

INTRADEPARTMENTAL MEMORANDUM

FILE: Basin Electric – Antelope Valley Station (0160)

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

THROUGH: Diana A. Trussell, Manager DAT
Solid Waste Program
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FROM: Ethan Hardy, Environmental Engineer EH
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SUBJECT: Permit Application Review

DATE: September 17, 2026

Introduction

The North Dakota Department of Environmental Quality (Department) received a permit application for a renewal for the Basin Electric – Antelope Valley Station’s (Basin) special waste landfill.

Basin Electric – Antelope Valley Station currently owns and operates a special waste landfill, regulated under Permit 0160 on approximately 318 acres located in the W1/2 of Section 7, Township 145 North, Range 87 West in Mercer County, ND, a small portion of Section 12, Township 145 North, Range 88 West in Mercer County, ND and a small portion of Section 18, Township 145 North, Range 87 West in Mercer County, ND. Basin is proposing to renew their permit to continue disposing of coal combustion residuals (CCR) generated by the Antelope Valley Station Power Plant. The facility was first permitted in 1995.

Design

The CCR landfill currently operates on property adjacent to the Antelope Valley Station Power Plant. The facility maintains onsite security and other access control measures to prevent unwanted access to the landfill. The landfill was originally permitted for four cells (Cells 1 – 4). Approximately 52 acres of the existing landfill is currently active. In 2021, the facility modified their solid waste permit to add a lateral expansion of four new cells (Cells 5 – 8), as well as a leachate pond for managing leachate at the facility. The new cells are north of the current active landfill. In 2022, the facility completed construction of Cell 5.

The landfill is currently located in an area that was a reclaimed surface mine of Coteau Properties Company that was once in operation in the early 1990s. The soils are “made land” and are not natural soil bodies that reflect natural soil forming processes. The site is underlain

by approximately 150 feet of clay rich soil (mine spoil material) with hydraulic conductivity values around 1×10^{-7} centimeters per second (cm/s). As part of the permitting process, the facility conducted a site characterization of the new landfill expansion area and developed one new upgradient well, and three new downgradient wells to monitor groundwater. The facility currently monitors the Spaer Bed aquifer identified as the uppermost aquifer as a basis for groundwater quality at the facility. The base of the mine spoils typically lack a monitorable saturated zone.

The liner system for the landfill expansion areas consists of six inches of scarified subgrade, 24 inches of clay liner material, a 60-mil high density polyethylene (HDPE) geomembrane liner, and 12 inches of drainage layer or geocomposite. The base liner system will drain towards the east from which four new sumps (one for each new cell) will be developed to pump leachate to the new leachate pond. The leachate pond is lined with six inches of recompact subgrade, 24 inches of clay material, and a 60-mil HDPE geomembrane liner. Leachate will be managed primarily by evaporation; the pond is adequately sized to contain three consecutive 100-year, 24-hour rainfall events.

Operation

The landfill consists of eight cells and a leachate pond. To date, five of those cells are currently constructed and operating with future cells to be constructed as the units are needed.

The facility has a plan of operations that was updated in April 2021. Only waste generated by the plant will be accepted for disposal at the facility. The plan of operations identifies a list of wastes that can be and are accepted for disposal at the landfill. All required equipment will be located on site to ensure effective and efficient operations of the facility, including waste handling, waste covering, surface water management control, general maintenance, and road maintenance. All equipment will have routine maintenance performed on a regular basis. Basin is responsible for training all employees to operate required equipment prior to use. Documentation of training, such as names, dates, description of instruction methods, and copies of certificates awarded are to be placed in the landfill's operating record.

The facility currently maintains a groundwater monitoring network for the landfill that consists of multiple upgradient, and downgradient wells. Groundwater is sampled and analyzed in accordance with the facility's sampling and analysis plan.

Closure

For Cells 1 – 4, the final cover system will consist of (from top down):

- Vegetative cover consisting of six inches (minimum) of suitable plant growth material (SPGM) topsoil;
- 36 inches (minimum) of plant rooting zone soil;
- 24 inches of compacted clay soil material with a saturated hydraulic conductivity of 1×10^{-7} cm/sec or less; and
- Buffer layer over the subgrade soils to provide a suitable subgrade for the cover system, if needed.

For Cells 5 – 8, the final cover system will consist of (from top down):

- Vegetative cover consisting of 6 inches (minimum) of SPGM topsoil;
- 18 inches (minimum) of plant rooting zone soil or 30 inches (minimum) of plant rooting zone soil if a geocomposite drainage layer is utilized;
- 12 inches of granular drainage material or equivalent geocomposite drainage layer;
- 40-mil (minimum) geomembrane hydraulic barrier layer; and
- Buffer layer over the subgrade soils to provide a suitable subgrade for the geomembrane layer and cover system, if needed.

Sequential partial closures will be implemented as closure grades are reached to limit the amount of open area and the amount of leachate generation during the filling process. Following the placement of the SPGM layer, permanent stormwater run-off controls will be implemented to help carry stormwater away from the landfill during the post closure period. Seed, fertilizer, and mulch will be applied to help with erosion control at the facility. Construction Quality Assurance Documentation and Report will be provided to the Department following completion of any closure activity.

Compliance History

The facility has not had any items of noncompliance noted since the facility was last permitted in 2016 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 with the permit application.

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

A review of the North Dakota Parcel Viewer provided by the North Dakota Geographic Information Systems identifies that Basin Electric Power Cooperative is the owner of the land for which the landfill is located.

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

A preapplication for the facility was submitted to the Department on April 27, 1994. A preapplication for the landfill expansion area was submitted to the Department on March 8, 2019. Both preapplications have been approved by the Department.

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

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

An application form provided by the Department was included with the application. One printed copy, and one electronic copy of the application was provided with the submittal.

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)

The landfill is constructed within the footprint of a prior mined area. The North Dakota Public Service Commission was consulted in 2019 when the facility proposed expanding the footprint of the landfill into the NW ¼ of Section 7. It was confirmed that Coteau Properties Company mined the area from 1990-1992 and was released from reclamation liability with Final Bond Release No. 3 to Permit NACT-8601 in 2008.

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;

A completed application form with the required signatures was included with the permit application.

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 facility only accepts waste generated by the plant, thus no solid waste generated outside the state will be stored or disposed of at the landfill. The following is a list included with the application identifying the wastes accepted for disposal at the landfill:

- Fly ash
- Flue gas desulfurization (FGD) sludge
- Bottom ash
- Wood and wood products, railroad ties
- Tires and rubber products
- Plastic and plastic products
- Masonry products and materials
- Earthen materials
- Metal and metal products
- Triple-rinsed and punctured herbicide cans
- Rags
- Construction materials
- Insulation
- Floor dry
- Sump waste
- Petroleum-contaminated soils (small spills)
- Spent resin from water plant demineralizers

- General inert waste
- Lime waste
- Water treatment wastes
- Spent activated carbon
- Drained oil filters
- Non-friable asbestos
- Boiler cleaning waste
- Ceramic or glass insulators, bushings, and other non-PCB substation waste

On average, approximately 1,850 tons of FGD, fly ash, and bottom ash is disposed of each day in the landfill. The other waste placed within the landfill normally averages 500 tons per year and comprises of less than 1% of total waste.

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 facility is a coal combustion residual landfill and thus also required to meet the location standard requirements of NDAC Section 33.1-20-08-03. These requirements are explained in greater detail in **Section 12** of this memo.

A Site Characterization Report is included with the application. A site map is provided identifying the regional hydrogeology, major aquifers, and surface water that is located around the facility. The groundwater level in the Spaer Bed, the uppermost aquifer is identified as being 200 feet or more below the ground surface. A description of regional geology and hydrogeology is discussed in detail within the report. The plan identifies two possible receptors of leachate constituents from a release from the landfill unit: the Renner Aquifer, which may be used for water supply, and a non-drinking water supply used for livestock watering. The report concluded that it would take approximately 15,220 years for a release from the landfill to reach the Renner Aquifer, and approximately 15,820 years to reach the livestock well located about 5,700 feet downgradient from the expansion footprint. These travel times suggest that regional geology is naturally protective against a potential release.

The facility provided a potential receptor analysis map in the Site Characterization Report identifying all aquifers and wells within the regional area. The map identifies that the landfill is not directly above any aquifer. The potentiometric surface is identified to be hundreds of feet below the base grades of the landfill expansion area per the cross sectional maps of the stratigraphy and lithology of the region. The landfill is in an old surface mine spoils area that was mined in the early 1990s and reclaimed. The Engineering Report discusses and explains geotechnical testing that was done in regard to foundation settlement and consolidation analysis. The facility is not located within a channel, ravine, woody draw, an area designated as critical habitats for threatened species, or an area of steep topography. The facility is not located within 1,000 feet of any state or

national park and is not located within ten thousand feet of any airport runway. The design drawings identify the facility maintains a 25-foot separation between any aboveground, or underground pipeline or transmission line.

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

Barr Engineering prepared a summary of Earthwork Construction Quantities that helped identify the amount of soil materials needed for construction activities, as well as the soil materials available on site for use in these activities. The summary identifies the amount of SPGM topsoil, SPGM subsoil, drainage layer, clay, and random fill materials needed for liner and cover construction activities. The conclusion identifies a shortage of approximately 422,676 cubic yards of soil between the materials required and the materials available for use. Additional sourcing of materials is required by the facility to meet these requirements for future cover, and construction activities. The facility is working on sourcing the materials as they need them.

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

The facility operating personnel will receive training from Basin for the following items:

- Permit Requirements and Procedures
- Disposal Procedures
- Leachate Management
- Contingency Actions
- Facility Emergency Response
- Equipment Safety and Operation

All activities will be performed in strict conformance with Basin's written Safety Regulation Compliance Policies. These policies establish written procedures and provide training and equipment for personnel to complete their work in an environment that places safety at the highest standard in the workplace. These policies have provisions for accident prevention and safety along with fire protection services at the plant site.

The facility maintains a leachate pond onsite, the main method of leachate control is via evaporation, and no discharge is expected from the site. Since the facility is a landfill, the only expected air quality issues are regarding fugitive dust. The facility maintains a fugitive dust control plan to mitigate these concerns when they arise.

The ash disposal facility and haul roads are to be inspected on a weekly basis (minimum) by qualified personnel. An annual landfill inspection will be performed by a qualified professional engineer (QPE). Plant personnel are involved with the hauling, and maintenance of solid waste to and from the facility. Should an upset occur or be found during an inspection, a supervisor

is to be notified and any necessary corrective measures implemented. All inspections, results, and actions taken are to be recorded in a log maintained at the plant site and included in the facility's 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 facility maintains a leachate pond used for storing leachate generated from the CCR landfill. The liner of the pond consists of six inches of scarified clay, and a recompacted six inches of subgrade material, 24 inches of compacted clay material, and a 60-mil HDPE geomembrane liner. The liner system is required to maintain a hydraulic conductivity of 1×10^{-7} cm/s or less. The leachate pond has capacity to contain three consecutive 100-year 24-hour rainfall events, while maintaining the minimum 2 feet of freeboard. The Contingency Action Plan identifies the procedures for addressing any emergency situations and steps to remediate the release from the impoundment, should one occur. For as long as there are leachate discharges to the leachate pond after closure, the pond will remain in place. However, financial assurance provisions have been made if the pond is permanently closed by removal after landfill closure.

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

Haul roads leading to the facility are routinely maintained and utilized by Basin or Coteau Properties. A dozer is utilized at the landfill to adequately spread and compact any waste disposed of at the facility. Each landfill cell will be developed in lifts ranging from 5 to 8 feet thick and placed in a manner until final grades are achieved. An ash compaction study was conducted at the facility in 1994 and determined that this placement method was suitable for disposal activities. Soil will be stockpiled on site and kept available to provide cover and for construction of the final cover, as per the Engineering Report for the landfill expansion area. The application includes a soil balance which provides the quantities of soil required for specific construction and covering activities, as well as soils stockpiled and available for use. The facility routinely identifies and surveys the landfill to track the amount of material disposed, as well as the volume remaining for disposal.

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 requirements of this section are not applicable as the facility is not proposing a special waste landfill. The facility is a CCR landfill and is subject to the requirements of section 33.1-20-08.

12) CCR unit, chapter 33.1-20-08;

Location Standards

The application included a Location Restrictions Demonstrations Report, dated March 2022, and prepared by Barr Engineering. This document is used to satisfy the requirements of this section for the landfill. With the exception of unstable areas, the location restrictions only apply to Cells 5 – 8 as they are a lateral expansion of the CCR landfill. Cells 1 – 4 were constructed and operational prior to the 2015 Federal CCR Rules regarding CCR disposal and this requirement does not apply to existing CCR landfills.

Placement Above Uppermost Aquifer

The facility has a groundwater monitoring plan that includes multiple upgradient and downgradient wells. The uppermost aquifer (Spaer Bed) generally shows low permeability and water level in some wells recover at slow rates after they have been sampled. The water levels noted in the wells are believed to represent static equilibrium. All water levels observed have been shown to be below an elevation of 1894 feet. The lowest base elevation of the clay liner for Cells 5 – 8 is approximately 2050 feet providing 156 feet of buffer.

Wetlands

Barr Engineering completed a field and desktop wetland review of the expansion area in accordance with the 1987 United States Army Corps of Engineers (USACE) Wetland Delineation Manual for the Great Plains Region. The USACE identified six aquatic resources within the proposed landfill expansion area. The USACE provided an Approved Jurisdictional Determination (AJD) confirming that these waters are not jurisdictional under Section 404 of the Clean Water Act. Based off this determination, the landfill expansion area meets the requirements of this section

Fault Areas

The area surrounding the plant was analyzed using the Quaternary Fault and Fold Database for the United States from the U.S. Geological Survey to determine if Cells 5-8 are greater than 200 feet from the outermost damage zone of any faults that have had displacement in Holocene time. The database contains information on faults and associated folds in the United States that demonstrate geological evidence of surface deformation in large earthquakes during the Quaternary Period (last 2.6 million years to the present). According to the database, no outermost damage zones associated with faults with displacement in Holocene times are located near the plant or within 200 feet of the footprint for

Cells 5 – 8. A map displaying known faults in the United States is provided in the report.

Seismic Impact Zone

A desktop review of available seismic data was performed to determine whether Cells 5-8 are located within a seismic impact zone. 2014 USGS National Seismic Hazard Maps show that Cells 5 – 8 are in an area of less than 0.10-g horizontal acceleration. In addition, the USGS National Seismic Hazards Mapping Project, PSHA Deaggregation program, 2014 version, was used to determine that the peak ground acceleration for the site location is estimated at 0.0237 g.

Unstable Areas

Cells 5 – 8 are to be constructed over a previously mined area containing mining spoils from reclamation activities. The spoils and groundwater conditions were examined and evaluated by Barr Engineering and included in the Site Characterization Report. The findings indicated that conditions are similar to those observed for Cells 1 – 4. Since the mine spoils are from human-made depositions, there is a concern for potential settlement and consolidation due to additional loading. These conditions were evaluated and determined to be negligible based on observed conditions. Groundwater is not present within the spoils, further minimizing potential for consolidation from dissipation of pore pressure from additional loading. A sensitivity analysis was carried out and included in the Engineering Report. These calculations determined a maximum potential settlement of 6 to 8 inches.

Design Criteria

The application included an Engineering Report, dated April 2021, prepared by Barr Engineering to meet the requirements of this section. Cells 5 – 8 are considered a lateral expansion of a CCR landfill therefore the requirements of this section apply.

1. New CCR landfills and any lateral expansion of a CCR landfill must be designed, constructed, operated, and maintained with the appropriate hydraulic barrier and leachate management system capable of collecting and removing leachate and contaminated surface water within the disposal unit during the operating period and post closure period.

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 geomembrane liner, overlying a two-foot compacted clay barrier layer. The clay barrier layer will have a maximum

hydraulic conductivity of 1×10^{-7} cm/sec when compacted to a minimum of 95 percent standard Proctor dry density, with a moisture content of 2 to 5 percent wet of optimum. The facility has not proposed an alternative composite liner system.

2. Liner design criteria for CCR surface impoundments

The requirements of this section do not apply as the facility is not proposing a CCR surface impoundment.

3. Structural integrity criteria for existing CCR surface impoundments, new CCR surface impoundments, and lateral expansions of CCR surface impoundments.

The requirements of this section do not apply as the facility is not proposing a CCR Surface Impoundment.

Operating Criteria

1. Air Criteria

The facility maintains a fugitive dust control plan and has included it with the application. The primary method of controlling fugitive dust during landfill operations is the CCR moisture conditioning that occurs before the materials are loaded into haul trucks. CCR material is conditioned to a 10-20% moisture content which is effective at preventing airborne conditions. The facility's environmental coordinator periodically inspects fugitive dust emissions, if emissions are observed additional controls will be implemented to correct the situation. Basin will amend the written plan if a change in conditions occurs that would affect the plan. The facility has not received any public complaints to date; the facility has included with the application a log form for citizens to use to complain if any situation arises. The facility posts an annual report to the publicly accessible website by December 1st of every year, logging the dust control activities for the year.

2. Run-on and runoff controls for CCR Landfills

The facility provided a Run-on and Run-off Control System Plan, dated 2021, and prepared by Barr Engineering with the permit application. Site grading and existing topography near the landfill prevents surface drainage run-on onto the active portion of the CCR unit for events up to and exceeding a 25-year, 24-hour storm. The report shows that the proposed landfill perimeter dikes are elevated above the surrounding topography and that the surrounding area drains away from the landfill, with arrows added to illustrate surface drainage outside of the landfill. All ash contact surface water will be contained within the lined areas of the landfill and leachate pond. Ash-contact water generated from Cells 1 – 4 is controlled within the lined limits of the existing landfill through

installation of ditches from active landfill areas to the existing lined sump within the landfill. The ash-contact water and leachate generated from Cells 5 – 8 will also be controlled within the lined limits of the landfill. Surface run-off will be intercepted in perimeter ditches and directed into the leachate collection system. Site hydrology and hydraulics were modeled using HydroCAD Version 10.00-16 and Soil Conservation Service (SCS) methods. The design storm for the run-off control system is the 25-year, 24-hour storm event, which has a rainfall depth of 3.62 inches (reference: NOAA Atlas 14). Hydrology calculations were included in the report. Basin will amend the plan whenever there is a change in conditions that would substantially affect the written plan. On the publicly accessible website, the initial run-on/run-off control plan is provided, along with the 2021 5-year update. The next update to the plan is expected to be completed in 2026.

3. Hydrologic and hydraulic capacity requirements for CCR Surface Impoundments

The requirements of this section do not apply as the facility is not a CCR surface impoundment.

4. Inspection requirements for CCR Surface Impoundments

The requirements of this section do not apply as the facility is not a CCR surface impoundment.

5. Inspection requirements for CCR Landfills

The plan of operations states that inspections of the landfill are to be conducted on a weekly basis at a minimum by qualified personnel. Annual inspections are done by a QPE. The most recent annual inspection is included with the application. Subsequent annual inspections are posted to the facility's publicly accessible website. All inspection results are recorded and logged; these reports are maintained at the plant and in the facility's operating record. The annual inspection reports identify the results of weekly and previous annual inspections, changes to the volumes of the landfill, any geometry changes, and notes any appearance of actual or potential structural or stability weaknesses of the CCR unit.

Ground Water Monitoring and Corrective Action

As the facility is an existing landfill, and has laterally expanded, the requirements of this section apply. The facility provided a Groundwater Monitoring System Certification, Sampling and Analysis Plan and the Annual Groundwater and Corrective Action Report. The facility maintains copies of subsequent annual groundwater monitoring reports on the publicly accessible website.

The facility utilizes two groundwater monitoring systems to monitor Cells 1 – 4, and Cells 5 – 8. For Cells 1 – 4, there are two upgradient wells and four downgradient wells. For Cells 5 – 8, there is one upgradient well and five downgradient wells.

A Sampling and Analysis Plan (SAP) was included. The plan identifies field procedures, sampling procedures, packaging and shipment, chain of custody, and quality assurance/quality control (QA/QC) requirements. The facility currently utilizes interwell prediction limits as the method of statistical analysis to determine any statistically significant increases (SSIs) that may arise.

Detection monitoring will be performed semiannually for the required constituents. All information obtained will be evaluated and posted in the operating record per the SAP plan. To date, the facility currently operates under a detection monitoring program.

If through statistical analysis, an SSI is determined there are two scenarios for continued groundwater monitoring at the facility.

- a. The facility demonstrates that an alternative source is the reason for the SSI. The facility has prepared Alternative Source Demonstrations (ASD) in the past and provides them to the Department for review. The ASDs are put in the annual groundwater and corrective action reports.
- b. Establish an assessment monitoring program at the facility. The facility will provide notification of the transition within the operating record per the SAP. Assessment monitoring will begin within 90 days of confirming the SSI. If assessment monitoring is required, the sampling will require annual sampling events for the required constituents in addition to additional constituents, and semiannual sampling events for the additional constituents detected in the annual sampling.

Closure and Postclosure Care

Closure and Post Closure Plans were included with the application. These plans were approved and stamped by Professional Engineer Seth Hueckman (PE-10057). These plans are made available on the publicly accessible website.

Closure

Closure of the landfill will be accomplished by leaving existing CCR in place and constructing a final cover system. A maximum of 15% closure grades were selected to maximize airspace, accommodate settling, and promote surface drainage. The final cover will be constructed in phases as closure grades are reached to limit the amount of open area.

For Cells 1 – 4, the final cover system will consist of (from top down):

- Vegetative cover consisting of six inches (minimum) of suitable plant growth material (SPGM) topsoil;
- 36 inches (minimum) of plant rooting zone soil;
- 24 inches of compacted clay soil material with a saturated hydraulic conductivity of 1×10^{-7} cm/sec or less; and
- Buffer layer over the subgrade soils to provide a suitable subgrade for the cover system, if needed.

For Cells 5 – 8, the final cover system will consist of (from top down):

- Vegetative cover consisting of 6 inches (minimum) of SPGM topsoil;
- 18 inches (minimum) of plant rooting zone soil or 30 inches (minimum) of plant rooting zone soil if a geocomposite drainage layer is utilized;
- 12 inches of granular drainage material or equivalent geocomposite drainage layer;
- 40-mil (minimum) geomembrane hydraulic barrier layer; and
- Buffer layer over the subgrade soils to provide a suitable subgrade for the geomembrane layer and cover system, if needed.

Following closure, construction quality assurance reports will be prepared and provided to the Department for review and approval. A notification of closure will be prepared within 30 days after completion of the last final cover construction event. A notation will be recorded on the deed to the property following complete closure of the landfill to notify any future landowners of the unit as well as the restrictions of post closure use of the property.

Post-Closure

Basin will be responsible for the post-closure care of the site. The post-closure care period begins on the date of final closure certification and continues for a period of 30 years from the date of final closure of the entire CCR unit. Routine inspection of the landfill and adjoining land area will occur at least two times a year. These inspections will include observations of the cover integrity (for example, settlement or vegetation quality), erosion and surface water drainage, the leachate management system, monitoring systems, and site security features. Inspections may also be performed after a severe weather event. If the site inspection reveals any problems or potential problems, appropriate corrective measures will be performed. Routine post-closure maintenance activities will be completed as needed. These routine activities include, but are not limited to, mowing,

noxious weed control, maintaining access control, and maintaining drainageway flow capacity. All features including, but not limited to, monitoring wells, security system, leachate collection systems, and surface water control structures will be properly maintained.

Leachate will be collected and managed throughout the post-closure care period. Routine groundwater monitoring will be performed during the post-closure care period. The closed landfill will not be used for cultivated crops, heavy grazing or any other use which might disturb the protective vegetative and soil cover. In addition, post-closure property use will not include activities or developments that could be detrimental to surface water management features, groundwater monitoring systems, or other facility infrastructure. No later than 60 days after the completion of post-closure care, Basin will prepare a notification verifying that post-closure care has been completed and will submit the notification to the Department for approval.

Recordkeeping, Notification, and Posting of Information to the Internet

Basin maintains the operating record for the facility at Basin's headquarters located in Bismarck, ND. These documents are made available and provided to the Department upon request. A recordkeeping inspection was conducted as part of this review, and Basin provided each of the requested documents as required and showed that the operating record is complete. Basin maintains a publicly accessible website used to store documents and reports as required by NDAC Section 33.1-20-08-08. The items maintained on the website include documents relating to Location Standards, Design Criteria, Operating Criteria, Groundwater Monitoring and Corrective Action, and Closure and Post closure Care.

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;

A Plan of Operations, and Contingency Action Plan were included with the application. These plans describe waste handling procedures, leachate management, groundwater monitoring, closure and reclamation, and procedures for handling contingencies in emergency situations.

All waste transported to the landfill will be by truck; much of the haul route is on haul roads constructed by Coteau Properties Company also used for mining activities. Initially, any newly constructed cell will be covered with the specified drainage layer, following with three feet of ash placement to provide protection from vehicular damage. A dozer is used at the landfill to level the ash piles; the lift thickness will range from five to eight feet until final grades are achieved. Facility equipment will be utilized to remove snow in the winter months; all the snow removed will remain within the lined areas.

Only waste generated by the plant will be accepted for disposal at the facility. The facility provided a list of accepted wastes available for disposal at the landfill. The facility will not accept waste that has excessive moisture and contains free liquids; when those conditions are present, the facility has options for solidifying the waste. Any debris that can be windblown will be placed in areas specified for this type of material. Windblown material will be covered on a frequent basis. Any spilled material will be cleaned up immediately and returned to the disposal area. On average, approximately 1,850 tons of FGD, fly ash and bottom ash is disposed of each day.

Contingencies that may need corrective action are observed and monitored after severe weather or environmental events, facility inspections, and or through environmental monitoring events. After a severe weather event, the landfill will be inspected as soon as weather permits to identify any damage that may require immediate action. The facility identifies multiple alternatives for managing leachate and leachate spills in the event of a severe rainfall event or collection system failure. The facility will use available site soils, and equipment for fighting any fires that may result at the landfill. If it is unsafe to fight fires inhouse, the facility maintains adequate communication channels with local first responders. Following a contingent event, a brief report will be prepared and provided to the Department in the facility's annual report.

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 records are kept at Basin's headquarters which are located in Bismarck, ND and are available in electronic and paper form.

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

The facility has included a groundwater monitoring plan for the CCR landfill with the application. More information discussing the requirements of this section is included in **Section 12** of this review memo.

k. Construction quality assurance and quality control;

A construction quality assurance and quality control plan was included with the permit application. The following items are discussed within the plan:

- Testing methods utilized to determine soil properties
- Random fill used for construction of roadways, embankments and berms
- Liner subgrade testing requirements prior to liner placement
- Select clay for liner construction and corresponding requirements
- Drainage layer material placement and testing requirements
- Subsoil, SPGM, vegetation, and stormwater best management practices (BMP) installations
- Geomembrane preparation, placement, and welding
- Leachate and surface water collection piping
- Access road construction
- Field observations and certifications
- Documentation, surveying, and reporting 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 facility is a CCR landfill and is required to comply with the closure standards of NDAC Chapter 33.1-20.1-08. Discussion on the closure of the facility is further detailed in the **Closure** section and **Section 12** of this review memo.

m. Demonstrations of capability to fulfill the post closure standards, section 33.1-20.1-04.1-09 and otherwise provided by this article; and

The facility is a CCR landfill and is required to comply with the post closure standards of NDAC Chapter 33.1-20.1-08. Discussion on the post closure of the facility is further detailed in **Section 12** of this review memo

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.

Conclusion

Based on the submitted application and items discussed above, Basin Electric Power Cooperative has shown that the renewal meets the requirements of the North Dakota Solid Waste Management Rules. It is proposed that the Department grant Basin Electric Power Cooperative a permit with the conditions listed in Permit 0160. The proposed permit length is for a period of 10 years because the facility has shown compliance with the rules.

CRH:DAT:EH
Attachment