**Introduction**

On December 15, 2020, the North Dakota Department of Environmental Quality (Department) received a permit application for a renewal for Dakota Gasification Company’s (DGC) special waste landfill.

DGC currently owns and operates a special waste landfill, regulated under Permit 0109 on approximately 160 acres (115 acres are usable for solid waste management activities) located in the SW1/4 of Section 19, Township 146 North, Range 87 West in Mercer County, ND. DGC is proposing to renew their permit to continue operations. DGC is also proposing several minor modifications that will be discussed throughout this memo. The facility was first permitted in 1994.

**Design**

The site is underlain by the Sentinel Butte formation that consists of embedded clay, silt, sand and lignite seams, and is the uppermost bedrock formation in the area. Lignite seams form the most common monitorable units at the site due to their higher permeability versus the silt/clay units. The uppermost saturated unit below the landfill liner is the shallow Beulah Bed, which is a lignite seam. The Beulah Bed lignite was largely mined out prior to landfill siting and was later constructed with mixed subsoil spoils mined from the seam. The shallow groundwater flow zone from the mined Beulah Bed was disrupted by the surface mining, and while the old mine surface was mostly restored by backfill of spoils, the effects on the shallow aquifer are not well understood. The uppermost undisturbed aquifer is the Spear Aquifer, a thin lignite seam bed overlain with layers of clay, shale and claystone with a thickness range of 115 to 150 feet and with hydraulic conductivity values around $10^{-7}$ centimeters per second (cm/sec).
The special waste landfill is comprised of 10 cells. Phases 1 - 5 were constructed with a compacted clay liner system permitted. Phases 6 - 10 are constructed as needed and has a composite liner. The composite liner is comprised of a clay sub-liner overlaid with a five-foot compacted clay liner and has a high-density polyethylene (HDPE) lined collection trench and a perforated piping system in each phase. The clay liner in each phase is sloped toward the drainage system and covered with coarse bottom/gasifier ash and includes perforated pipe and coarse aggregate encased in synthetic filter fabric.

The collection trench drainage is sloped to the collection sump on the northwest side of the landfill (Phase 1) for the top north half (Phases 1 - 5), and to the southeast corner for the south half (Phases 6 - 10) of the landfill. All filled areas will be sloped generally to the east to allow runoff to infiltrate into the collection trench system. Then, leachate/water that accumulates in the collection sump is then pumped to the evaporative leachate storage pond on the west end of the landfill. Excess leachate is also transported back to the plant to sluice ash into the settling basins.

Operation

The entire landfill facility covers 160 acres with a capacity of over 14 million cubic yards of disposal space with an expected lifespan of approximately 39 years. The landfill phase development and sequential final closure currently proceeds from Phase 10 to Phase 6. Phases 1 - 5 have been filled to grade and sequentially closed. Phases 8 - 10 have been constructed, with Phase 10 sequentially closed. Phase 9 is nearly full, and Phase 8 construction was completed in the fall of 2020. Phase 8 is now receiving wastes for disposal.

The facility receives highly alkaline gasifier ash, sludge-like "clam-ash" from the ash handling system, de minimis amounts of ammonium fertilizer and miscellaneous plant trash. Gasifier ash is sluiced with water, then the water/ash slurry is dewatered in bins and the dry gasifier ash is hauled to the landfill for disposal. Clam ash goes into two settling basins for dewatering and is then hauled to the landfill for disposal.

Minor Modification Request: DGC is requesting that de minimis quantities of urea fertilizer (not to exceed one cubic meter per calendar month) be allowed for disposal similar to the ammonium sulfate disposal exemption currently in place. Since the last permit renewal, DGC has constructed and begun operation of a urea plant. The Department has no objection to this minor modification, and it is recommended that this waste stream be added to the appropriate permit condition in the permit.

Minor Modification Request: DGC is requesting that the current requirement in Permit Condition F.12. to take samples for waste characterization of the clam ash and gasifier ash be reduced to once every permit cycle. This request is based on the fact that the feedstock and process generating the ash does not substantively change from year to year. The Department has reviewed the minor modification request and is denying it because of the highly alkaline characteristics of the gasifier ash and the more concentrated clam (fine) ash. It is recommended that the current permit condition be carried over to the next permit.

Minor Modification Request: Currently DGC is required to submit quarterly reports under the current permit. DGC is requesting that the quarterly reporting be reduced to annual. The Department has reviewed the minor modification request is denying it because quarterly reports are beneficial to both the Department and the facility for communication and current status.
However, the Department will update the quarterly reporting condition to match what other facilities are required to do and the quarterly report will be a fillable form.

**Minor Modification Request:** Currently DGC is required to take quarterly leachate samples under the current permit. DGC is requesting that the quarterly leachate sampling be reduced to annual. The Department has reviewed the minor modification request is denying it because the leachate sampling is warranted due to the high pH levels of the leachate.

**Closure**

Sequential final closure of each phase begins within 30 days after receipt of the final volume of waste in that phase. DGC notifies the Department, in writing, of their intent to close each phase. The north portion of Phase 1 was brought to grade first, and the partial sequential cover grade was completed. Once the final grade of each phase is reached, sequential partial closure is initiated. The sequential closure then proceeded from Phases 1 through 5 and was completed on Phase 10. Currently, Phase 9 is nearly full to grade and soon sequential partial closure will take place. As Phases 6 through 9 are utilized, final ash grades will be established and sequential closure completed in each phase.

The complete closure cap design is constructed in this sequence as noted below:

1. An ash layer is placed upon the surveyed final grade of each phase;
2. Construction of a three-foot compacted clay liner
3. Placement of one foot of overburden soil over clay liner;
4. Placement of three feet of suitable plant growth material (SPGM) over the overburden;
5. Placement of a minimum of six inches of topsoil and several varieties of native grass seed to prevent/inhibit erosion.

**Compliance History**

The following items of noncompliance have been noted since 2016:

1. During the March 9, 2016 inspection, the following deficiencies were noted:
   a. Damaged leachate system beneath Phase 9;
   b. Inadequate training of plant personnel overseeing landfill operation and contractors working in the landfill;
   c. Spreading and compaction of waste;
   d. Cleaning up track-out in the plant ash loading/dewatering area.
2. Leachate line leak on April 13, 2016
3. Overtopping of excess leachate inside Phase 8 and 9 separation berm. The excess leachate spilled over the berm, and subsequently flowed into Phase 8.
4. During the March 19, 2019 inspection, the following deficiency was noted:
   a. The levels of leachate in the surface impoundment constructed over closed Cell 1 appeared to be lower than what was noted during the November 2018 inspection and likely that the surface impoundment was leaking.
5. During the October 30, 2019 inspection, the following deficiency was noted:
   a. The stormwater impoundment was exceeding its freeboard requirement of 2 feet. The cause of the exceedance was determined to be a leachate pump that froze due to unseasonably cold weather conditions.
6. A Department letter of apparent noncompliance (LOAN), dated April 9, 2020, informed the facility of deficiencies in its annual financial assurance update.
7. On March 29, 2020, DGC staff discovered an earthen berm failure between the stormwater holding pond and the leachate impoundment (southeast corner pond) within the landfill. Stormwater was entering the southeast corner pond via a channel through the berm. On March 30, 2020 and March 31, 2020, DGC emailed the Department about the berm breach that separates the contact/stormwater pond from the adjacent leachate impoundment.

8. During the September 21, 2020 inspection, the following deficiencies were noted:
   a. An animal burrow on closed Phase 10
   b. Areas lacking adequate native grass cover closed Phase 10.
   c. Erosion on the north slope of Phase 3

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.**

The permit application did not include a copy of the notarized affidavit of the notice of disposal. A review of Department files did not locate a copy either. This requirement is covered in the permit by Permit Condition E.18.

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

The landfill property and surrounding access areas of the landfill are owned by DGC. They have the right to the use of the property including all access routes. After facility final closure, DGC will maintain the right of access to the site throughout the post-closure period.

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

A preapplication was completed and approved by the Department in December 1994.

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

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

DGC submitted one print copy and one searchable electronic copy of the application and supporting documents along with the permit application processing fee of $20,000. The application was prepared and signed by the applicant.

**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;

   DGC submitted one print copy and one searchable electronic copy of the application and supporting documents along with the permit application processing fee of $20,000. The application was prepared and signed by the applicant.

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;

   DGC included the Waste Acceptance Plan (WAP) which has a listing of the waste types accepted for disposal at the landfill, along with an average yearly breakdown of the types and estimated amounts and percentages of these wastes. Physical and chemical characteristics, parameters and analyses were also addressed within the WAP.

   The facility receives highly alkaline gasifier ash, sludge-like "clam-ash" from the ash handling system, _de minimis_ amounts of ammonium fertilizer and miscellaneous plant trash. Gasifier ash is sluiced with water, then the water/ash slurry is dewatered in bins and the dry gasifier ash is hauled to the landfill for disposal. Clam ash goes into two settling basins for dewatering and is then hauled to the landfill for disposal.

   See Operation section of this memo for additional information including two proposed minor modifications requested by DGC.

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;

   In 1990, a complete "Hydrogeologic Investigation and Detailed Site Design Report" was prepared by Donohue, the contracted consultant agency. The investigation detailed that the location for the proposed facility was suitable for landfill construction and disposal activities and fulfilled the general location standards outlined in NDAC Section 33.1-20-04.1-01. The site is overlain by the Sentinel Butte Formation, and contains interbedded lignite seams, some of which contained recoverable amounts of lignite. One of these seams is the "Beulah Bed," which is the uppermost groundwater saturated unit below the landfill liner. Portions of the Beulah Bed were mined out in the northeast part of the site prior to landfill development, and mine spoils underlie much of the 160-acre site.

   Underneath the Beulah Bed, no lignite seams were mined, and underlying the Beulah Bed there is a 35- to 60-foot-thick layer of clay, claystone and shale
that eliminates any possibility of vertical leachate seepage to the deeper Spaer (lignite seam) Aquifer.

The shallow groundwater flow in the Beulah Bed lies about 80-95 feet below the ground surface (bgs), and flows from the northwest to south, while the undisturbed Spaer Aquifer is situated about 115-155 bgs, and groundwater flow is from the southeast to north/northeast. Groundwater flows from the Beulah/Spoils water table to Antelope Creek Aquifer that lies outside the permitted area. The Antelope Creek Aquifer in turn feeds water into the Spaer Aquifer and possibly even lower lignite seams.

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

A detailed soil survey and segregation of suitable plant growth material was completed and included within the 1990 Donohue report. The report showed that there were sufficient quantities on site for closure of the facility.

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

All DGC personnel receive instruction in solid waste handling and permit requirements, which includes the dates of training, facility plans, description of instruction methods and certificates that are placed in the facility’s operating record. In addition, DGC complies with requirements regarding the reduction of facility odors; controlling fugitive dust; a permanent facility sign with required data; employee facility inspections and collections of windblown ash and trash for temporary storage containment and landfill disposal.

The landfill is designed to divert all outside stormwater from entering the landfill, and to contain all ash water runoff within the facility. All ash water runoff contained in the facility is recycled in the DGC ash handling system. All stormwater that does not come into contact with ash is either discharged under the Department’s – Division of Water Quality Permit NDR05-0736 or is recycled into the DGC cooling water system.

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 facility has one surface impoundment that is located in Phase 6 of the landfill. It is the leachate sump for Phases 6 through 10. It has a composite liner which is comprised of a clay sub-liner overlaid with a five-foot compacted clay liner and has a high-density polyethylene (HDPE) liner. Excess leachate is also transported back to the plant to sluice ash into the settling basins.

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

The Plan of Operations 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 special waste landfill is comprised of 10 cells. Phases 1 – 5 were constructed with a compacted clay liner system permitted. Phases 6 – 10 are constructed as needed and has a composite liner. The composite liner is comprised of a clay sub-liner overlaid with a five-foot compacted clay liner and has a high-density polyethylene (HDPE) lined collection trench and a perforated piping system in each phase. The clay liner in each phase is sloped toward the drainage system and covered with coarse bottom/gasifier ash and includes perforated pipe and coarse aggregate encased in synthetic filter fabric.

The collection trench drainage is sloped to the collection sump on the northwest side of the landfill (Phase 1) for the top north half (Phases 1 – 5), and to the southeast corner for the south half (Phases 6 – 10) of the landfill. All filled areas will be sloped generally to the east to allow runoff to infiltrate into the collection trench system. Then, leachate/water that accumulates in the collection sump is then pumped to the evaporative leachate storage pond on the west end of the landfill. Excess leachate is also transported back to the plant to sluice ash into the settling basins.

Sequential final closure of each phase begins within 30 days after receipt of the final volume of waste in that phase. DGC notifies the Department, in writing, of their intent to close each phase. The north portion of Phase 1 was brought to grade first, and the partial sequential cover grade was completed. Once the final grade of each phase is reached, sequential partial closure is initiated. The sequential closure then proceeded from Phases 1 through 5 and was completed on Phase 10. Currently, Phase 9 is nearly full to grade and soon sequential partial closure will take place. As Phases 6 through 9 are utilized, final ash grades will be established and sequential closure completed in each phase.

The complete closure cap design is constructed in this sequence as noted below:

1. An ash layer is placed upon the surveyed final grade of each phase;
2. Construction of a three-foot compacted clay liner;
3. Placement of one foot of overburden soil over clay liner;
4. Placement of three feet of suitable plant growth material (SPGM) over the overburden;
5. Placement of a minimum of six inches of topsoil and several varieties of native grass seed to prevent/inhibit erosion.
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;

Operating personnel receive instructions on the facility's operation and it is operated according to the Plan of Operation.

The Plan of Operation includes:

1. Waste Acceptance Plan;
2. Recordkeeping and Reporting;
3. Groundwater Monitoring Plan;
4. Sequential and Final Closure, Post-Closure and Financial Assurance Plan;
5. Construction Operations;
6. Surface Water and Erosion Controls;
7. Emergency Response Plan, including spill procedures for suspected hazardous waste spillage;
8. Contingency actions in case of emergencies including leachate leakage, groundwater contamination, fires, truck spillages of ash, dust controls;
9. Worker Safety Procedures, Equipment Maintenance and Training;
10. Operating Record, including description/quantity of wastes; inspection reports, corrective actions, and waste characterization of lab analyses.
11. Inspections and Reporting.

The Waste Acceptance Plan which is part of the Plan of Operation includes:

1. Categories of solid waste received for disposal;
2. Waste acceptance procedures;
3. Procedures for Dewatering of Waste Prior to Disposal;
4. Waste Handling and Rejection Procedures;
5. Leachate removal operation and maintenance procedures;
6. Safety procedures;
7. A description of special waste management;
8. Procedures for evaluating waste characteristics, free liquids content, testing frequencies and analytical methods;
9. Procedures for managing the approved wastes (gasifier/clam ashes, plant trash, miscellaneous wastes), and
10. Any amendments to the waste acceptances procedures and description of non-acceptable solid wastes as needed.

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 in the Environmental Department.

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

DGC submitted a revised groundwater work plan in December 2020 that was approved. The revised plan discussed the installation of three new monitoring wells, and the abandonment of three older nonfunctioning monitoring wells. In total, there are presently eight monitoring wells, five of which are shallow monitoring wells and two are deep monitoring wells into the undisturbed thick clay formation underlying the shallow Beulah bed, and over the uppermost aquifer (Spaer aquifer), which is a relatively thin lignite seam. The semi-annual groundwater monitoring sampling plan includes:

1. Groundwater elevations to record rate/direction of groundwater flow;
2. "Pure" groundwater not affected by any solid waste facility leakage or contamination;
3. Consistent frequencies of groundwater samples over the years for comparative analyses with specific sample collection and analytical procedures;
4. Chain of custody controls and parameters for lab analyses;
5. Consistent QA/QC and data statistical methods/analysis procedures;
6. Reporting of statistically significant increases (SSIs) of any samples over background levels or exceedances of maximum concentration limits (MCLs) or water quality standards are affected;
7. Ensure the protection of human health and resources; and
8. Control/correct seasonal sampling data variability.

As part of the permit application, DGC requested several minor modifications to their groundwater monitoring plan. This memo will include a brief description of each of the requests, however, the requests will be reviewed and addressed separate from this permit application review and a letter will be sent to DGC regarding the Department’s decision on each of the requests. The current groundwater monitoring plan will continue to be used until the Department approves or denies any of the requested minor modifications.

**Minor Modification Request:** DGC is proposing to move to a suite of about five or six 'indicator' parameters for groundwater monitoring. These could
tentatively include arsenic, selenium, chloride, sulfate, alkalinity, and pH, but could also have other parameters replace these in consultation with the Department. Utilizing a few indicator parameters for periodic monitoring rather than the full suite of parameters would still provide the ability to adequately identify a release from the landfill, and would such an event occur, the facility could at that point begin monitoring for all parameters.

**Minor Modification Request:** DGC is proposing to remove volatile organic compounds (VOC) testing from the current groundwater monitoring plan. There have been no significant detections of VOCs at the facility, and it is extremely unlikely that any VOCs would be introduced to the facility via the ash as the VOCs would have volatized in the gasification process and would not be carried into the ash.

**Minor Modification Request:** DGC proposes discontinuing monitoring from the deep monitoring wells associated with the Spaer Bed Aquifer. In the event of a release from the landfill, a contamination plume would not reach the Spaer Bed within the post-closure monitoring period or for any significant amount of time thereafter. This is due to the Spaer Bed’s depth as well as having a low-permeability clay shelf overlying it. Therefore, monitoring these deep wells does not provide any useful information.

**Minor Modification Request:** DGC proposes the use of intrawell prediction limits instead of the CUSUM control chart approach that is currently used for all monitoring well data. The landfill area has previously been mined, and the use of the CUSUM statistical method is not recommended for monitoring backgrounds that are still changing from prior disruption. As a result, for this facility the CUSUM approach is overly sensitive to changes in background data and possibly more likely to detect false positives than the use of the current industry standard for previously disturbed soils of intrawell prediction limits. The use of intrawell prediction limits may be as statistically robust as the use of the CUSUM one. Should the Department disagree with the use of intrawell prediction limits in lieu of CUSUM control charts, there are other statistical methods for analyzing groundwater data as well, such as the use of trend testing or Piper plots, that DGC would be willing to consider in consultation with the Department.

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

The facility follows the Department’s Guideline 5: *Quality Assurance Guidelines for Construction of Landfill and Surface Impoundment Liners, Caps, and Leachate Collection Systems* for construction quality assurance and quality control. After construction of a new phase or a closure project, the facility submits a construction documentation report to the Department for review and approval.

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

Sequential final closure of each phase begins within 30 days after receipt of the final volume of waste in that phase. DGC notifies the Department, in
writing, of their intent to close each phase. The north portion of Phase 1 was brought to grade first, and the partial sequential cover grade was completed. Once the final grade of each phase is reached, sequential partial closure is initiated. The sequential closure then proceeded from Phases 1 through 5 and was completed on Phase 10. Currently, Phase 9 is nearly full to grade and sequential partial closure will take place. As Phases 6 through 9 are utilized, final ash grades will be established, and sequential closure completed in each phase.

The complete closure cap design is constructed in this sequence as noted below:

1. An ash layer is placed upon the surveyed final grade of each phase;
2. Construction of a three-foot compacted clay liner;
3. Placement of one foot of overburden soil over clay liner;
4. Placement of three feet of suitable plant growth material (SPGM) over the overburden;
5. Placement of a minimum of six inches of topsoil and several varieties of native grass seed to prevent/inhibit erosion.

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

A written post-closure plan was included with the application, and it addresses the post-closure requirements including maintenance and monitoring activities for a period of 30 years. The plan includes:

1. Groundwater monitoring to be performed on approximately ten monitoring wells, with samples collected from these wells twice a year for the first five years, and once per year for the following 25 years.
2. Surface water monitoring and erosion controls: during the initial seeding of native grasses, straw mulch will be utilized on the cover to minimize erosion and facilitate plant growth. A robust native grass growth will be the primary tool to control erosion with a final grade to inhibit surface water pooling.
3. Leachate collection system monitoring will be operated seasonally until all leachate has been removed from the landfill. It is anticipated the system will be operated only for a short period (three to four years), following final closure.
4. Final cover management will include short and long-term management, including final cover inspections and the repair of cover erosion, subsidence, and differential settlement features with soil backfilling and reseeding. Best management practices (BMPs) will be situated as needed to control run-off. Vegetative cover management will include the application of an approved herbicide to control weed growth on the native grass or additional SPGM as needed. The facility will evaluate the final cover in accordance to the Department's Guideline 28: Evaluating Final Vegetative Cover of Closed Landfills.
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 December 15, 2020.

**Site Specific Conditions**

It is recommended that the following conditions be added based on the permit application review:

**G.1.** The facility is approved to accept the following wastes:

- Gasifier ash
- Plant trash
- Clam ash
- De minimis amounts of ammonium sulfate fertilizer
- De minimis amounts of urea fertilizer
- Miscellaneous nonhazardous waste
- Other wastes identified in the facility's approved waste acceptance plan

(NDAC Subsection 33.1-20-07.1-01(2))

**G.2.** The Permittee shall obtain and analyze a representative sample of leachate/contact water contained in any leachate collection or accumulation or system, sump and/or other accumulation area, any surface impoundment and stormwater pond on a quarterly basis. The samples should be analyzed for pH, total dissolved solids, conductivity, arsenic, and selenium. The analytical results shall be submitted to the Department as part of the quarterly reports required in Permit Condition F.6. (NDAC Paragraph 33.1-20-04.1-09(3)(e)(2))

**G.3.** Sequential closure of solid waste disposal units shall be implemented as described in the approved closure plan. (NDAC Subdivision 33.1-20-04.1-03(1)(g), NDAC Subsection 33.1-20-04.1-05(2), and NDAC Subdivision 33.1-20-04.1-05(5)(d))

The largest approved open area is 42.5 acres before sequential partial closure must be initiated. (NDAC Subdivision 33.1-20-04.1-05(5)(a))

**G.4.** No area of the landfill final cover, including, but not limited to support berms and the outer slopes of any drainage control berm/swale, shall be greater than the 25% (4:1) maximum slope allowed by NDAC Paragraph 33.1-20-04.1-09(4)(b)(3).

**G.5.** The Permittee shall conduct waste characterization of the clam ash and gasifier ash on an annual basis using a Departmentally-approved method. The results shall be submitted electronically to the Department at solidwaste@nd.gov.

**Conclusion**

As part of the permit application, DGC requested several minor modifications to current permit conditions, waste acceptance and their groundwater monitoring plan. This memo includes a
brief description of each of the requests and states whether the Department approves, denies or
will require further review the minor modification. Here is a list of the Department’s decision on
each one:

- **Minor Modification Request:** DGC is requesting that *de minimis* quantities of urea
  fertilizer (not to exceed one cubic meter per calendar month) be allowed for disposal.
  Approved by the Department. See the Operations section of this memo for additional
  information.

- **Minor Modification Request:** DGC is requesting that the current requirement in Permit
  Condition F.12 to take samples for waste characterization of the clam ash and gasifier
  ash be reduced to once every permit cycle. Denied by the Department. See the
  Operations section of this memo for additional information.

- **Minor Modification Request:** DGC is requesting that the quarterly reporting be
  reduced to annual. Denied by the Department. See the Operations section of this
  memo for additional information.

- **Minor Modification Request:** DGC is requesting that the quarterly leachate sampling
  be reduced to annual. Denied by the Department. See the Operations section of this
  memo for additional information.

- **Minor Modification Request:** DGC is proposing to move to a suite of about five or six
  ‘indicator’ parameters for groundwater monitoring. These could tentatively include
  arsenic, selenium, chloride, sulfate, alkalinity, and pH, but could also have other
  parameters replace these in consultation with the Department. Requires further review
  by the Department. See J. Demonstration of capability to fulfill the groundwater
  monitoring section of this memo for additional information.

- **Minor Modification Request:** DGC is proposing to remove volatile organic compounds
  (VOC) testing from the current groundwater monitoring plan. Requires further review by
  the Department. See J. Demonstration of capability to fulfill the groundwater
  monitoring section of this memo for additional information.

- **Minor Modification Request:** DGC proposes discontinuing monitoring from the deep
  monitoring wells associated with the Spaer Bed Aquifer. Requires further review by the
  Department. See J. Demonstration of capability to fulfill the groundwater
  monitoring section of this memo for additional information.

- **Minor Modification Request:** DGC proposes the use of intrawell prediction limits
  instead of the CUSUM control chart approach that is currently used for all monitoring
  well data. Requires further review by the Department. See J. Demonstration of
  capability to fulfill the groundwater monitoring section of this memo for additional
  information.

As part of the permit application, DGC requested several minor modifications to their
groundwater monitoring plan. This memo will include a brief description of each of the requests,
however, the requests will be reviewed and addressed separate from this permit application
review and a letter will be sent to DGC regarding the Department’s decision on each of the
requests. The current groundwater monitoring plan will continue to be used until the Department approves or denies any of the requested minor modifications.

Based on the submitted application and items discussed above, Dakota Gasification Company has shown that the renewal meets the requirements of the North Dakota Solid Waste Management Rules. It is proposed that the Department grant Dakota Gasification Company a permit with the conditions listed in Permit 0109. The proposed permit length is for a period of 9 years because the facility has not had any major compliance issues since the previous renewal.

CRH:DAT:KDJ
Attachment