INTRADEPARTMENTAL MEMORANDUM

FILE: WISCO (0372)

TO: Charles R. Hyatt, Director
    Division of Waste Management

FROM: Diana A. Trussell, Manager
       Solid Waste Program
       Division of Waste Management

SUBJECT: Permit Application Review

DATE: June 24, 2022

Introduction

On October 15, 2020, the North Dakota Department of Environmental Quality (Department) received a permit application for a minor modification and renewal for WISCO, Inc.'s (WISCO) oilfield special waste landfill.

WISCO currently owns and operates an oilfield special waste landfill, regulated under Permit 0372 on approximately 147 acres located in the NW1/4 of Section 26, Township 154 North, Range 104 West in Williams County, ND. WISCO is proposing to modify and renew their permit to add a solidification treatment unit and to continue operations. The facility was first permitted in 2013.

Design

The facility includes a lined disposal area (landfill), a lined leachate pond, two sedimentation basins, an access road, an office and scale location, and soil stockpiles. The lined landfill area is approximately 25.6 acres, and the lined leachate pond is approximately 2.5 acres.

Landfill

The landfill has a waste disposal capacity of approximately 3,200,000 cubic yards (yd³). The landfill will be developed in four cells with Cell 1 being constructed in two phases. Cell 1 – Phase 1 was constructed in 2014 and Cell 1 – Phase 2 was constructed in 2019. There will be a cell separation berm constructed on the west side of each new cell to prevent waste or leachate from contacting clean soil or stormwater runoff. Leachate from within the lined area will be collected in a sump in the southeast corner of the landfill and will be pumped to the leachate pond located to the south of the landfill. Stormwater to the west of the phase separation berm will be detained and pumped to the sedimentation basin and treated as clean surface water. Landfill cells will last from 2 to 10 years depending on the fill rate.
A composite liner will be constructed on the base and side slopes of the landfill. The composite liner will consist of a 60-mil high density polyethylene (HDPE) liner, overlying a 3-foot compacted clay barrier layer. The clay barrier layer will have a maximum hydraulic conductivity of \(1 \times 10^{-7}\) centimeters per second (cm/sec) and will be compacted to a minimum of 95 percent standard Proctor dry density, with a moisture content 2 to 5 percentage points wet of optimum. The HDPE liner will be overlain by 12 inches of granular drainage material or, alternatively, a geonet that is used for the leachate collection layer. The hydraulic conductivity of the drainage layer is specified to be \(1 \times 10^{-3}\) cm/sec, or greater. If used, a geonet drainage material will be selected to provide hydraulic conductivity equal to or greater than a 12-inch-thick granular drainage material layer would provide. On all side slopes steeper than 20 percent, a dual-sided textured geomembrane will be utilized to improve stability of the geomembrane/clay interface and geomembrane/drainage layer or geonet surface.

The leachate collection system in combination with the base liner has been designed to collect and convey leachate from the landfill cells to the collection sump, which is then pumped to the leachate pond. The granular drainage layer or geonet drains leachate to the slotted leachate collection pipes installed in the leachate collection trenches. The pipes are embedded in drainage aggregate above a geotextile or geonet cushion layer and covered with a fine filter aggregate or geonet filter layer. The sump incorporates a side-slope riser pumping system to eliminate piping penetrations of the landfill liner. The system is designed to limit the hydraulic head on the liner system to no more than 12 inches. Leachate head is monitored continuously via a side slope riser accessing the storage sump and the use of a pressure transducer. The pressure transducer readout will be positioned between the side slope riser pipes and the leachate pond for easy inspection.

The leachate pond was constructed in 2014 as part of the Cell 1 – Phase 1 construction. A composite liner was constructed on the base and side slopes of the leachate pond. The composite liner consists of a 60-mil HDPE liner, overlying a 3-foot-thick compacted clay barrier layer. A dual-sided textured geomembrane was utilized on the side slopes to improve stability of the geomembrane/clay interface. The clay barrier layer has a maximum hydraulic conductivity of \(1 \times 10^{-7}\) cm/sec or less and was compacted to a minimum of 95 percent standard Proctor dry density, with a moisture content 2 to 5 percentage points wet of optimum. The HDPE liner on the floor was overlain by 12 inches of random fill material to hold down and provide protection to the geomembrane. The random fill material was placed above a protective geotextile layer. The HDPE liner on the side slopes was covered with a protective geotextile layer and a 60-mil HDPE geomembrane utilized for additional layers of ultra-violet and puncture resistance protection. The 60-mil HDPE protection layer was anchored at the top with the liner geomembrane and extended down past the toe of slope by 5 feet, extruded to the liner geomembrane, and covered with the random fill layer on the floor of the pond. The leachate pond is designed for a maximum open waste area of 16.7 acres plus direct surface runoff. The leachate pond has a lined footprint of approximately 2.52 acres (806 feet by 136 feet with a depth of 12 feet). The leachate pond provides approximately 5,800,000 gallons of leachate holding capacity plus 2 feet freeboard.

Solidification Treatment Unit

The solidification treatment unit will be located adjacent to the landfill office. The unit will consist of a treatment pit and adjacent loading/unloading area enclosed within a pre-engineered metal building. The proposed treatment pit is 8 feet deep by 21 feet wide by 62 feet long and constructed of concrete. A steel plate liner is proposed for the base of the pit to provide containment and protect the concrete structure. The treatment unit will operate as a closed
system. All free liquids will be solidified leaving no leachate to manage. The treatment unit area will be constructed with a minimum grade of 2% away from the building foundation to ensure proper drainage and to keep storm water from entering the treatment area.

**Operation**

**Landfill**

The facility accepts oilfield special waste, industrial waste, inert waste, petroleum contaminated waste and mixed waste. Mixed waste refers to the mixing of exempt and non-hazardous (exempt or non-exempt) wastes as defined in the Environmental Protection Agency's (EPA) *Exemption of Oil and Gas Exploration and Production Wastes from Federal Hazardous Waste Regulations.*

Wastes will be rejected if the waste does not meet the definitions of special waste, industrial waste, inert waste and mixed waste.

The landfill is designed with four cells. Cell 1 has been constructed in 2 phases. Filling will progress across the cells in lifts. Once the opposite end of the active fill area is reached, filling will progress back across the fill area. Waste will be placed, spread, and compacted in lifts as small as practical to minimize the potential for standing water in the active filling areas, to optimize space, and to minimize environmental effects. Dozers will be used to compact waste lifts 6 to 12 inches which up to five passes typically required to reach desired compaction. A sheepfoot compactor may be used with three to four passes typically required to reach desired compaction. Waste lifts will be sloped with a minimum of 2% towards the perimeter. Any waste that is accepted and found to emit strong odors will immediately be covered with material to minimize its impact.

Any areas of the landfill where final cover or additional solid waste will not be placed within 6 months, intermediate cover will be placed. Intermediate cover consists of 8 inches of compacted clay-rich soil.

The leachate pond was constructed in 2014 as part of the Cell 1 – Phase 1 construction. The leachate pond is designed for a maximum open waste area of 16.7 acres plus direct surface runoff.

**Solidification Treatment Unit**

The entrance and exit for the building will be through overhead doors that can accommodate large vehicles such as side dumps, vac trucks, end dumps, loaders, and other vehicles. Treatment operations will take place within the metal building and solidification activities will not be exposed to storm water. Waste will be unloaded from transport vehicles directly into the solidification pit. Incoming dry solid waste, recycled dry solid waste from the landfill, cement lime, and/or fly ash will be added as necessary to the pit to solidify the waste. The waste will be mixed as necessary using an excavator. Once free liquids have solidified, the waste will be transported to the adjacent landfill for disposal. The loading/unloading area will be cleaned as necessary to ensure that free liquids are not tracked out of the treatment unit building.
Closure

Landfill

According to the engineering report in the permit application, the final cover will be a minimum of 5 feet thick consisting of a 1.5-foot compacted clay barrier with a hydraulic conductivity equal to or less than $1 \times 10^{-7}$ centimeters per second (cm/sec), 2-foot-thick low permeability soil layer overlain by a 1.5-foot-thick cover soil layer. The 1.5-foot-thick cover soil layer consists of 1 foot of subsoil that serves as a plant rooting zone and a minimum of 0.5 foot of suitable plant growth material (SPGM) topsoil. The SPGM topsoil layer will be mulched and seeded with shallow-rooted, drought-tolerant grasses. The drawings in the engineering report in the permit application show a minimum of a 3-foot final cover that consists of a 1.5-foot compacted clay barrier with a hydraulic conductivity equal to or less than $1 \times 10^{-7}$ cm/sec, 1 foot of subsoil that serves as a plant rooting zone and a minimum of 0.5 foot of suitable plant growth material (SPGM) topsoil. Both final covers meet the requirements and prior to closure the facility will have to decide which final cover system it will be utilizing.

The final cover sides slopes are designed with 25 percent slopes with a 21-foot-wide berm constructed at approximately mid-slope around the perimeter of the cap. The bench contains a ditch and berm system that helps control run-off and erosion. The top is flat and is approximately 2-acres with a minimum 2% slope which drains to the southeast into the downslope drainage structure. A small diversion berm on the south and east sides of the top direct water away from flowing over the 25% side slopes. Runoff will be directed along the final cover on the surface. The runoff from the final cover will ultimately drain to the sedimentation basin on the south side of the landfill. Erosion will be controlled by limiting the slopes to 25% and installing erosion control mulch and matting on newly constructed cover systems to ensure stability and quick vegetation establishment.

Solidification Treatment Unit

Upon closure, the treatment unit will be closed in accordance with the solid waste management rules. Testing and remediation will be completed as necessary at the time of closure. If allowed, the metal building may remain and be repurposed.

Compliance History

The following items of noncompliance have been noted since 2018:

- Accepting more industrial waste than allowed in one month
- Excessive amount of leachate ponded at the west edge of Cell 1
- Greater than 12 inches of leachate head on liner
- Leachate collection system not flushed annually
- No WISCO personnel on site during an inspection
- Puddling of leachate within the cell due to using a sprinkler to spray leachate over the active area of the landfill
- Lack of runoff controls for leachate from hose that was between the leachate pond and the cell
- Schedule B not revised – financial assurance
- 2021 Annual Groundwater Report not received on time
The above items of noncompliance have been appropriately addressed by the facility, and no formal notices of violations have been issued to the facility.

While there have not been any violations of the odor standards, the Department has received several complaints regarding odors at the facility. It is recommended that a permit condition be added to the permit requiring the facility to submit an odor control plan to address odor concerns.

**Solid Waste Management Rules (NDAC Article 33.1-20)**

**NDAC Section 33.1-20-02.1-05. Record of notice.**

A record of notice was filed with the Williams County Recorder on January 16, 2014 and a copy was provided to the Department.

**NDAC Section 33.1-20-02.1-06. Property rights.**

The permit application included a copy of the Warranty Deed showing that WISCO owns the property.

**NDAC Section 33.1-20-03.1-01. Preapplication procedures.**

On June 12, 2012, WISCO submitted a preapplication to the Department. The preapplication was routed to the North Dakota Geological Survey, North Dakota Water Commission (now the North Dakota Department of Water Resources), and the Department's Division of Water Quality. WISCO had originally proposed a larger landfill by diverting the drainageway leading from north of Highway 2 westward, around the proposed unit. Commenters expressed concerns with that regarding erosion and drainage issues. WISCO then proposed only development of the area east of the drainageway and provided a setback from that erosion-prone drainage area. The Department approved the preapplication in a letter dated August 8, 2012.

**NDAC Section 33.1-20-03.1-02. Permit application procedures.**

**NDAC Subsections 33.1-20-03.1-02(1) – (3)**

A permit application including supporting documentation was submitted to the Department on October 15, 2020. A hard copy and a digital copy were provided. A permit application processing fee of $23,000 was enclosed.

**NDAC Subsection 33.1-20-03.1-02(4)**

A public notice by the facility is not required for a permit renewal and no major modifications are being proposed.

**NDAC Subsection 33.1-20-03.1-02(5)**

Notification to the North Dakota Public Service Commission is not required as the facility is not proposing to dispose of coal processing wastes in a mining permit area.
Applications for a solid waste management unit or facility permit must include the following information where applicable:

a. A completed application form, subsection 1;

   A permit application including supporting documentation was submitted to the Department on October 15, 2020. A hard copy and a digital copy were provided. A permit application processing fee of $23,000 was enclosed.

b. A description of the anticipated physical and chemical characteristics, estimated amounts, and sources of solid waste to be accepted, including the demonstration required by North Dakota Century Code section 23.1-08-14;

Landfill

A waste acceptance plan was included with the permit application. The plan includes the following information:

- Accepted Wastes
- Rejected Wastes
- Waste Acceptance Procedures
- Waste Rejection Procedures
- Waste Screening
- Waste Sampling

The facility accepts oilfield special waste, industrial waste, inert waste, petroleum contaminated waste and mixed waste. Mixed waste refers to the mixing of exempt and non-hazardous ( exempt or non-exempt) wastes as defined in the Environmental Protection Agency’s (EPA) Exemption of Oil and Gas Exploration and Production Wastes from Federal Hazardous Waste Regulations.

Wastes will be rejected if the waste does not meet the definitions of special waste, industrial waste, inert waste and mixed waste. The following wastes will be rejected:

- Hazardous waste as defined by North Dakota Century Code (NDCC) Chapter 23.1-04
- Asbestos containing materials (ACM)
- Wastes with free liquids
- Radioactive waste not considered to be naturally occurring radioactive material (NORM)
- Municipal solid waste/household garbage
- Putrescible waste
- Regulated infectious waste
- Animal carcasses
- Polychlorinated biphenyl (PCB) waste and PCB oils
- Waste grains, elevator screens and similar food-related agriculture wastes
- Waste oil
- Batteries
- Pesticide containers which have not been rinsed
- Waste grain seed and elevator screenings
- Petroleum contaminated waste exceeding 50 parts per million (ppm) of benzene as determined by EPA Method 8260

The facility states that it will accept up to 25,000 tons per month, not to exceed 300,000 tons of special waste per year. In addition, the facility will accept up to 25,000 tons of industrial waste per year or 3,000 tons in any one month.

The facility has a pre-screening process which includes reviewing the material description of the waste including the name of the waste generator, the source or process generating the waste, the location from where the waste is generated, the volume and any other pertinent information. Next a waste profile record must be submitted by the generator to the facility. The waste profile record includes the following information:

- Generator name, address, phone number and contact name
- Hauler/contractor name, address, phone number, contact name, and transportation license
- Address or originating location of the waste
- Material name, which typically represents the process that cause the material to be generated (i.e. drill cuttings)
- Material description:
  - Anticipated waste volume
  - Waste type
  - Analytical waste characterization
  - Generator representation and certification that:
    - All information is true and accurate
    - Analytical work is from a representative sample of the waste
    - Materials that required radioactive testing have been analyzed by a State recognized laboratory and data supplied to the facility
    - No wastes will be delivered to the landfill that do not conform to the waste profile record
    - Representation that no prohibited waste will be delivered to the landfill

The plan also describes NORM and technologically enhanced naturally occurring radioactive material (TENORM) screening. Natural gas and crude oil production and transportation waste and wastes that may have been contaminated by such material will be analyzed for radium-226 (Ra-226) and radium-228 (Ra-228) and lead-210 (Pb-210) by a state approved laboratory prior to acceptance. In 2016 the Department modified the regulations regarding the disposal of TENORM waste and eliminated the disposal limit for
lead-210. The facility would not be required to test for lead-210 in the waste. If the total laboratory measured Ra-226 plus Ra-228 or Pb-210 concentrations are greater than 5 pCi/g, the waste will not be accepted by the facility. The following wastes (not all inclusive) would be tested:

- Accumulated materials including solids, scale, sediment, production sands, emulsion, sludges, and other tank bottoms from storage facilities, separators, heater-treaters, vessels, tanks, and production impoundments that hold product or exempt waste
- Pipe scale, hydrocarbon solids, hydrates, and other deposits removed from tubular goods, piping, casing, filters, filter bags, clean-out traps and other equipment
- Pigging wastes from gathering lines
- Filter sock and proppant from oilfield exploration, production and deep well injection activities
- Any other waste material suspected to contain TENORM or likely to have accumulated TENORM in concentrations greater than 5 picocuries per gram (pCi/g)

No waste will be accepted at the landfill without having passed the pre-screening and waste profiling procedures. The documentation and records must be on file will the landfill prior to the waste arriving. Each load will include a numbered waste manifest that provides the information below:

- Generator name, address and contact details
- Generator certification statement
- The waste origin/location
- The waste description/generating process
- Transporter name, address and contact details

Once the waste arrives, the waste is inspected and verified. The waste is visually inspected and compared with the description on the documentation provided by the waste generator. A sample may be collected for testing if necessary to verify acceptance of the material. If the waste appears to have or is suspected to contain free liquids, the waste will be inspected and tested prior to acceptance by the landfill. The Paint Filter Liquids test (EPA Method 9095) will be used to determine if the waste contains free liquids.

The facility also conducts random waste sampling on at least 1 out of every 100 loads. The tests include the free liquids test, screening using a handheld Geiger counter, and testing from Ra-226 and Ra-228. Waste loads from new generators and/or haulers will be tested more frequently.

The plan states that a handheld Geiger counter will be used to screen production wastes only, not exploration waste, industrial wastes, or inert wastes. If the screening is under twice background, the waste can be accepted. If the screening is at least twice background or more, the waste will be rejected. The facility will notify the Department if any loads are rejected. The Department requires that all incoming loads, regardless of the
type of waste, are screened. This requirement is addressed through Permit Condition F.7.

Solidification Treatment Unit

The Plan of Operation included waste information and waste acceptance/rejection procedures. The treatment unit will only accept wastes that meet the definitions of special waste, industrial waste, inert waste, and mixed waste when solidified. No hazardous or TENORM waste will be accepted, even if they would meet that definition when material was added for solidification (i.e. no dilution). In general, the treatment unit will follow the same rejection protocols as the landfill with the exception that the treatment unit will accept free liquids. The same TENORM screening will be performed at the treatment unit as at the landfill.

c. The site characterization of section 33.1-20-13-01 and a demonstration that the site fulfills the location standards of section 33.1-20-04.1-01;

The permit application included the Site Characterization Investigation Report and Environmental Monitoring System Plan dated February 2013 by Barr Engineering (Barr).

During the fall of 2012, twenty-four soil borings were advanced across the general landfill area and seven were turned into piezometers. Several of the piezometers will be converted to permanent groundwater monitoring wells and water level piezometers. One of the soil borings was advanced to a depth of 185 feet below ground surface and two of the soil borings were completed as groundwater monitoring wells.

The site lies within the glaciated area of the Missouri Plateau. Surficial geology consists of the Coleharbor Formation glacial till draped over the pre-existing bedrock topography. Glacial till is composed of a heterogeneous mixture of all particle sizes from clay through boulders, although till in Williams County is generally a mixture of nearly equal parts of clay, silt, and sand with a small percentage of gravel. It is thickest (40 feet) in the southwest part of the site and thinnest (three feet) in the northeast corner of the site. The till is generally classified as fat clay with sand, lean clay with sand or sandy lean clay. The average permeability is 2.9x10⁻⁶ centimeters/second (cm/sec).

Underlying the Coleharbor Formation in Williams County, the Tertiary-aged Fort Union Group is subdivided into five formations, the uppermost of which is the Sentinel Butte Formation. The Sentinel Butte Formation consists of sedimentary beds of alternating clay, silt, sand and lignite. The Sentinel Butte Formation is likely about 250 feet thick or more in the vicinity of the site.

The uppermost layer in the Sentinel Butte Formation, found in the northeast corner of the site, is a clayey sand unit approximately 20 feet thick. The next lower unit in the northern three-fourths of the site is a clay unit (typically fat clay), which is thickest in the northeast part of the site, ranging from 0 to 50 feet thick. There are instances of thin lignite beds within the clay unit. The clay unit has an average permeability of 4.6x10⁻⁶ cm/sec.
Underlying the clay unit within the proposed disposal area is a typically brown to dark brown silty or clayey sand ranging in thickness of up to 70 feet. Barr refers to this unit as "Volcanic Tuff" or "Tuff," however, the characterization information for this unit as tuff does not appear conclusive. This unit has an average permeability of $4.9 \times 10^{-8}$ cm/sec. Laboratory soil testing results show careful compaction of the materials will lower its hydraulic conductivity to an average $2.0 \times 10^{-7}$ cm/sec.

The lower portion of the silty or clayey sand/tuff unit is saturated and is the uppermost hydrogeological monitorable unit. The silty or clayey sand/tuff unit is underlain by a lignite unit ranging in thickness from 2 to 10 feet.

A lower claystone unit underlies the lignite and is continuous across the proposed disposal unit. This lower claystone unit is classified as fat clay and sandy fat clay and has an average hydraulic conductivity of $4.9 \times 10^{-9}$ cm/sec.

The hydraulic conductivity of the silty or clayey sand/tuff unit is reduced with careful compaction. WISCO's July 9, 2013 "Revised Engineering Report" proposes that the top 36 inches of native subsoil classified as volcanic tuff upon which the clay liner materials will be placed on shall be removed, moisture conditioned, and recompacted to at least 95 percent standard Proctor density (ASTM D698). It also proposed that the final liner subgrade surface shall be smooth rolled with vibratory compaction.

Given its variability, not all of the silty or clayey sand/tuff unit may act as well as compacted clay. It is recommended that at least the upper 18 inches of the compacted three feet of material be liner quality clay and that the same compactive effort and testing requirements be employed for the entire 36-inch zone as described in the Department's *Guideline 5 - Quality Assurance for Construction of Landfill and Surface Impoundment Liners, Caps and Leachate Collection Systems*, including Section III, Backfill or Subliner Installation and Section IV, Subbase Preparation. The placement of at least 18 inches of recompacted, clay-rich liner quality soil as a subliner or subbase should be included as a permit condition. If WISCO finds they have excess coarser material, they might consider using it under the final cover layer to help prevent wicking of salts. Excess course material may be used in other areas where sandier material might be advantageous.

d. **Soil survey and segregation of suitable plant growth material;**

A "High Intensity Soil Survey" completed by Prairie Soil Consulting, LLC for the landfill site is included within the permit application.

According to the soil survey, the area generally consisted of a nearly level to gently rolling upland with several entrenched swales draining to a tributary of Little Muddy Creek. The most extensive soils on these areas were phases of the Williams soil. Steeper areas were dominated with Zahill soils. Niobell-like and Belfield-like soils, derived from alluvium, were found in swales. No strongly sodium-affected or saline soils were observed in the area. The on-site soils will provide excellent materials for site reclamation and revegetation. A total of 219,723 cubic yards of suitable plant growth material
(SPGM) were identified across the site. There is more than enough SPGM is present at the site for reclamation purposes. The SPGM and subsoil stockpiles are shown on Drawing C-01. The site has 121,000 yd$^3$ of SPGM topsoil and 182,000 yd$^3$ of subsoil available onsite for closure which equals or exceeds the quantities needed for closure.

e. Demonstrations of capability to fulfill the general facility standards of section 33.1-20-04.1-02;

The permit application included a separate Plan of Operation for the landfill and the solidification treatment unit. The plans cover the requirements of this section.

Landfill

A Plan of Operation was included for the landfill. The plan included the following sections:

- Site layout, access and circulation
- Development timetable
- Employee training
- Operating equipment
- Signage
- General waste handling procedures:
  - Initial cell filling procedures
  - Fill progression and procedures
  - Intermittent and intermediate cover
  - Final cover
- Traffic control
- Inclement weather operations (wet weather, cold weather and windy weather)
- Nuisance controls (dust, vector, litter, wildlife, noise and odor)
- Sequential partial closure
- Surface water management
- Leachate management system
- Inspection and maintenance operations:
  - General inspection requirements and records
  - Site infrastructure maintenance
  - Stormwater management system maintenance
  - Turf and vegetation maintenance
  - Leachate management system maintenance
- Monitoring operations
- Reporting procedures
- Safety and training
- Emergency services

The permit application also included a Contingency Action Plan. The plan included the following sections:
Solidification Treatment Unit

A Plan of Operation was included for the solidification treatment unit. The plan included the following sections:

- Site layout and access
- Facility description
- Waste acceptance/rejection
- Waste transport and handling
- Nuisance controls
- Leachate management
- Closure

f. Facility engineering specifications adequate to demonstrate the capability to fulfill performance, design, and construction criteria provided by this article and enumerated in this subdivision;

1) Transfer stations and drop box facilities, section 33.1-20-04.1-06.

The requirements of this section are not applicable as the facility is not proposing a transfer station or a drop box facility.


The requirements of this section are not applicable as the facility is not proposing to manage any waste piles.

3) Resource recovery, section 33.1-20-04.1-08.

The requirements of this section are not applicable as the facility is not proposing any resource recovery activities.

4) Land treatment, section 33.1-20-04.1-09 and chapter 33.1-20-09.

The requirements of this section are not applicable as the facility is not proposing a land treatment facility.
5) **Non-CCR surface impoundments, section 33.1-20-04.1-09 and chapter 33.1-20-08.1.**

The permit application included a revised *Engineering Report* dated October 2020 prepared by Barr.

The leachate pond was constructed in 2014 as part of the Cell 1 – Phase 1 construction. A composite liner was constructed on the base and side slopes of the leachate pond. The composite liner consists of a 60-mil HDPE liner, overlying a 3-foot-thick compacted clay barrier layer. The clay barrier layer has a maximum hydraulic conductivity of $1 \times 10^{-7}$ cm/sec or less and was compacted to a minimum of 95 percent standard Proctor dry density, with a moisture content 2 to 5 percentage points wet of optimum. The HDPE liner on the floor was overlain by 12 inches of random fill material to hold down and provide protection to the geomembrane. The random fill material was placed above a protective geotextile layer. The HDPE liner on the side slopes was covered with a protective geotextile layer and a 60-mil HDPE geomembrane utilized for additional layers of ultra-violet and puncture resistance protection. The 60-mil HDPE protection layer was anchored at the top with the liner geomembrane and extended down past the toe of slope by 5 feet, extruded to the liner geomembrane, and covered with the random fill layer on the floor of the pond. The leachate pond is designed for a maximum open waste area of 16.7 acres plus direct surface runoff. The leachate pond has a lined footprint of approximately 2.52 acres (806 feet by 136 feet with a depth of 12 feet). The leachate pond provides approximately 5,800,000 gallons of leachate holding capacity plus 2 feet freeboard. Additional information can be found in the Design section of this memo.

6) **Any disposal, section 33.1-20-04.1-09.**

The permit application included a Plan of Operation for the landfill which addresses the requirements of this section. Additional information can be found in **g. The plan of operation** section of this memo.

7) **Inert waste landfill, chapter 33.1-20-05.1.**

The requirements of this section are not applicable as the facility is not proposing an inert waste landfill.

8) **Municipal waste landfill, chapter 33.1-20-06.1.**

The requirements of this section are not applicable as the facility is not proposing a municipal waste landfill.
9) Industrial waste landfill, chapters 33.1-20-07.1 or 33.1-20-10.

The requirements of this section are not applicable as the facility is not proposing an industrial waste landfill.

10) TENORM waste landfill, chapters 33.1-20-07.1 or 33.1-20-10 and 33.1-20-11

The requirements of this section are not applicable as the facility is not proposing a TENORM waste landfill.

11) Special waste landfill, chapter 33.1-20-07.1;

The permit application included a revised Engineering Report dated October 2020 prepared by Barr.

The landfill has a waste disposal capacity of approximately 3,200,000 cubic yards (yd³). The landfill will be developed in four cells with Cell 1 being constructed in two phases. Leachate from within the lined area will be collected in a sump in the southeast corner of the landfill and will be pumped to the leachate pond located to the south of the landfill.

A composite liner will be constructed on the base and side slopes of the landfill. The composite liner will consist of a 60-mil HDPE liner, overlying a 3-foot compacted clay barrier layer. The clay barrier layer will have a maximum hydraulic conductivity of 1x10⁻⁷ cm/sec and will be compacted to a minimum of 95 percent standard Proctor dry density, with a moisture content 2 to 5 percentage points wet of optimum. The HDPE liner will be overlain by 12 inches of granular drainage material or, alternatively, a geonet that is used for the leachate collection layer. The hydraulic conductivity of the drainage layer is specified to be 1x10⁻⁵ cm/sec, or greater.

The granular drainage layer or geonet drains leachate to the slotted leachate collection pipes installed in the leachate collection trenches. The pipes are embedded in drainage aggregate above a geotextile or geonet cushion layer and covered with a fine filter aggregate or geonet filter layer. The sump incorporates a side-slope riser pumping system to eliminate piping penetrations of the landfill liner. The system is designed to limit the hydraulic head on the liner system to not more than 12 inches. Leachate head is monitored continuously via a side slope riser accessing the storage sump and the use of a pressure transducer. The pressure transducer readout will be positioned between the side slope riser pipes and the leachate pond for easy inspection. Additional information can be found in the Design and Operation sections of this memo.
12) **CCR unit, chapter 33.1-20-08;**

The requirements of this section are not applicable as the facility is not proposing a CCR unit.

13) **Municipal solid waste ash landfills, chapter 33.1-20-10;**

The requirements of this section are not applicable as the facility is not proposing a municipal solid waste ash landfill.

14) **Regulated infectious waste unit, chapter 33.1-20-12;**

The requirements of this section are not applicable as the facility is not proposing a regulated infectious waste unit.

g. **The plan of operation of section 33.1-20-04.1-03;**

**Landfill**

A Plan of Operation was included for the landfill. The plan included the following sections:

- Site layout, access and circulation
- Development timetable
- Employee training
- Operating equipment
- Signage
- General waste handling procedures:
  - Initial cell filling procedures
  - Fill progression and procedures
  - Intermittent and intermediate cover
  - Final cover
- Traffic control
- Inclement weather operations (wet weather, cold weather and windy weather)
- Nuisance controls (dust, vector, litter, wildlife, noise and odor)
- Sequential partial closure
- Surface water management
- Leachate management system
- Inspection and maintenance operations:
  - General inspection requirements and records
  - Site infrastructure maintenance
  - Stormwater management system maintenance
  - Turf and vegetation maintenance
  - Leachate management system maintenance
- Monitoring operations
- Reporting procedures
- Safety and training
- Emergency services
The permit application also included a Contingency Action Plan. The plan included the following sections:

- Event-triggered contingencies
- Inspection-triggered contingencies
- Monitoring-triggered contingencies
- Corrective action for emergency actions and non-emergency actions
- Equipment availability
- Financial assurance for corrective action

**Solidification Treatment Unit**

A Plan of Operation was included for the solidification treatment unit. The plan included the following sections:

- Site layout and access
- Facility description
- Waste acceptance/rejection
- Waste transport and handling
- Nuisance controls
- Leachate management
- Closure

**h. Demonstration of the treatment technology of section 33.1-20-01.1-12;**

The requirements of this section are not applicable as the facility is not proposing to treat waste.

**i. The place where the operating record is or will be kept, section 33.1-20-04.1-04;**

The operating record is kept at the facility's offices onsite.

**j. Demonstration of capability to fulfill the groundwater monitoring, sections 33.1-20-08-06 or 33.1-20-13-02;**

The permit application included a Sampling and Analysis Plan (dated October 2020). The monitoring network includes groundwater monitoring wells, leachate monitoring, and surface water monitoring. The plan includes the following sections:

- Monitoring program including:
  - Network
  - Analytical parameters
  - Characterization of baseline water quality
  - Routine monitoring schedule
  - Sample collection and analysis
  - Evaluation of monitoring data
- Detection monitoring sampling procedures
The groundwater monitoring network consists of five wells in the water table aquifer. There is one upgradient well (PZ-11) and four downgradient wells (PZ-2, PZ-8, PZ-9, and PZ-10). In addition, wells PZ-3, PZ-4, and PZ-7 are used for water level monitoring.

Groundwater monitoring is conducted in the spring and fall of each year. The samples are analyzed for the parameters in Table 1 of the Solid Waste Management Rules NDAC Chapter 33.1-20-13.

Leachate sampling is performed at the same frequency as the groundwater monitoring. Samples of the leachate will be obtained from the leachate collection sump discharge prior to discharge into the leachate pond.

Surface water monitoring is conducted on runoff. Due to a lack of precipitation during events sampling, sometimes there is insufficient water volumes to collect samples at some locations or at all locations.

k. Construction quality assurance and quality control;

The permit application included template technical specifications for oilfield special waste landfill construction. Also included was a Construction Quality Assurance Manual. The manual included the following sections:

- Earthwork construction:
  - Soil Components
  - Sedimentation basins
  - Swales and ditches
  - Vegetation
  - Observation of work
  - Laboratory and field tests
- SPGM and subsoil management
- Geomembrane liner installation
- Geonet drainage layer installation
- Leachate and surface water collection piping
- Certification surveys
- Documentation report and drawings

l. Demonstrations of capability to fulfill the closure standards, section 33.1-20.1-04.1-05 and otherwise provided by this article;

Landfill

The permit application included a Closure/Post-Closure Care Plan. The plan included the following sections for the Closure Plan:

- Notification of partial closure
- Partial sequential closure schedule
- Closure procedure
- Surface impoundment
• Certification of closure for partial closure and certification of final closure
• Deed notation
• Amendment of closure plan

According to the engineering report in the permit application, the final cover will be a minimum of 5 feet thick consisting of a 1.5-foot compacted clay barrier with a hydraulic conductivity equal to or less than $1 \times 10^{-7}$ centimeters per second (cm/sec), 2-foot-thick low permeability soil layer overlain by a 1.5-foot-thick cover soil layer. The 1.5-foot-thick cover soil layer consists of 1 foot of subsoil that serves as a plant rooting zone and a minimum of 0.5 foot of suitable plant growth material (SPGM) topsoil. The SPGM topsoil layer will be mulched and seeded with shallow-rooted, drought-tolerant grasses. The drawings in the engineering report in the permit application show a minimum of a 3-foot final cover that consists of a 1.5-foot compacted clay barrier with a hydraulic conductivity equal to or less than $1 \times 10^{-7}$ cm/sec, 1 foot of subsoil that serves as a plant rooting zone and a minimum of 0.5 foot of suitable plant growth material (SPGM) topsoil. Both final covers meet the requirements and prior to closure the facility will have to decide which final cover system it will be utilizing.

The final cover sides slopes are designed with 25 percent slopes with a 21-foot-wide berm constructed at approximately mid-slope around the perimeter of the cap. The bench contains a ditch and berm system that helps control run-off and erosion. The top is flat and is approximately 2-acres with a minimum 2% slope which drains to the southeast into the downslope drainage structure. The downslope structure on the final cover has been designed to handle a 100-year, 24-hour rainfall. A small diversion berm on the south and east sides of the top direct water away from flowing over the 25% side slopes. Runoff will be directed along the final cover on the surface. The runoff from the final cover will ultimately drain to the sedimentation basin on the south side of the landfill. Erosion will be controlled by limiting the slopes to 25% and installing erosion control mulch and matting on newly constructed cover systems to ensure stability and quick vegetation establishment.

The Universal Soil Loss Equation was used to estimate the annual soil erosion losses from the final cover. Using a maximum slope length of 240 feet at a 25% slope, the estimated loss is 1.10 tons/acre/year once the final cover vegetation is established. This meets the requirements that slopes must not result in long-term surface soil loss in excess of 2 tons/acre/year.

The HELP model was used to determine if the liner and leachate removal system in combination with the final cover achieves the required efficiency of at least 98.5% or better for the collection or rejection of precipitation that falls on the site. The model showed that the liner and leachate removal system in combination with the cover system (both top area and side slopes) is approximately 99.9% effective for the collection or rejection of the precipitation that falls on the site.
The largest open area will be 16.7 acres. Cost estimates for closure of 16.7 acres from 2021 equal $772,251.

**Solidification Treatment Unit**

Upon closure, the treatment unit will be closed in accordance with the solid waste management rules. Testing and remediation will be completed as necessary at the time of closure. If allowed, the metal building may remain and be repurposed.

m. Demonstrations of capability to fulfill the postclosure standards, section 33.1-20-04.1-09 and otherwise provided by this article; and

**Landfill**

The permit application included a Closure/Post-Closure Care Plan. The plan included the following sections for the Post-Closure Plan:

- Inspection
- Maintenance
- Groundwater monitoring
- Reporting
- Surface impoundment
- Ultimate land use
- Amendment of post-closure care plan

Once closure of the landfill has been completed, inspections will be completed in the spring and fall of each year. The twice a year inspections will be conducted throughout the entire post-closure care period of 30 years. The inspections include:

- Evaluate settlement of final cover
- Inspect for soil loss from erosion and examine the quality of vegetation
- Inspect the groundwater monitoring system for damage or degradation
- Inspect the drainage control facilities for evidence of erosion or accumulation of sediment
- Evaluate the effectiveness of site security controls
- Inspect landfill dikes for damage or degradation
- Inspect the leachate management system for evidence of erosion, damage, or degradation
- Landfill cover vegetation will be evaluated for overall health and effectiveness

Groundwater monitoring will continue throughout the post-closure care period. The surface impoundment will be maintained and operational during the post-closure care period. Once post-closure care has been completed, the surface impoundment will be closed by removing all standing liquids, waste and waste residues, the liner and leak detection system and any
underlying and surrounding contaminated soils. The area will then be reclaimed by regrading the disturbed area, replacing all SPGM and properly revegetating the disturbed area.

Cost estimates for post-closure care from 2021 equal $1,446,223.

**Solidification Treatment Unit**

The requirements of this section are not applicable to the solidification treatment unit and postclosure care is not required.

n. **A disclosure statement as required by North Dakota Century Code section 23.1-08-17.**

A disclosure statement that meets the requirements of this section was submitted to the Department on October 15, 2020.

**Site Specific Conditions**

It is recommended that the following condition from the current Permit 0372 be included in the permit (it has been renumbered in accordance with the permit):

G.6. A subbase of recompacted soil is required for any disposal unit where the excavation for the 36-inch composite liner encounters or is within 36 inches (measured at right angles to the liner) of the predominantly silty or clayey sand-textured sediments referred to by the applicant as "Volcanic Tuff." In these areas, the landfill shall be over-excavated at least 36 inches and a 36-inch subbase shall be placed below the approved 3-foot composite liner. The lower subbase may be constructed of at least 18 inches of recompacted sediments from within the excavation. The remaining upper 18 inches of the 36-inch subbase shall be recompacted, clay-rich, clay liner quality soil material. All recompacted subbase materials shall be placed and tested in the manner outlined in Guideline 5 - Quality Assurance for Construction of Landfill and Surface Impoundment Liners, Caps and Leachate Collection Systems. At least 36 inches of low permeability clay-rich soil or approved recompacted subbase materials placed and recompacted as described above shall be demonstrated to be in place, tested and approved by the Department prior to placement of waste in any phase of the landfill.

It is recommended that the following condition be included in the permit based on the review of the permit application.

G.7. The Permittee shall develop an odor control management plan. Upon approval by the Department, the plan shall be implemented. In conjunction with the Williams County Board of Commissioners, the plan shall be evaluated annually. Beginning with the 2022 annual report, a summary of the evaluation shall be included in the annual report required by condition E.16. (NDAC Section 33.1-20-02.1-04 and NDAC Subsection 33.1-20-04.1-02(4))
Conclusion

Based on the submitted application and items discussed above, WISCO, Inc. has shown that the minor modification and renewal meets the requirements of the North Dakota Solid Waste Management Rules. It is proposed that the Department grant WISCO, Inc. a permit with the conditions listed in Permit 0372. The proposed permit length is for a period of 8 years because while the facility has had a few compliance problems, overall the facility stays in compliance.

CRH:DAT
Attachment