INTRADEPARTMENTAL MEMORANDUM

FILE: Rainbow Energy Center, LLC – Coal Creek Station – Evaporation Ponds 91, 92, 93, and 94 (New Permit)

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

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

SUBJECT: Permit Application Review

DATE: September 19, 2022

Introduction

On June 30, 2022 and July 5, 2022, the North Dakota Department of Environmental Quality (Department) received a permit application for the renewal for Rainbow Energy Center, LLC – Coal Creek Station’s (Rainbow Energy) surface impoundment facility.

Rainbow Energy currently owns and operates a surface impoundment facility (Evaporation Ponds 91, 92, 93 and 94), that is currently regulated under Permit 0033 on approximately 2,560 acres, of which 280 acres is used for the surface impoundment facility, located in the Sections 8 and 9, Township 145 North, Range 82 West in McLean County, ND. Rainbow Energy is proposing to renew their permit to continue operating Evaporation Ponds 91, 92, 93 and 94 and to split these ponds from their existing permit into a separate permit as they are non-CCR surface impoundments. The facility was first permitted in 1983.

Design

A composite liner which consisted of two feet of low permeability soil overlain by 40-mil high-density polyethylene (HDPE) geomembrane and nonwoven geotextile was installed in 1990 for Evaporation Pond 91, 1991 for Evaporation Pond 92, 1992 for Evaporation Pond 93, and 1991 for Evaporation Pond 94. The geotextile was overlain by 12 inches of sand and 6 inches of bottom ash on the floor of each evaporation pond and two feet of fly ash on the side slopes as protective cover.

In 2011, the liner systems for Evaporation Ponds 91, 93, and 94 were vertically extended. The liner system for Evaporation Pond 91 was vertically extended approximately three feet, and Evaporation Ponds 93 and 94 were vertically extended approximately five feet. The composite liner extensions consisted of linear low-density polyethylene (LLDPE) geomembrane overlying geosynthetic clay liner (GCL) that overlapped and tied into the existing liner systems. Berms
were built up accordingly to protect the composite liner systems and included fly ash, rock, or concrete revetment.

**Operation**

Rainbow Energy uses four Evaporation Ponds (91, 92, 93 and 94) which receive contact water pumped via the Drains Pond Transfer Pumphouse, and wastewater from Falkirk Mine and the Lignite Runoff Basin. The water is pumped to Evaporation Pond 91 or 92 and then can be transferred to Evaporation Ponds 93 and 94. The ponds store and remove the excess process water inventory because the plant is a zero-discharge site.

**Closure**

Rainbow Energy is intending to close Evaporation Ponds 91, 92, 93 and 94 by removal. However, the potential exists that the ponds may be drained and closed as landfills in which case the Closure and Post-Closure Plan provided details for that scenario. An alternative final cover system is proposed that includes 30 inches of clay-rich, plant root zone soil (growth medium/infiltration layer) and overlain by 6 inches of topsoil (erosion layer) which will be seeded with native grasses. More information can be found in the I. Demonstrations of capability to fulfill the closure standards, section 33.1-20.1-04.1-05 section of this memo.

**Compliance History**

No items of noncompliance have been noted since 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 is not required for surface impoundments that are not closing with waste in place.

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

Rainbow Energy is the owner of the property.

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

A preapplication was previously approved for the Evaporation Ponds prior to the initial permit.

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

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

An electronic copy of the permit application and supporting documents were submitted to the Department on June 30, 2022. The hard copy of the permit application and supporting documents were submitted to the Department on July 5, 2022. A permit application processing fee of $3,000 was also submitted to the Department on July 1, 2022.
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;

An electronic copy of the permit application and supporting documents were submitted to the Department on June 30, 2022. The hard copy of the permit application and supporting documents were submitted to the Department on July 5, 2022. A permit application processing fee of $3,000 was also submitted to the Department on July 1, 2022.

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;

Rainbow Energy uses four Evaporation Ponds (91, 92, 93 and 94) which receive contact water pumped via the Drains Pond Transfer Pumphouse, and wastewater from Falkirk Mine and the Lignite Runoff Basin. The water is pumped to Evaporation Pond 91 or 92 and then can be transferred to Evaporation Ponds 93 and 94. The ponds store and remove the excess process water inventory because the plant is a zero-discharge site.

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 unconsolidated surficial deposits are of the Coleharbor formation consisting of stratified and unstratified glacial drift. The drift appears to be the result of three glacial advances. The near-surface materials are silty clay and sandy clay till with interbedded sand lenses. Bedrock is located along the north and south side of the facility as the flanks of the west-to-east drainage network of wetlands and legal drain system.

Regional groundwater flow in the vicinity of the facility is a subtle expression of the surface topography, which is influenced by the configuration of the eroded bedrock. The groundwater flow direction is generally toward the wetlands in the central part of the site except where locally affected by other factors such as mounding beneath the ponds. The groundwater in the
uplands is within the poorly consolidated bedrock, while the groundwater in the lowlands is encountered in the glacial till.

The previous permit applications and approved preapplication demonstrated that the facility meets the location standards in this section. Additional information can be found in the Department's files.

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

A soil survey and segregation of suitable plant growth material was completed before the initial construction of the facility.

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

An Operations Plan for Evaporation Ponds 91, 92, 93 and 94 was included with the permit application. The plan addresses the requirements of this section and includes the following sections:

- Permitted Units
- Site Development including:
  - History
  - Site Development Plan
  - Liner
- Waste Acceptance Plan
- General Operations including:
  - Hours of Operation
  - Unit Access
  - Signage
  - Unit Equipment Functional Requirements
  - Site Facilities
  - Personnel Requirements – Administrative Responsibilities and Qualifications and Training
  - Contractor Training
  - Health and Safety
  - Storm Water Management – Surface Water Control
  - Environmental Controls – Dust, Litter, Odor, Vector, Noise and Erosion Control, and Illegal Dumping
- Surface Impoundment Operations including:
  - Regulatory Compliance
  - Operations Overview
  - Construction
  - Design Considerations – Slope Stability and Evaporation Pond Hydraulic Systems
- Monitoring and Inspections including:
  - Groundwater Quality Monitoring
  - Closure and Post-Closure Monitoring
- Contingency Plans including:
  - CCS Contingency Plans – Freeboard, Seepage, Pipelines, Pumps and Distribution Systems, and Impoundment Breach
o Extreme Events – General Emergency Procedures, Fire Protection, Hazardous Substance, Explosions, High Winds or Tornadoes, Snow and Ice, Medical Emergency, Vehicle Accident or Property Damage, and Downed Power Line or Power Interruption

- Recordkeeping and Reporting including:
  o Operating Record
  o Annual Report
  o Additional Records
  o Access and Disbursement of Unit Records

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.

A composite liner which consisted of two feet of low permeability soil overlain by 40-mil high-density polyethylene (HDPE) geomembrane and nonwoven geotextile was installed in 1990 for Evaporation Pond 91, 1991 for Evaporation Pond 92, 1992 for Evaporation Pond 93, and 1991 for Evaporation Pond 94. The geotextile was overlain by 12 inches of sand and 6 inches of bottom ash on the floor of each evaporation pond and two feet of fly ash on the side slopes as protective cover.

In 2011, the liner systems for Evaporation Ponds 91, 93, and 94 were vertically extended. The liner system for Evaporation Pond
91 was vertically extended approximately three feet, and Evaporation Ponds 93 and 94 were vertically extended approximately five feet. The composite liner extensions consisted of linear low-density polyethylene (LLDPE) geomembrane overlying geosynthetic clay liner (GCL) that overlapped and tied into the existing liner systems. Berms were built up accordingly to protect the composite liner systems and included fly ash, rock, or concrete revetment.

More information can be found in the g. The plan of operation section of this memo, the application, and Department's files.

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

More information can be found in the Design, Operation, 5) Non-CCR surface impoundments, section 33.1-20-04.1-09 and g. The plan of operation section of this memo, the application, and Department's files.

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.

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;

An Operations Plan for Evaporation Ponds 91, 92, 93 and 94 was included with the permit application. The plan addresses the requirements of this section and includes the following sections:

- Permitted Units
- Site Development including:
  - History
  - Site Development Plan
  - Liner
- Waste Acceptance Plan
- General Operations including:
  - Hours of Operation
  - Unit Access
  - Signage
  - Unit Equipment Functional Requirements
  - Site Facilities
  - Personnel Requirements – Administrative Responsibilities and Qualifications and Training
  - Contractor Training
  - Health and Safety
  - Storm Water Management – Surface Water Control
  - Environmental Controls – Dust, Litter, Odor, Vector, Noise and Erosion Control, and Illegal Dumping
- Surface Impoundment Operations including:
  - Regulatory Compliance
  - Operations Overview
  - Construction
  - Design Considerations – Slope Stability and Evaporation Pond Hydraulic Systems
- Monitoring and Inspections including:
  - Groundwater Quality Monitoring
  - Closure and Post-Closure Monitoring
- Contingency Plans including:
  - CCS Contingency Plans – Freeboard, Seepage, Pipelines, Pumps and Distribution Systems, and Impoundment Breach
  - Extreme Events – General Emergency Procedures, Fire Protection, Hazardous Substance, Explosions, High Winds or Tornadoes, Snow and Ice, Medical Emergency, Vehicle
Accident or Property Damage, and Downed Power Line or Power Interruption

- Recordkeeping and Reporting including:
  - Operating Record
  - Annual Report
  - Additional Records
  - Access and Disbursement of Unit Records

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 on Rainbow Energy's electronic workspace and is accessible to Rainbow Energy's employees. The information from the operating record will be furnished upon request at reasonable times to Department representatives.

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

Rainbow Energy included the Water Quality Monitoring Program Plan which includes the following sections:

- Background including:
  - Hydrogeologic Conditions
  - Historical Water Quality Monitoring Program
- 2000 Water Quality Monitoring Plan
- Data Gathering and Evaluation including:
  - Equipment and Preparation
  - Sample Collection
  - Chain of Custody Control
  - Quality Assurance and Quality Control
  - Analytical Procedures
- Detection Monitoring Program including:
  - Parameters
  - Frequency of Sampling
  - Statistical Methodology
  - Data Management

Evaporation Ponds 91 and 92 are monitored by seven groundwater monitoring wells: MW-29, MW-31, MW-32 (dry), MW-33, MW-38 (upgradient), MW-79 and MW-80. Evaporation Ponds 93 and 94 are monitored by six groundwater monitoring wells: MW-17, MW-18, MW-21, MW-23 (upgradient), MW-87 and MW-89. The wells are monitored semi-annually and an annual groundwater report is submitted to the Department by April 1st of each year.
k. Construction quality assurance and quality control;

Rainbow Energy has a thorough "Construction Quality Assurance Guidelines – Coal Creek Station" that includes:

- List of Terms
- Pre-Construction Meeting
- Progress Meetings – Daily Meetings and Weekly Meetings
- Deficiency Meetings
- Deficiencies
- Documentation including:
  - Daily Record Keeping
  - Soils Observation and Testing Data Sheets
  - Geosynthetics Observation
  - Construction Problem and Solution Sheets
  - Photo Documentation
  - Design and Specification Clarifications or Modifications
  - Weekly Progress Reports
  - Certification Report
- Lines of Communication, Responsibility, and Qualifications including:
  - Construction Manager (Project Manager)
  - Design Engineer and CQA Certifying Engineer
  - Construction Quality Assurance Monitor
- Geosynthetics Manufacturer
- Geosynthetics Contractor
- Earthworks Contractor
- Lines of Communication
- Geomembrane
- Geosynthetic Clay Liner
- Earthworks Quality Assurance

The plan meets the requirements of this section.

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

A Closure and Post-Closure Plan for Evaporation Ponds 91, 92, 93 and 94 was included with the permit application. The plan addresses the requirements of this section and includes the following sections:

- Closure Plan including:
  - Closure by Removal
  - Closure as a Landfill
    - Drainage and Stabilization of Permitted Wastes
    - Final Cover System Installation
    - Surface Water Controls
    - Vegetation
  - Final Cover System
Financial assurance cost estimates for closure were included for the four evaporation ponds. The total closure cost is $28,964,00.

Rainbow Energy is intending to close Evaporation Ponds 91, 92, 93 and 94 by removal. However, the potential exists that the ponds may be drained and closed as landfills in which case the Closure and Post-Closure Plan provided details for that scenario. An alternative final cover system is proposed that includes 30 inches of clay-rich, plant root zone soil (growth medium/infiltration layer) and overlain by 6 inches of topsoil (erosion layer) which will be seeded with native grasses.

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

A Closure and Post-Closure Plan for Evaporation Ponds 91, 92, 93 and 94 was included with the permit application. The plan addresses the requirements of this section and includes the following sections:

- Closure Plan including:
  - Closure by Removal
  - Closure as a Landfill
    - Drainage and Stabilization of Permitted Wastes
    - Final Cover System Installation
    - Surface Water Controls
    - Vegetation
  - Final Cover System
    - Alternative Final Cover System
    - Cover Soil Resources
  - Closure Estimates – Largest Area Requiring Final Cover
  - Closure Schedule
- Post-Closure Plan
  - Inspection
  - Maintenance
  - Monitoring
  - Contact Information
  - Planned Property Usage

Financial assurance cost estimates for post-closure were included for the four evaporation ponds. The total postclosure cost is $879,000.
Rainbow Energy is intending to close Evaporation Ponds 91, 92, 93 and 94 by removal. However, the potential exists that the ponds may be drained and closed as landfills in which case the Closure and Post-Closure Plan provided details for that scenario.

The plan states that post-closure care is not needed if the ponds are closed by removal. The Department has been requiring similar facilities to undergo 5 years of post-closure care to ensure vegetation has reestablished and that there are no groundwater impacts.

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 July 1, 2022.

Site Specific Conditions

It is proposed that the following conditions be included from the previous permit:

G.1. The facility shall be operated in full accordance with the approved plan of operation and the waste screening provisions. (NDAC Section 33.1-20-04.1-03)

G.2. The liquid within the non-CCR surface impoundments shall be sampled at the same frequency and for the parameters as in the facility’s approved Groundwater Monitoring Plan. The analytical results shall be submitted to the Department with the groundwater monitoring report. (NDAC Subdivision 33.1-20-04.1-04(4))

Conclusion

Based on the submitted application and items discussed above, Rainbow Energy Center, LLC has shown that the renewal meets the requirements of the North Dakota Solid Waste Management Rules. It is proposed that the Department grant Rainbow Energy Center, LLC a permit with the conditions listed in the draft permit. The proposed permit length is for a period of 10 years because there are no major changes to the operation and the facility has a good compliance history.

CRH:DAT
Attachment