologic Description

Regional. The 640-acre Uintah Advantage site is situated on the Leland Bench in the central Uinta Basin. The Uinta Basin is bounded on the north by the Uinta Mountains, to the west by the limits of the drainage of the Strawberry River, and to the south by escarpment of the Roan Cliffs (Howells et al. 1987). The Uinta Basin forms a complex geologic structural basin and is a significant source of oil and gas production. Oil and gas are found in the Eocene-age Green River Formation (shales) and Cretaceous Mancos Shale.

The Leland Bench is an arid plateau that rises between the Green and Duchesne River drainages. The geology of the Leland Basin is described as "Holocene and Pleistocene piedmont and basin alluvium (Qa)" (Sprinkel 2007). The Leland Bench alluvium is characterized by variably consolidated, poorly to moderately sorted sand, gravel, cobbles, and boulders deposited on near-planar bedrock surfaces.

The soil type in the area of the evaporation ponds is described primarily as "Boreham loam, 0 to 2 percent slopes." A typical soil profile includes an A horizon from 0 to 9 inches with loam, a Bk1 and Bk2 horizon from 13 to 49 inches of loam, and a 2Bk3 horizon from 49 to 60 inches with very gravelly sandy loam.

Surface Water There are no springs, streams or other water bodies found at the project site. Some ephemeral stream beds are present. The nearest persistent surface water is the Pleasant Valley Wash/Pariette Draw located approximately 2.9 miles southwest of the site. The elevation of the evaporation pond site is approximately 5,160 feet MSL, and the elevation of the Pleasant Valley Wash is approximately 4,865 feet MSL. The Duchesne River is located approximately six miles to the east with an approximately elevation of 4,670 feet MSL.

Hydrogeology

The Project site is located within the central Uinta Basin. The project area is not considered an area of significant groundwater development (Burden et al. 2017). The regional groundwater system in the Leland Bench area is not well-characterized but likely to be comprised of unconsolidated basin-fill deposits where groundwater is under both unconfined and confined conditions. Recharge is the groundwater system occurs by infiltration of precipitation (7.26 inches per year average annual precipitation), ephemeral streams, and by regional inflow from consolidated rock.

Depth to groundwater in the project area is not known. Pre-drilling evaluations for numerous oil wells in the area estimated a depth to groundwater of 100 to 200 feet below grade, but drilling logs do not indicate that groundwater was encountered.

No site-specific groundwater quality data are available. Based on limited groundwater quality data collected in the area (Howells et al. 1987), TDS concentrations in the project area are estimated to be between 3,000 and 3,500 milligrams per liter (mg/L) with TDS increasing towards the south.

The nearest downgradient groundwater water well appears to be located approximately 9.7 miles east-southeast of the evaporation ponds (Water Right 43-10389). A private water supply well was installed in 2008 to a depth of 966 feet and provides up to 4.73 acre-feet per year of water for domestic, irrigation, and livestock use.

The nearest groundwater water right appears to be located approximately 2.5 miles north (topographically upgradient) of the evaporation ponds (Water Right 43-12953). A private water well was approved in 2017 but does not yet appear be installed. The well was approved with a depth up to 500 feet and may provide up to 1.73 acre-feet per year of water for domestic, irrigation, and livestock use.

Ground Water Quality

Ground Water Classification. In accordance with UAC R317-6-3.5 and ground water quality information provided in the permit application and available data from the area, groundwater in the proposed waste water pond areas is classified as Class III Limited Use Ground Water.

Class III Protection Levels. It is not anticipated that groundwater monitoring will be required for this Project, but if it is determined at a later time to be necessary, Class III protection levels will be established. In accordance with UAC R317-6-4.6, Class III ground water will be protected as a potential source of drinking water, after substantial treatment, and as a source of water for industry and agriculture. Class III protection levels are established in accordance with the following criteria in UAC R317-6-4.6B:

a. Total dissolved solids (TDS) may not exceed the greater of 1.25 times the background concentration level or background plus two standard deviations.

b. When a contaminant is not present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 0.5 times the ground water quality standard, or the limit of detection.

c. When a contaminant is present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 1.5 times the background concentration or 0.5 times the ground water quality standard or background plus two standard deviations; however, in no case will the concentration of a pollutant be allowed to exceed the ground water quality standard. If the background concentration exceeds the ground water quality standard no increase will be allowed.

COMPLIANCE SCHEDULE

- BAT Performance Monitoring. The evaporation pond will be visually inspected on-site on a daily basis.

  A. In-person daily inspections will record the following information:

     1. Name of Inspector
     2. Date and Time of inspection
     3. Weather conditions (e.g. sunny, warm, rainy) including temperature and any significant rainfall in the last seven days
     4. Nature of inspection (routine or repair inspections)
     5. Condition of liner and location of any breaches in the liner noted on a site plan
     6. Any repair action taken
     7. Water level in pond
     8. Water level in each leak collection sump (elevation of secondary/lower liner of leak collection pit and depth of leak detection sump must be known). Water level must be less than one foot above secondary liners in the LCRS.
     9. Indication if pumping is necessary
     10. Volume of water pumped from each pond. Pump rate should be less than 5,528 gallons per day to maintain one foot of hydraulic head above secondary pond liners in the LCRS.
     11. Changes in operation procedures
     12. Signature of inspector

  B. Any BAT failure will be reported to DWQ within 24 hours and addressed immediately. A summary and compilation of all inspection reports and any corrective actions will be sent to DWQ on a quarterly basis.

- Final Closure Plan. When the permittee discontinues its operations at the facility, the Permittee shall notify the Director of such a decision and submit a Final Closure Plan within 180 days prior to the closure of the facility.

Figures

Figure 1 – Site Location Map
Figure 2 – Facility Map

References

Burden, Carole B. and others, 2017. Groundwater Conditions in Utah, Spring of 2017. Utah Department of Natural Resources. Cooperative Investigations Report No. 58

Howells, Lewis, Mark S. Longson and Gilbert L. Hunt, 1987. Base of Moderately Saline Ground Water in the Uinta Basin, Utah, with an Introductory Section Describing the Methods Used in Determining Its Position. Utah Department of Natural Resources, Technical Publication No. 92 / USGS Survey Open-File Report 87-397.

Sprinkel, Douglas A., 2007. Interim Geologic Map of the Vernal 30'x60' Quadrangle, Uintah and Duchesne Counties, Utah, and Moffat and Rio Blanco Counties, Colorado. Utah Geologic Survey Open-File Report 506DM.

Permit Application Documents

The following documents are considered part of the ground water quality discharge permit application and will be kept as part of the administrative file.

1. Uintah Advantage, LLC Leland Bench Crude Oil Upgrading Ground Water Discharge Permit Application and Supporting Documents, prepared and submitted by Uintah Advantage, February 13, 2018 (edocs DWQ-2018-003211).

2. Uintah Advantage, LLC Leland Bench Crude Oil Upgrading Ground Water Discharge Permit Application:
    - Revised Waste Water Pond Design and Installation
    - Revised Hydrogeological Report
    - Revised Contigency and Corrective Action Plan

    Prepared by Uintah Advantage, November 2, 2018 (edocs DWQ-2018-012830)

3. Uintah Advantage, LLC Leland Bench Crude Oil Upgrading Ground Water Discharge Permit Application:
    - Revised Waste Water Pond Design and Installation
    - Revised Contigency and Corrective Action Plan

    Prepared by Uintah Advantage, February 11, 2019 (edocs DWQ-2019-001582)

4. Action Leakage Rates for Uintah Waste Water Ponds, rev2. Prepared by Uintah Advantage/Z Engineering and Environmental Services (email), April 8, 2019 (edocs DWQ-2019-003734)