

**INTRADEPARTMENTAL MEMORANDUM**

FILE: Jamestown MSW Landfill (0213)

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

THROUGH: Diana A. Trussell, Manager *DAT*  
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SUBJECT: Permit Application Review

DATE: December 22, 2023

**Introduction**

On August 2, 2023, the North Dakota Department of Environmental Quality (Department) received a permit application for a permit renewal for the City of Jamestown's municipal solid waste landfill facility.

The City of Jamestown currently owns and operates a municipal solid waste (MSW) landfill, regulated under Permit 0213. The facility lies within Section 36, Township 140 North, Range 63 West in Stutsman County, ND. The city is proposing to renew their permit to continue operating a MSW landfill. The facility was first permitted in 1976.

**Design**

The site is controlled by fencing that surrounds the facility, and entrance with a gate that is closed and locked when an operator is not onsite. Portable fencing is used within the active cell area to control windblown debris and a fence surrounds the active cell area to also help catch windblown debris. The landfill site has had several soil borings and/or monitoring well installation projects since 1975. These include initial drilling and soil borings completed in 1975, 1985, 1991, 1993, 1994, 2006 and 2015.

In 1991, Donahue and Associates performed the initial hydrologic. Several additional monitoring wells were installed along with more soil borings. Currently, there are 21 upgradient, cross-gradient and downgradient groundwater monitoring wells (MW) over the landfill property. These are situated either within the surficial drift/till units, such as the Seven-Mile Aquifer. The much deeper Midway Aquifer also underlies portions of the proposed landfill expansion area.

The entire bottom liner of the current landfill has been constructed with a three-foot thick layer of compacted clay with a hydraulic conductivity of  $1 \times 10^{-7}$  centimeters per second (cm/sec) or less and includes a high-density polyethylene (HDPE) 60-mil liner.

The liner system for the five MSW cells will consist of a composite liner system. This will include a 24-inch clay barrier layer with a minimum 60-mil HDPE geomembrane layer; a 12-ounce non-woven geotextile and a 12-inch granular drainage layer. The clay barrier layer will be borrowed from on-site soils, with lifts compacted to approximately six inches or more with a minimum two feet-thick compacted clay layer with a hydraulic conductivity of  $1 \times 10^{-7}$  centimeters per second (cm/sec) or less.

The existing leachate collection system for the currently active 11-acre landfill has landfill pumps that transport leachate from the cell sump to an underground storage tank north of the landfill. Leachate is then transferred from the underground tank to a mobile tanker truck and hauled to the city's wastewater treatment plant (WWTP). Repairs and management of the leachate collection system includes cleaning the apron and jetting the apron drain so that spilled leachate drains back into the underground tank. Other maintenance duties include checking the pumping controls to ensure automatic leachate pumping from the landfill sumps, and periodic pump checks to confirm they shut off automatically when the underground tank is full. The city currently provides the Department with written reports regarding semi-annual monitoring of groundwater and quarterly monitoring of landfill gas.

### Operation

The facility also includes a surface impoundment (leachate pond) near the entrance to the facility. Separated earthen stockpiles and compost are currently onsite for daily cover. Topsoil stockpiles are also on site for sequential and final landfill coverage.

The facility has a Waste Identification and Acceptance Plan. The plan includes a description of waste acceptance and rejection procedures along with the categories of non-hazardous solid waste. The initial identification and acceptance of MSW wastes begins at the scale house located within the City of Jamestown's Baler facility (Permit 0035). If the incoming MSW wastes are acceptable, they are then baled and wire-tied within the baler building. These bales are then transported over to the MSW landfill and stacked closely together to minimize air voids. The bales are overlain each day with a six-inch layer of subsoil daily cover. The city also utilizes other alternative daily cover materials mixed with subsoil, primarily compost and occasionally spent lime and wood chips.

The city maintains recordkeeping and reporting requirements that include submissions of annual landfill reports by March 1<sup>st</sup> each calendar year. The reports include types, quantities and waste sources for the year; surface water containment and management; precipitation totals; status of waste compaction and current disposal areas; closure and erosion-control activities over final-cover cells and their conditions; personnel training; summaries of construction, leachate monitoring, and any emergency-related events. Random inspections are made of incoming MSW, and formal inspections are conducted by staff are conducted at least monthly and maintained at the baler facility.

### Closure

As each cell becomes filled, it will be sequentially closed with final earthen cover. All sequential and final cover contours are proposed to have a 20 percent maximum grade on the landfill

perimeters, and six percent on the crown. The grade would be generally uniform to facilitate surface water drainage from the landfill final cover.

The final earthen cover system will consist of a bottom 18-inch clay barrier layer overlying the final earthen cover of a filled cell; then a 12-inch rooting layer, and a six-inch suitable plant growth material (SPGM) topsoil layer. The clay subsoil (lower B and C horizons), and topsoil (A and upper B horizons), will come from separated stockpiles excavated or hauled from on-site borrow areas. A passive landfill gas control system is planned for construction within the fill boundaries of the landfill when final earthen cover is applied.

Erosional controls on the final landfill cover will include drain channels and pipes that would be sized for a 25-year, 24-hour storm event. If erosional concerns were to continue on the final cover, landfill staff and/or consultants would re-grade the landfill contours and utilize additional turf establishment measures (e.g. reseeding the final cover and utilizing fertilizer).

Once the landfill is completely closed, staff will conduct 30 years of post-closure facility inspections, as per the NDAC rules. The post-closure plan includes semiannual inspections, landfill maintenance, environmental monitoring and an annual report.

The following structures would be inspected a minimum of twice a year:

- Final cover soil inspections, monitoring the final cover for settlement, subsidence, erosion, run-on and run-off, animal borrows, rock/debris blockages.
- Surface water drainage structures will be inspected for any damages caused by silting in, blockage, erosion and stability.
- Gas vent wells will be checked for damage and settlement.
- The leachate collection system will be checked to verify that it is operating properly.

### **Compliance History**

The following items of noncompliance have been noted since 2016:

- 2020:
  - The 2019 Annual Groundwater Report was not submitted by April 1<sup>st</sup>.
- 2021:
  - Standing water was observed on the closed MSW landfill cells along with two areas of erosion on the closed MSW landfill cells.
  - Topsoil was stockpiled without vegetative growth and was blowing away.
  - One of the liner seams in the surface impoundment was being held down with five-gallon buckets filled with concrete and another piece of liner was flapping in the wind.
  - The 2021 Annual Financial Assurance submittal was not complete.
- 2022:
  - The 2021 Annual Report was not submitted by March 1<sup>st</sup>.
  - The 2021 Annual Groundwater Report was not submitted by April 1<sup>st</sup>.
  - The facility did not have all of the required records available for review by the Department when requested.

The above items of noncompliance have been appropriately addressed by the facility, and no formal notices of violations have been issued to the facility.

**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 included that showed it had been recorded with the Stutsman County Recorder on February 22, 2017.

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

The application contains a surveyed land description and warranty deeds for the 48-acre expansion area. Several warranty deeds were notarized by the official Notary Public for Stutsman County, dated October 1, 1975; October 14, 1975; July 17, 1997 and August 8, 2006.

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

A preapplication is not required as the facility was first permitted in 1976 before a preapplication was required.

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

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

The City of Jamestown submitted an application to the Department. The application included supporting documents and the required application fee. One electronic copy and one paper copy were submitted.

**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.

**NDAC Subsection 33.1-20-03.1-02(6)**

**Applications for a solid waste management unit or facility permit must include the following information where applicable:**

**a. A completed application form, subsection 1;**

The City of Jamestown submitted an application to the Department. The application included supporting documents and the required application fee. One electronic copy and one paper copy were submitted.

- 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;**

The city has developed a Waste Identification and Acceptance Plan that was included as part of the application. It identifies the prohibited wastes that cannot be disposed of in the landfill, and defines the allowable MSW, commercial and industrial waste streams for landfill disposal.

The plan also has procedures for random load scale-house inspections at the baler facility (Permit 0035), and identifies incoming wastes as acceptable, unknown wastes pending further evaluation, prohibited wastes and acceptable wastes for disposal at the MSW active area.

According to the 2023 annual report, the MSW site received 16,901.54 tons of baled MSW for disposal. The waste is primarily generated from the City of Jamestown and surrounding small rural communities and some farms.

- 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 landfill meets the site characterization criteria, including no domestic and livestock wells within one mile of the landfill property. The entire site does not lie within a hundred-year floodplain, and neither the current landfill nor the proposed site overlies any well head protection areas, steep topography, woody draws, or US Fish and Wildlife areas of critical wildlife habitat. The existing MSW landfill area has had seven soil boring and/or monitoring well installation projects since the existing landfill was first permitted in 1975. In 1991 and 1993, Donahue and Associates performed the initial hydrogeologic investigation and installed several monitoring wells.

There are five major glacial aquifers that occur in the vicinity of the current landfill site. Of these five, the Seven Mile Coulee aquifer and the Midway aquifer underlie portions of the existing landfill. These are currently monitored via groundwater monitoring wells. The Seven Mile aquifer is a shallow sand and gravel unit that parallels the existing MSW landfill. The Seven Mile Coulee aquifer is not present in the western area of the facility as it is an alluvial deposit associated with the Seven Mile Coulee to the east.

The Seven Mile Coulee aquifer is unconfined and water levels in the three existing groundwater monitoring wells generally represent the groundwater table. The borings done by the ND State Water Commission and NDGS (1994), demonstrated that the Seven Mile Coulee is a sand and gravel aquifer that is present underneath the existing landfill, and flows west. It is hydraulically connected to glacial till that is encountered several feet below ground in the western portion of the existing landfill. Glacial till is encountered at depth in the eastern portion of the existing landfill and at the surface in the landfill's western area. There are seven monitoring wells in the till, and the groundwater flow is generally to the east.

The larger and deeper Midway Aquifer (e.g. 40-100 feet below surface) flows through both the existing site and the proposed landfill expansion to the west. The Midway Aquifer is monitored by seven upgradient and downgradient monitoring wells, with a general southeast ground water flow direction.

The US Fish and Wildlife National Wetlands Inventory pinpointed eight wetlands in the northern area of the expansion area; three represent significant perennial wetlands. Given the locations of the existing wetlands, a 200-foot setback from Wetland No. 1 is planned for construction, and additional earthen subgrade will aid in protecting wetland numbers 7 and 8. Care will need to be taken to diminish MSW depositions in the remaining wetlands that may lie closer than 200 feet to the boundary of the MSW active cells. The construction of earthen berms to minimize or prohibit any potential leachate run-off from the future MSW landfill expansion areas into permanent wetland areas may be warranted.

The site does not lie within ten thousand feet of any airport runway currently used by turbojet aircraft or five thousand feet of any runway currently used only by piston-type aircraft. The MSW does not lie within any 25-foot radius where underground pipelines or transmission lines exist.

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

The area generally consists of nearly level to slightly rolling upland. The upland soils were derived from Wisconsin-aged glacial till. The most extensive soils on the gently undulating slopes range from 0 to six percent slopes of the Barnes and Svea soil loams. Generally, the soil material on nearly level areas is very deep, with well-drained soils of loamy glacial tills, with SPGM thicknesses varying from 19 to 43 inches deep. The Barnes, Svea, Wyard and Tonka map units with 0-6 percent slopes are considered prime farmland. The SPGM will be removed and stockpiled for later sequential final closure.

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

The City of Jamestown landfill staff ensure that all personnel involved in the landfill operation/monitoring receive specific training on the landfill Plan of Operation, to prevent accidents and environmental impacts. Documentation of all needed training, instruction methods and certificate copies require placement in the landfill operating record.

**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.

**2) Waste piles, section 33.1-20-04.1-07.**

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 MSW landfill currently has one surface impoundment with an HDPE composite liner, that is adjacent to the existing active disposal area. The leachate is periodically hauled away by trucks to be processed at the city's publicly owned WWTP. The city is will be constructing a second leachate impoundment immediately adjacent to the southeastern corner of the landfill.

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

The MSW landfill is designed and operated to prevent the run-on and runoff in an active area resulting from a maximum flow of a twenty-five-year, twenty-four-hour storm. The facility has adequate equipment for the landfill excavation, compaction, covering, surface water management, and monitoring procedures required by approved plans. Interior roads will be constructed and maintained to provide access to the facility.

The MSW Cells 4 – 8 will have active open areas limited in size to as small an area as practicable, along with sequentially closing cells full to grade in a timely manner. Litter and vector control measures will be implemented, and all earthen stockpiles maintained in close proximity to each cell. These stockpiles will include segregated SPGM topsoil, subsoil and finished compost stockpiles for daily and final cover activities.

All run-on and runoff must be properly controlled to avoid its concentration on or in solid waste active areas. No landfill cell with a composite liner can be exposed to freezing more than one winter season, except for composite liners in surface impoundments.

Closure and post-closure plans must include appropriate surface and groundwater monitoring, landfill gas monitoring and timely maintenance of the facility and any facility structures.

**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 MSW facility has lockable gates to control access, and the landfill has a composite liner consisting of an upper flexible membrane liner, and a lower HDPE 60-millimeter liner, that meets or exceeds the  $1 \times 10^{-7}$  centimeters per second hydraulic conductivity limit. Inspections of landfill gases, especially methane, is monitored at least quarterly by facility staff.

Scale house staff within the baler building (Permit 0035) observe all incoming trucks with MSW, and if non-acceptable incoming wastes are observed, the load is then rejected in the outdoor scale area. Acceptable MSW are then deposited inside the baler tipping floor and viewed by staff prior to baling of the inspected MSW. The Waste Identification and Acceptance Plan has a list of prohibited wastes. The application also included detailed closure criteria for all sequential and final closure activities.

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

**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;**

The Plan of Operation follows the requirements of this section and includes:

- A description of waste handling procedures;
- A fire or explosion plan;
- Landfill liner leaks or monitoring wells and soil contamination procedures;
- Staff and customers safety procedures;
- Staff facilities' inspections;
- Asbestos, animal carcasses, paint residues, sludges, free liquids, radioactive wastes, bulk containers and miscellaneous wastes;
- Procedures for industrial or special waste management wastes, and any other solid waste that the owner/operator may plan to handle;
- A stormwater pollution prevention plan (SWPPP) for stormwater discharges;

**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 City of Jamestown's Baling Facility (Permit 0035) office location.

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

The landfill facility has sixteen groundwater monitoring wells that are currently sampled twice yearly to conduct routine detection monitoring.

In 2014, four new monitoring wells were installed as nested well sets. Two of these MWs (MW-11A and MSW-11B), were installed west of the facility for upgradient groundwater monitoring, especially for the Seven-Mile surficial aquifer and the deeper Midway Aquifer. MW-12A and MW-12B were installed east (downgradient) of the landfill site, and west of the existing (closed) 34-acre MSW landfill.

MVTL conducts two groundwater monitoring well sampling events each year in the spring and fall. The protocol-controlled samples are then examined by state-licensed laboratories to ascertain any statistically significant maximum contaminant level (MCL) exceedances.

**k. Construction quality assurance and quality control;**

The facility has a construction quality assurance and quality control program for both new cell construction and closure construction. The facility also utilizes the Department's Guideline 5: Quality Assurance For Construction of Landfill and Surface Impoundment Liners, Caps And Leachate Collection Systems. They specify that upon completion of either liner and/or closure, the facility will comply with all applicable as-built documentation requirements and that the construction has been completed in accordance with the approved plans and certification requirements.

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

The final cover system will be constructed in accordance with the closure plan and the final cover design, as detailed in the permit application. The cover will consist of an 18-inch clay barrier layer over the wastes; a 12-inch soil rooting layer, and a six-inch layer of SPGM. The final cover will typically be built in 3 to 8-acre segments. The city is proposing that the final cover side slope design be developed with a 20 percent slope grade in the total 48-acre landfill expansion area, and 25 percent slopes in the active fill area.

The clay barrier layer will require lifts compacted to approximately six inches in thickness and attain a 90 percent or greater Modified Proctor (ASTM D1557), with testing to occur on a maximum 100-foot grid pattern. Compaction will be attained with a moisture content between two and five percent. The 12-inch clay-rich rooting layer will be tested for Sodium Absorption Ratio (SAR). The top six-inch SPGM layer will be tested prior to construction, to determine if the soil material shall ensure that sodium concentrations are within an acceptable SAR range not exceeding 4.0. Electrical conductivity tests will also be performed on the rooting layer to ensure that the soil salt levels do not exceed two mmhos/cm.

The final cover plan will include earthen berms to direct surface water drainage into rip-rapped spillways. In addition, drainage channels and pipes will be sized for a 25-year, 24-hour storm. If erosional channels become an issue on the final cover, the facility staff will commence regrading and turf protection measures to remediate erosional issues. The final cover will be seeded with adaptive native grasses, and augmented if necessary, with soil amendments (lime, fertilizers, herbicides), for optimal growth. Staff will conduct periodic inspections of the final cover to ensure any erosion or thin grass cover issues are remediated.

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

Once the landfill is completely closed, staff would conduct 30 years of post-closure facility inspections, as per the NDAC rules. The post-closure plan would include semiannual inspections, landfill maintenance, environmental monitoring and an annual report.

The following structures would be inspected a minimum of twice a year:

- Final cover soil inspections, monitoring the final cover for settlement, subsidence, erosion, run-on and run-off, animal borrows, rock/debris blockages.
- Surface water drainage structures will be inspected for any damages caused by silting in, blockage, erosion and stability.
- Gas vent wells will be checked for damage and settlement.
- The leachate collection system will be checked to verify that it is operating properly.

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

A disclosure statement was included with the permit application.

**Conclusion**

Based on the submitted application and items discussed above, the City of Jamestown has shown that the renewal meets the requirements of the North Dakota Solid Waste Management Rules. It is proposed that the Department grant a permit with the conditions listed in Permit 0213. The proposed permit length is for a period of 10 years because overall the facility has had a good compliance record.

CRH:DAT:KDJ  
Attachment