



999 Fourier Dr., Ste. 101
Madison, WI 53717

T 608.826.3600
TRCcompanies.com

January 30, 2023

Mr. Tony Peterson
Wisconsin Department of Natural Resources
Eau Claire Service Center
1300 W Clairemont Ave
Eau Claire, WI 54701

Subject: Plan of Operation Modification
Phase IV Alma Offsite Ash Disposal Facility
Alma, Buffalo County, Wisconsin
License No. 4126

Dear Mr. Peterson:

On behalf of Dairyland Power Cooperative (DPC), TRC is submitting for the WDNR's review, the attached Plan of Operation (POO) Modification for Initial Permitting of Coal Combustion Residuals (CCR) Landfills for the Phase IV Alma Offsite Ash Disposal Facility (Phase IV Landfill) located in Alma, Wisconsin, License Number 4126. Via e-mail, we are also sending you a link to an electronic (PDF) copy of the POO Modification. Hard copies and electronic copies are disseminated per the attached Distribution List.

The Plan Modification was prepared in accordance with the requirements of Chapter NR 514.045, Wisconsin Administrative Code, following the general submittal requirements of Section NR 500.05 and the updated design requirements of Chapter NR 504.12. To assist in your review, copies of the NR 504 and NR 514.045 completeness checklists have been included, identifying the locations of the required information in the Plan Modification. DPC requests that the Department approves the Plan Modification for Initial Permitting for CCR Landfills for the Phase IV Landfill.

The Department's review fee should be invoiced to Mr. Leif Tolokken at the address indicated in the Distribution List. If you have comments or questions during your review of the Plan Modification, please feel free to contact me at (608) 622-9382 or Leif Tolokken (DPC) at (608) 386-2675.

Sincerely,

TRC

A handwritten signature in blue ink that reads "Todd W. Martin".

Todd Martin
Principal Project Manager

cc: See attached Distribution List

Distribution List

Recipient	Hard Copy	Electronic Copy ⁽¹⁾
Anthony Peterson Wisconsin Department of Natural Resources 141 NW Barstow Street #180 Waukesha, WI 53188	1	Yes
Matthew Bachman Wisconsin Department of Natural Resources 1300 W. Clairemont Avenue Eau Claire, WI 54701	1	Yes
Leif Tolokken Dairyland Power Cooperative 3200 East Avenue South La Crosse, WI 54601		Yes
Don Loock Dairyland Power Cooperative S2180 State Hwy 35 Alma, WI 54610		Yes
BreAnne Kahnk TRC 999 Fourier Drive, Suite 101 Madison, WI 53717		Yes

Footnotes:

⁽¹⁾ Electronic copies to be sent via an e-mail link.



Plan Modification for Initial Permitting of CCR Landfills

Alma Off-site Disposal Facility,
Phase IV Landfill
(License No. 4126)

January 2023

Prepared For:

Dairyland Power Cooperative
3200 East Avenue South
La Crosse, Wisconsin 54601

Prepared By:

TRC
999 Fourier Drive, Suite 101
Madison, Wisconsin 53717



Douglas R. Genthe
1/30/23

Douglas R. Genthe, P.E., D.GE
Vice President
Geo-Environmental Engineering



Stephen Sellwood

Stephen Sellwood, P.G.
Senior Hydrogeologist

Todd W. Martin

Todd W. Martin
Principal Project Manager

BreAnne Kahnk

BreAnne Kahnk, P.E.
Senior Engineer

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FIGURES

- Figure 1: Site Location Map
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PLAN SHEETS

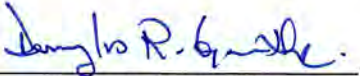
Plan Sheet 3A: 2022 Existing Conditions Map

APPENDICES


- Appendix A: NR 504 and NR 514.045 Checklists
- Appendix B: Phase IV Landfill Approval Letters
- Appendix C: Performance Standards Demonstrations
- Appendix D: Locational Criteria Demonstration
- Appendix E: Endangered Species/Critical Habitats Demonstration
- Appendix F: Plan of Operation Excerpts
- Appendix G: Construction Quality Assurance Plan
- Appendix H: GCL Conformance Demonstration
- Appendix I: Supplemental Leachate Collection System Design Demonstrations
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- Appendix K: Run-on and Run-off Control System Plan
- Appendix L: CCR Well Construction Documentation
- Appendix M: Baseline CCR Groundwater Monitoring Data
- Appendix N: Environmental Sampling Plan
- Appendix O: Fugitive Dust Control Plan
- Appendix P: Closure Plan
- Appendix Q: Post-Closure Plan
- Appendix R: Long-Term (Post-Closure) Care Costs



Certification Statement

"I, , hereby certify that I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 500 to 538, Wis. Adm. Code."

Douglas R. Genthe, P.E.

I, , hereby certify that I am a licensed professional geologist

Stephen Sellwood, P.G.

in the State of Wisconsin in accordance with the requirements of Chapter GHSS 2, Wisconsin Administrative Code; that the preparation of this document has not involved any unprofessional conduct as detailed in Chapter GHSS 5, Wisconsin Administrative Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in Chapters NR 500 to NR 538, Wisconsin Administrative Code.

1.0 Introduction

Dairyland Power Cooperative (DPC) operates a coal combustion residual (CCR) landfill in the Town of Belvidere, Buffalo County, Wisconsin. The CCR landfill is known as the Phase IV Alma Off-Site Ash Disposal Facility (Landfill) and is licensed under Number 4126. The Plan of Operation Conditional Approval was provided by the Wisconsin Department of Natural Resources (WDNR) on May 15, 2001, indicating that the Landfill was designed in compliance with chs. NR 500-590, Wisconsin Administrative Code. The Landfill is permitted with a design capacity of 3,011,000 cubic yards (cy) within 32 acres. As of 2022, approximately 1.3 million cubic yards of CCR waste have been placed in the Landfill and approximately 20.2 acres have been constructed (Cells 1-3).

DPC owns and operates the permitted Landfill in compliance with the Plan of Operation, Plan of Operation conditions of approval, and subsequent Plan Modifications that have been submitted to, and approved by, the WDNR and their applicable conditions, and the U.S. Environmental Protection Agency's (USEPA) CCR rule, Title 40 Code of Federal Regulations 40 CFR) Parts 257 and 261 Subpart D – “Standards for Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments”.

1.1 General Site Information

Project title:	Plan Modification for Initial Permitting of CCR Landfills, WDNR License #4126
Authorized facility contact:	Mr. Leif Tolokken, Manager Water and Waste Program Dairyland Power Cooperative 3200 East Avenue South La Crosse, Wisconsin 54602
Consultant:	TRC Environmental Corporation 999 Fourier Drive, Suite 101 Madison, Wisconsin 53717 Todd Martin, Project Manager (608) 622 9382
Facility location:	S2180 State Hwy 35, Alma, WI 54610 NE ¼ of the NE ¼ of Section 19 and portions of Sections 18 and 20, T21N, R12W, W ½ of the NE ¼, Section 23, T26N, R7E, Town of Belvidere, Buffalo County, Wisconsin
Date of Feasibility Determination:	September 10, 1999
Date of Plan of Operation Approval:	May 15, 2001
Liner Construction To Date (approval date):	Cell 1 (May 2002), 2A (May 2007), 2B (March 2008), 3A (March 2013), and 3B (November 2015)
Final Cover Events To Date (approval date):	Cover Event 1 (January 2010), Cover Event 2 (January 2012), Cover Event 3 (March 2017)

1.2 Purpose

The WDNR recently updated Chapters NR 500-520, Wisconsin Administrative Code, to incorporate the requirements of the Federal CCR rule (Title 40 Code of Federal Regulations Parts 257 and 261 Subpart D) into the Wisconsin solid waste regulations. The goal of these updates is for the WDNR to oversee CCR requirements for Wisconsin landfills as part of the state permitting program. Revisions to chs. NR 500-520 went into effect on August 1, 2022. As part of the revisions, owners/operators of new or existing CCR landfills that were licensed or constructed prior to August 1, 2022, are required to submit a plan of operation modification to the WDNR meeting the requirements of s. NR 514.045.

The purpose of this Plan of Operation Modification is to provide the necessary information required by the WDNR to show compliance with the revised requirements of ch. NR 500-520, Wisconsin Administrative Code. The following sections will detail compliance with s. NR 514.045. In addition, this Plan of Operation Modification will detail the Landfill's compliance with CCR operational requirements. The appendices include the WDNR ch. NR 514.045 and ch. NR 504 Completeness Checklists identifying the location of required information in this plan modification, along with the required CCR plans and supporting documentation and drawings to demonstrate compliance.

Appendix A includes the completed NR 514.045 and NR 504 checklists. Only the applicable sections of the NR 504 checklists were completed. **Appendix B** includes the prior approvals associated with the Landfill.

2.0 Locational Criteria and Performance Standards Demonstrations

2.1 Performance Standards

According to s. NR 514.045(1)(b), all phases of the CCR landfill are to meet performance standards specified under s. NR 504.04(4)(a),(b), and (c). The performance standards are addressed as follows:

1. **A significant adverse effect on wetlands as provided in ch. NR 103:** Wetlands were evaluated during preparation of the Feasibility Report (RMT, 1997). At that time, wetlands were not mapped in the Wisconsin Wetland Inventory Maps in the area of the Landfill. Based on an updated desktop review of the Landfill limits of waste, three wetlands classified as too small to delineate, one wetland indicator soil, and one NRCS wet spot were observed within the Landfill (Study Area) on the Wisconsin Department of Natural Resources (WDNR) Surface Water Data Viewer (SWDV). The wetland indicator soil and NRCS wet spot were observed in the southern portion of the Study Area. The mapped indicator soil as reported by the USDA Natural Resources Conservation Service (NRCS) Web Soil Survey, Northbend-Etrick silt loams, 0 to 3 percent slopes, frequently flooded, consists of 36 percent of the soil map unit classified as hydric.

Based on prior and ongoing construction activities occurring at the Landfill, the information reflected on the SWDV may not be representative of the current site condition of aquatic resources. The wetlands reflected on the SWDV are unlikely to be present; therefore, no adverse impacts to wetlands are anticipated as a result of the continuation of operations at the Landfill. The SWDV map is provided in **Appendix C**.

2. **A taking of an endangered or threatened species in accordance with s. 29.604, Stats:** The Feasibility Report dated September 1997 (RMT, 1997) noted that the Natural Heritage Inventory data files contained no occurrence records of Endangered, Threatened, or Special Concern species or natural communities, nor of any State Natural Areas within the Landfill area. Since the 1997 Feasibility Report, an updated endangered resources review was conducted to evaluate the existing Landfill area. The Endangered Resources (ER) Review request was submitted to the WDNR on December 21, 2022. The WDNR finalized the ER Review on January 13, 2023 (ERR Log # 22-859).

WDNR ER Review letter (ERR Log # 22-859) indicated records of 12 state-listed threatened and endangered species and three state listed special concern species. The list of threatened and endangered species included seven fish species, two mussel species, and one snail species. WDNR requires that erosion control measures shall be implemented to protect the species located downstream from the Landfill. The Landfill includes a stormwater management system that is designed to minimize erosion and sediment transport off-site. The storm water management system was designed to the 100-year, 24-hour storm event at the time of the 2000 Plan of Operation and continues to meet the 25-year, 24-hour storm event design requirements, as detailed in Section 3.4.

Temporary stormwater infrastructure and best management practices are used during construction and during intermediate phases of the Landfill's operation to manage storm water and sediment at the site. Through the continued implementation of these practices, adverse impacts to the identified species are not expected. The storm water management

system is detailed in Section 3.4. Additional requirements needed in order to not adversely impact the species noted in the ER Review letter are detailed in Section 2.4.

3. **A detrimental effect on any surface water:** During the Initial Site Inspection for the Landfill, inspection to determine whether the ephemeral waterways that were located the Landfill were navigable. During this inspection, it was determined that the ephemeral waterways were non-navigable. Therefore, the development and future development of this Landfill did not impact any navigable streams. No existing ponds, flowages, or floodplains were identified within the area occupied by the Landfill. The Site Inspection Letter is provided in **Appendix C**.

In addition to not impacting existing surface water features, the existing Landfill has been designed with sedimentation structures that limit the release of soil from the proposed facility in accordance with the applicable soil erosion and/or storm runoff regulations. The Landfill proposed two sedimentation basins that would be used to manage storm water following placement of the final cover. In addition, diversion berms, downslope flumes, perimeter ditching, and culverts were proposed to manage surface/storm water at the site as it is conveyed to the sedimentation basins. As of 2022, the larger of the sedimentation basins has been constructed, the remaining sedimentation basin is to be constructed with Cell 4B. The storm water design is further detailed in Section 3.4.

2.2 Locational Criteria

According to s. NR 514.045(1)(c), all phases of the CCR landfill are to meet locational criteria specified under s. NR 504.04(3)(g),(h), and (i). The locational criteria are addressed as follows:

1. **Within 200 feet of a fault that has had displacement in Holocene time:** Subsurface investigations performed and reported in the Feasibility Report (RMT, 1997) included rock coring. Faulting was not observed in the rock cores. Additionally, the USGS Quaternary Earthquake Fault Map submitted in the latest Location Restrictions Demonstrations report (TRC, 2018) does not map faults occurring in the past 1.6 million years in the region of the Landfill. An updated Earthquake Fault Map for 2022 was evaluated and no faults occurring in the past 1.6 million years are noted in the area of the Landfill.
2. **Within seismic impact zones:** The American Society of Civil Engineers (ASCE) 7 seismic hazard tool maps website (ASCE, 2022) indicated an adjusted peak ground acceleration of 0.029g. This design peak ground acceleration is below the 0.1g lower limit for seismic impact zones; therefore, the site is not located in a seismic impact zone.
3. **Within unstable areas:** Risks presented by unstable areas caused by soil conditions, geologic or geomorphologic features, and human made features were evaluated for compliance with state regulations. An analysis was performed as part of the Location Restrictions Demonstrations report (TRC, 2018) which determined that the geotechnical exploration performed for the Feasibility Report (RMT, 1997) and landfill design performed by a professional engineer observed and documented no unstable foundation conditions. Soils within the footprint were found to consist of silt and lean clay overlaying medium to dense silty sand with evidence of highly weathered sandstone or dolomite in some areas to depths of 152 feet below ground surface. The observations did not suggest geologic conditions that are seen as unstable. Global stability calculations were performed as part of the Plan of Operations to evaluate the safety factors for the designed critical slopes (RMT, 2000). The analysis indicated acceptable factors of safety for the designed landfill.

Additionally, construction of the Landfill subgrade was performed under the observation of an engineer's representative and according to project specifications. Since the start of construction of the Landfill and as of today, no evidence of differential settlement impacting the foundation conditions have been observed. As no changes have created new unstable areas within the Landfill, this report satisfies the requirements of the s. NR 504.04(3)(i).

The Location Restrictions Demonstrations for the Landfill, dated May 2018, is provided in **Appendix D**. The updated supporting information detailed above supersedes the supporting information contained within the May 2018 document.

2.3 Floodplain Demonstrations

The FEMA floodplain map for the Landfill indicates the permitted area is not within a floodplain. The nearest floodplain boundary is along the western side of Highway 35, approximately 0.75 miles southwest of the southernmost limits of waste. The Landfill is in Zone X, which are areas of 0.2% annual chance of flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

The flood elevation of the floodplain nearest to the Landfill is about 670 feet (NAVD 1988). Subbase elevations within the Landfill range from approximately 780 feet above mean sea level (msl) in the southern portion and 862 feet msl in the northern portion of the Landfill (USGS mean sea level, 1929 adjustment) and final grades elevations up to approximately 966 feet msl. Because the Landfill's elevations are significantly higher than the flood elevation of the nearest floodplain and the Landfill is not located inside the floodplain, the facility nor its operations are not expected to restrict the flow of the regional flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste so as to pose a hazard to human life, wildlife, or land or water resources.

2.4 Endangered Species or Critical Habitats Demonstrations

The Landfill Study Area was submitted to the Wisconsin Department of Natural Resources (WDNR) along with an Endangered Resources (ER) review request to review of the Wisconsin Natural Heritage Inventory (NHI) database. A review of the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) website was conducted to identify state and federally listed species occurrences within or near the Alma Off-Site Disposal Facility.

The WDNR ER Review letter (ERR Log # 22-859) indicated records of 12 state-listed threatened and endangered species and three state listed special concern species. The list of threatened and endangered species included seven fish species, two mussel species, and one snail species. The DNR is requiring erosion control measures to avoid and minimize potential impacts to the fish and mussel species. DPC will continue to utilize erosion control BMPs in accordance with DNR Technical Standards as required by state statues to manage potential erosion and control sediment release from the Landfill during land disturbance activities. In addition, DPC's storm water management system is designed to manage erosion and sediment transport during the Landfill's operation. The storm water management system will continue to be maintained and is detailed in Section 3.4.

The DNR is also requiring habitat surveys for the snail species. Prior to disturbing areas where potential snail habitat occurs during liner construction activities, DPC will have a qualified individual perform a habitat survey for snail habitat. If habitat is found and would need to be impacted, DPC will contact the WDNR Endangered Resources Utility Liaison to discuss how to avoid impacts or to apply for an Incidental Take Permit, as per the requirement listed in the ER review letter.

The ER review letter also makes recommendations to avoid and minimize impacts to three state listed special concern fish species. This includes installing erosion control measures. Given that erosion control measures are required for state listed threatened and endangered fish and mussel species, DPC would follow this DNR recommendation. By following state requirements and recommendations, no adverse impacts on state listed special concern, threatened, or endangered species are anticipated.

The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) Official Species List indicated the potential presence of one endangered mammal, the Northern Long-eared Bat (*Myotis septentrionalis*), two endangered clams, Higgins Eye (*Lampsyllis higginsii*) and Sheepnose Mussel (*Plethobasus cyphus*), and one candidate insect species, the Monarch butterfly (*Danaus plexippus*). Included below are descriptions of potentially suitable habitat areas within the Landfill Study Area.

- Northern long-eared bat: Potential suitable woodland habitat was observed in the Study Area. If no clearing of forest or woodland habitat is expected to be needed, potentially suitable northern long-eared bat roost habitat will not be adversely affected by the Project and a no effect determination may be concluded. During previous construction events, tree clearing for Cells 4A and 4B was substantially completed. Therefore, if constructed, additional tree clearing would be minimal, and time of year tree clearing restrictions would be followed as needed. Tree clearing restrictions include conducting tree removal activities outside of the northern long-eared bat pup season (June 1 to July 31) and/or the active season (April 1 to October 31). This will minimize impacts to pups at roosts not yet identified (USFWS).
- Higgins Eye and Sheepnose Mussel: Suitable habitat is not present for the Higgins Eye and Sheepnose Mussel clam species. Streams providing suitable habitat for the listed mussel species are not present within the Study Area, therefore, no impacts to these species, including destruction or modification of their critical habitat are expected. Additionally, erosion control measures will be implemented to control for erosion and sediment release to waterways where the mussel may occur.
- Monarch Butterfly: Suitable flowering plant and milkweed habitat is not expected to be present in the Study Area, therefore, no destruction or adverse modification of critical habitat is anticipated. As of the date of this Plan Modification, the monarch butterfly is a candidate species only and no state or federal regulations for the species or their habitat are required to be followed, however, protection of identified habitat is encouraged by USFWS.

Results from the USFWS IPaC Official Species List are provided in **Appendix E**.

3.0 Design Demonstrations

The design of the Landfill was originally presented in the Plan of Operation, dated October 2000 (RMT, 2000) and modified with subsequent plan modifications submitted since 2001. The Plan of Operation was approved on May 15, 2001 by the WDNR. Applicable information previously provided in the Plan of Operation has been included in **Appendix F**.

As of January 2023, five liner construction events and three final cover construction events have been completed at the Landfill. During each of the construction events, an on-site quality assurance representative observed the construction and completed compliance testing. A summary of the construction activities along with the results of the compliance testing were submitted to the WDNR following construction for review and approval. All liner and final cover construction events have been approved by the WDNR. The approval letters for each construction event are included in **Appendix B**.

The following subsections will provide details pertaining to the design of the Landfill which also apply to the future construction at the landfill, summarizing information provided in previous submittals, supporting information or excerpts from previous submittals will be provided in the appendices as needed.

3.1 Accepted Waste Types

The Landfill only accepts CCR-related materials approved with the Plan of Operation or approved in subsequent Plan Modifications. These approved materials originated from DPC's Alma site which included Alma Station (Units 1 – 5) and John P. Madgett Generating Station (JPM) and DPC's Genoa Station No. 3 and include:

- Fly ash,
- Bottom ash,
- Sludge from the wastewater treatment plants for the Alma and Genoa power generating facilities,
- Asbestos generated from renovations at the power generating stations,
- Genoa Station No. 3 flue gas desulfurization (FGD) (similar to Sherco #3 FGD),
- Dry Sorbent Injection (DSI) – JPM Power Plant only,
- Activated carbon injection, JPM and Genoa
- Selective catalytic reduction – JPM Power Plant only, and
- Selective non-catalytic reduction - Genoa Power Plant only.

Throughout the Landfill's operating life, the waste stream sources have decreased as facilities have been decommissioned. Waste streams originating from Alma Generating Station (Units 1 - 5) and Genoa Station No. 3 have halted due to the decommissioning of these power plants.

3.2 Liner Design

Five liner construction events have been completed at the Landfill, which include Cells 1, 2A, 2B, 3A, and 3B. During each of the construction events, an on-site quality assurance representative working under the direction of a professional engineer licensed in the State of Wisconsin observed the construction and completed compliance testing. A summary of the construction activities along with the results of the compliance testing were submitted to the WDNR following construction for review and approval. The liner and cover construction events have been approved by the WDNR and their approval letters are included in **Appendix B**. Construction of future Cells 4A and 4B are expected to follow similar construction procedures as the previous liner construction events.

A revised existing conditions map, **Plan Sheet 1**, has been provided to detail the current conditions of the Landfill. Additional drawings associated with the site are included in **Appendix F**. Per s. NR 504.12(3)(a), a new or lateral expansion of a CCR landfill shall be designed, constructed, operated, and maintained with a composite liner and leachate collection and removal system. The following subsections detail the design of the CCR landfill for future potential expansions, which include Cells 4A and 4B.

3.2.1 Subbase grades

Subbase grades were designed to provide a minimum separation distance of 10 feet from the seasonal high groundwater table and the top of bedrock surface. In addition, 40 CFR 257.60 indicates that the Landfill (lateral expansions) must be located with a base that is no less than 5 feet above the upper limit of the uppermost aquifer.

The site water table, based on water level elevations measured in April 1996, is shown on the engineering cross sections from the Plan of Operation (**Appendix F.2**). The separation between the water table and the subbase grades on the engineering cross sections is typically 30 to 40 feet and is greater than 25 feet throughout the footprint of the Landfill. Water levels changes since 1996 have ranged from a decrease of approximately 1 foot (W-100/W-100R) to an increase of approximately 17 feet (W-104); therefore, the minimum 5-foot separation between the subbase grades and groundwater elevations has been maintained for the entire Landfill footprint.

Subbase grades within the Landfill slope from north to south, following the overall site's topography, mimicking the base grades detailed in Section 3.2.2. Interior perimeter berms are designed and constructed at a 3:1 slope. The floor slopes are designed to exceed the minimum 2% requirement for liner slopes.

3.2.2 Base Grades and Liner System

Base grades at the Landfill are designed to be raised a minimum 2 feet above subbase grades and follow the subbase grades slope from north to south. The base grades (and subbase grades) are designed in a herringbone configuration. This configuration increases the efficiencies of the leachate collection system as leachate is directed to designated low spots where the leachate can be removed from the landfill footprint.

The base grades within Cells 4A and 4B are designed with a 4% slope along the leachate collection line. These slopes exceed the minimum 0.5% requirement in s. NR 504.06(5)(b). The ridges in the herringbone configuration are designed to meet or exceed the minimum liner slope

requirements toward the leachate collection liner of 2%, in accordance with s. NR 504.06(2)(d). Liner slopes within Cell 4A and 4B range from 2% to 10%, exceeding the minimum requirement of s. NR 504.06(2)(d).

In general, the herringbone design of the Landfill does not exceed the maximum leachate flow distance requirements of 130 feet, except in two small areas in Cell 4. An exemption had been previously granted for the two exceedances, which are located in the southwestern corner of Cell 4A and along the eastern wall of Cell 4B. In Cell 4A the flow length exceeds the requirement by an average of 19 feet, and an average of 12 feet in Cell 4B. Due to the relatively steep base slopes (6% and 10% respectively) in these areas, the WDNR approved the exemption request in 2001 (**Appendix B**). Liner slopes within Cell 4A and 4B range from 2% to 10%, exceeding the minimum requirement of s. NR 504.06(2)(d). The base grades from the Plan of Operation, which are consistent with the constructed area grading and grades for Cells 4A and 4B, are provided in **Appendix F.2**.

A composite liner system for the Landfill is designed to be installed along the base and interior sidewalls of the entire Landfill. The composite liner consists of a geosynthetic clay liner (GCL), and a 60-mil high-density polyethylene (HDPE) geomembrane liner installed over a low-permeability layer soil layer as allowed by s. NR 504.06(7).

3.2.2.1 Low Permeability Soil Layer

Per s. NR 504.06(7)(c), the GCL in a composite liner system is to be underlain by a soil barrier layer that is a minimum 2 feet thick and meets the specifications of s. NR 504.07(4)(a)(12-17). Per s. NR 504.07(4)(12) the soil barrier layer (known hereby referenced as the low permeability soil layer) consists of soil types with the Unified Soil Classification System (USCS) classes of ML, CL, CH, SM, or SC or dual-classification of these soils. Condition 7a of the Plan of Operation approval noted that material in the upper 1 foot of the low permeability soil layer is required to consist of the soil types listed above, with a maximum particle diameter less than 1 inch and have at least 80% by weight pass the No. 60 screen and a P200 content of 40% of greater.

The soil that has historically been utilized for the low permeability layer is obtained from on-site material excavated during subbase construction. This is anticipated to be consistent for the future construction of Cells 4A and 4B. The on-site soil borrow for the low permeability layer has consisted of silty clay, silt, or lean clay with Unified Soil Classification System (USCS) symbols of ML, ML-CL, and/or CL, as noted in the liner construction documentation reports. This material has been in conformance with the requirements and specifications of the low permeability soil.

If Cells 4A and 4B are constructed, the material excavated during development of the subbase grades is anticipated to meet the low-permeability soil requirements, consistent with the previous construction events, and would be placed to a minimum 2-foot-thickness above the subbase grades. If additional soil material is needed, an off-site borrow source or commercial source would be utilized to supplement the soil volume requirements. Soil samples would be obtained during liner construction and tested both in the field (moisture-density testing) and in the laboratory (moisture content, dry density, grain size, and Atterberg) to show compliance with the material specifications.

Placement of the low-permeability soil layer will comply with the requirements of s. NR 504.07(4)(a)(12-17) and is detailed in Section 4.6.1 of the 2000 Plan of Operation text

excerpt provided in **Appendix F.1** and the Construction Quality Assurance (CQA) Plan included in **Appendix G**.

3.2.2.2 Geosynthetic Clay Liner

3.2.2.2.1 Geosynthetic Clay Liner Design

A GCL is designed to be placed directly above the low permeability soil layer along the base and sidewalls. The GCL consists of a layer of pure sodium bentonite encapsulated between two geotextiles. The bentonite barrier component of the GCL contains an expanding clay that absorbs water and swells to form low-permeability material. The liquid flow rate through the GCL layer is designed to be no greater than the liquid flow rate through 2 feet of compacted clay meeting the hydraulic conductivity requirement in s. NR 504.06(2)(a)(2). The liquid flow rate comparison is included in **Appendix H.1**.

GCL used in construction at the Landfill is required to be meet the requirements detailed in the CQA Plan (**Appendix G**). Previously used GCLs consist of either Bentomat ST or GSE BentoLiner NSL, both reinforced GCLs consisting of a layer of granular sodium bentonite clay encapsulated between a two geotextiles fabrics (upper – nonwoven; lower – woven) needle-punched together. The GCLs are certified as needle free. These or similar materials will be used during the liner construction of Cells 4A and 4B.

If Cells 4A and 4B are constructed, placement of the GCL will comply with the requirements of s. NR 504.07(4)(a)(1-11) and is detailed in Section 4.6.3 of the 2000 Plan of Operation text excerpt provided in **Appendix F.1** and the CQA Plan included in **Appendix G**.

3.2.2.2.2 Geosynthetic Clay Liner Compatibility Testing

Throughout Landfill operations, GCL compatibility testing has been completed per the requirements in the 2001 Plan of Operation Conditional Approval. As summarized below, the testing has not found a significant increase in the permeability of the GCL. Operations that would take place in Cells 4A and 4B would be consistent with existing operations and waste acceptance. Therefore, these findings summarized below can be applied to Cells 4A and 4B.

In 2006, a trend analysis for the GCL compatibility testing was completed and submitted to the WDNR. During this evaluation it detailed that the primary factor in the swelling of the bentonite component of the GCL is due to sodium ions present in the clay. The permeability of a GCL increases if a significant fraction of these sodium ions exchange with calcium ions in solution. Based on historic leachate samples taken through 2005, it was calculated that the overall increase in hydraulic conductivity of the GCL was approximately 2.3 percent. This increase is insignificant due to the order of magnitude of the GCL permeability being 10^{-9} cm/s (Cell 3B GCL hydraulic conductivity was reported as 1.23×10^{-9} cm/s). The resultant hydraulic conductivity of the GCL material would continue to be calculated to an order of 10^{-9} cm/s.

The most recent compatibility testing was completed in April 2009 when FGD waste was proposed to be accepted at the Landfill. Based on the study, it was expected that the disposal of the FGD material may cause a slight increase in the liner permeability, but the permeability of the liner is expected to stay well below 1×10^{-7} cm/s because the variability of the FGD waste is less than what was seen for the fly ash and Sherco scrubber material that was currently disposed of at the Landfill. The FGD material was approved for disposal in December 2009. The FGD approval

letter and 2009 leaching potential and GCL compatibility analysis is provided in **Appendix B** and **Appendix H.2.1**, respectively.

In November 2013, a subsequent plan modification (**Appendix H.2.2**) was submitted to the WDNR for the inclusion of several waste sources from the Alma and Genoa power generating facilities to the Landfill. These waste sources included DSI, which is currently one of the primary waste sources disposed at the Landfill. DSI residual material is similar to the FGD residual material generated at the Genoa facility, except that there is a higher sodium content and lower calcium content. As noted in the 2006 trend analysis, it is the presence of calcium ions (divalent ions) and their exchange with sodium ions that tends to cause an increase in GCL permeability. The decrease in calcium content in the waste source would presumably decrease the potential of this ion exchange.

As noted in the submitted 2013 Plan Modification, the annual results of the previous compatibility testing from 2003 through 2007 were reviewed along with the recent laboratory testing performed on the sodium bicarbonate samples from the JPM baghouse. Based on this review and the similarities in the leaching characteristics between the lime-based and sodium bicarbonate-based materials, it was not anticipated that a significant increase in permeability of the GCL would occur. Approval of these waste sources was provided to the Landfill from the WDNR in December 2013. The approval letter is provided in **Appendix B**.

3.2.2.3 Geomembrane Liner

The upper component of the composite liner system consists of a nominal 60-mil high density polyethylene (HDPE) geomembrane liner. The geomembrane liner located within the landfill base will consist of a smooth geomembrane, while the geomembrane on the sideslopes will be textured for added stability. HDPE geomembrane liners have historically been included in the design and construction of nonhazardous waste facilities. Testing of the compatibility of the HDPE geomembrane with the leachate generated from this type of facility has been previously performed by geomembrane manufacturers, suppliers, and industry users. These test results, provided from the 2000 Plan of Operation, indicate that the leachate from a typical nonhazardous waste disposal facility will not adversely affect the performance of the HDPE geomembrane liner and are included in **Appendix F.3**.

The geomembrane will be deployed above the GCL. Minimum geomembrane liner property requirements will comply with those presented in the CQA Plan. The geomembrane will be seamed with the previously installed geomembrane as to create a continuous seal. If Cells 4A and 4B are constructed, placement of the geomembrane will comply with the requirements of s. NR 504.06(3)(a-k) and is detailed in Section 4.6.4 of the 2000 Plan of Operation text excerpt provided in **Appendix F.1** and the CQA Plan included in **Appendix G**.

3.2.2.4 Geotextile Cushion

The leachate collection drainage layer, detailed in Section 3.2.3, is designed to require placement of geotextile on an as-needed basis for areas outside the leachate collection trenches. A minimum 12 ounce per square yard (oz/sy) of nonwoven geotextile is to be installed within the leachate collection trench following geomembrane installation to provide additional protection to the geomembrane from the pipe bedding materials. Material specified for use of the leachate collection drainage layer does not exceed particle sizes of ¼ inch in diameter; therefore, the geotextile would not be required outside the trenches. If the leachate collection drainage layer

includes particles exceeding 1/4 inch in diameter, geotextile should be placed over the entirety of the Landfill base grade, in accordance with s. NR 504.06(5)(t). The geotextile cushion would be secured in place via the anchor trench.

The geotextile in Cells 4A and 4B will be deployed above the geomembrane within the leachate collection drainage trenches, at a minimum. Minimum material specifications are presented in the CQA Plan. Placement of the geotextile is detailed in Section 4.6.6 of the 2000 Plan of Operation text excerpt provided in **Appendix F.1** and the CQA Plan included in **Appendix G**.

3.2.3 Leachate Collection System

The primary function of the leachate collection system was to maintain the average leachate head on the liner system to less than 12 inches per s. NR 504.12(3)(a)(1). The leachate collection system design for the Landfill consists of a minimum 1-foot-thick leachate collection drainage layer, leachate collection piping traversing north to south across the landfill base, and leachate conveyance piping between landfill cells and the leachate tank located outside the limits of waste. The leachate collection piping is outfitted with cleanouts to provide access for maintenance and jetting of the pipes throughout the operational and post-closure periods of the Landfill.

The leachate collection tank was previously installed during the Cell 1 liner construction event. Leachate collection and conveyance piping along with the drainage layer and cleanouts have been installed systematically as cells were developed at the Landfill. Construction of Cells 4A and 4B would include the installation of the remaining portions of the drainage layer, collection piping, cleanouts, and head wells.

Per s. NR 504.12(3)(a), a new or lateral expansion of a CCR landfill shall be designed, constructed, operated, and maintained with a composite liner and leachate collection and removal system. The following subsections will summarize the leachate collection system design presented in the Plan of Operation, which is consistent for the future potential expansion Cells 4A and 4B. Excerpts from the Plan of Operation are provided in **Appendix F.1**, details relating to the leachate collection system from the Plan of Operation plan set are provided in **Appendix F.2**.

3.2.3.1 Leachate Collection Drainage Layer

The leachate collection drainage layer consists of a minimum 1-foot thick of select granular fill that is placed over the geomembrane on the base and sidewalls of the Landfill. The leachate collection layer will have a minimum hydraulic conductivity of 1×10^{-2} cm/s, not exceed 1/4 inch in size, and meet the specifications detailed within the CQA Plan (**Appendix G**).

The material that has been utilized for the select granular fill has primarily been obtained from an off-site commercial source. The select granular fill utilized for the leachate collection drainage layer did not exceed the particle size requirements in s. NR 504.06(5)(t) which would have required geotextile atop the geomembrane outside the leachate collection trenches. In addition, hydraulic conductivities met the minimum requirement as specified in s. NR 504.06(5)(tm).

Aggregate material is used for bedding material for the leachate collection piping. The pipe bedding will have a uniformity coefficient of less than 4, maximum particle diameter of 1.5 inches, maximum of 5% of the material passing the number 4 sieve and consist of either rounded or subangular gravel. A minimum of 4 inches of bedding material is to be placed below the perforated collection pipe in the leachate collection trenches. The aggregate material is also to

be placed around the leachate collection pipe and mounded at least 1 foot above the pipe. The material that has been utilized for the select aggregate fill has been obtained from an off-site commercial source. The aggregate material has been in general conformance with the material specifications in NR 504.06(5)(e).

Material for the leachate collection drainage layer and aggregate pipe bedding material in Cells 4A and 4B would continue to be obtained from this or a comparable off-site commercial source and confirmation testing would be completed to determine that it met the required specifications.

The leachate collection drainage layer is designed to provide a soil filter for filtering the select aggregate fill material. However, if the soils obtained during construction do not meet that graded design, a 6-inch-thick layer of select graded fill will be placed over the bedding material as needed to maintain the soil filter to minimize migration of the select granular fill into the pipe bedding material. The use of select graded fill has been used periodically during the previous liner construction, depending on the characteristics of the granular and aggregate fill obtained.

Soil filter calculations have been completed previously as part of the Plan of Operation and continued to be completed as part of the liner construction documentation reports to confirm that the leachate collection drainage layer and pipe bedding material met the requirements for the graded filter design. The soil filter calculation utilized the DPC material specifications to show that the leachate collection drainage layer and the pipe bedding material met the requirements of a graded filter so clogging is not anticipated for the site. As noted above, if the materials obtained for construction show the potential for movement, a graded fill is installed to maintain the soil filter design.

The soil filter piping and permeability calculations from the Plan of Operation are provided in **Appendix F.4**. The assumptions made in these calculations are generally valid, with exception the uniformity coefficient of the average pipe bedding which exceed the requirements. Material used during construction have met the specifications in CQA Plan and the soil filter calculations from the two most recent liner construction events are included in **Appendix I.1 and I.2**. The soil filter design will be able to be maintained with the off-site commercial materials with Cells 4A and 4B.

Calculations have also been performed during the 2000 Plan of Operation to confirm that the average leachate head on the liner is limited to 1 foot or less, this calculation is provided in **Appendix F.5**. Assumptions made in these calculations are valid as the slope of the liner cover the most critical conditions encountered for the entire Landfill, which includes Cell 4, and the leachate generation rate in ch. NR 512 is consistent. Therefore, as designed and installed, the Landfill (on average) is expected to maintain a leachate head on the liner to 1 foot or less in accordance with s. NR 504.12(3)(a)(1). Because the leachate collection lines are 1,200 feet or less and are considered extended lines, the requirements under s. NR 514.07(8)(c)(3)(b) were not considered.

The leachate collection drainage layer will be placed within 30 days of completing geomembrane installation and quality assurance testing. To minimize the potential for large wrinkles in the geomembrane, the drainage layer will be placed during cooler temperatures when possible. Wrinkles in the geomembrane that are higher than they are wide, will be smoothed or cut out and repaired prior to placing the drainage layer. Initial lifts of the select granular fill will be approximately 2 to 3 feet thick to allow for vehicular traffic over the geomembrane component for material hauling. A minimum of 2 feet of material will be placed prior to operating tracked vehicles

and flotation tire–equipped vehicles, while a minimum of 3 feet of material will be placed prior to operating trucks and other wheeled hauling equipment. These initial lifts will be graded down to the 1-foot minimum design with the use of low ground pressure tracked vehicles, meeting the requirements of NR 504.06(3)(h). To protect this layer, DPC will place a minimum 2-foot layer of bottom ash or ash from the JPM Station over the select granular fill.

3.2.3.2 Leachate Collection Piping, Sumps, and Manholes

The leachate collection piping, cleanout risers, and head wells are designed to consist of HDPE piping. HDPE materials have historically been utilized within solid waste facilities, both for municipal and industrial applications. Based on the EPA 9090 Chemical Compatibility study between CCR materials and HDPE and VLDPE, the HDPE materials did not have any changes in the polymer structure or original performance of the polymer's characteristics. In addition, HDPE has been tested to show satisfactory chemical resistance properties to chemical attack from compounds associated with CCR materials as noted in the Ineos's Chemical Resistance Guide (**Appendix I.3**) per s. NR 504.12(3)(a)(2)(a).

Leachate collection piping consists of 6-inch-diameter perforated SDR 17 HDPE pipes placed in minimum 18-inch-deep vee-trenches constructed in the valleys of the herringbone base grades. The vee-trenches sideslopes have a maximum slope of 3:1, per s. NR 504.06(5)(d) and contain a geotextile placed underneath the pipe bedding material. The geotextile is detailed in Section 3.2.2.4. The perforated collection piping includes a maximum 1/2-inch diameter holes set 45 degrees from center, consistent with piping installed within the previous liner construction. This is also permissible per the piping and permeability calculations. The leachate collection piping is designed to gravity flow to the south through liner penetrations (detailed below) to the leachate conveyance system.

Pipe joints will be butt-fusion–welded in accordance with the manufacturer's recommendations. The leachate collection piping will be flushed following construction.

An exemption request has previously been approved by the WDNR in the 2001 to allow for horizontal pipe penetrations through the southern liner sideslope to allow leachate to gravity drain to the leachate collection tank south of the Landfill. The leachate collection lines transition into dual encased transfer piping that penetrates the liner sideslope, and ultimately combine via manholes into a single transfer pipeline that is routed to the existing leachate tank. The penetrations were designed to prevent leachate from leaving the liner system. Section 3.8.4 of the Plan of Operation included in **Appendix F.1** details the design of these penetrations. Drawing details are provided in the Plan of Operation Plan Set in **Appendix F.2**. These penetrations are included in leachate removal design for Cells 4A and 4B, and their construction will be consistent with those in Cells 1 through 3.

The leachate collection pipes are outfitted with perimeter cleanouts at the end of each leachate collection pipe. Midline cleanouts are included in Cells 3 and 4 along the longest collection lines to maintain pipe cleanout lengths of 1,200 feet or less. The cleanout risers and midline risers consist of 6-inch nonperforated SDR 17 HDPE pipe. The cleanout risers will be placed up the sidewalls of the Landfill, daylighting atop the perimeter berm or in manholes with a locking cap. A minimum 2-foot-thick (vertically) of select granular fill is be placed above cleanout risers on the sideslopes of the Landfill.

Pipe strength calculations were conducted during preparation of the 2000 Plan of Operation. The calculations indicated that the proposed loading from waste placed above the pipes would not adversely impact strength characteristics of the pipes. The strength parameters (diameter, SDR, material) for piping currently installed at the Landfill are consistent or stronger than those included in the Plan of Operation. Similar strength material will continue to be used for the construction of Cells 4A and 4B. No changes to the height of proposed waste have been proposed in subsequent plan modifications. Minimal changes to the final cover configuration have occurred since the Plan of Operation. These have included reverting back to the 3-foot final cover system approved by WDNR instead of the 5-foot cover system presented in the WDNR Plan of Operation Approval letter. This final cover system is more consistent with the loading presented in the pipe strength calculations provided in the Plan of Operation. These pipe strength calculations are included in **Appendix F.6**.

3.2.3.3 Leachate Conveyance and Storage Tank

The leachate collection pipe transitions into a non-perforated pipe prior to penetrating the liner system as detailed in Section 3.8.4 of the Plan of Operation text excerpt included in **Appendix F.1**. At the liner penetration, the leachate piping transitions from single walled pipe to dual-encased pipe in accordance with s. NR 504.06(5)(L) for pipelines location outside the limits of waste/ash. The leachate transfer piping is designed to gravity drain from the northern side of the Landfill to the existing leachate tank located south of Sedimentation Basin 1.

The dual-encased transfer piping has been previously installed at the Landfill and consists of 6-inch non-perforated SDR 17 HDPE pipe encased within a 10-inch diameter nonperforated SDR 11 HDPE pipe. Outside the limits of waste/ash, seven concrete manholes were designed to provide locations for changes in piping direction, for piping to manifold into a single transfer pipe, cleanout access, and to monitor interstice between the casing and carrier pipes.

The seven previously proposed transfer leachate manholes were installed during the previous liner construction events. An additional manhole located between the tank and loadout station to monitor volume of leachate extracted from the tank was also installed during a previous liner construction event. The concrete manholes were installed as the perimeter berms were constructed. During construction of Cell 3A, two leachate transfer pipelines were preemptively installed from Manhole 7 (located south of Cell 4A) to the construction limits of Cells 4A to allow for the future leachate collection piping connections.

Due to the additional construction that occurred during the Cell 3A liner construction event, additional dual-encased transfer piping and leachate transfer manholes are not anticipated to be installed during liner construction events for Cells 4A and 4B.

The leachate collection tank was installed during the construction of Cell 1 per the requirements of the Plan of Operational approval. The tank consists of a double-walled, fiberglass-coated, steel reinforced Duraglass Type I storage tank that was bedded on clean sand and secured with deadman anchors. Double wall steel reinforced tanks tend to be resistant against structural failure and both internal and external corrosion. These types of tanks are generally used for both municipal and industrial applications. The existing tank has been in service at the Landfill for over 20 years and has not experienced failures due to the interactions between the leachate and the tank. Leachate from the tank is pumped via dual encased piping to the processing facility or loadout station. The leachate generated, once extracted, is used as approved in the Plan of

Operation or hauled off-site for disposal and treatment. Use of the generated leachate for dust control, as previously presented in the 2000 Plan of Operation, is detailed in Section 5.1.

3.2.3.4 Leachate Collection System Maintenance, Monitoring, and Operation

The Landfill leachate system is designed with leachate head wells that are used to monitor the hydraulic head of the leachate within the Landfill. Two leachate head wells are to be installed within each cell of development, totaling in eight head wells for the entire Landfill. Six head wells are currently installed at the Landfill. Construction of Cells 4A and 4B would complete the installation of the remaining 2 head wells.

The head wells consist of a 3-inch-diameter Schedule 120 non-perforated PVC piping with a 5-foot screen and installed at a level grade toward the toe of the perimeter berm sidewall with surface access at the top of the perimeter berm. The head wells will be placed over the geomembrane, within the select granular fill drainage layer at a constant elevation. A minimum of 2-feet of select granular fill will be placed above the head well along the base and sidewall of the Landfill. General fill will be mounded around the head well piping at the termination at the top of the berm for support. During final cover construction, the mounded general fill will be replaced with final cover material. Drawing details of the head wells are included in **Appendix F.2**.

DPC measures head levels on a monthly basis per their environmental monitoring plan. If elevated head levels are discovered, DPC evaluates the potential causes and attempts to lower the levels in a timely fashion. These measures include completing additional leachate collection pipe jetting to confirm that they are clear and televising the line on a more frequent basis. The most recent leachate line video inspection was performed in June 2022 in which the lines were found to be in good working condition with no significant problems encountered during the post-jetting video inspection (DPC, 2022).

Due to the properties of the CCR material disposed of at the facility, precipitation that contacts the active area of the Landfill and becomes leachate is prone to runoff from the higher elevations and to concentrate in lower areas of the waste mass surface causing temporary ponding of leachate. DPC has implemented the practice of constructing vertical leachate drains out of bottom ash in areas prone to ponding to more efficiently route leachate to the leachate collection system.

3.3 Final Cover System

Final grades at the Landfill consist of 4H:1V sideslopes from the high point to the top of the perimeter berm. The final grades, in conjunction with the final cover system and surface water management system, promote surface water runoff, effectively reducing infiltration of precipitation and thereby reducing the quantity of leachate generated.

As of January 2023, three final cover construction events have been completed. During each of the final cover construction events, an on-site quality assurance representative, working under the direction of a professional engineer licensed in the State of Wisconsin, observed the construction and completed compliance testing. A summary of the construction activities along with the results of the compliance testing have been submitted to the WDNR for review and approval. The final cover construction events have been approved by the WDNR, approval letters are included in **Appendix B**.

Per s. NR 504.12(4), a new or existing CCR landfill or lateral expansion of a CCR landfill shall be designed and constructed with a final cover system that meets the requirements under s. NR 504.07. A new or existing CCR landfill or a lateral expansion of a CCR landfill may also propose an alternative final cover system design in accordance with s. NR 504.10. The approved final cover system complies with the requirements for an alternative final cover system design.

3.3.1 Final Cover System Design

In 2004, DPC submitted a Plan of Operation Modification (**Appendix J.1**) to modify the final cover presented in the conditional Plan of Operation approval. The final cover system presented the Plan of Operation Conditional Approval required the following:

- 2-foot soil barrier layer,
- GCL,
- 40 mil very flexible polyethylene (VFPE) geomembrane,
- 1-foot granular drainage layer,
- 1.5-foot general fill rooting layer, and
- 6-inch topsoil layer.

The 2004 Plan of Operation Modification presented a modified final cover system, which has been used in the previous three final cover construction events. This modified final cover system consists of the following components (from bottom to top):

- 2-foot moisture-conditioned and compacted “select” fly ash (i.e. mixture containing a minimum of 40 percent of the more reactive J.P. Madgett fly ash),
- 40-mil geomembrane,
- 1-foot-thick sand drainage layer,
- 1.5-foot-thick general soil cover layer, and
- 6-inch-thick topsoil layer.

The 2004 Plan of Operation Modifications was subsequently approved by the WDNR on March 4, 2004 (**Appendix B**). Both the Plan of Operation Approval final cover design and the modified final cover design are approved for use at the Landfill. If the Plan of Operation final cover design is used for future cover events, additional details pertaining to the cover system tie-in will be prepared. A plan modification will be prepared if alternate materials for the “select fly ash” layer need to be used or an alternative cover system is proposed.

The modified final cover system effectively utilizes the moisture-conditioned and compacted “select fly ash” as the capping layer/barrier layer in s. NR 504.07. As noted in the 2004 Plan of Operation Modification, ash mixtures of at least 40 percent JPM ash have resulted in a compacted hydraulic conductivity ranging from 1×10^{-9} cm/s to 8×10^{-7} cm/s; however, an assumed hydraulic conductivity of 1×10^{-6} cm/s was used as a conservative approach in the 2004 Plan of Operation Modification. The material has previously been used to construct low-permeability ash and ash-

slurry containment berms for the Phase I-III Landfills, and was found to be “extremely dense, durable, and have a low permeability once compacted and cured.” (TRC, 2004)

Percolation modeling via the HELP model was used to justify the performance of the modified final cover system and resulted in a similar efficiency as the final cover system presented in the Plan of Operation Approval. The use of the moisture-conditioned select fly ash along with the geomembrane was shown to provide comparable reductions in infiltration into the waste mass as s. NR 504.07(4) materials and provides a lower hydraulic conductivity than 1×10^{-5} cm/s or an effectively equivalent hydraulic conductivity as the base liner in accordance with s. NR 504.12(4)(b)(1-2).

The geomembrane component consists of a minimum 40-mil linear low density polyethylene (LLDPE) geomembrane that is placed in direct contact with the select fly ash material. Minimum geomembrane liner specifications are to comply with those presented in the CQA Plan (**Appendix G**). The geomembrane will be seamed with the previously installed geomembrane as to create a continuous seal and barrier over the final waste grades of the Landfill.

A drainage and rooting zone layer is included in the modified final cover system. The drainage system is included to provide lateral drainage away from the capping layer of the final cover system. The drainage layer is located immediately above the capping layer and consists of 1-foot of sand that has a minimum hydraulic conductivity of 1×10^{-3} cm/s. Previously utilized materials were obtained from off-site commercial sources and had hydraulic conductivity between 1.7×10^{-2} cm/s and 8.4×10^{-2} cm/s, meeting the minimum requirements in s. NR 504.07(6)(a). This is expected to continue for the remaining cover events. Demonstration that the surface water head on the final cover is contained within the drainage layer as required by s. NR 504.07(6)(a) is provided in **Appendix J.2**.

Surface water that enters the drainage layer will be collected in 4-inch-diameter perforated, corrugated polyethylene collection pipes located below diversion berms installed as part of the final cover system. The design of the drain pipe is provided in the Section 3.11.4 of Plan of Operation text excerpt included in **Appendix F.1**. Drawing details from the Plan of Operation are included in **Appendix F.2**.

The drain pipes are designed to be placed at a minimum 1 percent slope to an outlet pipe. The respective outlet for the drain pipes is dependent on its location on the final cover and is detailed in the provided text excerpt. The drain pipes will be constructed within a select aggregate fill pipe bed enveloped with a geotextile to mitigate migration of the sand drainage layer into the pipe bedding material.

The rooting zone layer is to be a minimum 1.5-foot thick, this in conjunction with the drainage zone meet the 2.5 foot thick drainage and rooting zone requirement in s. NR 504.07(6). The rooting zone will consist of general fill that is placed above the drainage layer. The general fill has previously been obtained from on-site sources. This is expected to continue for the remaining cover events. If insufficient volumes are available on-site then off-site commercial sources will be utilized.

The rooting zone will provide protection to the geomembrane, provide a rooting zone for vegetation, and protect the capping layer from freeze-thaw and desiccation. The drainage layer and rooting zone provide area for infiltration to occur and be managed prior reaching the capping

layers of the final cover system. In addition, this layer provides additional protection against erosion impacting the capping layer of the final cover.

A 6-inch topsoil layer, in accordance with s. NR 504.07(7), is located above the rooting zone. The topsoil has previously been obtained from on-site borrow sources for the previous final cover construction events. This is expected to continue for the remaining cover events. If insufficient volumes are available on-site then off-site commercial sources will be utilized. Following placement, the topsoil will be seeded, mulched, and fertilized, as required. Seed mixes have consisted of Minnesota DOT #35-221 (formerly Minnesota DOT #340) and a temporary grass mixture of Minnesota DOT #25-121 (formerly Minnesota DOT #240) applied at 1-2 pounds per 1,000 square feet. Fertilizer will be placed at the appropriate rate, per specifications, to establish dense, thick vegetative growth on the final cover.

This final cover design is generally consistent with the typical s. NR 504.07 final cover design and accommodates settling and subsidence. Additionally, DPC's practices of moisture conditioning ash prior to depositing it in the landfill and compacting the waste during placement help to create a dense and stable waste mass. These practices further ensure that the final cover will not be negatively impacted by differential settlement. The overall stability of the Landfill final cover system has been previously evaluated in the Plan of Operation, resulting in sufficient factors of safety. Though changes in the final cover design have occurred, the previous analysis included additional geosynthetic materials, making it a more critical section. In addition, interface stability analysis has been conducted as part of the previous final cover construction events and the factor of safety against internal sliding has ranged from 1.7 to 2.8 which exceed the minimum requirement of 1.3. The interface stability calculation from the 2A cover construction report is included in **Appendix J.3**. The global stability analysis from the Plan of Operation is provided in **Appendix F.7**.

3.3.2 Final Cover System Construction

The final cover system will be constructed as specified in NR 504.07, the CQA Plan, Plan of Operation, subsequent Plan Modifications, and conditions from the WDNR. Construction will be generally consistent with the practices implemented during the previous final cover events. Installation of the geomembrane will be conducted in a similar fashion as detailed in Section 3.2.2.3. Below contains a summary of the construction of the final cover system, detailed information on the placement of the drainage layer, rooting zone, and topsoil is provided in Sections 4.6.5-4.6.8 of the 2000 Plan of Operation (**Appendix F.1**), and preparation of the condition select fly ash layer is detailed in the 2004 Plan of Operation Modification (**Appendix J.1**).

The conditioned and compacted ash layer will be placed in stages as the landfill filling progresses. The fly ash mixture containing a minimum of 40 percent JPM ash will be conditioned with 5 to 15 percent moisture and transported to the landfill where it will be placed, spread and compacted in maximum 12-inch-thick lifts to a minimum overall thickness of 2 feet. Once the conditioned and compacted ash layer is brought to final waste grades, the remaining portion of the final cover design will be placed.

Prior to geomembrane placement, the surface will be fine-graded and smooth drum-rolled and inspected. Field testing the ash component is not practicable as the material hardens as a low-permeability concrete-like mass as detailed in the 2004 Plan Modification. Therefore, operational

procedures that have historically been used to achieve the hydraulic conductivity properties will continue at the site.

Following certification of the select ash barrier layer, the geomembrane will be placed. Following a Plan Modification approval in 2011, the leak location testing requirement for final cover geomembranes was eliminated for future final cover construction events. The select granular fill will be placed as soon as practicable after geomembrane is installed to provide protection to the geomembrane. Geomembrane will be covered within 30 days following completion of geomembrane installation and quality assurance testing. Placement of the select granular fill will be consistent with the placement methods for the leachate collection drainage layer detailed in Section 3.2.3.1. Construction of the surface water drain pipes is detailed in Section 3.11.4 of the Plan of Operation (**Appendix F.1**). The rooting zone layer will be placed above the drainage layer in a single lift, followed by the topsoil layer.

Quality assurance testing will be completed as specified in the CQA Plan (**Appendix G**).

3.4 Storm Water Management System

Per 40 CFR 257.81 and s. NR 504.12(2), CCR landfills are required to have a storm water run-on control system that prevents flow onto the active portion of the CCR unit during the peak discharge from a 24-hour, 25-year storm event and a run-off control system from the active portion of the CCR unit to collect and control at least the water resulting from a 24-hour, 25-year storm event.

In addition, as a part of the initial permitting of the site, the Landfill was designed with a storm water management system to manage and convey stormwater at the site in accordance with s. NR 504.09. The design of the storm water system, as detailed in the Plan of Operation, is provided in Section 3.13 in **Appendix F.1**. Both temporary and permanent storm water system features were designed to a 100-year, 24-hour storm event (6.1 inches) at the time of the design in the Plan of Operation. This design rainfall event exceeds the current 25-year, 24-hour storm event (5.4 inches) as required by s. NR 504.12(2) and 40 CFR 257.81.

Designed run-on control features include diversion ditches, diversion berms, downslope flumes, sedimentation basins, culverts, and temporary controls. These features were designed to divert off-site surface water and on-site non-contact water away from the active fill areas. Permanent features are maintained at the site during operation and will be maintained throughout the post-closure period. These permanent features are constructed as liner and final cover construction progresses in order to continue to minimize off-site surface water from running onto the active portions the of the Landfill.

Designed run-off control features include the leachate handling system, in conjunction with cell delineation berms and perimeter berms. These features are used to limit contact surface water run-off from the active portions of the Landfill. This contact surface water is treated as leachate and is handled via the leachate collection and removal system.

The Run-on and Run-off Control System Plan details these features with respect to s. NR 504.12(2). The Run-on and Run-off Control System Plan is included in **Appendix K**.

4.0 Groundwater Monitoring System and Sampling Requirements

4.1 Regional Geology Summary

The site is located within the Western Upland physiographic region of South-Central Wisconsin adjacent to the Mississippi River (**Figure 1**). This area of Wisconsin was not glaciated during the most recent glacial advance and is known as the “Driftless Area” and is characterized by a significant amount of topographic relief. The facility is situated within a valley surrounded by steep slopes.

The thickness of unconsolidated soils beneath the Landfill ranges from approximately 15 to 60 feet. The predominant soil type includes fine- to coarse-grained silty sand, poorly graded sand with gravel, and/or poorly graded gravel with sand. The sandy soils range in thickness from 20 to 60 feet beneath the Landfill and are interpreted to be the result of fluvial deposition and in-situ weathering of underlying sandstone bedrock. In some areas beneath the Landfill, silts and clays ranging in thickness from a few feet to 40 feet overlie the sandy soils. The silt and clay soils were associated with loess deposits and, to a lesser degree, isolated lacustrine sediments.

Bedrock in the area is composed of the Prairie du Chien Group dolomite overlying Cambrian sandstone units. However, the Prairie du Chien group is absent beneath the Landfill due to erosion, so the sandy soil is directly underlain by Cambrian sandstone. The Cambrian sandstones were described as fine-grained, fissile, friable, and glauconitic with interbedded lenses of dark brown sandstone and calcareous shaley partings in boreholes performed during the Landfill’s initial siting.

The uppermost aquifer beneath the Landfill resides in the sandy soil and the underlying Cambrian sandstone. The saturated thickness of the aquifer ranges from 10 to 20 feet in the sandy soil. The Cambrian sandstone in the region is estimated to be approximately 400 feet in thickness (Young and Borman, 1973). Well drilling logs (WGNHS 2003 and WDNR 2015) in the vicinity of the Landfill present sandstone thicknesses of 338 feet to 435 feet. Precambrian igneous and metamorphic rock underlies the Cambrian sandstone.

4.2 Groundwater Monitoring System

The current groundwater monitoring system consists of 14 monitoring wells and piezometers:

Well	DNR ID	Type	Formation
W-42	17	Water Table	Sand and gravel
P-42A	18	Piezometer	Sandstone
P-42B	19	Piezometer	Sandstone
W-100R*	40	Water Table	Sandstone
W-100AR*	42	Piezometer	Sandstone
W-101*	23	Water Table	Sandstone
W-101A	24	Piezometer	Sandstone
W-102R*	44	Water Table	Sandstone
W-102AR	46	Piezometer	Sandstone

Well	DNR ID	Type	Formation
W-104	27	Water Table	Sandstone
W-104A	28	Piezometer	Sandstone
W-105*	29	Water Table	Sandstone
W-106*	30	Water Table	Sandstone
W-107*	31	Water Table	Sandstone

Note:

* Designated as a CCR well.

Six water table monitoring wells and one piezometer are proposed for designation as CCR wells in accordance with NR 507.15(3). Three of the water table wells are upgradient (i.e. “background”) wells (W-102R, W-101, and W-107). The four downgradient monitoring wells are W-100R, W-100AR, W-105, and W-106. Well locations are shown on **Figure 2**. Well construction information for the seven CCR wells is included in **Appendix L**.

The rationale for the selection of each monitoring point is discussed below:

- **Upgradient Monitoring Points** – Three upgradient water table monitoring wells (W-101, W-102R, and W-107) were selected to represent background groundwater quality. These three wells are completed in the sandstone bedrock.
- **Downgradient Monitoring Points** – Groundwater flow beneath the Landfill is generally to the south. Three water table wells (W-100R, W-105, and W-106), and one piezometer (W-100AR) are located downgradient of the Landfill, and each of these wells will be included in the CCR monitoring program. Wells W-100R and W-100AR are centrally located downgradient of the Landfill, with the majority of the groundwater channeled through the valley toward these points. Downward vertical gradients present in the aquifer support sampling in both shallow and deep portions of the aquifer using the W-100R/W-100AR well nest. Monitoring wells W-105 and W-106 are downgradient of the limits of existing or future waste placement.

4.3 Environmental Monitoring and Sampling Plan

4.3.1 Baseline Groundwater Monitoring

Eight rounds of baseline groundwater monitoring were completed for each of the CCR wells between September 2015 and June 2017. This baseline monitoring included the parameters listed in NR 507 Appendix I, Tables 1A and 3, except for alkalinity, hardness, nitrate plus nitrite as nitrogen (nitrate+nitrite-N), copper, manganese, silver, zinc, field conductivity, and field temperature. Previous site sampling included alkalinity, hardness, nitrate+nitrite-N, and field conductivity. DPC is in the process of completing the required baseline groundwater monitoring for copper, manganese, silver, zinc, and field temperature in the CCR wells. At this time two rounds have been completed (10/26/2022 and 11/28/2022). Baseline groundwater monitoring results for these parameters will be submitted when the eight rounds have been completed. The baseline groundwater quality data from 2015 through 2017 are included in **Appendix M**.

4.3.2 Detection Groundwater Monitoring

The current detection groundwater monitoring program includes analysis of groundwater samples collected semiannually from the 14 site monitoring wells and piezometers for field conductivity, field pH, field temperature, alkalinity, dissolved boron, hardness, sulfate, and dissolved selenium, and measurement of groundwater elevation. This meets the requirements of NR 507, Appendix I, Table 2, for non-CCR wells, except for chemical oxygen demand (COD). DPC requests that COD analysis not be required for non-CCR wells because it is not required at the CCR wells and COD analysis generates mercury laboratory waste.

For CCR wells, the parameters listed in NR 507 Appendix I, Table 1A, are required to be measured or analyzed on a semiannual basis. To meet this requirement, calcium, chloride, fluoride, and total dissolved solids (TDS) are proposed for addition to the detection monitoring program for the CCR wells. In addition, total boron rather than dissolved boron will be analyzed at CCR wells. The monitoring program is described in the Environmental Sampling and Analysis Plan included in **Appendix N**.

4.3.3 Applicable Standards

Detection groundwater monitoring results for CCR wells, and if required, assessment monitoring results, will be compared to NR 140 standards, except for radium, which will be compared to the federal maximum contaminant level (MCL). In accordance with NR 140, well-specific PALs will be calculated for substances that do not have published NR 140 standards. In addition, well-specific alternative concentration limits (ACLs) will be calculated for substances whose background concentrations exceed published NR 140 standards.

4.3.3.1 Indicator Parameters

Well-specific PALs were previously established for the site CCR wells in accordance with NR 140.20(2) for field conductivity, alkalinity (except at W-107), and hardness. These approved PALs are included in **Appendix B**. Additional well-specific PALs will be calculated in accordance with NR 140.20(2) for field pH, field temperature, alkalinity (at W-107), calcium, TDS, and lithium. Proposed PALs will be included in a future addendum when all baseline groundwater data have been collected.

4.3.3.2 Alternative Concentration Limits

Well-specific ACLs were previously established for nitrate+nitrite-N at CCR wells W-100R, W-100AR, and W-107. These approved ACLs are included in **Appendix B**. ACLs were not required for nitrate+nitrite-N at the other CCR wells because background concentrations were less than the NR 140 PAL.

Based on a review of baseline groundwater data collected at the CCR wells between September 2015 and June 2017, the following substances were not detected in groundwater samples from the CCR wells at concentrations exceeding NR 140 standards, and therefore, ACLs are not required: boron, chloride, fluoride, sulfate, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, mercury, molybdenum, radium, selenium, and thallium. DPC is currently in the process of collecting baseline data at CCR wells for copper, manganese, silver, zinc. The need for ACLs for these substances will be assessed once eight rounds of baseline data have been collected.

4.3.4 Leachate Monitoring

Leachate collected at the leachate tank will be monitored on a semiannual (March/September) basis for the parameters listed in NR 507, Appendix I, Table 4 for landfills accepting fly or bottom ash. DPC requests that COD analysis not be required for leachate samples because COD analysis generates mercury laboratory waste. The leachate tank will be sampled annually for semi-volatile organic compounds (NR 507, Appendix IV).

DPC will maintain records of leachate pumped. Leachate analytical results, volumes, and elevations will be reported to the WDNR on a semiannual basis. Results will be reported in accordance with NR 507.

5.0 Coal Combustion Residuals Plans

Per s. NR 514.045(1)(g), several operating plans are required to be included in the Plan of Operation Modification for CCR Landfill Initial Permitting. These plans include the following: Fugitive Dust Control Plan, Run-on and Run-off Control System Plan, Closure Plan, and Long-Term Care Plan (also known as a Post-Closure Plan). These are included in the appendices in their entirety and briefly summarized in the sections below.

5.1 Fugitive Dust Control Plan

Per s. NR 514.07(10)(a), the CCR Fugitive Dust Control Plan details the dust control measures the owner or operator will use to minimize CCR from becoming airborne at the facility. The Landfill published an Initial Fugitive Dust Control Plan on October 14, 2015, with the latest revision completed on December 30, 2022.

The fugitive dust control plan describes the dust control procedures for short-term CCR storage, the CCR landfill, and the facility roads. Short term storage management includes the use of CCR silos for backup storage of fly ash. Dust is controlled during the off-loading process by a filter system on the storage silos. In addition, when loading into trucks for placement in the Landfill, the CCR is conditioned (wetted) to reduce dusting. Use of covers and conditioning at the source location also assist in minimizing the generation of dust during transport.

In addition to conditioning the CCR material, additional measures are used (as applicable) during placement and operations to reduce dusting at the Landfill. These include reducing the active open areas to the extent practicable, wetting the CCR material during placement as needed, controlling dust during operations by spraying the working face, and stopping unloading operations when dust cannot be controlled.

Within the lined area of the Landfill, the use of generated leachate is proposed to be used for dust control in addition to pond water and river water. The use of leachate for this process was previously presented in the 2000 Plan of Operation. Care will be taken to monitor the spraying of leachate so that it does not leave the lined area of the Landfill.

The access road leading to the Landfill is paved with asphalt and access roads around the perimeter of the landfill are paved with crushed stone. Water is sprayed on the access roads during non-freezing weather conditions as needed to reduce airborne dust, no leachate or pond water will be utilized for this purpose. Paved roads are cleaned by a sweeper/vacuum truck as needed and trucks/vehicles are cleaned prior to leaving the Landfill area through the use of track out pads.

These dust control applications are typical for the industry and appropriate considering the conditions of the site. The applications are compatible with the current operations and can be initiated quickly to minimize and prevent fugitive dust at the site.

The Fugitive Dust Control Plan is provided in **Appendix O**.

5.2 Run-on and Run-off Control System Plan

A Run-on and Run-off Control System Plan was initially created for the Landfill in October 2016 with a 5-year revision completed in October 2021. The Run-on and Run-off Control System Plan was developed in accordance with 40 CFR 257.81, which is substantially consistent with s. NR 514.07(10)(b). Discussion of construction procedures and schedule of the run-on and run-off control system components is detailed below. As noted in Section 3.4, the storm water management system was designed to a 100-year, 24-hour storm event at the time of design. The design exceeds the current 25-year, 24-hour storm event required by s. NR 504.12(2)(a).

The run-on and run-off control system components are constructed incrementally as the Landfill is constructed and final cover is placed. The currently constructed components were built to the site specifications with construction oversight directed by a professional engineer licensed in the State of Wisconsin during the previous liner and final cover construction events. Construction documentation reports associated with these construction events were prepared, submitted to the WDNR, and approved by the WDNR (**Appendix B**). Because the timing of construction events is based on the filling rate of the Landfill, a definitive schedule for the construction of the system components is not practicable. Construction of these components will be consistent with the previous construction at the Landfill. These system components are summarized below:

- The run-on control system for the Landfill consists of perimeter berms, diversion berms, downslope flumes, ditching, sedimentation basins and culverts designed and constructed to control surface water during both the operational and post-closure periods of the Landfill. Run-on controls have been designed to divert off-site surface water away from the active fill areas. On-site water is routed to sedimentation basins, except surface water in contact with active fill areas which is treated as leachate.

The run-on control system components are constructed incrementally during both the liner construction and final cover construction. Temporary systems are used at the limits of the construction event to assist in the run-on control system until the remainder of the component is completed. The entirety of the run-on control system components will not be completed until Cell 4B is constructed and final cover has been placed over the Landfill. With the construction of Cell 4B, the final sedimentation basin will be developed along with the remainder of the perimeter berms and ditches. Final cover system components (diversion berms, downslope flumes, etc.) will continue to be installed as the final cover is constructed.

- The run-off control system consists of the leachate collection and handling system in conjunction with cell delineation berms and perimeter berms designed to prevent contact surface water run-off from the active portions of the Landfill. Contact surface water is managed as leachate. The leachate collection system transfers leachate from the active cells to an underground leachate storage tank located near the ash processing facility, where it is transferred into tanker trucks and transported to a licensed wastewater treatment facility.

The run-off control system components are constructed with the development of the individual landfill cell liners. The remaining portions to be constructed are associated with the leachate collection system located within Cells 4A and 4B.

The Run-on and Run-off Control System Plan is provided in **Appendix K**.

5.3 Closure Plan

The Closure Plan for the Landfill was created in October 2016 and revised in December 2022. The Closure Plan details how the Landfill will be closed and the steps required to close the Landfill while satisfying the regulations set forth by s. NR 514.07(10)(c), and applicable portions of s. NR 506.083. The Closure Plan is provided in **Appendix P**. Closure of the Landfill is briefly summarized below and detailed in Section 3.3 of this Plan Modification.

Closure of the Landfill will occur by leaving the waste in place. The Landfill will be closed using the composite final cover system as detailed in Section 3.3.1. This design was approved by WDNR in 2001 Plan of Operation Conditional Approval with a modified design approved through the 2004 Plan of Operation Modification (TRC, 2004). This design satisfies the final cover system requirements of s. NR 504.12(4).

The final cover will be installed in phases as portions of the Landfill reach the design top of waste grades. The largest of these phases is approximately 12.4 acres per the phasing plan presented in the 2000 Plan of Operation. Closure costs, updated in 2019, reflect this closure scenario.

The Landfill will be closed in a manner that controls post-closure infiltration of liquids into the waste, releases of waste, and leachate or contaminated run-off to groundwater or surface water and preclude the probability of impoundment of water, sediment, or slurry. Measures will be included that provide slope stability which will prevent movement of the final cover system during closure and post-closure. The closure of the Landfill will be completed within 6 months of commencing closure activities as required by s. NR 506.83(3). It is currently anticipated that that closure will be initiated in 2057, as detailed in the Closure Plan. This closure date is subject to change based on potential changes in volume of CCR accepted at the Landfill.

Appendix P includes the detailed description of the closure implementation as well as a detailed schedule estimate for completing closure once it is initiated. The closure schedule satisfies the requirements of s. NR 514.07(10)(c)(6).

5.4 Post-Closure Care Plan

A Post-Closure Care Plan (also known as a long-term care plan) was previously developed in October 2016 for the Landfill, and has been revised in conjunction with this Plan Modification. The Post-Closure Care Plan details the plans to maintain and monitor the Landfill after closure. The plan was revised to satisfy the requirements for the long-term care period of 40 years, per s. NR 506.084(2)(a). The plan covers the requirements for inspection, monitoring, maintenance, and post-closure use for the Landfill. The Post-Closure Care Plan satisfies the requirements set forth by s. NR 514.07(10)(d). The Post-Closure Care Plan is included in **Appendix Q**.

The long-term care cost estimate revised in 2019 has been updated following the revisions to chs. NR 500 to 520 for inclusion of the CCR monitoring requirements and is included in **Appendix R**.

6.0 Operations

General site operations to be employed for efficient site performance, in accordance with chs. NR 506, 507, and 514 were detailed in the 2000 Plan of Operation Section 5.

Per s. NR 514.07(10), the Plan of Operation will be updated every 10 years during the active life of the landfill to comply with regulations in place at the time of the update. These updates will be submitted to the WDNR as plan modifications.

In addition to those operating procedures currently initiated at the Landfill, DPC will also comply with the CCR related updates contained within ch. NR 506 and 507. These primarily include updated record keeping and inspection and reporting requirements for CCR Landfills.

6.1 Record keeping

Record keeping will be the responsibility of DPC and will be performed in accordance with s. NR 506.17(2). DPC will maintain a written operating record at their main office located at 3200 East Avenue South, La Crosse, WI 54601 throughout the operating life and long-term care period. The written operating record contains the plan of operation, plan modifications, construction documentation, department approvals, annual reports, inspection records, monitoring and corrective action records, notifications to the WDNR, and records of public comments received during a public comment period. These documents are placed in the written operating record as they become available and can be submitted to the WDNR if requested. Key landfill operations personnel working at the Alma Off-Site facility have electronic access to the written operating record.

In addition, DPC personnel will keep records of various activities and operations occurring at the site, including but not limited to performance of final cover, performance of scheduled maintenance activities, leachate quantities, and placement of final cover.

In addition to the written operating record, DPC also maintains a publicly accessible internet site titled "CCR Rule Compliance Data and Information." (<https://dairylandpower.com/ccr-rule-compliance-data-and-information>). Information posted to the internet site is made available for at least 5 years following the date on which the information was first posted and is posted within 30 days from placing the information within the operating record. Following approval of this Plan Modification, this document will be placed on the internet site. Construction documentation for new/lateral expansions for the existing CCR landfill will be placed on the site once completed. In addition, the documentation detailed in s. NR 506.17(3)(d)(3-11) will be maintained on the internet site as applicable.

6.2 Notifications

Notifications as required by ch. 507 or 508 will be sent to the WDNR before the close of the business day that the notification is required to be completed. Other notifications required in ch. 506 will be sent to the WDNR within 30 days of placing the notification in the written operating record.

6.3 Inspections and Reporting

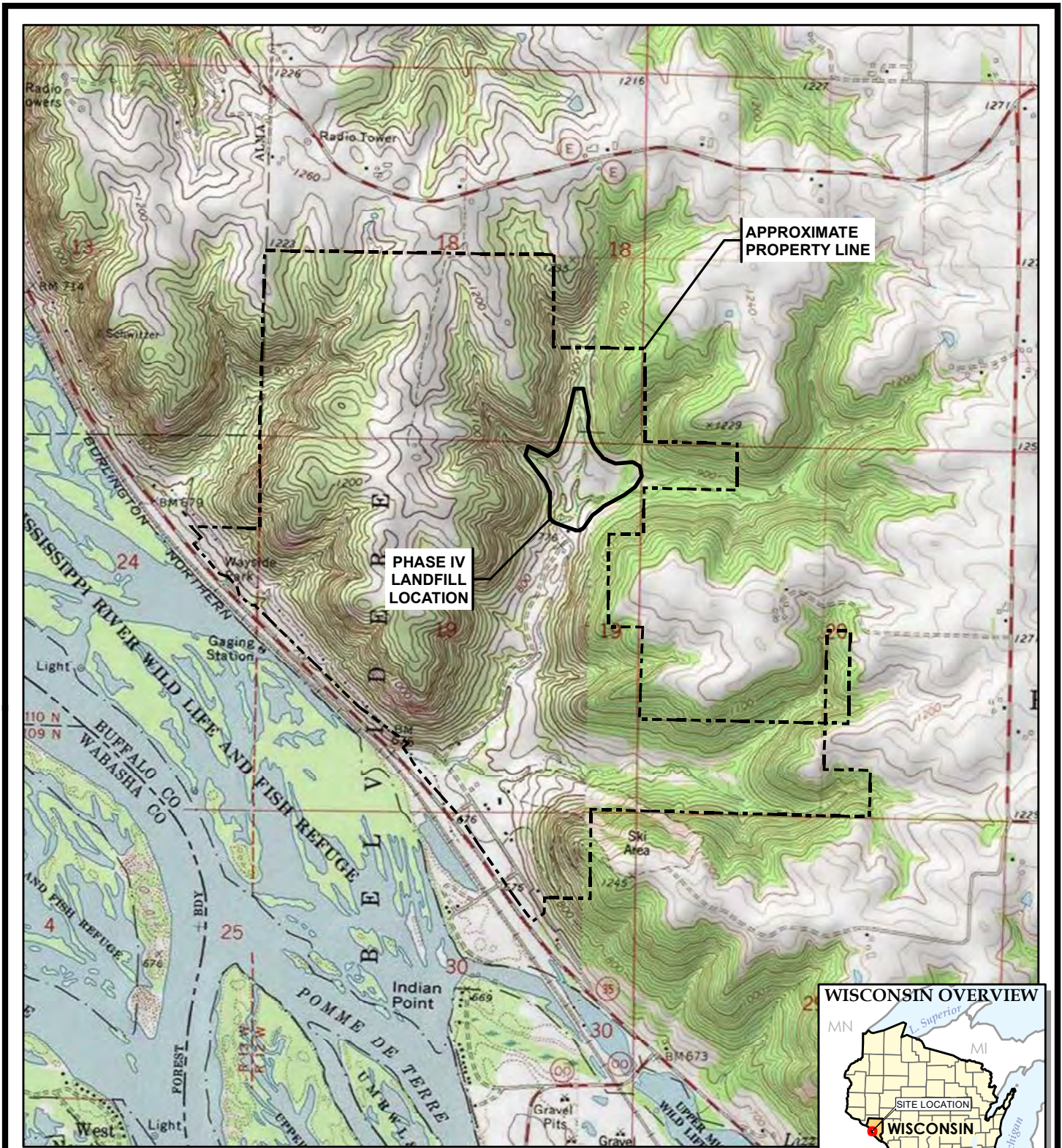
DPC inspects the Landfill on a weekly basis as required by s. NR 506.20(1), and after storm events when rainfall volumes exceed 1 inch within 24 hours. DPC completes inspections of the Landfill for appearances of actual or potential structural weaknesses or other conditions that may disrupt the operation or safety of the landfill. Fugitive dust inspections are detailed in the Fugitive Dust Control Plan (**Appendix O**). The results of the periodic inspections are logged in the electronic operating record at the Landfill and will be maintained for a period of at least 5 years. As required by 40 CFR 257.84(b), annual inspections by a professional engineer are and will continue to be completed at the Landfill. The inspection will be in accordance with 40 CFR 257.84(b) and s. NR 506.20(2).

An annual report will be developed for the Landfill prior to January 31 of each year. This report will include the annual fugitive dust control report, as detailed in **Appendix O**, the annual inspection report by a professional engineer, the annual groundwater monitoring and corrective action report, and the leachate pipe cleaning and inspection report as required by s. NR 506.07(5)(g).

7.0 References

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BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.



708 Heartland Trail
Suite 3000
Madison, WI 53717
Phone: 608.826.3600

TRC - GIS

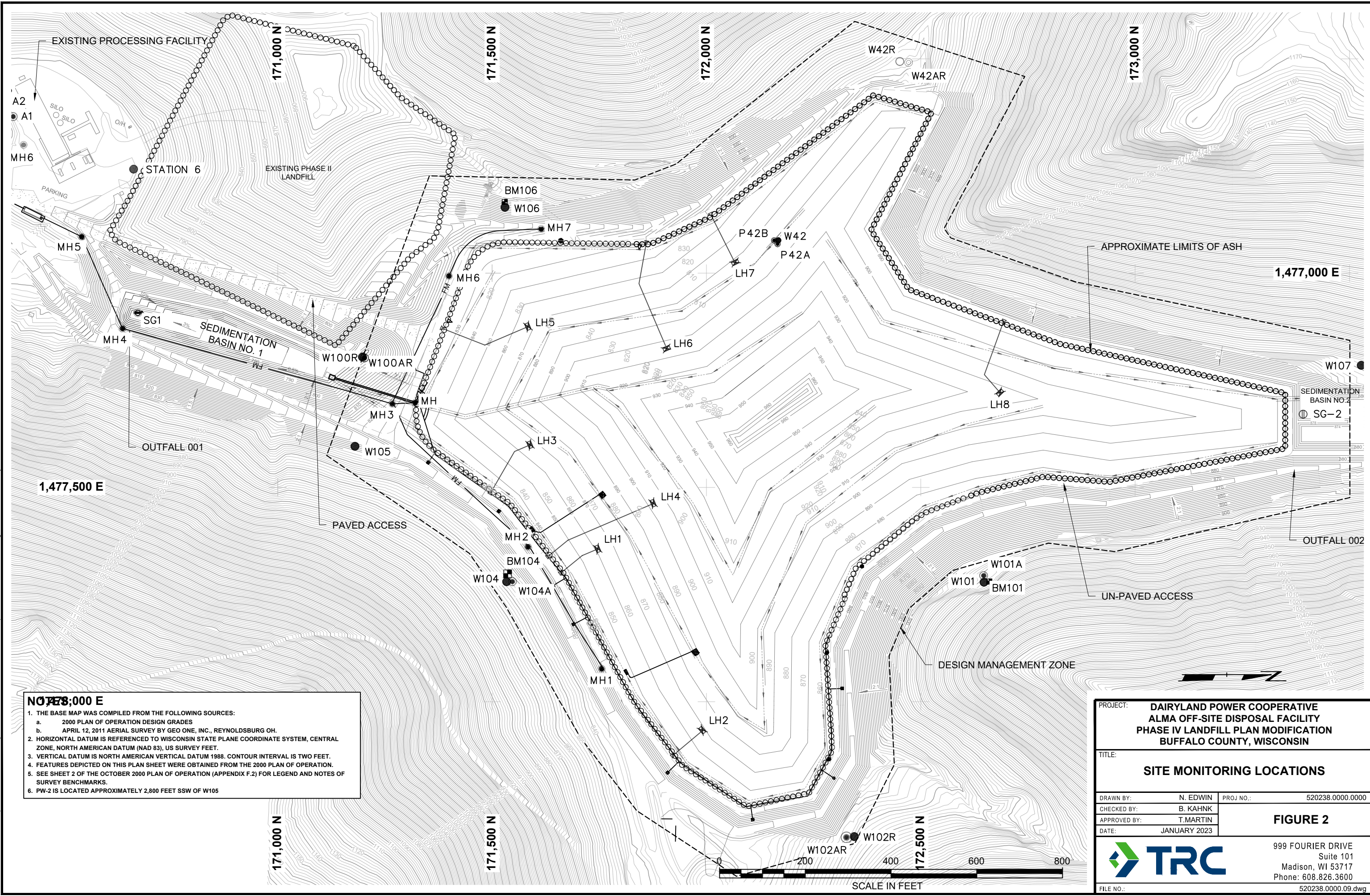
PROJECT: **DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE DISPOSAL FACILITY, PHASE IV LANDFILL
BUFFALO COUNTY, WISCONSIN**

TITLE: **SITE LOCATION MAP**

DRAWN BY:	R. SUENICHT
CHECKED BY:	S. EDWARDS
APPROVED BY:	S. SELLWOOD
DATE:	JANUARY 2023
PROJ. NO.:	469888.0001
FILE:	469888-001slm.mxd

FIGURE 1

11x17 - USER: NEdwin - ATTACHED XREFS: Grid.Mxd, Dimension.Mxd, Surface.Mxd, Hatch.Mxd, Block.Mxd, Base.Mxd, Elevation.Mxd, EG 2022-11-16, Survey.Mxd - ATTACHED IMAGES: 2022 Annual Airspace 0000, 520238.0000.09.dwg - PLOT DATE: January 27, 2023 - 4:46PM - LAYOUT: PLAN SHEET 2
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NOTES:

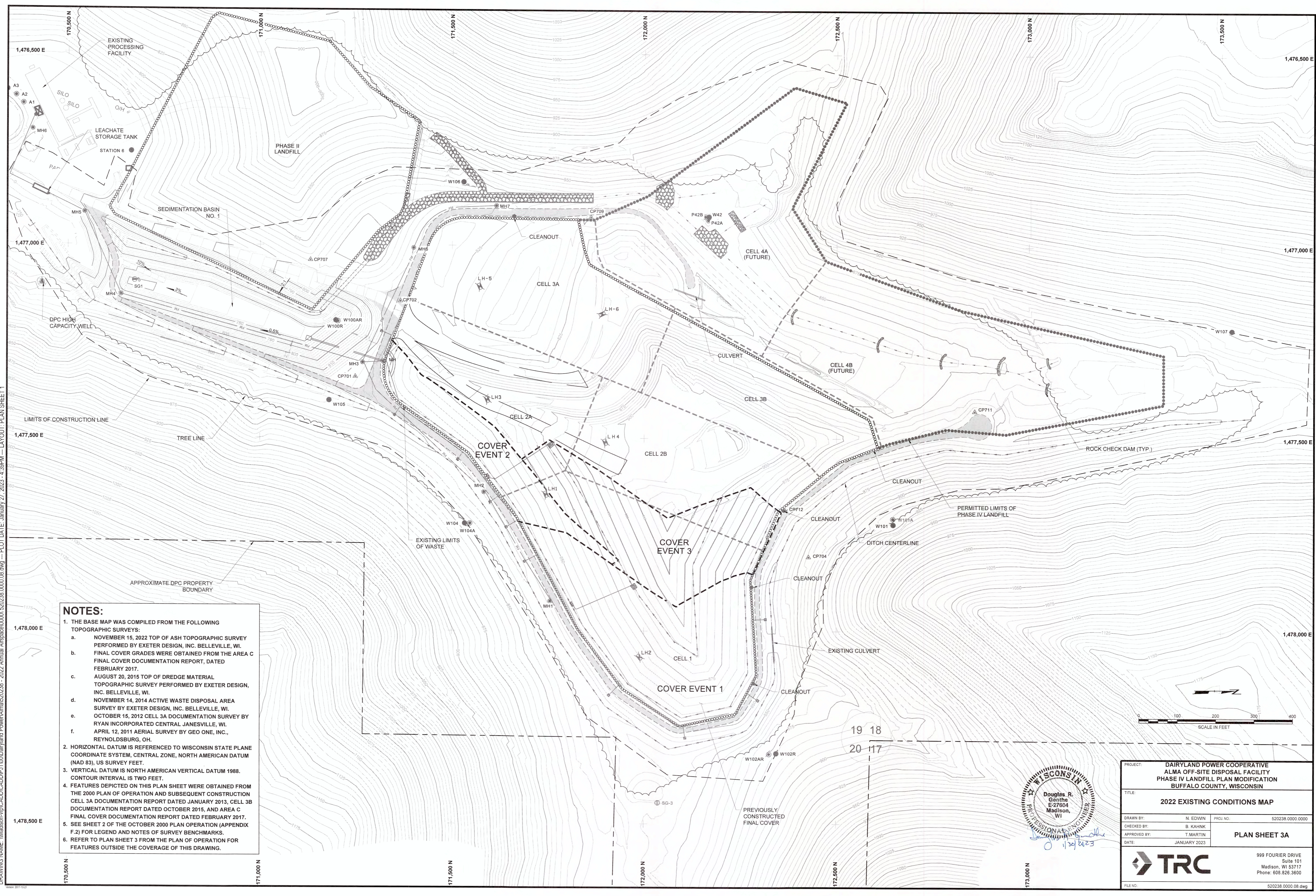
- THE BASE MAP WAS COMPILED FROM THE FOLLOWING SOURCES:
 - 2000 PLAN OF OPERATION DESIGN GRADES
 - APRIL 12, 2011 AERIAL SURVEY BY GEO ONE, INC., REYNOLDSBURG OH.
- HORIZONTAL DATUM IS REFERENCED TO WISCONSIN STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NORTH AMERICAN DATUM (NAD 83), US SURVEY FEET.
- VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM 1988. CONTOUR INTERVAL IS TWO FEET.
- FEATURES DEPICTED ON THIS PLAN SHEET WERE OBTAINED FROM THE 2000 PLAN OF OPERATION.
- SEE SHEET 2 OF THE OCTOBER 2000 PLAN OF OPERATION (APPENDIX F.2) FOR LEGEND AND NOTES OF SURVEY BENCHMARKS.
- PW-2 IS LOCATED APPROXIMATELY 2,800 FEET SSW OF W105

PROJECT:		DAIRYLAND POWER COOPERATIVE ALMA OFF-SITE DISPOSAL FACILITY PHASE IV LANDFILL PLAN MODIFICATION BUFFALO COUNTY, WISCONSIN	
TITLE:		SITE MONITORING LOCATIONS	
DRAWN BY:	N. EDWIN	PROJ NO.:	520238.0000.0000
CHECKED BY:	B. KAHNK	FIGURE 2	
APPROVED BY:	T. MARTIN		
DATE:	JANUARY 2023	999 FOURIER DRIVE Suite 101 Madison, WI 53717 Phone: 608.826.3600	
FILE NO.:	520238.0000.09.dwg		



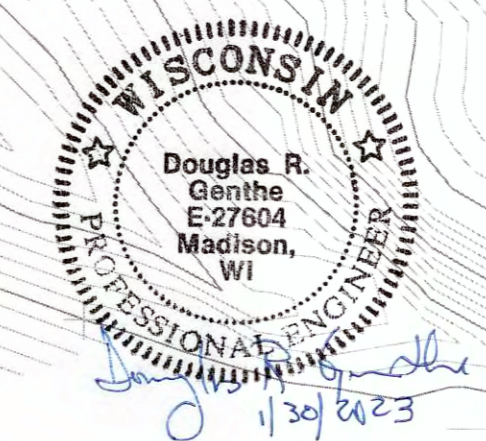
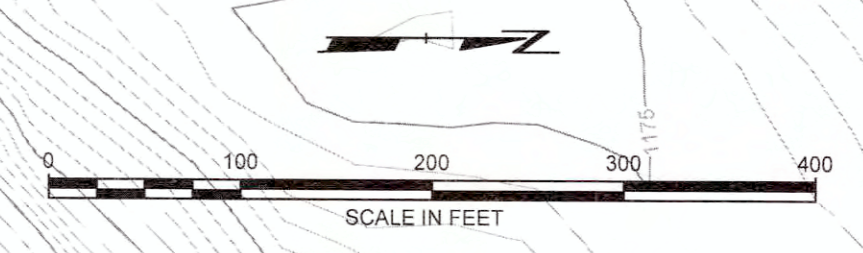
Plan Sheet 3A: 2022 Existing Conditions Map

2406 -- USER NEW -- ATTACHED SHEETS: Delimitation Map, Contour Map, Hatched Map, Slope Map, Ditch Map, Surface Map, Spot Map, Surface Map, Attached Images
 DRAWING NAME: \\madison-fpc\cadd\p1\000\ Dairyland Power\Alma\2023-2022 Annual\Alma\520238\0000.dwg -- PLOT DATE: January 27, 2023 - 4:39PM -- LAYOUT: PLAN SHEET 1



NOTES:

- THE BASE MAP WAS COMPILED FROM THE FOLLOWING TOPOGRAPHIC SURVEYS:
 - NOVEMBER 15, 2022 TOP OF ASH TOPOGRAPHIC SURVEY PERFORMED BY EXETER DESIGN, INC. BELLEVILLE, WI. FINAL COVER GRADES WERE OBTAINED FROM THE AREA C FINAL COVER DOCUMENTATION REPORT, DATED FEBRUARY 2017.
 - AUGUST 20, 2015 TOP OF DREDGE MATERIAL TOPOGRAPHIC SURVEY PERFORMED BY EXETER DESIGN, INC. BELLEVILLE, WI.
 - NOVEMBER 14, 2014 ACTIVE WASTE DISPOSAL AREA SURVEY BY EXETER DESIGN, INC. BELLEVILLE, WI.
 - OCTOBER 15, 2012 CELL 3A DOCUMENTATION SURVEY BY RYAN INCORPORATED CENTRAL JANESVILLE, WI.
 - APRIL 12, 2011 AERIAL SURVEY BY GEO ONE, INC., REYNOLDSBURG, OH.
- HORIZONTAL DATUM IS REFERENCED TO WISCONSIN STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NORTH AMERICAN DATUM (NAD 83), US SURVEY FEET.
- VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM 1988. CONTOUR INTERVAL IS TWO FEET.
- FEATURES DEPICTED ON THIS PLAN SHEET WERE OBTAINED FROM THE 2000 PLAN OF OPERATION AND SUBSEQUENT CONSTRUCTION CELL 3A DOCUMENTATION REPORT DATED JANUARY 2013, CELL 3B DOCUMENTATION REPORT DATED OCTOBER 2015, AND AREA C FINAL COVER DOCUMENTATION REPORT DATED FEBRUARY 2017.
- SEE SHEET 2 OF THE OCTOBER 2000 PLAN OF OPERATION (APPENDIX F.2) FOR LEGEND AND NOTES OF SURVEY BENCHMARKS.
- REFER TO PLAN SHEET 3 FROM THE PLAN OF OPERATION FOR FEATURES OUTSIDE THE COVERAGE OF THIS DRAWING.



PROJECT: DAIRYLAND POWER COOPERATIVE ALMA OFF-SITE DISPOSAL FACILITY PHASE IV LANDFILL PLAN MODIFICATION BUFFALO COUNTY, WISCONSIN	
TITLE: 2022 EXISTING CONDITIONS MAP	
DRAWN BY: N. EDWIN	PROJ. NO.: 520238.0000.0000
CHECKED BY: B. KAHNK	PLAN SHEET 3A
APPROVED BY: T. MARTIN	
DATE: JANUARY 2023	
999 FOURIER DRIVE Suite 101 Madison, WI 53717 Phone: 608.826.3900	
FILE NO.:	520238.0000.08.dwg

Appendix A: NR 504 and NR 514.045 Checklists

NR 504 Checklist

Design and Construction Criteria Completeness Checklist

Chapter NR 504, Wis. Adm. Code



Waste & Materials Management
 P.O. Box 7921
 Madison, WI 53707-7921

Revised August 2022

Instructions: This checklist is intended for use by department staff for the review of landfill plan of operation, feasibility reports, or other submittals when determining completeness with respect to the requirements under ch. NR 504, Wis. Adm. Code. The checklist may also be used by applicants and submitted with a landfill plan of operation, feasibility report, or other applicable submittal to facilitate department review. Refer to applicable statutes and codes for exact requirements.

General Information

Facility Name: Dairyland Power Cooperative - Alma Off-Site Disposal Facility

Facility Identification (FID) # _____

Facility Type: CCR Landfill

License/Monitoring # 4126

Submittal Type: Plan Modification - Initial Permitting for CCR Landfills

Initial Submittal: Date Received: ___/___/___ Completeness Due: ___/___/___ DNR Response: ___/___/___ (Complete: __ yes __ no)

Addendum # ___ Date Received: ___/___/___ Completeness Due: ___/___/___ DNR Response: ___/___/___ (Complete: __ yes __ no)

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
NR 504.04(3) LOCATIONAL CRITERIA. Are the proposed limits of filling within:					
(a) 1,000 feet of any navigable lake, pond or flowage not including landfill drainage or sedimentation control structures? ___ yes <u> X </u> no ___ If yes, was an exemption requested?	X				Not required to be submitted in NR 514.045 Plan of Operation Modification. Information previously provided in Feasibility Report (1997) and Plan of Operation (2000) and confirmed in Feasibility Report Determination Letter.
(b) 300 feet of any navigable river or stream? ___ yes <u> X </u> no ___ If yes, was an exemption requested?	↓				
(c) A 100-year flood plain? ___ yes <u> X </u> no ___ If yes, was an exemption requested?	↓			↓	

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
<p>(d) 1,000 feet of the nearest edge of the right-of-way of any state trunk highway, interstate or federal aid primary highway or any public park or state natural area? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no ___ If yes, was a line of site study provided showing that the landfill would not be visible from the road, park or natural area through the use of screening and/or, ___ was an exemption requested? Note: If waste may be visible for periods of time even with the use of screening, then an exemption should be requested.</p>	X				Not required to be submitted in NR 514.045 Plan of Operation Modification. Information previously provided in Feasibility Report (1997) and Plan of Operation (2000) and confirmed in Feasibility Report Determination Letter.
<p>(e) 10,000 feet of the end of an airport runway designed or planned to be designed and used by turbojet aircraft or within 5,000 feet of any airport runway designed for and used by piston type aircraft? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no Is FAA notification required? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no Note: If the proposed limits of waste filling would be within <u>5 miles</u> (for expansions of an existing MSW landfill) or within <u>6 miles</u> (for new MSW landfills, after year 2000) of the end of the runway of any airport used by turbojet or piston type aircraft, the applicant must provide notice to both the Federal Aviation Administration (FAA) and the affected airport. The report should contain all correspondence related to the notices including any determinations made by the FAA. (Ref. 49 U.S.C. § 44718(d), See FAA Advisory Circular AC 150/5200-34A, dated 1/26/2006)</p>					↓
<p>(f) 1,200 feet of any water supply well (i.e. public, private, irrigation or stock water supply wells)? <input checked="" type="checkbox"/> yes ___ no <input checked="" type="checkbox"/> was an exemption requested? If yes, have the following been provided for each identified well? ___ well location ___ former and present well owner ___ well driller ___ well construction log Note: Exemptions may not be granted if the above information is not provided.</p>					↓
<p>(g) 200 feet of a fault that has had displacement in Holocene time? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no ___ If yes, was an exemption requested?</p>	X			Section 2.2	
<p>(h) Seismic impact zones? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no ___ If yes, was an exemption requested?</p>	X			Section 2.2	
<p>(i) Unstable areas? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no ___ If yes, was an exemption requested?</p>	X			Section 2.2	
<p>NR 504.04(4) PERFORMANCE STANDARDS. Will the proposed landfill cause the following:</p>					

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DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(a) A significant adverse impact on wetlands? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no Has a practicable alternatives analysis and a wetland functional values analysis been completed in accordance with ch. NR 103, if a wetland will be affected by the proposed landfill or any noncommercial soil borrow source activity? Note: See DNR wetland regulation website (https://dnr.wisconsin.gov/topic/Wetlands/permits) to help determine if a wetland permit may be needed per s. 281.36, Stats.	X			Section 2.1	
(b) A take of an endangered or threatened species in accordance with s. 29.604, Stats? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	X			Section 2.1	
(c) A detrimental effect on any surface water? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no Note: Exemptions are not granted.	X			Section 2.1	
(d) A detrimental effect on groundwater quality or will cause or exacerbate an attainment or exceedance of any preventive action limit or enforcement standard at a point of standards application as defined in ch. NR 140? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> Has an exemption been requested to the groundwater standards in accordance with ss. NR 507.29 and NR 140.28, Wis. Adm. Code? If an exemption is required, does the feasibility report include: <input type="checkbox"/> A list of the specific wells and parameters for which an exemption is being requested. <input type="checkbox"/> A discussion of how the criteria listed in s. NR 140.28(2), (3) and (4) are met.	X			Not required to be submitted in NR 514.045 Plan of Operation Modification. Information previously provided in Feasibility Report(1997) and Plan of Operation(2000) and confirmed in Feasibility Report Determination Letter.	
(e) The migration and concentration of explosive gases in excess of 25% of the lower explosive limit for such gases at any time? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no					
(f) The emission of any hazardous air contaminant exceeding the limitations for those substances contained in s. NR 445.04 or 445.05? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no					
NR 504.05 GENERAL DESIGN AND CONSTRUCTION CRITERIA.					
(1) Is the landfill designed in substantial conformance with the design criteria in ss. NR 504.06 to 504.09?	X			Section 3.0	
(2) Is supporting justification included for any differences from ss. NR 504.06 to 504.09?	X				
(3) Is the proposed operating life of the landfill between 10 and 15 years? If the proposed life is not between 10-15 years is the facility exempted in s. 289.28(2), Stats. or the expansion of an existing facility?			X		Not required to be submitted in NR 514.045 Plan of Operation Modification. Information previously provided in Feasibility Report(1997) and Plan of Operation(2000) and exemption approved in Plan of Operations Approval Letter.
NR 504.06 MINIMUM DESIGN AND CONSTRUCTION CRITERIA FOR LANDFILL LINERS AND LEACHATE COLLECTION SYSTEMS.					
(1) GENERAL.					

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(a) If the landfill is proposed to accept municipal solid waste does the design incorporate a composite liner and a leachate collection system capable of limiting the average leachate head on the composite liner to 1 foot or less during operation and after closure of the landfill?			X		
Does the composite liner consist of the following: <input checked="" type="checkbox"/> An upper geomembrane component with nominal 60-mil minimum thickness <input type="checkbox"/> A lower component of 4 foot minimum compacted clay meeting NR 504.06(2)(a)	X				Alternative liner was submitted and approved in Plan of Operation Conditional Approval.
(2) COMPOSITE OR CLAY LINED LANDFILLS. Does the composite liner or clay liner design meet the following requirements:					
(a) Will all clay used in liner construction meet the following specifications: <input type="checkbox"/> A minimum of 50% by weight passing 200 sieve <input type="checkbox"/> A saturated hydraulic conductivity of 1×10^{-7} cm/sec or less <input type="checkbox"/> An average liquid limit of 25 or greater with no values less than 20 <input type="checkbox"/> An average plasticity index of 12 or greater with no values less than 10			X	Section 3.2.2	GCL liner is used at the Landfill.
(b) Is there at least a 10 foot separation between the seasonal high groundwater table and the bottom of the clay liner component? Note: For zone of saturation landfills select NA.	X			Section 3.2.1	
(c) Is there at least a 10 foot separation between the bedrock surface and the bottom of the clay liner component?	X			Section 3.2.1	
(d) Is there a minimum 2% liner surface slope toward the leachate collection system?	X			Section 3.2.2	
(e) Is there a minimum 4 foot thick clay component of a composite liner or a minimum 5 foot clay liner thickness?			X		Alternative liner was submitted and approved in Plan of Operation Conditional Approval.
(f) 1. Are the clay layers proposed to be constructed in the following manner: <input type="checkbox"/> Lift heights no greater than 6 inches after compaction <input type="checkbox"/> Footed compaction equipment having feet at least as long as the loose lift height <input type="checkbox"/> Disking or mechanical processing of clay to break up clods and adjust moisture <input type="checkbox"/> Clod size no greater than 4 inches <input type="checkbox"/> All compaction equipment to have a minimum static weight of 30,000 pounds <input type="checkbox"/> Alternative procedures or equipment proposed			X		Installation of the low permeability layer is designed/ was constructed in accordance with NR 504.07 and the Construction Quality Assurance Plan.
2. A sufficient number of equipment passes to ensure complete remolding of clay?			X		
3. Is clay compaction proposed to be 90% modified Proctor density at 2% wet of the optimum or 95% standard Proctor density at wet of the optimum moisture content? Alternately, the line of optimums method may be used.			X		
(g) Are interior sidewall slopes at a maximum of 3H:1V or at a minimum of 5H:1V?	X			Section 3.2.1	
(h) Are clay components of the liner in adjacent phases keyed together?			X		

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
Is the keying accomplished by excavating a minimum of 4 steps with a total width of spliced area measuring at least 15 feet?			X		
(3) COMPOSITE-LINED LANDFILLS. If the landfill is composite lined, are the following requirements specified in the plan of operation:					
(a) Is the geomembrane specifically formulated for waste containment purposes?	X			Section 3.2.2.3	
Is the nominal geomembrane thickness 60 mil or greater with no thickness below minimum industry accepted manufacturing tolerances?	X			Appendix F Appendix G	
(b) Is there geomembrane protection along areas of traffic or concentrated activity such as sumps, sideslope risers and entry ramps?	X			↓	
(c) For slopes in excess of 10%, will geomembrane panels be installed with panel seams perpendicular to the contour lines of the slope?	X				
(d) Prior to geomembrane placement, will the clay surface be prepared as follows: <input checked="" type="checkbox"/> Rolling and grading of clay surface to remove irregularities, protrusions, loose soil and abrupt changes in grade, <input checked="" type="checkbox"/> Free of stone, grading stakes, construction debris and contain no areas softened by high water content <input checked="" type="checkbox"/> Sufficiently dry and dense clay surface such that the construction equipment will not create ruts <input checked="" type="checkbox"/> Depressions and large cracks filled with tamped clay	X				
(e) Will the geomembranes be welded as follows: <input checked="" type="checkbox"/> Geomembrane panels welded by double-tracked, fusion welding machines for all linear seams, <input checked="" type="checkbox"/> Fusion welding of corners, butt seams and long repairs where possible, <input checked="" type="checkbox"/> Extrusion or fusion welding for all other repairs, detail work and patches, <input checked="" type="checkbox"/> Request for Department approval for other welding methods.	X				
(f) Will geomembrane components in adjacent phases be welded together to form a continuous geomembrane surface?	X				
Will the liner extended beyond the proposed edge of waste at a phase junction be protected from traffic and weather?	X			↓	
(g) Will wrinkles which are taller than they are wide be smoothed or cut out prior to covering with soil?	X			Section 3.2.3.1	
Will guidance be provided to machine operators placing soil on geomembrane by the use of an observer with an unobstructed view of the advancing lift of soil.	X			↓	
(h) Are the following minimum soil thickness on geomembrane proposed before vehicular traffic may occur: <input checked="" type="checkbox"/> 1 foot for vehicles with ground pressure less than 5 pounds per square inch, <input checked="" type="checkbox"/> 2 feet for other vehicles equipped with tracks and floatation tires, <input checked="" type="checkbox"/> 3 feet or more for trucks or wheeled hauling equipment.	X			↓	

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(i) In order to lessen desiccation effects, will the landfill base and the lower 10 feet of the sideslope be covered with a drainage blanket within 30 days after completing quality control and quality assurance testing?	X			Section 3.2.3.1	
Will the remaining sideslope be covered with either drainage material or geotextile to prevent damage to the geomembrane?	X			Section 3.2.3.1/App G	
(j) Will placement of soil over the geomembrane be performed during cooler temperature periods to the extent possible using methods which minimize wrinkling?	X			Section 3.2.3.1 App G	
(k) Will anchor trenches be designed and constructed around the landfill to secure the permanent edges of the geomembrane?	X			Section 3.2.2.3/App G	
Will geomembrane be seamed completely to the edge of the panel end to minimize potential of tear propagation?	X			Appendix F Appendix G	
(4) ZONE-OF-SATURATION LANDFILLS. Landfills with proposed base grades below the groundwater table must meet the following:					
(a) Is the landfill located in a fine-grained soil environment?				Not required to be submitted in NR 514.045 Plan of Operation Modification. Information previously provided in the Plan of Operation (2000) and confirmed in Plan of Operation Conditional Approval Letter.	
(b) Does the landfill meet the requirements of sub. (2)(a), (d), (e), (f), (g) and (h) and the requirements under sub. (3), if the landfill will accept municipal solid waste?					
(c) Has an analysis been performed on the effect which groundwater may have on uplift of the liner and the short and long-term stability of the geomembrane component?					
Does the analysis evaluate the effect of an underdrain or other dewatering system?					
(d) Have borings, backhoe pits or other means of exposing the subsurface soils been proposed on a 100-foot grid to a minimum 5 foot depth below the subbase grades of the liner?					
Are all granular or silty soils detected within this 5 foot depth proposed to be removed?					
(5) LEACHATE COLLECTION SYSTEMS. The leachate collection system must incorporate the following design features:					
(a) Does the leachate collection system design include the following features: <input checked="" type="checkbox"/> A leachate collection system included in each horizontal phase, <input checked="" type="checkbox"/> Leachate routed to the landfill perimeter in the most direct manner possible, <input checked="" type="checkbox"/> Limit average leachate head on the liner to 1 foot or less, <input type="checkbox"/> Limit maximum leachate flow distance to the perforated collection pipe to 130 feet.	X			Section 3.2.3 Appendix F Appendix G	Exemption request for the maximum leachate flow distance was approved in the 2001 Plan of Operation Conditional Approval
(b) Is the slope on the leachate collection pipe a minimum of 0.5%?	X				
(c) Is the minimum diameter of all leachate collection pipes 6 inches?	X				

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DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
Are all collection pipes proposed to be Schedule 80 PVC pipe or an approved substitute?	X			Section 3.2.3	HDPE piping used for leachate collection.
(cm) Are the proposed pipe fittings for use with PVC and HDPE pipe secured to the leachate collection pipe as follows: <input type="checkbox"/> PVC fittings and pipe solvent-welded <input checked="" type="checkbox"/> HDPE fittings and pipe fusion welded	X			Appendix F Appendix G	
(d) Do the leachate collection trenches conform to the following: <input type="checkbox"/> Rectangular leachate collection trenches for clay liners <input checked="" type="checkbox"/> V-trenches with a maximum 18 inches depth and 3H: 1V sideslope for composite liners <input type="checkbox"/> V-trenches smooth-drum rolled prior to placement of the membrane	X				
(dm) <input checked="" type="checkbox"/> Is a geotextile with a weight of 12 oz/yd ² used to line the trench base and sidewalls and is it placed directly over the geomembrane <input checked="" type="checkbox"/> Does the design show that the geotextile does not overlap across the top of the trench. <input checked="" type="checkbox"/> Are the geotextile specifications, including manufacturer's data for grab and puncture strength, used to demonstrate the resistance to damage from the aggregate to be placed over the geotextile?	X				
(e) Does the leachate collection pipe trench backfill conform to the following: <input checked="" type="checkbox"/> Uniformity coefficient of less than 4, <input checked="" type="checkbox"/> Maximum particle diameter of 1 ½ inches, <input checked="" type="checkbox"/> Maximum of 5% passing the number 4 sieve, <input checked="" type="checkbox"/> Rounded to subangular gravel, <input checked="" type="checkbox"/> Minimum 4 inches bedding depth before installation of leachate pipe, <input checked="" type="checkbox"/> Minimum 6 inches of granular material above the pipe, and an additional 12 inches of material mounded above the trench, <input checked="" type="checkbox"/> Graded soil filter or geotextile to minimize migration of drainage blanket into the trench, in cases where particle size of the bedding is significantly less than the collection trench bedding <input checked="" type="checkbox"/> No use of limestone and dolomite as trench backfill. <input type="checkbox"/> If limestone and dolomite are proposed for use as trench backfill, does the plan of operation address that there is no other suitable material reasonably available?	X				
(f) Have the sand and gravel sizes and geotextile and pipe openings been analyzed for the control of piping of soil materials and have the materials been chosen to achieve a stable and self-filtering structure under all conditions of leachate flow?	X			Appendix F and I	
(g) Do leachate collection lines have cleanout access on both ends of pipes?	X				
Does each leachate collection line have a maximum distance of 1,200 feet from the end of one cleanout to the toe of the opposite slope?	X				

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DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(h) Are there no vertical liner penetrations due to leachate lines, manholes and other engineering structures?	X			Section 3.2.3	
For clay lined landfills, are liner penetrations limited to leachate transfer lines in the horizontal direction only? For composite lined landfills, are there no liner perforations?			X	Appendix F	Exemption request for horizontal perforations approved in 2001 Plan of Operation Approval Letter.
(i) Is a 4'x4', 5 foot thick, anti-seep collar placed around any leachate transfer line penetrating the clay liner?			X		Composite Liner; alternative anti-seep collar used.
(j) Is the composite lined landfill designed with a sump and sideslope riser meeting the following requirements: __ 1. Sump volume and pump capacity sized to accommodate an annual leachate collection rate of 6 inches taking into account the potential for solids to build up over time. __ 2. Sump base protected with polyethylene plate or other acceptable means and placed prior to sideslope riser and backfill installation. __ 3. Leachate discharge pipe between the sideslope riser and the tank installed with valves to prevent backflow into the waste disposal area. __ 4. Sideslope riser pipe has a minimum diameter of 18 inches and geometry at the junction of the sump and sidewall to assure passage of the pump and hardware and assure correct positioning of the intake of the pump. __ 5. The area of the sump and depth of gravel fill are sized to allow remedial installation of access and hardware for removal of leachate if the sideslope riser and pump system fail.			X		Transfer liner horizontally penetrate composite liner and are routed to the leachate storage tank.
(k) Are gravity lines transporting leachate out of the landfill constructed with valves for flow control, and are the valves compatible with the leachate and operable from the ground surface?			X		
(l) Are all leachate lines located outside the landfill double-cased or in an approved secondary containment?			X		Transfer lines were previously constructed.
Are all leachate transfer lines proposed to be pressure tested prior to use?			X		
Is the upslope end of secondary pipe sealed and the downslope end open to drain into the manhole?			X		
(m) Are all leachate transfer lines, manholes, lift stations and other structures outside the waste limits designed to meet the following: <u>X</u> Designed as shallow as practical, and as far from the waste limits as possible so repair of these devices would not infringe on the landfill cover or liner systems <u>X</u> Constructed above the seasonal high groundwater table. __ If not constructed above the water table, is it not technically feasible to do so and does the design meet the requirements of (l) above.			X		

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DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(n) Are leachate collection tanks and manholes designed with the following: <input type="checkbox"/> Secondary containment to prevent leachate discharge to ground and surface water <input type="checkbox"/> Means to monitor the tank or manholes for leaks within the secondary containment <input type="checkbox"/> If no, is an alternative method proposed?			X	Section 3.2.3 Appendix F	Leachate collection tank was previously constructed.
(o) Are the leachate tanks designed to: <input type="checkbox"/> Contain leachate volume generated over a 4 day period, <input type="checkbox"/> Withstand the soil and liquid loads encountered during installation and use <input type="checkbox"/> Follow the consultant and manufacturer installation instructions.			X		
(p) Does the leachate loadout station design contain the following: <input type="checkbox"/> Measures to prevent accidental leachate discharge at the loadout from entering ground or surface water, <input type="checkbox"/> A loadout station paved and sloped to a catch basin to direct all spills to a catch basin.			X		
(q) Are leachate and gas system manholes and enclosures vented and do they have controlled access?	X		X		Gas system was not designed
For landfills designed with active extraction, are manholes and enclosures designed to minimize air intrusion?			X		as Landfill does not produce Gas
(r) Are all pumps, valves and meters designed to be controlled and operated from ground surface?	X				
(s) Are all leachate and groundwater collection systems designed to monitor the liquid volume removed?	X				
(t) Is there a minimum one foot thick granular drainage blanket placed on top of the geomembrane for a composite liner or on top of the clay component of a clay liner which contains the following elements: <input checked="" type="checkbox"/> no more than 5% passing 200 sieve <input checked="" type="checkbox"/> If the granular layer contains gravel greater than ¼", a certified needle free minimum 12 oz/yd ² nonwoven geotextile below the drainage blanket	X				
(tm) <input checked="" type="checkbox"/> Hydraulic conductivity (at anticipated field density) equal to or greater than 1 cm/sec for sites that accept any amount of MSW or 1x10 ⁻² cm/sec for landfills that do not accept MSW <input checked="" type="checkbox"/> Was the gradation of the drainage blanket (and associated hydraulic conductivity) selected to maintain the maximum head in the drain within the drain thickness?	X				
(u) If the major horizontal clay lined phase is above the saturated zone, is each phase designed with collection basin lysimeter (except for composite lined landfills)?			X		Site includes a composite liner.

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DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(6) ADDITIONAL REQUIREMENTS FOR LANDFILLS WITH EXTENDED COLLECTION LINES. Landfills with leachate collection lines that exceed 1,200 feet and will accept MSW must meet the following:					
(a) Do any leachate collection lines exceed 1,200 feet when measured from the end of <u>each</u> cleanout to the toe of the opposite slope? Will the landfill accept MSW? If no, check NA for (b) through (f) below.			X		Maximum collection line route to cleanout riser does not exceed 1,200 feet.
(b) Is the maximum length of each leachate collection line 2,000 feet or less from the access point at one end to the toe of the opposite slope?			X		↓
(c) Is the slope on the leachate collection pipe a minimum of 0.5% after accounting for primary and secondary settlement of the subgrade? Note: The minimum design slope is selected following computation of 100% of the primary and secondary consolidation settlement beneath the facility, which includes, as applicable, in-situ soil, added geologic material structural fill material, and compacted clay liner. Secondary settlement shall be calculated using a 100-year timeframe.			X		
(d) Is the pipe bedding material composed of course, uniform gravel with hydraulic conductivity greater than or equal 1 cm/sec? Note: This requirement is in addition to meeting the other requirements of s. NR 504.06(5)(e).			X		
(e) Has the maximum anticipated construction, operation and post-closure overburden loads over the leachate collection piping been calculated and used in selecting pipe material and wall thickness? __ Were the calculations based on a 6 inch pipe diameter and appropriate in-field consolidated density?			X		
(f) Have all components of the leachate collection system incorporated the following design features: __ prefabricated or smooth sweep bends with a minimum radius of 10 pipe diameters __ pipe alignments that minimize horizontal and vertical alignment changes for the entire pipe length __ elimination or minimization of obstructions which impose drag on pipe cleaning jetter hose or nozzles			X		
(7) COMPOSITE-LINED LANDFILLS USING GCLs.					
Is GCL proposed for use in a composite liner? If no, indicated NA for the following and (a) – (c).	X			Section 3.2.2	
Does the landfill accept only non MSW waste? Or if it accepts MSW will the GCL be placed over the 4 foot clay liner? If yes to either, the design must meet the requirements of (a) – (c). If no to both, then GCL may not be used as proposed.	X			Section 3.1	
(a) Has the hydraulic performance of the GCL been assessed by use of compatibility testing?	X			Section 3.2.2 Appendix H	

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DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(b) Does the GCL meet the specifications of NR 504.07(4)(a)1 to 11?	X			Section 3.2.2	
(c) Is the GCL underlain by a soil barrier layer a minimum 2 feet thick and meets the specifications of NR 504.07 (4)(a) 12. To 17.	x			Appendix F,G ↓	
NR 504.07 MINIMUM DESIGN AND CONSTRUCTION CRITERIA FOR FINAL COVER SYSTEMS.					
(1) GENERAL.					
(a) Is the final cover system designed to? <input checked="" type="checkbox"/> Minimize leachate generation by limiting the amount of percolation through the cap <input checked="" type="checkbox"/> Reduce landfill maintenance by design of compatible surface slopes and vegetation <input checked="" type="checkbox"/> Account for differential settlement and other stresses on the capping layer <input checked="" type="checkbox"/> Minimize freeze-thaw effects and desiccation of clay capping layer <input checked="" type="checkbox"/> Provide for removal of leachate and venting of gas from landfills accepting wastes with high moisture content or that which is readily biodegradable	X			Section 3.3 Appendix F Appendix J	
(b) Does the final cover system meet the requirements of subs. (2) to (9) below unless it is established (to the satisfaction of the department) that portions of final cover system are not needed based on proposed waste type and design?	X			Section 3.3 Appendix F Appendix J	Alternative final cover previously approved.
Is the geomembrane component included in the final cover design unless this is proposed to be an exclusively high volume industrial, or other landfill that does not accept municipal solid waste and is not composite lined?	X			↓	
(c) If the landfill is designed with a composite liner, is it also designed with a final cover system meeting subs. (2) to (9) below?	X				Alternative final cover previously approved.
(d) Does the landfill accept papermill sludge or other industrial solid wastes with high water contents and low strength? Will the strength of the waste prohibit the type of cover system specified in this section (subs. (2) to (9))? If yes, an alternate final cover system may be proposed.			X		
(2) GRADING LAYER.					
If this is a municipal solid waste landfill, does the design include a 6 inch grading layer above the final waste elevation?			X		
(3) SUPPORT LAYER AND LOW-STRENGTH WASTES.					
If the landfill accepts industrial wastes with high water content and low strength, does the design include a support layer for stabilization, reinforcement and removal of leachate and gas?			X		
(4) CLAY CAPPING LAYER.					
___ Does the landfill design include a two foot clay cap that meets the specification of NR 504.06(2)(a) listed below? A minimum of 50% by weight passing 200 sieve			X	↓	Alternative final cover previously approved.

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
___ A saturated hydraulic conductivity of 1×10^{-7} cm/sec or less ___ An average liquid limit of 25 or greater with no values less than 20 ___ An average plasticity index of 12 or greater with no values less than 10 ___ Will the clay capping layer be constructed according to NR 504.06(2)(f)?			X	Section 3.3 Appendix F Appendix J	
(a) If the two foot clay cap is replaced with a GCL and 2 foot soil barrier layer, does it meet the following: ___ 1. GCL consist of a layer of bentonite clay between 2 geotextiles ___ 2. GCL will be covered with a geomembrane the same day it is placed and in dry conditions ___ 3. GCL will be installed in a relaxed condition, free of tension or stress ___ 4. Adjoining panels of GCL have a minimum 6 inches overlap on longitudinal seams and a minimum 20 inches of overlap on panel end seams ___ 5. Irregular shapes, cuts or tears in the GCL are covered with a GCL patch with a minimum 12 inch overlap ___ 6. A seal of loose bentonite granules will be placed in seam overlaps at a minimum rate of 1 quarter pound per linear foot of seam for all seams ___ 7. Loose bentonite or bentonite amended soil will be placed at all patches and penetrations ___ 8. GCL panels are certified needle-free through magnetic and metal detection tests ___ 9. GCL will be placed in direct contact with a soil barrier layer ___ 10. Vehicle traffic on subgrade of GCL and on GCL will be restricted to minimum weight and number of machines to deploy GCL and geomembrane; vehicles operated to minimize damage to subgrade, GCL and geomembrane; deployment methods selected to prevent tearing or coming out of fibers of the GCL ___ 11. Soil cover placement over the geosynthetics will be completed in the same construction season as the geosynthetic construction ___ 12. Soil barrier layer will consist of fine-grained soil or a well graded sandy soil with fines, meeting USCS soil types ML, CL, CH, SM, or SC or dual -symbols classifications of these soils, with 25% by weight passing P200 sieve; upper one foot will have maximum particle size of 2 inches and lower one foot will have maximum particle size of 4 inches ___ 13. Soil barrier layer will be compacted in lift heights of no greater than 12 inches after compaction using footed compaction equipment with feet at least 6 inches long; each lift will be disked to break up clods; clods no greater than 4 inches ___ 14. Soil barrier layer will be compacted to ensure complete remolding of soil with equipment having a minimum static weight of 30,000 pounds	X			Section 3.3 Appendix F Appendix J Appendix P	If the WDNR specified cover is used then yes; alternative final cover design was approved in 2004 plan mod.

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
___ 15. Soil barrier layer will be compacted to 90% modified or 95% standard Proctor density or greater at a moisture content at or wet of optimum ___ 16. Each lift of will be keyed into clay or soil barrier layer soils in adjacent phases to form a continuous seal; steps will be a minimum width of 2 feet and there will be a minimum of 2 steps ___ 17. The surface of the top lift will be graded or compacted to be smooth and firm and will be inspected for removal of course grave, cobbles and debris prior to placement of GCL	X			Section 3.3 Appendix F Appendix J Appendix P	If the WDNR specified cover is used then yes; alternative final cover design was approved in 2004 plan mod.
(b) For industrial waste landfills that predominantly accept compressible wastes or wastes with high water contents and low strength, will the landfill be replacing the clay layer with a GCL overlying a minimum one foot sand layer? If yes, will the gradation of the sand layer be a uniform sand selected to vent gas, drain leachate and provide hydration water to the GCL?			X		
(c) For industrial waste landfills that predominantly accept ash, will the landfill be replacing the clay layer with a GCL overlying a minimum two feet soil barrier layer? If yes, will the soil barrier layer meet the requirement of (a)13 to 17 above and will the upper foot of soil barrier layer meet the requirements of (a)12 above? Note: The lower foot shall be designed to provide a capillary break between the ash and the upper one foot of soil barrier layer.	X				If the WDNR specified cover is used then yes; alternative final cover design was approved in 2004 plan mod.
(d) If the lower one foot of the clay layer is replaced with a one foot of foundry green sand system sand, will the sand meet the following: ___ Bentonite content of greater than 6% ___ Liquid limit of greater than 20 ___ Plasticity index of greater than 6 ___ Hydraulic conductivity of less than 1×10^{-7} cm/sec ___ Compaction of 90% modified or 95% standard Proctor density or greater at a moisture content at or wet of optimum			X		
(5) GEOMEMBRANE LAYER.					
If a geomembrane layer is proposed, does it meet the requirements of NR 504.06(3)(c) to (j) and the following:	X			Section 3.3 Appendix F	
(a) Nominal geomembrane thickness 40 mils or greater, and no thickness measurements below accepted industry tolerance	X			Appendix G Appendix P	
(b) Geomembrane installed in direct contact with the clay capping surface	X				
(c) Geomembrane penetrations fitted with prefabricated collar or a plate welded at the angle of final cover slope, which allows for differential settlement of waste without damage to the membrane seal	X			↓	

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(6) DRAINAGE ROOTING ZONE LAYER. Does the design include a drainage and rooting zone layer over the geomembrane or the clay cap that meets the following requirements:					
A minimum thickness of 2.5 feet and is not densely compacted	X				
(a) Drainage layer is designed to be placed immediately above the capping layer and consists of a 1-foot sand layer with a min. hydraulic conductivity of 1×10^{-3} cm/sec., or a geosynthetic drain layer of equivalent or greater transmissivity, including: <u>X</u> Design includes an analysis which demonstrates whether the maximum head in the drain layer will be confined within the thickness of the drain, <u>X</u> Drain calculations include infiltration rates based on saturated characteristics of the topsoil and rooting zone, and <u>X</u> Drain calculations include hydraulic gradient of one through the topsoil and rooting zone.	X			Section 3.3 Appendix F Appendix G Appendix J Appendix P	
(b) A perimeter drain pipe at the low end of all final cover sideslopes with the following design elements: <u>X</u> Drain pipe surrounded by a minimum of 6 inches of gravel or sand having a minimum hydraulic conductivity of 1×10^{-2} cm/sec <u>X</u> Drain pipe sloped to outlets spaced 200 feet apart unless different spacing is supported by modeling	X			Section 3.3 Appendix F Appendix G Appendix J Appendix P	
(7) TOPSOIL.				Section 3.3	
<u>X</u> Is a minimum of 6 inches of topsoil included over the cover layer? <u>X</u> Is fertilizer and lime addition proposed per section 630, WDOT or other spec.?	X			Appendix F Appendix G	
(8) REVEGETATION.				Appendix P	
<u>X</u> Is seed type and fertilizer based upon type and quality of topsoil, and compatibility with the native vegetation and final use? <u>X</u> Is seed mix and application rates per section 630 WDOT specifications unless the department approved different seed mix and application rates? <u>X</u> Are fertilizer and mulch application rates specified?	X			Section 3.3 Appendix F Appendix G	
(9) FINAL USE.					
(a) Is final use compatible with the final cover system?	X			Appendix Q	
(b) Are the following activities prohibited when landfill is no longer in operation? <u>X</u> Use of waste disposal area for agricultural purposes <u>X</u> Establishment or construction of any buildings over the waste disposal areas <u>X</u> Excavation of final cover or any waste materials	X			Appendix Q	
NR 504.075 SOIL BORROW SOURCES.					
(1) GENERAL.					

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
<p>Has an alternate geotechnical investigation program been approved by the department in writing prior to the field and laboratory investigation? __ yes __ no If yes, does the report include a copy of and justification for any approved alternative geotechnical investigation program? Note: An alternative geotechnical investigation program may be submitted in cases where previous information exists regarding the proposed soil borrow source.</p>			X		
<p>(a) Have the required number of test pits or borings been completed on a uniform grid pattern across the proposed borrow source(s)? __ 10 test pits/borings for the first 5 or less acres __ 1 additional test pit/boring for each additional 3 or less acres __ Proposed acreage of proposed borrow source(s) __ Number of test pits/borings required __ Number of test pits/borings made __ Have logs identifying geologic origin, testing results, USCS classification, and visual description of each major soil unit encountered also been included?</p>					
<p>(b) Does the report include Atterberg limits and grain size analyses to 0.002 mm particle size for 2 samples from each test pit/boring?</p>					
<p>(c) Does the report include the relationship of water content to dry density using either the modified or standard Proctor method (curves must be developed with a minimum of 5 points) for 1 sample from each major soil unit and no fewer than 3 samples for uniform clay deposits?</p>					
<p>(d) Does the report include laboratory hydraulic conductivity test results for each sample used to develop the Proctor curves?</p>					
<p>(6) STOCKPILING.</p>					
<p>Does the report include discussion of segregating stockpiled soils by USCS soil type, soil gradation, Atterberg limits and compaction specifications? Note: Stockpiling of soils obtained from clay borrow sources and soil barrier layer sources for landfill liner of final cover construction shall be conducted in an organized manner that minimizes mixing of dissimilar soil types. Soils from differing sources may not be commingled unless soil properties are similar.</p>					
<p>(7) DATA PRESENTATION FOR ALL CLAY BORROW SOURCES AND SOIL BARRIER LAYER SOURCES. Does the submittal for soil borrow sources for clay and soil barrier layers include the following?</p>					
<p>(a) Calculated volume of soil needed and the volume of acceptable soil available</p>					
<p>(b) Property boundaries and test pit/boring locations on a topographic map (scale: 1" = 500') that extends a minimum of 500 feet beyond the proposed borrow source</p>					
<p>(c) Isopach map showing thickness of acceptable soil</p>					
<p>(d) Description of methods for separating acceptable soil from unacceptable soil</p>					
<p>(e) Proposal for maintaining drainage and sedimentation control</p>					

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(f) All data from the testing program			X		
(8) DATA PRESENTATION FOR OTHER BORROW SOURCES. Does the submittal for soil borrow sources other than those used for clay and soil barrier layers include the following?					
(a) Property boundaries shown on a topographic map (scale: 1" = 500') that extends a minimum of 500 feet beyond the proposed borrow source					
(b) Proposal for drainage and sedimentation control					
(9) STORMWATER MANAGEMENT.					
Does the submittal for a soil borrow source include a stormwater management plan that complies with the requirements of s. NR 504.09(1)(a) to (f) and (h) to (j), unless the borrow source is subject of other permits with equivalent authority and requirements, such as a stormwater discharge permit or non-metallic mining reclamation permit?					
(10) RECLAMATION OR BORROW SITES.					
(a) Does the report include reclamation plans for borrow sources on the landfill property that include the following: ___ post-mining land use that is integrated with the existing and proposed drainage ___ surface water discharge requirements ___ grades and final use of the landfill Is the reclamation plan consistent with NR 135.06 to 135.12?					
(b) For soil borrow areas not on landfill property, is the reclamation plan consistent with NR 135? If required, has a reclamation plan been submitted and a nonmetallic mining reclamation permit been received from the appropriate regulatory authority?					
(11) OTHER REQUIRMENTS.					
(a) If the proposed clay borrow source(s) contains less than a five foot, but greater than 2 foot uniform clay thickness, does the report contain a construction methodology and documentation procedure to ensure the liner meets the soil index property requirements of s. NR 504.06(2)(a)?					
(b) Does the report include a description of measures to be taken to comply with wetlands protection requirements, runoff and sediment controls and surface water discharge permit requirements and to minimize effects on areas of special natural resource interest and historical or archaeological areas within and adjacent to the proposed limits of excavation?					
NR 504.08 MINIMUM DESIGN AND CONSTRUCTION CRITERIA FOR LANDFILL GAS EXTRACTION SYSTEMS.					
(1) GENERAL.					

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
If the landfill has the potential to generate landfill gas, is the landfill designed to prevent the migration of explosive gases generated by the waste?			X	Site is a CCR landfill.	
(2) ACTIVE GAS EXTRACTION AND TREATMENT. Does landfill design include an active gas recovery system which includes the following features:					
(a) Vertical gas extraction wells with a maximum 150 foot radius of influence per well with lesser radii of influence on wells near the perimeter Note: The radii of influence of adjacent wells shall overlap. Alternate well spacings may be proposed if site specific data is obtained through performance of pump tests.					
(b) Vertical gas extraction wells extending to 10 feet above the leachate collection system, and installed in 36 inch diameter boreholes Note: An exemption may be proposed to allow for placement of gas extraction wells closer to the leachate collection system.					
(c) The pipe in the boreholes are a minimum 6 inch diameter, Schedule 80 PVC or an approved equal					
(d) The lower 2/3 to 3/4 of the pipe in the borehole is slotted or perforated pipe					
(e) Backfill around slotted pipe is one inch to 1 1/2 inch washed stone and the top 10 feet of the borehole is sealed					
(f) Each gas extraction well has a flow control valve and sampling port					
(g) The header system is looped to allow alternate flow paths for the gas					
(h) A minimum slope of 2% for header pipes over the waste					
(i) Polyethylene is used for the header and lateral pipes					
(j) The blower, header and laterals are sized such that a minimum vacuum of 10 inches of water column is available at the well furthest from the blower					
(k) A drip leg or equivalent is installed immediately before the blower while preserving suction at the wells under maximum operating vacuum					
(l) All condensate and gas transfer piping outside waste limits are encased in 2 feet of clay, double-cased pipe or another approved secondary containment If the piping is not encased is the proposed system designed with multiple drip legs within the landfill where the bulk of the condensate has been removed?					
(m) The system has the ability to collect and treat all condensate, measure volumes and collect samples					
(n) A flare designed to meet the requirements of ch. NR 445					
(3) GAS MONITORING WELLS.					
___ Does the design provide at least one gas monitoring well on each side of the landfill? Will the wells be constructed per NR 507.11?					
(4) PASSIVE GAS EXTRACTION SYSTEMS. If the landfill accepts only industrial waste with the potential to generate gas and which does not use an active gas extraction system, is a passive gas venting system proposed which includes the following:					

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
<input type="checkbox"/> A design that allows gas venting from the entire landfill surface? <input type="checkbox"/> An analysis to determine vent trench spacing for an effective system and to ensure compliance with ch. NR 445 limits for hazardous air contaminants <input type="checkbox"/> A continuous 1 foot layer of granular soil placed under the capping layer with a minimum hydraulic conductivity of 1×10^{-3} cm/sec Note: This layer may be part of the support layer required in s. NR 504.07(3). <input type="checkbox"/> A series of flexible, perforated pipes connected to a series of outlets			X	Site is a CCR landfill.	
NR 504.09 STORM WATER MANAGEMENT AND MISCELLANEOUS DESIGN AND CONSTRUCTION CRITERIA FOR LANDFILLS.					
(1) STORM WATER MANAGEMENT.					
(a) Are drainage ditches, structures and sedimentation basins proposed to be constructed during the initial stages of site construction to control runoff and limit entrained sediment from reaching surface water bodies?				Not required to be submitted in NR 514.045 Plan of Operation Modification. Information previously provided in Feasibility Report(1997) and Plan of Operation(2000) and exemption approved in Plan of Operations Approval Letter.	
(b) Are the following concepts incorporated in the design of the temporary and permanent erosion and sediment control measures: <input type="checkbox"/> Scheduling of grading and construction to minimize soil exposure <input type="checkbox"/> Retention of existing vegetation whenever feasible <input type="checkbox"/> Seeding and mulching of disturbed areas <input type="checkbox"/> Diversion of runoff away from disturbed and active fill areas <input type="checkbox"/> Minimization of runoff velocities <input type="checkbox"/> Designing drainageways and outlets to handle concentrated and increased flows <input type="checkbox"/> Trapping of sediment on-site <input type="checkbox"/> Inspection and maintenance of runoff control structures Note: The applicant should submit a copy of the facility's storm water pollution prevention plan (SWPPP) with the plan of operation. The SWPPP may address the items listed above, in addition to storm water or surface water monitoring for the facility.					
(c) Are the calculations required in pars. (d), (e) and (f) performed for the period in the landfill's development where the surface conditions and contributing acreage would result in the greatest runoff volume?					
(d) Are all temporary and permanent storm water control structures designed to accommodate peak flow rates from a 25 year, time of concentration storm event?					↓

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(e) Are the storm water management features designed to accommodate the following: <input type="checkbox"/> Temporary and permanent sediment controls are designed to settle the 0.015mm particle size for all storms up to and including the 25 year, 6 hour event? <input type="checkbox"/> The sedimentation basin surface area is based upon the average rainfall intensity over the 25 year, 6 hour event? <input type="checkbox"/> The principal spillway and outlet protection for the sedimentation basin is designed to pass a 25 year, time of concentration storm event? <input type="checkbox"/> The emergency spillway for the sedimentation basin is designed to pass a 100 year, time of concentration event? <input type="checkbox"/> The sedimentation basin dewatering structure is designed to drain the basin in less than 3 days <input type="checkbox"/> A design analysis documenting compliance with the above is included			X		Not required to be submitted in NR 514.045 Plan of Operation Modification. Information previously provided in Feasibility Report (1997) and Plan of Operation (2000) and exemption approved in Plan of Operations Approval Letter.
(f) Is storm water diverted from active fill and borrow areas to sediment control structures?	X			Section 3.4 Appendix K	
(g) Are the containment berms around active fill areas designed to comply with the following: <input checked="" type="checkbox"/> Control and collect runoff from a 25 year-24 hour storm event <input checked="" type="checkbox"/> Containment analysis is based upon the volume of liquid generated from areas with exposed waste and areas with daily cover <input checked="" type="checkbox"/> Storm water in contact with active fill areas will be treated as leachate	X			Section 3.4 Appendix K	
(h) Are storm water drainage ditches, structures and sedimentation basins designed to discharge along the existing drainage patterns capable of accepting anticipated flow volume?					Not required to be submitted in NR 514.045 Plan of Operation Modification. Information previously provided in Feasibility Report (1997) and Plan of Operation (2000) and exemption approved in Plan of Operations Approval Letter.
(i) Has an analysis been performed to determine the amount and velocity of runoff prior to landfill development and to document compliance with above requirement?					
(j) Does storm water diversion and construction at the landfill minimize impacts on adjacent property?					
(j) Do storm water management features comply with other applicable requirements such as those of, but not limited to, ch. NR 103 and ch. 30, Stats., permits? Note: The design should also comply with NR 151 storm water requirements.					
(2) MISCELLANEOUS.					
(a) Is a method of controlling any dust or windblown debris included in the design?					
(b) Is access restricted through fencing, natural barriers or other methods?					
(c) Are all access roads, including those in the active area, designed for all weather operation?					
(d) Are all access roads used by highway vehicles designed with less than 10% grade?					



Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
Is the intersection of the landfill access road with an existing highway designed with sufficient sight distance and minimize traffic interference?					Not required to be submitted in NR 514.045 Plan of Operation Modification. Information previously provided in Feasibility Report (1997) and Plan of Operation (2000) and exemption approved in Plan of Operations Approval Letter.
(e) intentionally left blank					
(f) Is a minimum 100 foot separation distance between the fill limits and the adjacent property line, and a minimum 50 foot distance from landfill excavation or berm and the adjacent property line maintained (excluding storm waste diversion structures)?					
(g) Is the landfill designed such that final waste grades are reached as soon as possible and open refuse filling area is minimized?				↓	
(h) Are the final slopes designed to be no less than 5% and no greater than 4H:1V, except for papermill sludge sites which may have a max.6H:1V final slope for papermill and wastewater treatment sludge landfills?					
(i) Are a minimum of 2 leachate headwells proposed per major horizontal phase?					
(j) Is a weight scale supplied (if proposed as a municipal solid waste landfill)?					
(k) Is the landfill designed with properly protected, permanent horizontal and vertical control benchmarks, and are the elevations tied to USGS datum and horizontal control referenced to property boundary?					
NR 504.095 DESIGN CRITERIA FOR LANDFILLS THAT RECIRCULATE LEACHATE					
(1) GENERAL. Leachate recirculation systems shall be designed to meet the following requirements:					
(a) Is the MSW landfill designed with a composite liner and leachate collection system meeting the requirements of NR 504.06? If no, leachate recirculation may not be approved.			X		
(b) Is the leachate recirculation limited to areas of the landfill where the leachate collection drainage blanket has a hydraulic conductivity of 1cm/sec or greater? Note: The department may approve leachate recirculation in existing cells with lower permeability leachate collection blankets, provided that the operator can demonstrate that the maximum leachate head on the liner can be maintained at less than 12 inches and that the recorded leachate head has not exceeded 12 inches in the past.			X		
(c) Is the leachate recirculation limited to areas of the landfill which are connected to the active gas extraction systems where the system is capable of collecting the additional gas expected? Note: Active gas extraction shall commence in those areas no later than the initiation of leachate recirculation.			X		
(d) Is the leachate recirculation distribution system more than 100 lateral feet from the exterior sideslope final grades?			X		
(e) Will there be a minimum depth of 20 feet of waste maintained between the landfill base and the lowest point of leachate distribution?			X		

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(f) Do the operating controls and instructions for leachate recirculation address the following: ___ All weather and seasons of operation ___ Cessation of leachate recirculation upon discovery of seeps, excessive pressures within the waste mass, saturated conditions within the waste mass, inadequate shear strength of the waste mass or other conditions indicative of instability?			X		
(2) SURFACE APPLICATION.					
(a) Is the leachate distribution system designed so no leachate is introduced into the waste in a manner that causes ponding or surface runoff of leachate (No open surface trenches or ponds)?			X		
(b) Is the leachate distribution system designed to minimize evaporation of the leachate and volatilization of compounds in leachate?			X		
(3) VERTICAL DISTRIBUTION SYSTEMS.					
(a) Are the wells designed for leachate recirculation and gas extraction?			X		
(b) Is the well spacing based on the leachate flow rates, pumping characteristics, permeability of the waste mass, and ability of the waste to accept liquid without being pressurized?			X		
(c) Are the leachate distribution wells designed with a surface seal to control odors and landfill gas?			X		
(d) Are the pumping pressures and pumping intervals for the wells designed to prevent surface emergence of leachate?			X		
(e) Is the leachate distribution system designed to achieve a uniform distribution of leachate throughout the zone of influence of the wells?			X		
(f) Are the leachate distribution wells designed to also extract landfill gas?			X		
(4) HORIZONTAL DISTRIBUTION SYSTEMS.					
(a) Is the leachate distribution piping designed to distribute leachate consistently along its length?			X		
(b) Is the distribution system designed with a permeable bedding material capable of rapidly dissipating recirculated leachate into the waste mass?			X		
(c) Is the distribution system designed with bedding material capable of maintaining its structure and characteristics during the expected operation life of the system?			X		
(d) Is the distribution system designed to operate with specific distribution periods with landfill gas extracted in the interval between those distribution periods and to minimize uncontrolled landfill gas emissions?			X		
(e) Are the pumping pressures and pumping intervals for the wells designed to prevent surface emergence of leachate?			X		

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
NR 504.10 ALTERNATIVE DESIGN CRITERIA FOR LANDFILLS ACCEPTING HIGH VOLUME INDUSTRIAL WASTES.					
This section applies only to landfills designed primarily for high volume industrial waste, wood residue and minor amounts of other waste as approved by the Department. This section applies to all new landfills and to the expansion of existing landfills for which the plan of operation was approved after February 1, 1988. This section also applies to new and existing CCR landfills and lateral expansions of a CCR landfill.					
(1) GENERAL.					
(a) Has the landfill been designed to either meet the requirements of NR 504.05 to 504.09 or has an alternative design been proposed which meets the following provisions?	X			Section 3 Appendix F Appendix G	Alternative final cover design has been previously approved
(b) Note: If the applicant does not completed construction of the first major phase of the landfill within 2 years from the date of the plan of operation approval, the applicant shall reapply for approval to construct. The department may require additional conditions or approval and require redesign of the landfill in accordance with state-of-the-art design criteria.	X			Appendix J	in 2004 Plan mod approval.
(c) Does municipal waste which is generated by the process, such as manufacturing process packaging not exceed 10% by weight? Note: If yes, then the landfill may not be subject of the design requirements of s. NR 504.05(1). Household and plant waste not generated as a direct result of the manufacturing process such as office and cafeteria waste, may not be disposed of in a landfill which does not meet the requirements of s. NR 504.05(1).			X		Only CCR waste accepted.
(2) DESIGN CAPACITY.					
Does the design capacity meet NR 504.05(3)?			X		
(3) DESIGN CRITERIA.					Site has been
Does the feasibility study demonstrate that the alternative design adequately protects the public health, welfare and the environment, and the design meets or exceeds the NR 504.04 location and performance standards? If no, then an alternative design may not be approved. Is the alternative design supported with the following types of information:			X		based on anticipated disposal rates at time of permitting site life was anticipated at 13.9 years.
(a) Landfill characteristics including regional and specific information on land use, geology, hydrology, hydrogeology and soils			X		
(b) Waste characteristics such as quantity and physical/chemical analysis of waste and leachate			X		Modified final cover was previously approved.
(c) Analysis of any design to control geologic/hydrogeologic conditions			X		
(d) Field demonstration data			X		See Appendix B and J.
(e) Design and performance data for similarly designed and constructed landfills			X		
(f) Accepted scientific or engineering analysis or field studies, field plots, research, manufacturer's data or demonstrations			X		

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
<p>(g) For new and existing CCR landfills and any lateral expansion of a CCR landfill, a demonstration that the alternative design meets the federal requirements located under 40 CFR part 257, Subpart D dated April 17,2015 (80 FR 21468), as amended at 83 FR 36451, July 30, 2018.</p> <p>Note: The code of federal regulations may be obtained at www.ecfr.gov. Copies of 40 CFR part 257, subpart D dated April 17, 2015 (80 FR 21468), as amended at 83 FR 36451, July 30, 2018 are available for inspection at the legislative reference bureau.</p>	X			Section 3.3	
NR 504.11 MINIMUM DESIGN AND CONSTRUCTION CRITERIA FOR LANDFILLS ACCEPTING RESIDUE PRODUCED BY BURNING MUNICIPAL SOLID WASTE.					
(1) APPLICABILITY. This section applies to landfills designed for residue produced by the burning of municipal solid waste as approved by the department. This section applies to all new and existing landfills.					
(2) LANDFILL DESIGN CRITERIA FOR RESIDUE PRODUCED BY BURNING MUNICIPAL SOLID WASTE.					
(a) If the landfill has proposed to accept municipal solid waste combustor residue that tests below the NR 502.13(6)(g) limits, is it a composite lined monofill cell which follows the following criteria:			X		
___ Does the composite liner consist of a minimum 60 mil geomembrane overlying a minimum 4 foot thick compacted clay liner meeting NR 504.06 specifications?					
___ Is the monocell designed to separately sample and collect leachate from residue areas?					
___ If an alternate design is proposed, such as a double liner, does the design provide equivalent protection?					
(b) If the landfill is proposed to accept municipal solid waste combustor residue that tests above the limits in NR 502.13(6)(g), does the landfill design include a double composite lined monofill cell which meets the following criteria:					
___ Is there a double composite liner with 2 separate composite liners each with a minimum 60 mil geomembrane liner overlying a minimum 4 foot compacted clay liner meeting NR 504.06 specifications?					
___ Is the composite liner separated by a minimum one foot (detection) layer of granular material?					
___ Are separate leachate collection systems designed above and between the composite liners and is separate leachate sampling and collection from the detection layer possible?					
(c) Note: All landfills which accept municipal solid waste combustor residue shall be approved by the department in accordance with s. NR 514.07 (5) prior to accepting each specific residue waste stream.					
NR 504.12 MINIMUM DESIGN AND CONSTRUCTION CRITERIA FOR CCR LANDFILLS					

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(1) APPLICABILITY. In addition to ss. NR 504.04 to 504.10, applicable to all landfills or landfills accepting high volume industrial waste, this section includes design criteria that are applicable to the construction of a new or existing CCR landfill or a lateral expansion of a CCR landfill.					
(2) RUN-ON AND RUN-OFF CONTROLS. Does the submittal demonstrate that the CCR landfill is/will be designed, constructed, operated, and maintained with a run-off and run-on control system in accordance with the requirements under s. NR 504.09(1)(f) and (g) and all of the following: <u>Note: Complete NR 504.09(1)(f) and (g) above.</u>					
(a) A run-on control system that prevents flow onto the active portion of the CCR landfill during a peak discharge from a 24-hour, 25-year storm event.	X			Section 3.4 Appendix K	
(b) A run-off control system from the active portion of the CCR landfill that collects and controls, at a minimum, the water volume resulting from a 24-hour, 25-year storm event.	X			Section 3.4 Appendix K	
(3) LINER DESIGN. (a) Does the submittal for a new CCR landfill or a lateral expansion of a CCR landfill demonstrate the landfill is/will be designed, constructed, operated, and maintained with a composite liner that meets the requirements under s. NR 504.06(2) and (3), and a leachate collection and removal system that meets the requirements under s. NR 504.06(5). <u>Note: This section does not apply to existing CCR landfills. Complete NR 504.06(2), (3), and (5) above.</u>	X			Section 3.2	
Is the new CCR landfill or lateral expansion of a CCR landfill constructed or designed with a composite liner that consists of 2 components: <u>X</u> An uppermost component that consists of a nominal 60-mil or thicker geomembrane liner, ___ A lower component that consists of a minimum 4-foot-thick layer of compacted clay, OR <u>X</u> A geosynthetic clay liner (GCL) used in place of the clay liner of a composite liner in accordance with s. NR 504.06(7). <u>Note: Complete NR 504.06(7)(a) – (c) above if a GCL is used. This includes s. NR 504.07(4)(a) 1 to 17 as referenced.</u>	X			Section 3.2	
In addition to the minimum design and construction criteria for landfill liners and leachate collection systems under s. NR 504.06, does the liner and leachate collection system meet all of the following:					
1. The leachate collection and removal system is/will be designed, constructed, operated, and maintained to limit the leachate head level on the liner to one foot or less.	X			Section 3.2.3	

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
2. The leachate collection and removal system is/will be constructed of materials that exhibit all of the following properties: <ul style="list-style-type: none"> a. <input checked="" type="checkbox"/> Chemically resistant to the CCR and any non-CCR waste managed in the CCR landfill and the leachate expected to be generated. b. <input checked="" type="checkbox"/> Of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying waste, waste cover materials, and equipment used at the CCR landfill. 	X			Section 3.2.3 Appendix F,	
3. The leachate collection and removal system is/will be designed and operated to minimize clogging during the active life and during the long-term care of the landfill.	X			Section 3.2.3	
4. The geomembrane component of the liner is/will be installed in direct and uniform contact with the compacted clay soil component.			X		GCL and geomembrane composite liner is used.
5. A liner that utilizes a GCL and soil barrier layer in accordance with s. NR 504.06 (7) is/will be designed to have a liquid flow rate no greater than the liquid flow rate through 2 ft of compacted soil with a hydraulic conductivity 1×10^{-7} cm/sec. The liquid flow rate comparison shall be made using the following equation, which is derived from Darcy's Law for gravity flow through porous media: $Q/A = q = k (h/t + 1)$ Where: Q = flow rate (cubic centimeters / second). A = surface area of the liner (squared centimeters). q = flow rate per unit area (cubic centimeters / second / squared centimeter). k = hydraulic conductivity of the liner (centimeters / second). h = hydraulic head above the liner (centimeters). t = thickness of the liner (centimeters).	X			Section 3.2.3 Appendix H	
(b) A new CCR landfill or a lateral expansion of a CCR landfill shall be designed and constructed with a subbase grade that is located no less than 5 feet above the upper limit of the uppermost aquifer, or shall demonstrate that there will not be an intermittent recurring or sustained hydraulic connection between any portion of the base of the CCR landfill and the uppermost aquifer due to normal fluctuations in groundwater elevations, including the seasonal high water table. Note: A new CCR landfill or lateral expansion of a CCR landfill is also required to comply with s. NR 504.06(2)(b) or (4) for zone-of-saturation landfills. The definition of an uppermost aquifer can be found under s. NR 500.03(246m).	X			Section 3.2	
(c) A new CCR landfill or a lateral expansion of a CCR landfill may not be constructed over a closed CCR surface impoundment.			X		No surface impoundments at the facility.

Facility Name:

DESIGN & CONSTRUCTION CRITERIA REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(4) FINAL COVER SYSTEM. (a) Does the submittal for a new or existing CCR landfill or a lateral expansion of a CCR landfill demonstrate the landfill is/will be designed and constructed with a final cover system that meets requirements under s. NR 504.07? <u>Note: Complete NR 504.07 above.</u>	X			Section 3.3	Alternative cover previously approved.
(b) If an alternative final cover design is proposed within the written closure plan, does it meet the requirements under s. NR 504.10 and all of the following: <u>Note: Complete NR 504.10 above.</u>	X			Section 3.3	Alternative cover previously approved.
1. The permeability of the final cover system is/will be less than or equal to the permeability of any bottom liner system or natural subsoils present or shall be no greater than 1×10^{-5} cm/sec, whichever is less.	X			Section 3.3	
2. The design of the final cover system is/will include an infiltration layer that achieves an equivalent reduction in infiltration as the layers specified under s. NR 504.07 (4).	X			Section 3.3	
3. The design of the final cover system is/will include an erosion layer that provides equivalent protection from wind or water erosion as the topsoil layer specified under s. NR 504.07 (7).	X			Section 3.3	
4. The disruption of the integrity of the final cover system is/will be minimized through a design that accommodates settling and subsidence.	X			Section 3.3	

Legal Note: This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

NR 514.045 Checklist

Coal Combustion Residual (CCR) Landfill Plan of Operation Modification for Initial Permitting Checklist Section NR 514.045, Wis. Adm. Code



August 2022

Waste & Materials Management
P.O. Box 7921
Madison, WI 53707-7921

This checklist is intended for use by department staff to determine completeness during the review of plan of operation modifications for initial permitting of CCR landfills under s. NR 514.045, Wis. Adm. Code. Refer to applicable statutes and codes for exact requirements. The completeness determination is due within 90 days after the owner or operator of a new or existing CCR landfills submits the plan of operation modification for initial permitting. Refer to ss. NR 514.045(2) – (4), Wis. Adm. Code for subsequent steps upon determining whether or not the plan of operation modification is complete. This checklist refers to and should be used with the Design and Construction Criteria Completeness Checklist for ch. NR 504, Wis. Adm. Code requirements and other applicable Wis. Adm. Code chapters.

General Information

Facility Name: Dairyland Power Cooperative - Alma Off-Site Disposal Facility

Facility Identification (FID) Number: _____ License Number: 4126

List all CCR units covered under this plan of operation modification for initial permitting. This includes all existing and new CCR landfills and any future cells to be constructed under the current plan of operation approval.

CCR Unit Name (Phase):	Type of Unit (Existing, New, or Approved – but not constructed):
------------------------	--

<u>Phase IV Landfill</u>	<u>Existing</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Facility Name: Dairyland Power Cooperative - Alma Off-Site Disposal Facility

Initial Submittal:	Date Received: ___/___/___	Completeness Due: ___/___/___	DNR Response: ___/___/___	(Complete: __ yes __ no)
Addendum # __	Date Received: ___/___/___	Completeness Due: ___/___/___	DNR Response: ___/___/___	(Complete: __ yes __ no)

NR 514.045 Procedural requirements for initial permitting of CCR landfills. (1) GENERAL. An owner or operator of a new or existing CCR landfill that is licensed or constructed prior to August 1, 2022, shall submit a plan of operation modification to the department no later than February 1, 2023, to update the plan of operation to comply with the applicable requirements under chs. NR 500 to 520 for CCR landfills. The plan of operation modification shall address all phases of the CCR landfill. At a minimum, the plan of operation modification shall include all of the following:

REGULATORY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
NR 514.045(1)(a) Does the submittal meet the requirements under s. NR 500.05, including the certifications required under s. NR 500.05(4)?					
NR 500.05 GENERAL SUBMITTAL REQUIREMENTS.					
(1) Has payment of the review fee of \$30,500 been received? Note: The department sends an invoice to the facility contact upon receipt of the submittal. Payment is due within 30 days of receipt of the invoice.					DPC shall be invoiced.
(2) Has a cover letter detailing the desired action been submitted?	X			Cover Letter	
(3) Have the appropriate number of written and electronic copies been submitted to the department?	X				
(4) Are the report and plan sheets submitted under the seals and certifications of a licensed professional engineer and professional geologist?	X				
(5) Technical Procedures:					
Were all test procedures specified in the report?	X				
Were all technical procedures used to investigate the facility current standard procedures?	X				
Were explanations and reasons given for deviations from any current standard method?	X				
(6) Do all maps, plan sheets, drawings, isometrics, cross-sections, figures, photographs and tables meet the following requirements?	X			Plan Sheets/ Appendix F.2 Figures	

Facility Name: _____

REGULATORY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(a) No larger than 32 inches by 44 inches and no smaller than 8 ½ inches x 11 inches. Note: Section NR 514.045, Wis. Adm. Code requires engineering plans be drawn on standard 24 inch by 36-inch plan sheets.	X			Plan Sheets/ Appendix F.2 Figures	
(b) Appropriate scale to show all required detail in sufficient clarity.	X				
(c) <u>X</u> numbered <u>X</u> legends for all symbols <u>X</u> referenced in the narrative <u>X</u> horizontal & vertical scales <u>X</u> titled <u>X</u> drafting and origination dates					
(d) Use uniform scales.	X				
(e) Contain a north arrow.	X				
(f) Use mean sea level as the basis for all elevations.	X				
(g) Contain a survey grid based on monuments established in the field and which utilize a coordinate system and datum, such as state plane coordinates, Universal Transverse Mercator (UTM), or Wisconsin Transverse Mercator.	X				
(h) Show original topography and a grid system shown on the plan sheets that show construction, operation, and closure topography.	X				
(i) Any cross-sections: <u>X</u> Show survey grid locations, <u>X</u> Reference major plan sheets, <u>X</u> Include a reduced diagram of plan view showing cross-section location.	X				
(7) A table of contents listing all sections of the submittal.	X				
(8) An appendix listing the following: <u>X</u> names of all references <u>X</u> all raw data <u>X</u> testing and sampling procedures <u>X</u> calculations	X			Appendix A - R	
NR 514.045(1)(b) Does the submittal include a demonstration that all phases of the CCR landfill meet the performance criteria under s. NR 504.04(4)(a), (b), and (c)?					
NR 504.04(4) PERFORMANCE STANDARDS. Will the proposed landfill cause the following:					

Facility Name: _____

REGULATORY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(a) A significant adverse impact on wetlands? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no Has a practicable alternatives analysis and a wetland functional values analysis been completed in accordance with ch. NR 103, if a wetland will be affected by the proposed landfill or any noncommercial soil borrow source activity? Note: See DNR wetland regulation website (https://dnr.wisconsin.gov/topic/Wetlands/permits) to help determine if a wetland permit may be needed per s. 281.36, Stats.	X			Section 2.1	
(b) A take of an endangered or threatened species in accordance with s. 29.604, Stats? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no	X			Section 2.1	
(c) A detrimental effect on any surface water? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no Note: Exemptions are <u>not</u> granted.	X			Section 2.1	
For new CCR landfills or a lateral expansion of a CCR landfill, if the landfill failed to make the demonstration showing compliance with the criteria above, has the landfill ceased placing CCR in the CCR landfill per NR 514.045(5)(b)?			X		
NR 514.045(1)(c) Does the submittal include a demonstration that all phases of the CCR landfill meet the locational criteria under s. NR 504.04(3)(g), (h), and (i)?					
NR 504.04(3) LOCATIONAL CRITERIA. Are the proposed limits of filling within:					
(g) 200 feet of a fault that has had displacement in Holocene time? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> If yes, was an exemption requested?	X			Section 2.2, Appendix D	
(h) Seismic impact zones? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> If yes, was an exemption requested?	X			Section 2.2, Appendix D	
(i) Unstable areas? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> If yes, was an exemption requested?	X			Section 2.2, Appendix D	
For new CCR landfills or a lateral expansion of a CCR landfill, if the landfill failed to make the demonstration showing compliance with the criteria above, has the landfill ceased placing CCR in the CCR landfill per NR 514.045(5)(b)?			X		
NR 514.045(1)(c) (continued) Does the demonstration for unstable areas address all of the following factors, at a minimum, when determining whether an area is unstable:					
1. On-site or local soil conditions that may result in significant differential settling.				Section 2.2, Appendix D	
2. On-site or local geologic or geomorphologic features.				Section 2.2, Appendix D	

Facility Name: _____

REGULATORY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
3. On-site or local human-made features or events both surface and subsurface.				Section 2.2, Appendix D	
For existing CCR landfills that do not comply with the location criteria for unstable areas specified above, has the owner or operator, within 6 months of the determination, done the following per NR 514.045(5)(a): ___ ceased placing CCR and non-CCR waste streams into the CCR landfill ___ closed the CCR landfill in accordance with the requirements under s. NR 506.083 Note: This timeframe does not apply if the owner or operator complies with the alternative closure procedures under s. NR 506.083 (7).			X		
NR 514.045(1)(d) Does the submittal include a demonstration that the facility or practices near floodplains will not cause the following effects:					
<input checked="" type="checkbox"/> Restrict the flow of the regional flood <input checked="" type="checkbox"/> Reduce the temporary water storage capacity of the floodplain <input checked="" type="checkbox"/> Result in washout of solid waste so as to pose a hazard to human life, wildlife, or land or water resources. Note: NR 504.04(3)(c) also requires no person may establish, construct, operate, maintain, or permit the use of property for a landfill where the limits of filling are or would be within a floodplain.	X			Section 2.3	
For new CCR landfills or a lateral expansion of a CCR landfill, if the landfill failed to make the demonstration showing compliance with the criteria above, has the landfill ceased placing CCR in the CCR landfill per NR 514.045 (5)(b)?			X		
NR 514.045(1)(e) Does the submittal include a demonstration that the facility or practices will not result in the destruction or adverse modifications of the critical habitat of endangered or threatened species as identified in s. NR 27.03(1)?	X			Section 2.4	
For new CCR landfills or a lateral expansion of a CCR landfill, if the landfill failed to make the demonstration showing compliance with the criteria above, has the landfill ceased placing CCR in the CCR landfill per NR 514.045 (5)(b)?			X		
NR 514.045(1)(f) Does the submittal include a demonstration that the CCR landfill design meets requirements under s. NR 504.12 or an alternate design under s. NR 504.10? Does the demonstration include a design report, engineering drawings, and calculations? Note: <u>Complete NR 504.12 and if applicable NR 504.10 (for an alternate design) of the NR 504 Design and Construction Criteria Completeness Checklist.</u>	X			Section 3.0	
For new CCR landfills or a lateral expansion of a CCR landfill, if the landfill failed to make the demonstration showing compliance with NR 504.12 and NR 504.10 (for an alternate design), has the landfill ceased placing CCR in the CCR landfill per NR 514.045(5)(b)?			X		

Facility Name: _____

REGULATORY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
NR 514.045(1)(g) Does the submittal include all of the plans required under s. NR 514.07(10)?					
NR 514.07(10) PLAN OF OPERATION. Does the submittal include all of the following:					
(a) A CCR fugitive dust control plan in accordance with all of the following:	X			Section 5.1; Appendix O	
1. The plan shall identify and describe the CCR fugitive dust control measures the owner will use to minimize CCR from becoming airborne at the facility. The owner shall select and include in the CCR fugitive dust control plan the CCR fugitive dust control measures that are most appropriate for site conditions, along with an explanation. See s. NR 514.07 (10)(a)1. for control measure examples.	X			Section 5.1; Appendix O	
2. The plan shall include procedures to wet CCR with water to a moisture content that will prevent wind dispersal, but will not result in free liquids. In lieu of water, wetting of CCR may be accomplished with an appropriate chemical dust suppression agent.	X			Section 5.1; Appendix O	
3. The plan shall include a description of the procedures the owner will follow to periodically assess the effectiveness of the control plan. At a minimum, the assessment shall include a visual inspection at least every 7 days, unless the CCR landfill is inactive, and all areas are covered by intermediate or final cover.	X			Section 5.1; Appendix O	
4. The plan shall be modified in accordance with s. NR 514.04 (6) whenever there is a change in conditions that may substantially affect the plan of operation.	X			Section 5.1; Appendix O	
5. The plan shall address the preparation of an annual fugitive dust control report in accordance with s. NR 506.20 (3)(a).	X			Section 5.1; Appendix O	
(b) A run-on and run-off control system plan that includes all of the following:					
1. A run-on and run-off control system designed in accordance with the requirements under s. NR 504.12 (2).	X			Section 5.2 Appendix K	
2. Plan sheets depicting the location of run-on and run-off control features, detail drawings, and supporting engineering calculations.	X			Section 5.2 Appendix K	
3. Construction procedures and a schedule for construction.	X			Section 5.2; Appendix K	
4. Modification every 5 years from the date of the most recent plan approval or whenever there is a change in conditions that may substantially affect the written plan in effect. The modification shall be requested by the owner in accordance with s. NR 514.04 (6) prior to the 5-year deadline.	X			Section 5.2 Appendix K	
(c) A written closure plan in accordance with all requirements under NR 514.06 (10) and all of the following:					
1. A narrative description of how the CCR landfill will be closed, including a description of the steps necessary to close the CCR unit at any point during the active life of the CCR unit, consistent with recognized and generally accepted good engineering practices.	X			Section 5.3 Appendix P	

Facility Name: _____

REGULATORY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
<p>2. A description of the final cover system, designed in accordance with s. NR 504.07, and the methods and procedures to be used to install the final cover.</p> <p>Note: <u>Complete NR 504.07 of the NR 504 Design and Construction Criteria Completeness Checklist.</u></p>	X			Section 5.3 Appendix P	
3. A demonstration, including a narrative discussion, of how final closure will meet the performance standards under s. NR 506.083 (6).	X			Section 5.3 Appendix P	
4. An estimate of the maximum volume in cubic yards of CCR that will be disposed on-site over the active life of the CCR landfill.	X			Section 5.3 Appendix P	
5. An estimate of the largest area of the CCR landfill that will require a final cover at any time during the CCR landfill's active life.	X			Section 5.3 Appendix P	
6. A schedule for completion of all closure activities, including an estimate of the year in which all closure activities for the CCR landfill will be completed.	X			Section 5.3 Appendix P	
7. The plan shall be modified in accordance with s. NR 514.04 (6) whenever there is a change in conditions that may substantially affect the written closure plan or unanticipated events necessitate a revision of the written closure plan.	X			Section 5.3 Appendix P	
8. If closure of the CCR landfill will be accomplished through removal of CCR from the CCR landfill, the closure plan shall be modified and approved by the department prior to implementation in accordance with s. NR 514.04 (6).			X		CCR material will remain in place for closure.
(d) A written long-term care plan that addresses all of the following:					
<p>1. A description of the monitoring and maintenance activities and the frequency at which those activities will be performed. The activities shall include, at a minimum, all of the following:</p> <p><u>X</u> Long-term care activities specified under s. NR 514.06 (11).</p> <p><u>X</u> Maintaining the integrity and effectiveness of the final cover system, including making repairs as necessary.</p> <p><u>X</u> Maintaining the effectiveness of the leachate collection and removal system and operating the leachate collection and removal system in accordance with the requirements under s. NR 504.12 (3) (a).</p> <p><u>X</u> Maintaining the groundwater monitoring system and monitoring the groundwater in accordance with ch. NR 507 and the sampling plan approval.</p>	X			Section 5.4 Appendix Q	
2. The name, address, telephone number, and email address of the person or office to contact about the facility during long-term care.	X			Section 5.4 Appendix Q	
3. A description of the planned uses of the property during long-term care. Post-closure uses may not disturb the integrity of the final cover, liner, or other component of the landfill, or function of the monitoring systems unless approved in writing by the department. A written request for approval as part of the plan of operation submittal or a modification shall include a demonstration that disturbance of any part of the CCR landfill will not increase the potential threat to human health or the environment.	X			Section 5.4 Appendix Q	

Facility Name: _____

REGULATORY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
NR 514.045(1) (h) Does the submittal include a demonstration that the CCR groundwater monitoring system complies with the requirements under s. NR 507.15(3), including documentation of the design, installation, and development of any CCR wells?					
NR 507.15(3) CCR LANDFILLS. In addition to the detection groundwater monitoring system required under s. NR 507.19, the CCR landfill owner shall submit a plan establishing a separate CCR groundwater monitoring system for the purpose of monitoring groundwater quality in the uppermost aquifer. The plan shall be submitted with the plan of operation modification for initial permitting in accordance with s. NR 514.045 or in the feasibility report under ch. NR 512. The plan shall include all of the following:					
(a) Does the monitoring system consist of a sufficient number of CCR monitoring wells, installed at appropriate locations and depths?	X			Section 4.2	
Are the CCR wells adequate to yield groundwater samples from the uppermost aquifer that accurately represent upgradient groundwater quality that has not been affected by leakage from CCR landfill and downgradient groundwater quality passing the waste boundary of the CCR landfill?	X			Section 4.2	
Are the downgradient monitoring wells installed to ensure detection of groundwater contamination in the uppermost aquifer, including all known or suspected contaminant pathways?	X			Section 4.2	
(b) Has the number, spacing, and depths of monitoring wells that are part of the CCR groundwater monitoring system plan based upon site-specific technical information that includes the following? <input checked="" type="checkbox"/> Aquifer thickness <input checked="" type="checkbox"/> Groundwater flow rate <input checked="" type="checkbox"/> Groundwater flow direction, including seasonal and temporal fluctuations in groundwater flow	X			Section 4.2	
Does the monitoring system consider the saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials comprising the uppermost aquifer and materials comprising the confining unit defining the lower boundary of the uppermost aquifer, including thicknesses, stratigraphy, lithology, hydraulic conductivities, porosities, and effective porosities?	X			Section 4.2	
(c) Does the monitoring system plan include the minimum number of monitoring wells necessary to meet performance standards specified under (a) based on the site-specific information specified under (b).?	X			Section 4.2	
1. Does the groundwater monitoring system plan contain a minimum of one upgradient and 3 downgradient monitoring wells to be designated as CCR wells?	X			Section 4.2	

Facility Name: _____

REGULATORY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
2. Does the groundwater monitoring system contain additional monitoring wells as necessary to accurately represent the background groundwater quality in the uppermost aquifer that has not been affected by leakage from the CCR landfill and the quality of groundwater passing the waste boundary of the CCR landfill?	X			Section 4.2	
(d) Have the monitoring wells been designed and installed in accordance with NR 507.06 and regularly inspected in accordance with NR 507.13?	X			Appendix L	
(e) Has the documentation of the design, installation, development, and decommissioning of all wells and measurement/sampling devices been performed in accordance with NR 507.14 and NR 141, where applicable? This includes submission of all required forms to the department in the timeframes specified.	X			Appendix L	
NR 514.045 (i) Does the submittal include an updated sampling plan that addresses the requirements under s. NR 507.15(3)?					
NR 507.15(3) CCR LANDFILLS. Does the sampling plan address all of the following:					
(f) A sampling plan, which includes the CCR groundwater monitoring system, in accordance with s. NR 507.16 and the requirements under s. NR 140.16. <i>Note: Complete NR 507.16(1) below.</i>	X			Appendix N	
Does the sampling plan include consistent sampling and analysis procedures designed to ensure the production of monitoring results that provide an accurate representation of groundwater results that provide an accurate representation of groundwater quality in the uppermost aquifer at the upgradient and downgradient CCR wells and that provide a characterization of leachate quality generated by the CCR landfill?	X			Appendix N	
(g) Does the sampling plan include sampling and analytical methods that are appropriate for groundwater sampling and that accurately measure all required monitoring parameters under ch. NR 507, Appendix I in groundwater samples?	X			Appendix N	
Does the sampling plan specify the CCR landfill owner or operator obtain and analyze samples in accordance with the sampling plan and the requirements under s. NR 507.17?	X			Appendix N	
(h) In addition to the field measurements required under s. NR 507.17(1), does the plan include measurement of the groundwater elevations in each CCR well immediately prior to purging, each time groundwater is sampled.	X			Subsection 3.1.2 of Appendix N	
Does the plan include determination of the rate and direction of groundwater flow each time groundwater is sampled and reporting the result to the department in accordance with s. NR 507.26?	X			Section 7 of Appendix N	
Does the plan include that groundwater elevations in wells that monitor the same CCR landfill be measured within a timeframe short enough to avoid temporal variations in groundwater flow that could preclude accurate determination of groundwater flow rate and direction?	X			Subsection 3.1.2 of Appendix N	

Facility Name: _____

REGULATORY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(i) Has the owner/operator established baseline groundwater quality levels for each CCR monitoring well in accordance with NR 507.18 for each CCR well and for each of the constituents required under ch. NR 507 Appendix I, Table 1A and the sampling plan?		X		Section 2 of Appendix N	In progress
(j) Has the owner/operator measured the total recoverable metal concentrations when measuring groundwater quality for each CCR monitoring well?	X			Section 2 of Appendix N	
Does measurement of total recoverable metals include both the particulate fraction and dissolved fraction of metals in natural waters? To ensure this, groundwater samples from CCR wells may not be field filtered prior to analysis.	X			Subsection 3.1.5 of Appendix N	
(k) Does the plan specify the owner/operator notify the department in writing within 60 days of completing sampling and analysis at any CCR well when a groundwater standard at the point of standards application has been attained or exceeded in accordance with s. NR 507.30?	X			Section 7 of Appendix N	
(L) Does the plan specify the owner/operator conduct detection groundwater monitoring at all CCR monitoring wells in accordance with NR 507.19 and all of the following?	X			Subsection 1.1 of Appendix N	
Does detection groundwater monitoring include groundwater monitoring for all constituents appropriate for CCR wells as listed under ch. NR 507 Appendix I, Table 1A and additional parameters as required by the department.	X			Subsection 1.1 of Appendix N	
1. Is the minimum monitoring frequency semi-annual for detection groundwater monitoring?	X			Subsection 1.1 of Appendix N	
Has baseline groundwater quality been established at each CCR monitoring well in accordance with s. NR 507.18? This includes collection of a minimum of 8 independent groundwater quality samples for each CCR well, analyzed for constituents' approval for CCR landfills as listed under ch. NR 507 Appendix I, Tables 1A and 3 and additional parameters as required by the department.		X		Section 2 of Appendix N	In progress
2. Does the plan specify the number and methodology of groundwater quality samples be collected and analyzed for each CCR well during subsequent sampling events consistent with the approved sampling plan?	X			Section 1 of Appendix N	
Does the plan specify the CCR landfill owner or operator inform the department in accordance with s. NR 507.26 of any CCR well that purges dry, is damaged or obstructed, or in any way is rendered such that a sample was unable to be collected from the well during a scheduled sampling event and does the plan specify the owner or operator propose remedial actions to correct the problem prior to the next sampling event?	X			Subsection 3.1.3 of Appendix N	

Facility Name: _____

REGULATORY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
3. Does the plan specify the owner or operator of the CCR landfill notify the department and respond in accordance with s. NR 507.30 when a groundwater standard at the point of standards application has been attained or exceeded at any CCR well? This includes the establishment of an assessment monitoring program meeting the requirements under s. NR 508.06, unless the exceedance is determined by the department to be from a source other than the CCR landfill, or that the groundwater standard exceedance resulted from error in sampling, analysis, or natural variation in background groundwater quality in accordance with s. NR 508.06(2)(f)2.	X			Subsection 8.4 of Appendix N	
4. Does the plan specify the point of standards application for a groundwater quality exceedance at a CCR well, the horizontal distance for the design management zone under s. NR 140.22(3)(a) for a CCR landfill is 0 feet from the waste boundary and may not be expanded by the department under s. NR 140.22(3)(b)? The waste boundary includes the horizontal space taken up by any liner, dike or other barrier designed to contain CCR waste.	X			Subsection 8.4 of Appendix N	
(m) Does the plan specify the owner or operator of the CCR landfill prepare an annual groundwater monitoring and corrective action report for submittal to the department, placement in the written operating record and position g on the publicly accessible internet site under s. NR 506.17(2) and (3) no later than January 31 of the year following the calendar year a groundwater monitoring system has been approved by the department, and annually thereafter?	X			Section 7 of Appendix N	
Does the plan specify that the annual report document the status of the groundwater monitoring and any corrective action implemented at the CCR landfill, summarize key activities completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year?	X			Section 7 of Appendix N	
Does the plan specify the annual groundwater monitoring and corrective action report contain, at a minimum the information included in ss. NR 507.15(3)(m) 1. – 5.	X			Section 7 of Appendix N	
NR 507.16(1) SAMPLING PLAN. Does the sampling plan include the following information:					
(a) An 8 1/2 by 11 inch site map showing locations of all sample points and devices. An 11 by 17 inch site map may be included if clarity is compromised using the 8 1/2 by 11 inch size. Different symbols shall be used to differentiate types of monitoring devices such as groundwater monitoring wells, collection lysimeters and gas monitoring wells. Each sample point shall be labeled.	X			Figure 1 of Appendix N	
(b) A sample schedule, including all of the following: <input checked="" type="checkbox"/> 1. The months that each sample point is to be sampled. <input checked="" type="checkbox"/> 2. The sampling period, as designated by the department. <input checked="" type="checkbox"/> 3. The list of parameters that are to be analyzed for in the sample from each monitoring device during each month that sampling occurs.	X			Table 2 of Appendix N	

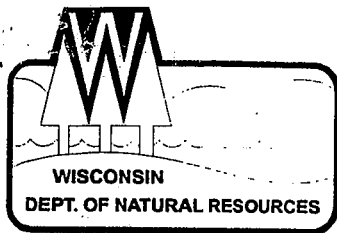
Facility Name: _____

REGULATORY REQUIREMENTS	COMPLETE?			LOCATION	COMMENTS
	Y	N	NA		
(c) Procedures for field measurements, including all of the following: <input checked="" type="checkbox"/> 1. The order in which wells should be sampled if the groundwater has been impacted by regulated or other activities. <input checked="" type="checkbox"/> 2. The procedures and type of equipment used to measure water level elevations. <input checked="" type="checkbox"/> 3. The procedures and type of equipment used to measure temperature, pH, conductivity and procedures to determine turbidity, odor and color.	X			Section 3 of Appendix N	
(d) Procedures for purging wells, including all of the following: <input checked="" type="checkbox"/> 1. Procedures to purge wells prior to collecting samples. <input checked="" type="checkbox"/> 2. Procedures for determining the volume of water to be removed from each well. <input checked="" type="checkbox"/> 3. The type of equipment used to purge wells. <input checked="" type="checkbox"/> 4. The rate of flow while purging, when applicable. <input checked="" type="checkbox"/> 5. Procedures to clean purging equipment between wells. <input checked="" type="checkbox"/> 6. The amount of time required between purging and sampling.	X			Section 3 of Appendix N	
(e) Procedures for obtaining samples from wells, including all of the following: <input checked="" type="checkbox"/> 1. Procedures and type of equipment used to retrieve samples. <input checked="" type="checkbox"/> 2. Volume of sample required for analysis. <input checked="" type="checkbox"/> 3. Procedures and type of equipment to filter samples, including when to filter and when not to filter samples, if applicable. <input checked="" type="checkbox"/> 4. The rate of flow when sampling, when applicable. <input checked="" type="checkbox"/> 5. Procedures and type of equipment to physically and chemically preserve samples. <input checked="" type="checkbox"/> 6. Procedures to clean sampling equipment following sampling of one well and prior to sampling the next well.	X			Section 3 of Appendix N	
(f) Procedures for establishing field quality assurance and quality control, including all of the following: <input checked="" type="checkbox"/> 1. Field blank, duplicate sample and trip blank procedures. <input checked="" type="checkbox"/> 2. The frequency at which the field blanks, duplicate samples and trip blanks will be collected or processed.	X			Section 4 of Appendix N	
(g) Special procedures to sample water supply wells.			X		
(h) Special procedures to sample leachate headwells and other devices.	X			Subsection 3.3 of Appendix N	
(i) Chain of custody procedures, including persons responsible for sampling and methods for transporting samples to the laboratory.	X			Subsections 3.1.9 and 3.1.10 of Appendix N	

Legal Note: This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

Appendix B: Phase IV Landfill Approval Letters

F.6 3081-34



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Tommy G. Thompson, Governor
George E. Meyer, Secretary
Scott A. Humrickhouse, Regional Director

West Central Region Headquarters
1300 W. Clairemont Avenue
PO Box 4001
Eau Claire, Wisconsin 54702-4001
Telephone 715-839-3700
FAX 715-839-6076
TDD 715-839-2786

September 10, 1999

Mr. George Johnston
Dairyland Power Cooperative
3200 East Avenue South, P.O. Box 817
La Crosse, WI 54602-0817

FID# 606009360
License # 4126
Buffalo County
SW
Approval

Subject: Feasibility Determination for the Proposed Dairyland Power Cooperative Phase IV Ash Disposal Facility, Town of Belvidere, Buffalo County, Wisconsin. License No. 4126

Dear Mr. Johnston:

We have determined that the proposed Phase IV disposal area, Alma Off-Site Ash Disposal Facility is feasible, subject to certain conditions; and that it should provide for satisfactory solid waste disposal. We have also determined that the Wisconsin Environmental Policy Act requirements have been met through the preparation of an Environmental Assessment. An Environmental Impact Statement is not needed for this project.

This favorable determination entitles you to submit a plan of operation, which meets the conditions set forth in the feasibility report and subsequent addenda, the attached determination and chapter NR 514, Wis. Adm. Code. This determination does not guarantee that we will approve a plan of operation, or license your proposed facility. When preparing your plan of operation, we advise you to carefully review the requirements of chs. NR 500 through 538, Wis. Adm. Codes.

Dairyland Power Cooperative requested an exemption to s. NR 504.04(3)(f), Wis. Adm. Code, for one (1) water supply well (PW-1) located downgradient and within 1,200 feet of the limits of filling for the proposed Phase IV development. This water supply well is approximately 410 feet deep and is cased to a depth of 113 feet below the ground surface. Due to its location downgradient of the proposed landfill no exemption will be granted for this well. This well must be abandoned in accordance with ch. NR 812.26, Wis. Adm. Code, prior to waste placement in the Phase IV development. If an exemption request is made to the Department outlining non-potable uses for this well which can be independently confirmed prior to waste placement in the Phase IV development, an exemption may be considered at that time.

Dairyland Power Cooperative requested an exemption to the locational criteria of s. NR 504.04(3)(f), Wis. Adm. Code, for a proposed high capacity well (PW-2). This well would be located a minimum of 250 feet from the limits of waste and situated hydraulically upgradient/sidegradient of the proposed Phase IV development. The well design would include steel casing down to an elevation of at least 650 M.S.L. which would place the bottom of casing approximately 170 feet below the top of bedrock. The remainder of the well would be constructed as an open borehole in the bedrock and would extend to between 450 and 500 feet below the ground surface. For these reasons the Department is granting this exemption to the separation distance in s. NR 812.08(4)(g)(1), and the locational criteria in s. NR 504.04(3)(f), Wis. Adm. Code.



Dairyland Power Cooperative requested an exemption to s. NR 512.11(3), Wis. Adm. Code, regarding the submittal of a bedrock piezometric map. It has been shown that the groundwater flow direction is the same in the fluvial sand and gravel as it is in the underlying Cambrian Sandstone and the water table intersects both the unconsolidated sediment and bedrock. For these reasons the Department is granting this exemption.

Dairyland Power Cooperative requested an exemption under s. NR 140.28, Wis. Adm. Code, for a number of monitoring wells based on the background quality data. We have granted groundwater quality exemptions at specific monitoring wells where elevated concentrations of certain parameters have been detected during the four (4) rounds of background groundwater sampling. The following criteria as established in s. NR 507.18(2)(b), Wis. Adm. Code, were used to determine if granting groundwater quality exemptions were appropriate:

1. Any of the values from the background sampling exceed a parameter's enforcement standard (ES), or
2. Two or more of the values exceed a parameter's preventive action limit (PAL), or
3. The average of a parameter's value is greater than the PAL.

Landfill owners must perform baseline groundwater monitoring in accordance with s. NR 507.18, Wis. Adm. Code and report any exceedances to Wisconsin's groundwater standards. At sixteen (16) different monitoring locations the groundwater data indicated elevated concentrations above the ch. NR 140, Wis. Adm. Code, groundwater standards for the parameters listed in ch. NR 507, Table 3. We have granted exemptions to the State's groundwater quality standards for specific monitoring wells where elevated concentrations of certain parameters have been detected. Alternate concentration limits (ACLs) will need to be established in accordance with s. NR 705.29 for these wells and parameters. To determine what these ACLs shall be, this approval requires that more baseline data be collected in order to have at least eight (8) rounds of data for the calculations. Elevated concentrations of sulfate at Sta. 6 are related to filling and housekeeping activities of the now closed Phase II area. The Department will grant an exemption to the groundwater standard for sulfate at Sta. 6 for the proposed Phase IV development and allow an ACL to be calculated. However, no calculated ACL for sulfate may be applied to existing landfill phases 1, 2, and 3 (license number 2927, FID number 606009360). Dairyland Power Cooperative must continue to monitor the sulfate concentrations at this well location.

Dairyland Power Cooperative requested an exemption to s. NR 507.21, Wis. Adm. Code, for leachate quality monitoring since the leachate will be disposed at the Dairyland Power Cooperative waste water treatment plant in Alma, Wisconsin. Leachate analytical data provides pertinent information regarding conditions within the landfill. Further, in your October 7, 1998, "Additional Information requested for Feasibility Determination" report was a letter dated September 24, 1998 from the alternate leachate disposal facility – La Crosse Wastewater Utility. In this letter, the La Crosse Wastewater Utility specified that they be routinely provided with leachate analytical data. Therefore, an exemption for leachate quality monitoring will not be granted.

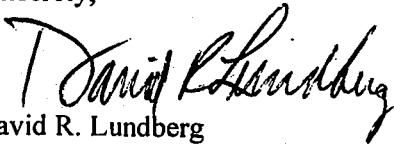
Dairyland Power Cooperative requested an exemption to s. NR 512.15(2)(b), Wis. Adm. Code, for the number of samples analyzed from each clay borrow source test pit. Due to the relatively thin nature of the clay deposit at the on-site borrow source, only one sample was collected and analyzed from most of the test pits. This clay will not be needed if the proposal for a geosynthetic clay liner (GCL) is approved for the liner and cover. For these reasons the Department is granting this exemption.

Dairyland Power Cooperative – Off-Site Phase IV Ash Landfill
Feasibility Determination
09/10/99

The proposed Phase IV development will be situated within a valley at the juncture of four surface water drainage ways. The bluff top land surrounding this landfill location is approximately 450 feet above the valley. In a heavy precipitation storm event, the amount and velocity of run-off water flowing from the uplands down into this valley can become quite significant. The landfill owner should be aware a potential exists for high velocity water flows from the higher elevations to erode and/or washout surface water controls during the different phases of construction. It will be imperative that the surface water structures are assessed and repaired, if necessary, as quickly as possible following any heavy storms.

If you have any questions regarding this determination, please contact Mark Stephenson, Hydrogeologist at (608) 785-9983; Marty Herrick, Environmental Engineer, at (608) 789-5518; or Jack Tritt, Waste Management Specialist from our Eau Claire office at (715) 839-3768.

Sincerely,



David R. Lundberg
Waste Management Team Leader
West Central Region

cc: Mark A. Osten, RMT Inc., 744 Heartland Trail, P.O. Box 8923, Madison, WI 53708-8923
Paul Huebner – WA/3
Dennis Mack – WA/3
Chuck Leveque – LC/5
Mark Stephenson – La Crosse
Marty Herrick – La Crosse
Jack Tritt – WCR
Jack Connelly/Bureau File – WA/3
Jim Pardee – EA/6
Patti Cronin – Waste Facility Siting Board
Sandra Ebert – Buffalo County Clerk, P.O. Box 58, Alma, WI 54610
Lyle Hofer – Town of Belvidere Clerk, P.O. Box 216, Cochrane, WI 54622
Nathan D. Sampson – Zoning Administrator, P.O. Box 492, Alma, WI 54610-0492

PROJECT SUMMARY
GENERAL SITE INFORMATION

Proposed Facility Name: Dairyland Power Cooperative Phase IV Ash Disposal Area

Authorized Contact: Mr. George Johnston
Dairyland Power Cooperative
P.O. Box 817
3200 East Avenue South
La Crosse, Wisconsin 54601
(608) 787-1322

Site Location and Area: Dairyland Power Cooperative (DPC) is proposing to site and develop a noncontiguous coal ash disposal area (Phase IV) at their existing Alma off-site disposal facility. This disposal facility would be located in the NE1/4 of the NE1/4 of Section 19 and portions of Section 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin. The proposed limits of filling would cover 32.1 acres within a parcel of 1,113 acres owned by DPC. The proposed site is located adjacent, but not connected to, DPC's current off-site ash disposal facility. The site is located approximately 4,000 ft. east of State Trunk Highway (STH) "35" and 3,200 ft. south of County Road "E". The area surrounding the proposed disposal site is generally sparsely populated agricultural land. Access to the facility is along a private entrance road from STH 35.

One water supply well is located within 1200 feet of the proposed limits of fill. This well would be abandoned prior to waste placement in the Phase IV development.

Proposed Capacity and Site Life: The proposed Phase IV disposal area has a design capacity of approximately 3,011,000 cubic yards. The estimated site life is 13.9 years but may be influenced by the demand for both fly ash and bottom ash as beneficial reuse materials.

Proposed Service Area, Waste Types and Leachate Characteristics: The proposed site will be owned and operated as a private industrial solid waste disposal facility. Waste disposal will, for the most part, be limited to fly ash and bottom ash from the burning of coal. This material will be produced at the Alma Units 1 – 5, the John P. Madgett (JPM), and the Genoa Station No.3 generating facilities owned and operated by DPC. A small quantity (less than 1% of the total waste stream) of asbestos from power plant renovations and waste water treatment plant sludge from DPC's Alma power generating station will also be disposed at this site. The chemical characteristics of the leachate produced within the site are expected to be the same as for the existing Phase III.

Present Land Use and Zoning: DPC is currently using a portion of their property for coal ash disposal operations in Phases I through III. Phases I, II, and III are located 1,000 feet, 100 feet, and 1,400 feet respectively to the south/southwest of the proposed landfill footprint. Phase I was closed in 1993. Phase II was closed in October 1997. Phase III is approximately 7 acres in size and depending on ash generation rates and anticipated beneficial reuse demands, is expected to reach capacity by the year 2004. The 1,113 acre parcel is zoned as an agricultural district as is the surrounding land.

Topography and Hydrology: The site is located within the Mississippi River drainage basin in a valley, at the juncture of four surface water drainage-ways. The lower (southern) end of the valley is currently being used for ash disposal under previous approvals. The bluff top land surrounding this site is primarily used for agricultural purposes and extends roughly 450 feet above the valley floor where the landfill would be situated.

Ephemeral waterways, which flow only in direct response to precipitation, route surface water from the uplands and steep slopes into the central valley. These waters then flow through ditches and culverts toward the Mississippi River located approximately 1 mile south. The nearest wetlands are located approximately 1 mile south of the proposed site along the Mississippi River.

Regional and Site Specific Geology: The surficial soil at the proposed site generally consists of a sand and silty sand with lenses of gravel. Additionally, several borings contained layers of finer grained soil including silt and clay ranging from a few feet to as much as 40 feet in thickness. The sandy soil typically extends to bedrock at depths ranging from 15 to 60 feet below the existing ground surface. The sandy soil is primarily the result of fluvial deposition; however, some of the sand near the bedrock surface appears to be the result of *in situ* weathering of the sandstone bedrock.

Bedrock in the area is composed of the Prairie du Chien Group Dolomite, which acts as a cap rock overlying Cambrian Sandstone. In the proposed landfill footprint, however, the Prairie du Chien has been removed by erosion.

Cambrian Sandstone underlies the unconsolidated sediment in the landfill footprint. This bedrock type is fine-grained with interbedded lenses of dark brown sandstone and calcareous, shaley partings. The bedrock surface mimics the surface topography only at higher relief. The top of bedrock is substantially deeper in the central portion of the landfill footprint than along the valley slope area.

Hydrogeology: The groundwater table beneath the site is present both within the unconsolidated sandy sediment and within the sandstone bedrock. The overlying sand and gravel aquifer is hydraulically connected to the sandstone bedrock. The depth to groundwater varies from 27.5 feet in the northeastern portion of the site to 110 feet below ground surface on the northern end of the site. The minimum separation between the proposed subbase grades and the high water table is approximately 30 feet. Groundwater flows into the central portion of the valley and then toward the Mississippi River approximately 1 mile south/southwest of the site.

The *in situ* hydraulic conductivity of the fluvial sand and gravel across the site ranges from 5.3×10^{-3} to 2.8×10^{-4} cm/sec. The geometric mean horizontal hydraulic conductivity in this unit is approximately 1.4×10^{-3} cm/sec. The *in situ* hydraulic conductivity in the Cambrian Sandstone ranged from 2.5×10^{-5} to 1.0×10^{-2} cm/sec. The geometric mean horizontal hydraulic conductivity within the geologic unit is 1.1×10^{-3} cm/sec.

Baseline groundwater quality results, for indicator parameters and public health and welfare parameters for the proposed site were provided as part of the feasibility report. In one or more wells installed at the site the concentrations of lead, manganese, nitrogen (nitrate + nitrite), selenium and sulfate attained or exceeded the preventive action limit (PAL) or enforcement standard (ES) established in ch. NR 140, Wis. Adm. Code. The Department is granting an exemption under s. NR 140.28, Wis. Adm. Code for the baseline exceedances of the parameters

listed above at these monitoring wells. Calculations of PAL's for detection parameters and alternative concentration limits (ACLs) for wells granted exemptions to the groundwater standards, should be prepared in accordance with chs. NR 507.27 and NR 507.29, Wis. Adm. Code. As part of the plan of operation, Dairyland Power Cooperative should propose PALs for detection monitoring parameters and ACLs for the parameters granted exemption to the groundwater standards.

Proposed Design: The proposed Phase IV ash disposal facility would be developed in 4 phases with filling beginning in a 6 acre tract along the east central portion of the site and generally progressing westward. The proposed area of ash disposal would cover approximately 32 acres and provide 3,011,000 cubic yards of design capacity.

The proposed surface water control system is designed for a 100-year, 24-hour storm event. Surface water control will include the phased construction beginning prior to landfill construction of the permanent surface water controls around the site perimeter supplemented with temporary surface water controls where necessary.

The proposed design would include a geosynthetic clay liner (GCL) installed over a 2-foot thick, low permeability subbase and overlain by a 60-mil high density polyethylene (HDPE) geomembrane. The low permeability subbase soil would come from on-site material excavated within the Phase IV footprint.

An alternate liner design was included in the feasibility report. This alternate design included a 4-foot thick compacted clay liner in lieu of the GCL. The HDPE geomembrane would be installed over the clay liner and tested in accordance with ss. NR 504.06 (2) (a) and (f), Wis. Adm. Code.

Regardless of which liner type is installed, a leachate collection system would be constructed in an overlying coarse-grained drainage layer material. Leachate that would accumulate in a collection tank would be recycled for the purpose of sluicing ash waste into the disposal area. Excess leachate will be trucked to Dairyland Power's own wastewater treatment plant at the Alma, Wisconsin generation station or to the alternate treatment plant (La Crosse Wastewater Utility) in the City of La Crosse, Wisconsin. This landfill would not be classified as a zone of saturation landfill because the minimum separation between the subbase grades and the high water table is approximately 30 feet.

Final cover would consist of a 6-inch soil grading layer over the ash, followed by a GCL, a 40-mil very flexible polyethylene (VFPE) geomembrane, a 1-foot sand drainage layer, a 1-foot general soil cover layer and a 6-inch topsoil layer. Final grades are designed at a maximum of 4H:1V slope

An alternate final cover design was also included in the feasibility report. This alternate design consists of a 2-foot thick compacted clay layer in lieu of the grading layer, GCL and geomembrane in accordance with NR 504.07, Wis. Adm. Code. A 2.5-foot thick general soil cover layer would be placed over the clay followed by a 6-inch thick layer of topsoil.

The ash to be disposed at this site is biologically inert; thus, a gas management system was not included in the project design.

The planned final use for the Phase IV ash disposal area will be as open green space.

Environmental Monitoring: The proposed ash landfill would include an environmental monitoring program to measure groundwater levels and quality, surface water quality and leachate quantity and quality. Samples would be taken semi-annually from groundwater monitoring wells installed at various depths and locations around the site. Leachate head wells and the leachate collection tank will also be monitored on a regular basis. All environmental monitoring data including groundwater, leachate quality and leachate head measurements and surface water monitoring would be reported to the Department electronically on diskettes.

Groundwater analysis would include those parameters specified in NR 507, Appendix 1, Table 2, Wis. Adm. Code. Leachate analysis would include those parameters specified in NR 507, Appendix 1, Table 4, Wis. Adm. Code.

BEFORE THE STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

DETERMINATION OF SITE FEASIBILITY
DAIRYLAND POWER COOPERATIVE
PHASE IV ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY, WISCONSIN
WDNR LICENSE # 4126

FINDINGS OF FACT

The Department finds that:

- 1) Dairyland Power Cooperative (DPC) has proposed to construct and operate an ash disposal landfill in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin.
- 2) The proposed ash disposal facility is intended to serve the needs of DPC as a private industrial solid waste disposal facility. Waste disposal at this site will consist of fly and bottom ash which is produced at the Alma Units 1 – 5, the John P. Madgett (JPM), and the Genoa Station No. 3 (G-3) power generation facilities owned and operated by DPC.
- 3) The proposed ash disposal landfill would have a design capacity of 3,011,000 cubic yards with an approximate operational life of 13.9 years.
- 4) The Department made an initial site inspection of the proposed site on August 24, 1994.
- 5) On April 25, 1995, the Department received an Initial Site Report (ISR) dated April 1995, and submitted by RMT, Inc., on behalf of DPC.
- 6) On July 17, 1995, the Department determined that the ISR was complete and issued an opinion that the proposed site may have potential for development as an industrial solid waste disposal facility.
- 7) The Department considered the following documents in its review of the feasibility of the proposed ash disposal landfill:
 - (a) A Feasibility Report, dated September 19, 1997, and received by the Department on September 19, 1997, prepared by RMT, Inc., on behalf of DPC.
 - (b) A DPC Feasibility Report Clarification dated November 25, 1997, and received by the Department on November 26, 1997, prepared by RMT, Inc., on behalf of DPC.
 - (c) A Feasibility Report Addendum – Geotechnical Testing Results dated December 15, 1997, and received by the Department on December 16, 1997, prepared by RMT, Inc., on behalf of DPC.

- (d) An Additional Information Requested for Feasibility Determination report dated October 7, 1998, and received by the Department on October 8, 1998, prepared by RMT, Inc., on behalf of DPC.
 - (e) A Supplemental Information to Support Feasibility Determination report dated April 30, 1999 and received by the Department on May 3, 1999, prepared by RMT, Inc., on behalf of DPC.
 - (f) A Request for Approval of High Capacity Well Location report dated August 19, 1999, and received by the Department on August 20, 1999, prepared by RMT, Inc., on behalf of DPC.
- 8) The Feasibility Report review fee of \$20,000 was received by the Department on October 28, 1997.
- 9) On June 22, 1998, the Department determined that the Feasibility Report was complete; however, additional information was requested to aid in the feasibility determination.
- 10) On January 5, 1999 and January 27, 1999, the Department requested additional information to aid in the feasibility determination.
- 11) A public notice under s. 289.25 (3) Stats., was published in The Buffalo County Journal on July 2, 1998. The Department did not receive any responses to the public notice.
- 12) The proposed landfill expansion would not be located within:
- (a) 1,000 feet of any navigable lake, pond, or flowage;
 - (b) 300 feet of a navigable river or stream;
 - (c) a floodplain;
 - (d) 1,000 feet of the nearest edge of the right-of-way of any state trunk highway, interstate, federal aid primary highway, or the boundary of any public park;
 - (e) 10,000 feet of any airport runway end used or planned to be used by turbojet aircraft or within 5,000 feet of any airport runway end used by piston type aircraft or within an area where the design or operation of the landfill would pose a significant bird hazard to aircraft;
 - (f) within 200 feet of a fault that has had displacement in Holocene time;
 - (g) within a seismic impact zone; or
 - (h) within an unstable area.
- 13) The proposed limits of fill of the ash disposal landfill would be located within 1,200 feet of the DPC high-capacity water supply well (PW-1) for which an exemption to s. NR 504.04 (3) (f), Wis. Adm. Code, was requested. The Department has determined that the exemption is

not warranted and that this well must be abandoned prior to waste placement in the Phase IV disposal area.

- 14) A new well (PW-2) is proposed for construction and would be located a minimum of 250 feet hydraulically upgradient/sidegradient to the Phase IV disposal area. An exemption to s. NR 504.04 (3) (f), Wis. Adm. Code is requested for this well. The Department has determined that the exemption is warranted because of the proposed design and location.
- 15) The proposed ash disposal landfill, if designed, constructed, and operated in accordance with the feasibility report and the conditions set forth below, would not be within an area where there is a reasonable probability that the facility will cause:
 - (a) a significant adverse impact on wetlands as provided in ch. NR 103, Wis. Adm. Code;
 - (b) a significant adverse impact on critical habitat areas;
 - (c) a detrimental effect on any surface water;
 - (d) a detrimental effect on groundwater quality;
 - (e) the migration of explosive concentrations of gases in any facility structure or in the soil or air beyond the facility boundary; or
 - (f) the emission of any hazardous air contaminants in excess of standards contained in s. NR 445.03, Wis. Adm. Code.
- 16) The Department considered the following information while reviewing the need for exemptions to groundwater standards at this facility:
 - (a) baseline groundwater monitoring data provided in the Feasibility Report and Addenda to the Feasibility Report;
 - (b) well construction details and boring logs provided in the Feasibility Report;
 - (c) well location plan sheets and water table maps provided in the Feasibility Report and Addenda to the Feasibility Report;
 - (d) the landfill design specifications provided in the Feasibility Report and Addenda to the Feasibility Report as conditioned herein.
- 17) Based on an examination of site conditions, the Department finds the following:
 - (a) Groundwater concentrations of arsenic, lead, manganese, nitrogen (nitrate + nitrite), selenium, silver and sulfate at the site area are found at concentrations exceeding the ch. NR 140, Wis. Adm. Code, groundwater standards. These exceedances are due to baseline groundwater quality associated with natural hydrogeologic conditions or substances released by other human activities on, or near, the proposed facility.

- (b) The elevated concentrations of sulfate at Station 6 reflects groundwater quality related to the Phase II ash disposal area.

18) Based on an examination of the groundwater quality data for the proposed facility for substances of public health concern, and the information listed in Findings of Fact 16 and 17, the Department finds the following:

- (a) Mean baseline concentrations above the preventive action limit (PAL) but below the enforcement standard (ES) established for the following substances of public health concern were observed in groundwater samples from the monitoring wells listed below:

<u>SUBSTANCE</u>	<u>WELL NUMBER</u>
lead	W-100A, W-101
nitrogen (nitrate + nitrite)	W-100, W-100A, W-107
selenium	Sta. 6, W-100, W-100A, W-102A, W-104A

- (b) The mean concentration of samples analyzed for arsenic in well W-107 does not attain the PAL established in NR 140, Wis. Adm. Code.
- (c) The mean concentration of samples analyzed for manganese in monitoring wells W-42, W-100A, W-104A, and W-107 do not attain the PAL established in NR 140, Wis. Adm. Code. Therefore, the requested exemption to the groundwater standard for manganese is not necessary.
- (d) The concentration of silver in the duplicate sample obtained from Station 1, on February 14, 1996, was not detected in the regular sample obtained from Station 1, on the same date and was not detected more than once during the sampling period. Therefore, an exemption to the groundwater standard for this well is not necessary.
- (e) The proposed facility will not cause the concentration of lead, nitrogen (nitrate + nitrite) and selenium to exceed the ES for these substances at a point of standards application because of the landfill design.
- (f) The proposed facility is designed to achieve the lowest possible concentrations for lead, nitrogen (nitrate + nitrite) and selenium which are technically and economically feasible.

19) Based on an examination of the groundwater quality data for the proposed facility for substances of public welfare concern and Findings of Fact 16 and 17 above, the Department finds the following:

- (a) Mean baseline concentrations above the ES established for the following substance of public welfare concern was observed in groundwater samples from the monitoring well listed below:

<u>SUBSTANCE</u>	<u>WELL NUMBER</u>
sulfate	Sta. 6

- (b) The proposed facility is designed to achieve the lowest possible concentration of sulfate, which is technically and economically feasible.
 - (c) The anticipated increase in the concentration of sulfate does not present a threat to public health or welfare because of the landfill design.
- 20) Granting the exemptions that are set forth below will not inhibit compliance with the Wisconsin solid waste management standards in chs. NR 500 through 538, Wis. Adm. Code.
- 21) Neither the applicant, nor any person owning a 10% or greater legal or equitable interest in the applicant or in the assets of the applicant:
- (a) is in noncompliance with a plan approval or order issued by the Department for a solid or hazardous waste facility in Wisconsin;
 - (b) owns or previously owned a 10% or greater legal or equitable interest in a person, or in the assets of a person, who is not in compliance with a plan approval or order issued by the Department for a solid or hazardous waste facility in Wisconsin.
- 22) The Department has complied with the requirements of chs. NR 150, Wis. Adm. Code, and s. 1.11, Stats., and has adopted all practical means to avoid or minimize environmental harm consistent with social, economic and other essential considerations.
- 23) The special conditions set forth below are needed to assure that the facility will not pose a substantial hazard to public health or welfare.

CONCLUSIONS OF LAW

1. The proposal will comply with the applicable requirements of chs. NR 500 through 538, Wis. Adm. Code, provided that the conditions of the feasibility determination set forth below are met.
2. The procedural requirements of ss. 1.11 and 289.21 to 289.29, Stats., have been complied with.
3. The Department has the authority to determine that a site is feasible with special conditions, if the conditions are needed to ensure compliance with chs. NR 500 through 538, Wis. Adm. Code.
4. The Department has the authority to deny a landfill design that does not meet the requirements of s. NR 140.28 and s. NR 504.06 (1), Wis. Adm. Code.
5. The Department has the authority under s. NR 140.28, Wis. Adm. Code, and ss. 160.19 (8) and (9), Stats., to grant exemptions to the groundwater standards for lead, nitrogen (nitrate + nitrite), selenium and sulfate.

6. The Department has the authority under s. NR 504.04 (2), Wis. Adm. Code, to grant exemptions to the location criterion of s. NR 504.04 (3) (f), Wis. Adm. Code, regarding the siting of a solid waste land disposal facility within 1,200 feet of any private water supply well.
7. The Department has the authority under s. NR 812.43 (1), Wis. Adm. Code, to grant variances to the location criterion of s. NR 812.08 (4) (g) (1), Wis. Adm. Code, regarding private water supply wells located within 1,200 feet of a proposed landfill.
8. As provided for under s. 289.28 (1), Stats., sufficient need for the proposed ash disposal facility has been established.
9. In accordance with the foregoing, the Department has the authority under s. 289, Stats., to issue the following grant of exemptions, determination of need and design capacity, and conditional feasibility determination.

GRANT OF EXEMPTIONS

1. Dairyland Power Cooperative (DPC) has demonstrated circumstances which warrant an exemption to the groundwater standards for lead, nitrogen (nitrate + nitrite), selenium and sulfate in ch. NR 140, Wis. Adm. Code as specified in s. NR 140.28, Wis. Adm. Code. Therefore, the Department grants an exemption to allow the landfill expansion to be developed in an area where a preventive action limit or enforcement standard has been attained or exceeded. Exemptions are, therefore, granted for these parameters and the wells listed in Findings of Facts 18 and 19. DPC must establish alternative concentration limits (ACLs) for the wells and substances listed in Findings of Facts 18 and 19 when sufficient rounds of baseline groundwater quality samples have been collected. These alternative concentration limit calculations must be presented to the Department for approval prior to waste placement in the Phase IV ash disposal area. The sulfate concentration found in Sta. 6 is related to filling activities associated with the now close Phase II area. An ACL may be calculated and applied for sulfate concentrations at Sta. 6 associated only with the proposed Phase IV development. The calculated ACL for Sta. 6 may not be applied to the other ash disposal landfills (Phases I, II, or III, License No. 2927, FID No. 606009360) at the Alma, Wisconsin off-site facility.
2. Dairyland Power Cooperative has demonstrated circumstances which warrant an exemption from s. NR 504.04 (3) (f), Wis. Adm. Code and a variance from s. NR 812.08 (4) (g) (1), Wis. Adm. Code, to allow construction of a solid waste landfill where the proposed limits of filling are within 1,200 feet of any private water supply well. An exemption is hereby granted for the proposed well (PW-2) provided that the conditions set forth in the August 27, 1999 variance approval letter from the Department of Natural Resources, Bureau of Drinking Water and Groundwater are met.
3. Dairyland Power Cooperative has demonstrated circumstances which warrant an exemption from s. NR 512.11 (3), Wis. Adm. Code, regarding the submittal of a bedrock piezometric map. An exemption is hereby granted.

4. Dairyland Power Cooperative has demonstrated circumstances which warrant an exemption from s. NR 512.15 (2) (b), Wis. Adm. Code, for the number of samples analyzed from each clay borrow source test pit. An exemption is hereby granted.

DETERMINATION OF NEED AND DESIGN CAPACITY

The Department hereby determines as follows:

1. There is sufficient need within the anticipated service area for the proposed Dairyland Power Cooperative, Phase IV Ash Disposal Area in the Town of Belvidere, Buffalo County, Wisconsin.
2. A design capacity of 3,011,000 cubic yards for the proposed Phase IV Ash Disposal Facility will provide for an expected operational life of approximately 13.9 years.

CONDITIONAL FEASIBILITY DETERMINATION

The Department hereby determines that the proposed Dairyland Power Cooperative, Phase IV Disposal Area, Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County, Wisconsin is environmentally feasible and has the potential for use as an industrial solid waste disposal landfill. This determination is contingent on the fact that the following conditions are complied with and the Plan of Operation is prepared in accordance with chs. NR 500 through NR 538, Wis. Adm. Codes.

GENERAL:

1. The maximum design capacity of the proposed Dairyland Power Cooperative, Phase IV Ash Disposal Area shall not exceed 3,011,000 cubic yards.
2. The Plan of Operation, at a minimum, shall comply with the requirements of chs. NR 500 through 538, Wis. Adm. Code, the Feasibility Report, and conditions of this approval. Additionally, supporting justification shall be provided if the plan differs from the provisions of the Administrative Code.

FACILITY DESIGN:

3. This Feasibility Determination is in part based on the use of a geosynthetic clay liner (GCL). The GCL is a new technology and installation, quality assurance (QA) and quality control (QC) standards have not been codified in the NR 500 series, Wis. Adm. Code. Consequently the Bureau of Waste Management's "Guidance for the Use of Geosynthetic Clay Liners (GCLs) at Solid Waste Facilities" should be followed as well as the manufacturers recommendations when submitting final design for the GCL in the Plan of Operation. The compatibility of the anticipated waste stream with respect to the GCL has been addressed in the Feasibility Report. If waste stream characteristics change from those presented in the Feasibility Report then the compatibility of those changes may have to be readdressed.

ENVIRONMENTAL MONITORING:

4. A minimum of 8 rounds of baseline groundwater sampling data, which represent background groundwater conditions, shall be provided for the substances and wells requiring an exemption from the groundwater standards of ch. NR 140, Wis. Adm. Code. The results of this monitoring, justification for use or removal of any baseline monitoring results in the calculation of alternative concentration limits (ACL) and the ACL calculations shall be submitted with the Plan of Operation.
5. The facility environmental monitoring plan, including groundwater, leachate, and surface water shall be included in the Plan of Operation and shall be consistent with that outlined in the environmental monitoring section of the attached feasibility summary. Detection monitoring shall comply with ch. NR 507, Wis. Adm. Code, including using the analytical methods specified in Appendix II.
6. A revised sampling plan shall be included in the Plan of Operation. The plan shall comply with ch. NR 507.16, Wis. Adm. Code. The months of sampling and order of sampling wells shall be defined in the sampling plan.
7. Detection leachate monitoring shall be conducted in accordance with ch. NR 507, Appendix I, Table 4. The months of sampling shall be defined in the sampling plan.
8. The environmental monitoring program shall meet the requirements of NR 507, Wis. Adm. Code, or provide justification for not doing so. The monitoring points assigned to the Phase IV ash disposal area are detailed in Attachment A, Tables 1, 2 and 3.
9. As part of the Plan of Operation, Dairyland Power Cooperative shall provide a plan to protect existing monitoring devices during construction of the Phase IV ash disposal area.
10. Dairyland Power Cooperative shall propose inspection of erosion control measures on a regular basis and/or following major precipitation events. Include a timeline for making any necessary repairs.
11. As part of the Plan of Operation, Dairyland Power Cooperative shall specify the sequencing of erosion control and stormwater control structures with regard to landfill sequencing.
12. As part of the Plan of Operation, Dairyland Power Cooperative shall include a timeline for proper abandonment of water supply well PW-1, or justification for continued use of this well. If the Department does not approve continued use as a non-potable water supply, the well shall be abandoned on accordance with ch. NR 812.26, Wis. Adm. Code prior to waste placement in the Phase IV development.

The Department retains the jurisdiction either to require the submittal of additional information or to modify this approval at any time if, in the Department's opinion, conditions warrant further modifications.

NOTICE OF APPEAL RIGHTS

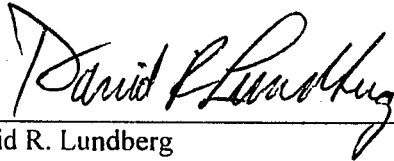
If you believe you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated Sept. 10, 1999

DEPARTMENT OF NATURAL RESOURCES
For the Secretary



David R. Lundberg
Waste Management Team Leader
West Central Region



Mark Stephenson
Plan Review Hydrogeologist

ATTACHMENT "A"

TABLE 1

**ENVIRONMENTAL MONITORING SUMMARY
 DAIRYLAND POWER COOPERATIVE PHASE IV ASH DISPOSAL AREA**

ASH DISPOSAL LANDFILL DETECTION MONITORING, FILTERED SAMPLES:

WELL NAME	DNR I.D. #	WUWN	Selenium Dissolved 1145	Alkalinity Total 39036	Boron Dissolved 1020	COD 341	Specific Conduct. 94	Field pH 400	Ground-water Temp. 10	Ground-water Elevation 72020	Hardness Total 22413	Sulfate Dissolved 946
Station 1	1	BX385	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Station 2	2	BX386	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Station 6	16	IM717	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-42	17	LO914	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
P-42A	18	LO915	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
P-42B	19	LO916	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-43	20	LO917	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-100	21	LO918	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-100A	22	LO919	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-101	23	LO920	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-101A	24	LO921	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-102	25	LO922	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-102A	26	LO923	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-104	27	LO924	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-104A	28	LO925	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-105	29	LO926	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-106	30	LO927	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-107	31	LO928	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA

WUWN = Wisconsin Unique Well Number
 SA = Semi-Annual Sampling

TABLE 2

**HIGH CAPACITY WATER SUPPLY WELL
 MONITORING SUMMARY**

WELL NAME	DNR I.D. #	WUWN	Selenium Total 1147	Alkalinity Unfilter 410	Boron Total 1022	COD Unfiltered 340	Specific Conduct. 94	Field pH 400	Ground-water Temp. 10	Hardness Unfiltered 900	Sulfate Total 945
PW-2	*	NG834**	SA	SA	SA	SA	SA	SA	SA	SA	SA

WUWN = Wisconsin Unique Well Number
 * - To be assigned upon completion of well installation

Dairyland Power Cooperative - Off-Site Phase IV Ash Landfill

Feasibility Determination

9/10/1999

** - Well number assigned by Dept. of Natural Resources, Bureau of Drinking Water and Groundwater in a letter dated August 27, 1999 to Dairyland Power Cooperative.

SA = Semi-Annual Sampling

TABLE 3

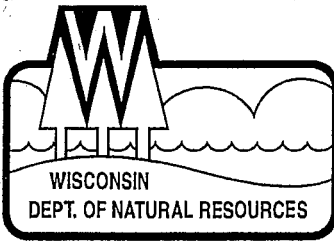
LEACHATE MONITORING SUMMARY

LEACHATE COLLECTION SYSTEM, UNFILTERED SAMPLES

PARAMETER	PARAMETER #	FREQUENCY
BOD ₅	310	SA
Field Conductivity	94	SA
Field pH	400	SA
Alkalinity, Total	410	SA
Boron, Total	1022	SA
Cadmium, Total	1027	SA
Chloride	940	SA
COD, Total	340	SA
Hardness, Total	900	SA
Iron, Total	74010	SA
Lead, Total	1051	SA
Manganese, Total	1055	SA
Mercury, Total	71900	SA
Selenium, Total	1147	SA
Sulfate	945	SA
Total Suspended Solids	150	SA
*Leachate Volume Pumped	32	MONTHLY

SA = Semi-Annually

* = The volume of the leachate removed shall be recorded at least monthly (reported semi-annually).



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Scott McCallum, Governor
Darrell Bazzell, Secretary
Scott A. Humrickhouse, Regional Director

West Central Region Headquarters
1300 W. Clairemont Avenue
PO Box 4001
Eau Claire, Wisconsin 54702-4001
Telephone 715-839-3700
FAX 715-839-6076
TTY 715-839-2786

May 15, 2001

Mr. Robert Carothers
Dairyland Power Cooperative
JPM Station
500 Old State Highway 35
Alma, WI. 54610

FID # 606009360
Buffalo Co.
SW/LIC. File

Subject: Conditional Plan of Operation Approval for Dairyland Power Cooperative Phase IV Disposal Area, Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County, License #4126.

Dear: Mr. Carothers:

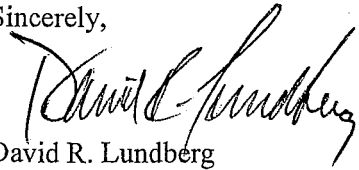
We have completed our review of your plan of operation for the proposed Phase IV Disposal Area Landfill and determined that it is consistent with Wisconsin's solid waste regulations. Therefore, the plan of operation is approved, subject to compliance with chs. NR 500-590, Wis. Adm. Code, and the conditions of the attached approval.

This approval contains conditions that require certain changes to the proposed design, construction, and monitoring of this facility. They include revisions to the final cover design, leachate extraction system, and several minor aspects of construction documentation, and leachate monitoring.

You are reminded that this approval does not relieve you of obligations to meet all other applicable federal, state and local permits, as well as zoning and regulatory requirements.

If you have any questions regarding this approval please call Marty Herrick at (608) 789-5518 or Barb Hennings at (608) 264-6021.

Sincerely,


David R. Lundberg
Waste Management Team Leader
West Central Region

Attachments: Project Summary, Conditional Plan of Operation Approval, Table 1 (PALs), Table 2 (ACLs), Monitoring Summary

cc: Dennis Mack/Paul Huebner/Bureau Files-WA/3
Jack Tritt-WCR
Barb Hennings-WA/3
Marty Herrick-LAX
Tony McKimmy-DPC

Bernie Krantz-RMT
Colleen Hellenbrand-WA/3
Bob Grefe-WA/3
Steve Karklins - DG/3

PROJECT SUMMARY
DAIRYLAND POWER COOPERATIVE
PHASE IV DISPOSAL AREA
ALMA OFF-SITE ASH DISPOSAL FACILITY

GENERAL INFORMATION

AUTHORIZED CONTACT: Mr. Robert Carothers
Dairyland Power Cooperative
JPM Station
500 Old State Highway 35
Alma, WI. 54610

LICENSEE AND PROPERTY OWNER: Dairyland Power Cooperative

SITE LOCATION: Dairyland Power Cooperative (DPC) is proposing to construct an industrial ash landfill located in the NE ¼ of the NE ¼ of Section 19 and portions of Sections 18 and 20, Township 21N, Range 12 W, Town of Belvidere, Buffalo County, Wisconsin. The site is located approximately 4,000 ft. east of State Trunk Highway (STH) "35" and 3200 ft. south of County Road "E".

One water supply well is located within 1,200 feet of the proposed limits of fill and will be abandoned prior to waste placement in the Phase IV disposal facility. A new water supply well will be installed south of the existing landfills at a distance greater than 1200 feet from any limits of filling.

ACREAGE AND ACCESS: The licensed disposal area will be 32.1 acres of a 1,113 acre parcel of land owned by DPC. Access to the facility is from U.S. Highway 35 onto the landfill's private haul road.

PROPOSED CAPACITY AND SITE LIFE: The facility will provide 3,011,000 cubic yards of capacity for the disposal of ash from DPC's Alma and Genoa power generating facilities. The Phase IV disposal area has a projected site life of 13.9 years. The estimated annual quantity of ash to be placed is 217,000 cubic yards. Filling rates will be influenced by power demands and the ability of DPC to use the ash for beneficial reuse purposes.

WASTE TYPES AND GENERATORS SERVED: The site is owned and operated as a private industrial solid waste disposal facility. The facility will accept primarily fly ash and bottom ash from the burning of coal at DPC's Alma and Genoa power generating stations. The facility will also accept sludge from the wastewater treatment plants for the Alma and Genoa facilities and asbestos generated from renovations at the respective facilities as well. An asbestos disposal plan is being approved as part of this plan of operation. The chemical characteristics of the leachate are expected to be similar to the existing Phase III disposal site.

PRESENT LAND USE AND ZONING: Land use in the area of the landfill is restricted by the local vertical relief which is approximately 500 feet between the southern end of the valley floor and the bluff top. Some of the land located above the facility on the bluff tops is used for agricultural purposes. The Phase IV disposal facility is located in the valley below the bluffs and the Phases I through III disposal facilities are located on the adjacent side hills. The bluffs and valley are forested and bedrock crops out at the top of the bluffs.

The proposed landfill is not located within a floodplain or a wetland but is located at the confluence of the surface waterways for the surrounding bluffs. Sediment and retention ponds and diversion channels will

reroute the surface discharges from the surrounding bluffs around the perimeter of the landfill, which will occupy the center of the drainage confluences. Ultimately the surface water drains into the Mississippi River.

DPC is currently using a portion of the property for coal ash disposal operations in Phases I through III. Phases I, II and III are located 1000 feet, 100 feet and 1400 feet respectively to the south/southwest of the proposed landfill's footprint. Phase I was closed in 1993 and Phase II was closed in October 1997. Phase III is approximately 7 acres in size and is expected to reach its final approved capacity in the near future. The 1113 acre parcel is zoned as an agricultural district. As part of this approval DPC has modified the conditional use permit from Buffalo County to include the Phase IV disposal facility. There are no designated recreational areas within a mile of the site and the facility is not visible from U.S. HWY 35. No historical, archaeological or environmentally unique areas are known to be present within one mile of the proposed landfill or borrow sites.

PERIOD OF LONG TERM CARE RESPONSIBILITY: DPC has, by law, a 40 year proof of financial responsibility period for long term care following landfill closure. However, DPC will be responsible for the long term care of the facility in perpetuity.

SITE CHARACTERISTICS

The site is located within the Mississippi River drainage basin in a valley at the confluence of four ephemeral surface water drainage-ways.

The surficial soil at the proposed site generally consists of sand and silty sand with lenses of gravel. Lenses of finer grained soil, including silt and clay, range from a few feet to forty feet in thickness. The sandy soils typically extend to bedrock with depths of 15 to 60 feet below the existing ground surface. The soils are from fluvial deposition and weathering of the sandstone bedrock.

Generally the bedrock in the area is composed of the Prairie du Chien Group Dolomite underlain by Cambrian Sandstone. However in the area of the Phase IV landfill the dolomite has been eroded and the bedrock is composed of the Cambrian Sandstone. The bedrock is fine grained with interbedded lenses of dark brown sandstone and calcareous, shaley constituents. The Prairie du Chien group crops out at upper elevations of the valley. The bedrock surface varies between 24 to 64 feet below the existing ground surface. The subbase of the landfill liner will be a minimum of 12 feet above the bedrock surface and no bedrock removal is anticipated as part of the landfill development.

The groundwater table beneath the site is present both within the unconsolidated sandy sediment and within the sandstone bedrock. The overlying sand and gravel aquifer is hydraulically connected to the sandstone bedrock. The depth to groundwater varies from 27.5 feet to 110 feet below ground surface. The minimum separation between the proposed subbase grades and the high water table is approximately 30 feet. Groundwater flows into the central portion of the valley and then toward the Mississippi River approximately one mile south /southwest of the site.

The *in situ* hydraulic conductivity of the fluvial sand and gravel across the site ranges from 5.3×10^{-3} to 2.8×10^{-4} cm/sec. The geometric mean horizontal hydraulic conductivity for this unit is approximately 1.4×10^{-3} cm/sec. The *in situ* hydraulic conductivity in the Cambrian sandstone is varied with the permeability ranging from 2.5×10^{-5} to 1.0×10^{-2} cm/sec. The geometric mean horizontal hydraulic conductivity within the geologic unit is 1.1×10^{-3} cm/sec.

For the proposed site, baseline groundwater quality results for indicator parameters and for public health

and welfare parameters were provided as part of the feasibility report. In one or more wells installed at the site the concentrations of lead, manganese, nitrogen (nitrate + nitrite), selenium and sulfate attained or exceeded the preventive action limit (PAL) or enforcement standard (ES) established in ch. NR 140, Wis. Adm. Code. The Department granted exemptions to groundwater standards in the feasibility determination. As part of the plan of operation, DPC has requested both alternative concentration limits (ACLs) for the parameters listed above and additional exemptions to the groundwater standards for selenium and lead. The plan of operation approval grants the exemptions for selenium but rescinds both a previously granted exemption for lead at well MW-101 because 6 of the 8 results are "no detect" and all exemptions at Station 6 because the well will not be part of the monitoring program for Phase IV. The requested exemptions for lead were not granted.

FACILITY DESIGN

The Phase IV ash disposal facility will be developed in four phases with filling beginning in a six acre tract along the east central portion of the site and generally progressing westward. The area of the Phase IV ash disposal is approximately 32 acres with a design capacity of 3, 011,000 cubic yards.

The surface water control system was designed for a 100 year, 24 hour storm event. Surface water control measures will be phased to match the construction of the landfill. Temporary sedimentation basins will be constructed and abandoned during various phases of construction and operation.

The landfill liner design includes the following components from top to bottom: a one foot thick granular drainage layer, a 60 mil High Density Polyethylene (HDPE) geomembrane, a geosynthetic clay liner (GCL) and a 2 foot thick low permeability subbase soil layer. The subbase will be compacted prior to placement of the low permeability soil barrier layer. The subbase is a fluvial sand deposit that will have loess material placed in various locations to bring it to the final grade. The low permeability soil barrier layer is a loess material obtained on site. It will be placed to achieve a density or compaction of at least 90% of the Modified Proctor and a hydraulic conductivity no greater than 1.0×10^{-5} cm/s. The loess barrier soils will be obtained as part of the excavation for the respective cells and will be characterized prior to placement.

Leachate from the landfill will be captured in a granular drainage layer and directed to the sump area of the leachate collection system. Because the volume of leachate generated is anticipated to be low a sidewall penetration of the liner is being allowed. This allows leachate to flow by gravity to the leachate collection tank. The leachate collection tank is a 30,000-gallon double walled steel tank located near the existing processing facility. The leachate would then be pumped into the processing facility where it is mixed with a retarding agent and then applied to the incoming ash prior to placement in the landfill. The retarding agent is used to slow the cementing nature of the ash. Excess leachate will be trucked to either DPC's wastewater treatment plant at the Alma generating station or to the City of LaCrosse, Wisconsin wastewater treatment plant.

Final cover for the landfill includes, from the bottom up: a 2 foot soil barrier above the ash, a GCL, a 40 mil very flexible polyethylene (VFPE) geomembrane, a 1 foot sand drainage layer, an 18 inch general cover layer and a 6 inch topsoil layer. Final grades are designed at a maximum of 4H: 1V slope. Because of the lack of organic matter in the ash a gas extraction system is not required. The two foot soil barrier layer below the GCL will consist of a one foot layer of coarse grained material placed on top of the ash and an upper one foot layer having properties similar to the material used for the soil barrier in the liner.

The final use for the landfill is green space.

ENVIRONMENTAL MONITORING

Environmental and performance monitoring will extend through the period of active site operation and perpetual long-term care. Monitoring data will be reported to the Department on diskettes in a format supplied by the Department, as specified in s. NR 507.26(3), Wis. Adm. Code. To determine exceedances of groundwater standards, analytical results will be compared to the indicator PALs in Table 1 and the ACLs in Table 2 of the attached approval, or the standards in ch. NR 140, Wis. Adm. Code.

Environmental monitoring will be conducted semi-annually at groundwater monitoring wells, the water supply well, and sedimentation ponds. Monthly monitoring will be performed at the leachate collection tank and leachate head wells. Environmental monitoring requirements are provided in the Environmental Monitoring Summary Report attached to the plan of operation approval.

Annual testing of the coal ash will be performed for three years following completion of the first phase of the landfill. The results will be compared to the existing data and at the end of the third year a brief report will be submitted. The purpose of the analysis is to account for the variability of the coal sources and demonstrate the compatibility of the ash with the GCL components of the liner and cap for the landfill. Four discrete samples will be collected on a quarterly basis and then blended to form a composite sample from which a synthetic leachate will be generated. The leachate will be analyzed for the following properties: boron, calcium, chromium, potassium, sodium, chloride, specific conductance, total suspended solids and sulfate.

CLOSURE AND LONG TERM CARE COSTS

Although DPC will be perpetually responsible for the long term care of the landfill, proof of owner financial responsibility for a long term care period of 40 years is required by law. Actions to be taken during closure and the 40 year owner financial responsibility period, along with the associated cost estimates, are summarized below. Closure costs for the Phase IV facility are based on a worst case scenario where cell 3 is open and final cover would be required for cells 1, 2A, 2B and 3. The premature closure cost estimate includes installing the final cover system, seeding and vegetating the final cover system and preparing a closure documentation report. The final cover system is composed of the barrier soils, the GCL, the geomembrane and the surface water management features.

CLOSURE COSTS:

Item	Quantity	Unit Cost	Estimated Cost
Barrier Layer (24 in.)			
12 in. Silty Soil	20,000 cy	\$1.5/cy	\$30,000
12 in. Coarse Material	20,000 cy	\$1.5/cy	\$30,000
GCL	542,300 sf	\$0.4/sf	\$217,000
40 Mil VFPE Geomembrane	542,300 sf	\$0.36/sf	\$195,200
Granular Drainage Layer (12in.)	60,260 sy	\$5.57/sy	\$335,700
Vegetative Layer (18 in)	90,390 sy	\$1.26/sy	\$113,900
Topsoil (6 in)	10,000 cy	\$1.50/cy	\$15,000
Surface Water Control System			\$50,000
Seed, Fertilize, Mulch	12.4 Acre	\$1350/Acre	\$16,700
Construction Plans			\$20,000
Construction Observation	16 Weeks	\$5500/Week	\$88,000
Documentation Report			\$ 20,000
Contingencies (25%)			\$282,875
Total Cost			\$1,414,375

LONG TERM CARE COSTS:

Long term care costs are itemized below and are based on estimated yearly expenses for:

Item	Quantity	Unit Cost	Estimated Cost/Year
<u>Cover Vegetation</u>			
Reseed/Erosion	32 Acre	\$ 500/Acre	\$16,000
Damage			
Mowing	Event	\$3200	\$3200
 <u>O &M</u>			
Storm Water			
Control Structures	Event	\$5000	\$5000
 <u>Settlement/Siltation</u>			
Repair Cover	32 Acre	\$200/Acre	\$6400
Sedimentation			
Basin Cleaning	Event	\$500	\$500
 <u>Leachate Control Features</u>			
Leachate Collection			
Line Cleaning	Event	\$2000	\$2000
Operation &			
Maintenance	Event	\$3000	\$3000
Leachate Disposal	876,000 Gallons	\$.025	\$21,900
Environmental Monitoring	Event	\$6500	\$6500
Compatibility Testing	Event	\$10,000	\$10,000 (one time)
Inspections		\$2000	\$2000
Reporting		\$3000	\$3000
Contingencies (25%)		\$17,375	\$17,375
40 Year Total			\$3,485,000

DPC will use the Net Worth test for demonstrating compliance the long term care account in s. NR 520.06(6), Wis. Adm. Code.

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONDITIONAL PLAN OF OPERATION APPROVAL
FOR
DAIRYLAND POWER COOPERATIVE
PHASE IV DISPOAL AREA
ALMA OFFSITE ASH DISPOAL FACILITY
TOWN OF BELVIDERE, WISCONSIN
WDNR LICENSE # 4126

FINDINGS OF FACT

The Department finds that:

1. Dairyland Power Cooperative (DPC) has proposed to construct an ash disposal landfill in the NE ¼ of the NE ¼ of Section 19 and portions of Sections 18 and 20, T21N, R12W, Town of Belvidere, Buffalo, County, Wisconsin.
2. The proposed ash disposal facility is intended to serve the needs of DPC as a private industrial solid waste disposal facility. Waste disposed at this site will consist of fly and bottom ash, which is produced at Units 1-5 at the John P. Madgett (JPM) and the Genoa Station No. 3 (G-3) power generating facilities owned and operated by DPC. The facility will also accept sludge from the wastewater treatment plants for the JPM and Genoa facilities and asbestos generated from renovations at the respective facilities as well.
3. The proposed ash disposal landfill would have a design capacity of 3,011,000 cubic yards with an approximate operational life of 13.9 years.
4. On September 10, 1999, the Department issued a favorable feasibility determination for the proposed Dairyland Power Cooperative Phase IV Ash Disposal Facility.
5. On October 23, 2000, the Bureau of Waste Management received a report entitled "Plan of Operation, Phase IV Disposal Area, Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County Wisconsin." The report, which included 23 plan sheets, was dated October 2000 and was prepared by RMT of Madison, Wisconsin. The Plan of Operation review fee, invoice SWK-0159, for \$7000 was received by the Department on November 22, 2000.
6. The information submitted in connection with the plan of operation includes the following:
 - a. On September 19, 2000, DPC received a ruling from the Department's Air Management program noting that a construction permit was not required,
 - b. On November 21, 2000, additional information on the compatibility testing of the GCL and the associated synthetic leachate generation analysis was submitted to the Department by RMT for DPC,
 - c. On February 8, 2001, DPC submitted to the Department an asbestos disposal plan,

- d. On March 15, 2001, DPC submitted to the Department additional information including a revised plan sheet number 13. The information was in response to a January 22, 2001 e-mail to DPC and RMT from Martin Herrick of the Department,
 - e. In response to a telephone conversation with Barb Hennings of the Department, on April 2, 2001, DPC submitted revised monitoring plan sheets because well "Station 6" was removed from the monitoring program.
7. Additional Documents considered in the review of the plan of operation include the following:
- a. The Department's guidance on GCL's and sample conditions,
 - b. The DPC Feasibility Report, accompanying plan sheets, and the Department's Feasibility determination,
 - c. March 21, 2001 memo from Barb Hennings to the DPC file explaining how PALs and ACLs were reviewed and approved,
 - d. March 21, 2001 memo from Barb Hennings to Steve Karklins of the Department requesting review of exemptions to groundwater standards,
 - f. March 27, 2001 memo from Steve Karklins to Dave Lundberg concurring with the proposed exemptions to the groundwater standards for selenium at wells P-42A, P-42B, Station 1, W-42, W-101, W-101A, W-102, W-104, W-105, and W-106.
8. Additional facts relevant to the review of the engineering aspects of the plan of operation include the following:
- a. Geosynthetic Clay Liners (GCLs) have been proposed, in conjunction with a soil a barrier layer, as a technical substitute for the clay component of composite liners and final covers for this project,
 - b. The Department has issued guidance on the use of GCL's, which has been combined with technical literature, soil barrier layers, and other project experience to develop conditions that are intended to maximize the longevity and integrity of the GCL's.
9. Additional facts relevant to the review of the groundwater quality and monitoring aspects of the plan of operation include the following:
- a. The proposed location of the replacement water supply well is outside the border of plan sheet 3 at station 168470N, 1476700E. This location is 1200 feet from the limits of filling of the Phase 3 landfill.
 - b. The Plan of Operation included indicator Preventive Action Limit (PAL) and Alternative Concentration Limit (ACL) calculations and requests for approval.
 - c. The Plan of Operation included a request for additional exemptions to groundwater standards.
 - d. At least eight values were used in the calculations of PALs. The calculated PALs and ACLs were rounded up to two significant figures.

- e. PALs and ACLs were granted largely as proposed except that actual result values were used in the calculation of specific conductance rather than the rounded values used in the calculations by the facility. Several PALs were not calculated due to insufficient information or likely impacts due to well construction.
 - f. The baseline monitoring results for chemical oxygen demand at wells W-42, W-100, W-101A, and W-105 indicate likely impacts due to well construction. The more recent results show no detect whereas the initial results vary considerably, in the range of 5 to 60 mg/L.
 - g. Of the eight analytical results submitted for chemical oxygen demand at well W-100A, one is ten times higher than the others. Excluding this outlier leaves seven values to be used for the calculation of a preventive action limit where s. NR 140.20(1), Wis. Adm. Code, requires 8 values.
 - h. The Department considered the following information while reviewing the need for exemptions to groundwater standards at this facility:
 - i. Baseline groundwater monitoring data provided in the Plan of Operation, the Addendum and electronic submittal dated 3/05/2001,
 - ii. Well construction details and boring logs provided in the Feasibility Report,
 - iii. Well location plan sheets provided with the Plan of Operation and the Addendum,
 - iv. Water table maps provided in the Feasibility Report and Addenda to the Feasibility Report,
 - v. Reports from the Department's GEMS electronic database including time vs. concentration plots for various parameters at Station 1 and Station 6,
 - vi. The landfill design specifications provided in the Plan of Operation as conditioned herein.
10. Based on an examination of site conditions, the Department finds the following:
- a. Groundwater concentrations of lead, and selenium are found at concentrations exceeding the ch. NR 140, Wis. Adm. Code, groundwater standards. These exceedances are due to baseline groundwater quality associated with natural hydrogeologic conditions or substances released by other human activities on, or near, the proposed facility,
 - b. The elevated concentrations of boron at Station 6 reflect groundwater quality related to the Phase II ash disposal area,
 - c. Station 6 will not be used as a monitoring point for the Phase IV facility.
11. Based on an examination of the groundwater quality data for the proposed facility for substances of public health concern, and the information listed in Findings of Fact 9 and 10, the Department finds the following:
- a. Mean baseline concentrations of samples analyzed for selenium in wells P42A, P42B, Station 1, W42, W101, W101A, W102, W104, W105, and W106 are less than the PAL but the results vary

widely,

- b. Mean baseline concentrations for lead at wells W104 and W105 approach but are not greater than the PAL. Six of the eight results are no detect. Therefore, an exemption to the groundwater standard for lead at these wells is not necessary,
 - c. An exemption for the groundwater standard for lead was granted at well W 101 in the 9/10/00 Feasibility Determination. The mean baseline concentration is greater than the PAL for lead. However, 6 of the 8 results are "no detect". Therefore, the exemption to the groundwater standard for lead at well W 101 is not necessary.
 - d. The proposed facility will not cause the concentration of selenium to exceed the ES for these substances at a point of standards application because of the landfill design,
 - e. The proposed facility is designed to achieve the lowest possible concentrations for selenium, which are technically and economically feasible.
12. The indicator PALs and special conditions set forth below are needed to assure that an increase in the concentration of selenium does not cause an increased threat to public health or welfare or inhibit compliance with chs. NR 500-590, Wis. Adm. Code.
13. Neither the applicant, nor any person owning a 10% or greater legal or equitable interest in the applicant or in the assets of the applicant:
- a. Is in noncompliance with a plan approval or order issued by the Department for a solid or hazardous waste facility in Wisconsin,
 - b. Owns or previously owned a 10% or greater legal or equitable interest in a person, or in the assets of a person, who is not in compliance with a plan approval or order issued by the Department for a solid or hazardous waste facility in Wisconsin.
14. Granting the exemptions that are set forth below will not inhibit compliance with the Wisconsin solid waste management standards in chs. NR. 500 through 590, Wis. Adm. Code
15. The Department has complied with the requirements of NR 150, Wis. Adm. Code, and s.1.11, Stats., and has adopted all practical means to avoid or minimize environmental harm consistent with social, economic and other essential considerations.

The special conditions set forth below are needed to assure that the facility will not pose a substantial hazard to public health or welfare.

CONCLUSIONS OF LAW

1. The Department has authority under s. 289.30, Stats. to approve a plan of operation with special conditions if the conditions are needed to ensure compliance with chs. NR 500 to 590, Wis. Adm. Code.
2. The Department has authority s. NR 500.08(4), Wis. Adm. Code, to approve exemptions to the requirements of chs. NR 500 to 590 in special cases except as otherwise provided.

3. The Department has the authority under s. NR 140.28, Wis. Adm. Code, and ss. 160.19 (8) and (9), Stats., to grant exemptions to groundwater standards and to specify terms and conditions under which the Department may seek remedial action relating to standards for which an exemption has been granted. This may include establishing alternative concentration limits.
4. The Department has the authority under s. 160.15(3), Stats., and s. NR 140.20, Wis. Adm. Code, to establish preventive action limits for indicator parameters.
5. The conditions of approval set forth below are needed to ensure compliance with chs. NR 500 to 590, Wis. Adm. Code.
6. In accordance with foregoing, the Department has the authority under ch. 289, Stats., to issue the following conditional approval.

GRANT OF EXEMPTIONS

1. DPC has demonstrated circumstances, which warrant an exemption from s. NR 504.05(5), Wis. Adm. Code requirement, whereby leachate flowing across the base of a liner is required to encounter a perforated leachate collection line within 130 feet. The following areas are exempted from the 130 foot flow length requirement:

Location	Area (acres)	Average Exceedance	Base Slope
NE Corner of Cell 2, Module A	0.165	27	6%
SW Corner of Cell 3	0.025	9	6%
SW Corner of Cell 4, Module A	0.070	19	6%
Small Area along East Wall of Cell 4, Module B	0.035	12	10%

2. DPC has demonstrated circumstances, which warrant an exemption from s. NR 504.06(5)(j), Wis. Adm. Code, whereby a penetration through the sideslope of the liner is being allowed and a sump and sideslope riser will not be installed. But instead the leachate is able to gravity drain to the leachate collection tank located near the ash processing facility.
3. DPC has demonstrated circumstances, which warrant an exemption to the groundwater standards for selenium in ch. NR 140, Wis. Adm. Code as specified in s. NR 140.28, Wis. Adm. Code. Therefore, the Department grants an exemption to allow the landfill to be developed in an area where a preventive action limit or enforcement standard has been attained or exceeded. Exemptions are, therefore, granted for these parameters and the wells listed in Findings of Facts 9 and 10. The Alternative Concentration Limits established for these exemptions and those granted in the Feasibility determination can be found in Table 2 of this approval. Based on additional information the Department may modify this approval.

RESCINDED EXEMPTIONS

1. With the initial four sampling results DPC demonstrated that an exemption to the groundwater standard for lead at well W101 was warranted. However, of the last four sampling results, three were no detect for a total of 6 results that showed no detect. Therefore, an exemption to the groundwater standard for lead at well W101 is not necessary and the grant of exemption is rescinded.
2. DPC demonstrated that an exemption to the groundwater standards for selenium and sulfate at well Station 6 was warranted. However, DPC has removed well Station 6 from the groundwater monitoring plan for this facility. Therefore, an exemption to the groundwater standards for sulfate and selenium at well Station 6 is not necessary and the grant of exemption is rescinded.

CONDITIONAL PLAN OF OPERATION APPROVAL

The Department hereby approves the Plan of Operation for the DPC Phase IV Ash Disposal Area, subject to compliance with chs. NR 500 to 590 Wis. Adm. Code, and the following conditions:

General

1. The capacity of this facility may not exceed its design volume of 3,011,000 cubic yards.
2. DPC shall perform all aspects of construction and operation of the landfill in accordance with the plan of operation, the requirements of chs. NR 500 to 590, Wis. Adm. Code, and the conditions of the approval. In the case of any discrepancies between the approval conditions and the plan of operation and its associated plan sheets, the approval conditions shall take precedence.
3. DPC shall present any proposed changes to the plan or this approval to the Department. If the changes are compatible with the desired performance of this landfill, as determined by the Department, an addendum will be added to this approval indicating acceptance of those modifications to this approval. Written Department approval is necessary prior to implementing any changes with the exception of minor field modifications that are documented in accordance with s. NR 516.04(3)(d), Wis. Adm. Code. All field modifications shall be discussed with the Department prior to implementation. Other changes may be handled as expedited plan modifications under s. NR 514.09, Wis. Adm. Code, as appropriate.

Design, Construction and Construction Documentation

4. A preconstruction report shall be submitted to the Department for review at least 2 weeks prior to the installation of the GCL component of the liner and final cover. One copy shall be submitted to the Bureau of Waste Management Technical Support Section and one copy shall be submitted to the regional environmental engineer. The report shall:
 - a. Identify any proposed revisions to the approved design, construction or documentation requirements including detailed diagrams incorporating all changes.
 - b. Identify the manufacturer of the GCL and the manufacturer's qualifications, and provide technical specifications of the bentonite and geosynthetics used for the GCL (e.g., thickness, bentonite mass, powdered or granules, bonding method, printed overlap lines on both sides).
 - a. Identify the installation contractor for the GCL, indicating specific on-site supervisory staff and a summary of their qualifications and experience, and quality control plans that the installation contractors will follow in the installation of the GCL.
 - b. Identify the quality assurance consultant indicating specific on-site staff and summarizing their qualifications and experience, and include a copy of the construction quality assurance plan to be used during documentation of the construction.
 - c. Describe contractor-specific storage and material handling procedures, deployment methods, attachment methods, panel overlaps, patching, procedures for minimizing bentonite loss in the GCL, and acceptable limits on sub-grade including maximum rut depth, maximum stone size and weather conditions.

- d. Provide results of all chemical compatibility and slope stability testing. Describe any measures intended to assure that an adequate slope stability safety factor will be present during construction and after hydration of the GCL.
 - e. Describe the method to be used to assure a smooth and firm surface prior to GCL placement including a method of removing gravel, cobbles and other debris in the surface of the soil layer.
 - f. Describe the method to be used to assure the GCL does not become saturated prior to covering with soil and the procedure that will be followed if the GCL does become saturated. Describe the methods and equipment to be used to place the geomembrane over the GCL, and the maximum time between deployment of the GCL and placement of soil cover layers to limit free swell of bentonite.
 - g. Provide the planned panel layout pattern for GCL placement.
5. Conformance sampling and testing shall be conducted on the GCL delivered on site and used in construction. Sampling shall be conducted by the quality assurance engineer or qualified technician. Laboratory testing shall be performed by the quality assurance engineer or at another laboratory not affiliated with the quality control testing.
- a. Clay mass per unit area (dried) shall be tested at a rate of one test per 40,000 ft² of GCL installed; results shall be reported at 0% moisture content.
 - b. Grab and peel tensile strength (MD and CD) shall be tested at a rate of one test per 100,000 ft² of GCL installed (ASTM D-4632).
 - c. Index flux shall be tested at a rate of one test per 100,000 ft² of GCL installed (ASTM D-5887).
 - d. Bentonite recovered from GCL sample shall be tested for free swell at a rate of one test per 100,000 ft² of GCL installed.
 - e. GCL shall be certified needle-free through magnetic and metal detection tests.
6. The placement of the GCL component of the final cover shall comply with the following:
- a. The GCL shall consist of a layer of pure sodium bentonite clay encapsulated between two geotextiles.
 - b. The GCL shall be installed in a relaxed condition and shall be free of tension or stress upon completion of the installation. Stretching of the GCL to fit shall not be allowed.
 - c. Adjoining panels of GCL shall be laid with a minimum of six inches of overlap on the longitudinal seams and a minimum 20 inches of overlap on the panel end seams.
 - d. Irregular shapes, cuts, or tears in the installed GCL shall be covered with a GCL patch that provides a twelve-inch overlap onto adjacent GCL surfaces.
 - e. Loose bentonite or bentonite amended soil shall be placed at all penetrations.
 - f. The GCL shall be covered with a geomembrane the same day that it is unpacked and placed in

- position. The GCL shall not be installed in standing water or during rain. The GCL shall be dry when installed and covered. GCL exhibiting unconfined swelling shall be removed and replaced.
- g. A rub sheet shall be placed over the GCL during installation of a geomembrane if a textured geomembrane will be in contact with the GCL.
7. Placement and testing of the two-foot soil barrier layer below the GCL shall meet the following minimum requirements:
- The upper one-foot of the barrier layer shall be composed of either a fine-grained soil or a well graded sandy soil with fines, with a maximum particle diameter less than one inch and meeting the criteria for USCS soil types ML, CL, CH, SM or SC with at least 80% by weight passing the No. 60 screen and a P200 content of 40% or greater.
 - Compacted in maximum one-foot lifts to at least 90% modified Proctor density.
 - One sample grain size distribution through the .005-millimeter particle size for each 1,500 cubic yards of soil placed.
 - Dry density and moisture testing in accordance with s. NR 516.07(1)(a), Wis. Adm. Code.
8. Quality assurance personnel shall be on site and performing their assigned duties at all times that the GCL is being deployed and covered. Daily inspector's summary reports shall be prepared by the quality assurance personnel for each day that installation of the GCL is either attempted or accomplished. The reports shall describe practices employed during the low-permeability soil layer placement and acceptance before GCL installation. Outline drawings on 8-1/2" X 11" paper shall be prepared as necessary to record the construction events. These reports shall be appended to the construction documentation reports and shall include the following information:
- Amount and location of the GCL placed, with changes from the design plan noted.
 - Methods and procedures used during placement of the GCL, minimum overlap of the panels, placement of additional bentonite, any problems due to precipitation events, and any loss of bentonite from the GCL.
 - Methods and equipment used to place the geomembrane over the GCL. The amount of time elapsed between placement of the GCL and placement of the geomembrane over the GCL.
 - Dates, locations and panel numbers where GCL samples are taken.
9. DPC shall notify the Department's environmental engineer assigned to this site a minimum of one week prior to beginning each of the construction events, listed below, for the purpose of allowing the Department to inspect the work. A construction documentation report shall be submitted in accordance with the requirements in ch. NR 516, Wis. Adm. Code, for the liner and final cover construction in the respective cells as noted below. Fees shall be paid to the Department in accordance with s. NR 520.04(5), Wis. Adm. Code, for each of the inspections and associated construction documentation reports as noted below.

	Liner Construction	Final Construction
Cells	1, 2A, 2B, 3, 4A, 4B	1, 2A& 2B, 3, 4A, 4B
Inspections	Subbase & barrier soils	Barrier Layer Soils
	Place GCL & geomembrane	GCL & Geomembrane installation
	Leachate collections system components	Drainage Layer
	Drainage blanket	Rooting Zone & Topsoil Placement

10. The construction documentation reports for the final cover shall include the following additional items listed below:

- a. Written certifications from the GCL installer's quality control representative, and the quality assurance consultant, that the construction was completed in accordance with approved plans with any deviations noted.
- b. Identification of all contractors and subcontractors involved with construction.
- c. Identification of the GCL supplier/manufacturer, material specifications of the installed GCL, and attachment methods used on the project. The report shall include the names of the on-site GCL installer and quality assurance personnel. A sample of the GCL used in the construction shall be included with the report.
- d. A narrative chronologically describing the construction including placement and compaction of the soil barrier layer, installation of the GCL, orientation, repairs and penetrations of the GCL, and placement of the geomembrane. If a textured geomembrane is used, the discussion of the method of placing the geomembrane shall include the type of slip sheet used. The narrative shall describe in detail the method used to connect the GCL to the previously constructed area and protection of edges for future connections.
- e. Identification of the source of the soil used to construct the low-permeability soil layer below the GCL.
- f. Documentation of the soil barrier layer thickness below the GCL on a 100-foot grid pattern, and results of all testing completed on the soil barrier layer.
- g. Photos/details documenting the following construction activities:
 - i. Equipment compacting the soil barrier layer in preparation for GCL placement.
 - ii. Equipment deploying the GCL and overlying materials.
 - iii. Tie-in of GCL to previously placed barrier (i.e., clay or GCL) layers.
 - iv. Protection of the edge of the GCL at end of day and for future connections.

11. The final cover structure shall be revised to include the following:

- a. A minimum of three feet of drain layer, rooting zone soil, and topsoil above the geomembrane component of the composite capping layer.
- b. A minimum of two feet of soil barrier layer between the top of the ash waste and the bottom of the GCL component of the capping layer. The soil barrier component of the composite capping layer shall include a minimum one foot of compacted soil meeting the construction and material specifications of the soil barrier layer component of the composite liner. A minimum of one foot of coarse-grained soil shall underlay the fine-grained upper layer. The coarse-grained lower layer shall be selected based on grain size and permeability properties such that this layer acts as a capillary break between the ash waste and the fine grained component.

12. Soil borrow sources for the fine-grained and coarse-grained components of the soil barrier component of the capping layer shall be identified, investigated, sampled, and proposed to the Department for review and approval no later than the date of submittal of the preconstruction report for the liner construction of cell 2A. The soil properties of the fine-grained and coarse-grained soils shall be compared and analyzed to demonstrate that the proposed soils are compactable, self-filtering, and capable of establishing a capillary break.

13. The construction documentation requirements proposed in the plan of operation and required by ch, NR 516, Wis. Adm. Code, shall be amended to include the following items and submitted within 90 days from the date of this approval:

a. ~~The fine grained components of the soil barrier layer components of the composite liner and cap shall be sampled and tested for liquid limit and plasticity index at a minimum rate of 1 per 5,000 yd³ of soil placed.~~ Testing of the coarse grained component of the soil barrier layer of the cap shall be conducted as proposed in the plan of operation.

b. Piping/permeability calculations for the ash waste and leachate collection sand, based upon the grain size characteristics of the ash waste and the soil used for the collection layer.

c. Summary of the electrical resistivity testing to be conducted on the geomembrane component of the liner and capping layer for each cell. The summary shall include identification of the contractor that performed the inspection, and identification of all defects detected and remedial measures taken to correct such defects. A plan sheet with locations and identifications of all defects and repairs, and actions taken to replace and repair other soil and geosynthetic layers that were disturbed as a part of the remedial actions.

d. Summary of quality assurance measures taken to detect and remove broken needles in the geotextile and GCL products used in the liner or final cover construction, both in fabricating plants and during installation of geosynthetics.

14. The leachate removal system shall be revised to include details for the anti-seep collar and use of factory-fabricated pipe boots and liner penetrations.

15. The final cover drainage system shall be revised to include a downslope flume on the Northeast side of the final covered area. The downslope flume shall intercept drainage sufficiently to eliminate routing water around the eastern exterior corner of the final cover.

16. The collection tank design shall be revised to eliminate the direct connection of the piping from manhole 5. The drain piping from manhole 5 shall be revised to connect directly to the manway of the tank, with provisions for inspecting, cleaning and pressure testing the pipe as the need arises.
17. Sedimentation basin details 2/22 and 3/22 shall be revised to include shutoff valves to control flow from the sedimentation basins.
18. Geotechnical stability analyses shall be conducted on each cell of liner construction, using the site specific testing data from ash waste, soils, and geosynthetics to be used in each cell. The stability analyses shall include a sliding block analysis. The sliding block analysis for cell 1 shall be submitted no later than the construction documentation for cell 1. For all subsequent liner cells, the analysis shall be included in the preconstruction report for each cell. The report for the analysis shall assess each interface of ash waste, soils, and geosynthetics for its effect on the stability analysis.

Environmental Monitoring

19. DPC shall perform environmental monitoring during both the active and post closure perpetual care periods in accordance with the attached Environmental Monitoring Summary report.
20. DPC shall provide all environmental monitoring data required in the Department's electronic format. Semi-annual environmental monitoring shall be performed in the months of March and September and the annual monitoring shall be performed in September. Monthly monitoring results shall be submitted with the semi-annual monitoring results.
21. Based on Finding of Fact 11c, the exemption to the groundwater standard for lead at well W-101 is no longer necessary. The exemption for lead at well W-101 is withdrawn.
22. DPC shall electronically submit the results for alkalinity, parameter number 39036, at wells W-102 on 12/15/1997 and W-107 on 9/8/1998 with in 30 days from the date of this approval.
23. Results from at least four additional rounds at wells W-42, W-100, W-101A and W105 shall be submitted to the Department electronically, in order to calculate PALs for chemical oxygen demand.
24. Indicator PALs and ACLs are established as presented in Tables 1 and 2. PALs and ESs for all other substances shall be as specified in ch. NR 140, Wis. Adm. Code, Tables 1 and 2. When submitting data to the Department, DPC shall compare the groundwater sampling results with these standards to determine whether exceedances have occurred.

Replacement Wells

25. The replacement water supply well shall be located no closer than 1200 feet from any limits of filling. The proposed location is approximately station 168470N, 1476700E.
26. In addition to any other Department requirements, DPC shall submit both the assigned Wisconsin Unique Well Number and copies of the well construction and well development forms to the Department's waste management hydrogeologist located in the LaCrosse Service Center.
27. The location of well nest W-100R, as proposed in the March 9, 2001 revised plan sheet 13, is approved. In the event that the W-100R well nest is submerged, DPC shall notify the Department within 30 days.

28. At any new or replacement wells, DPC shall collect the eight baseline monitoring samples no more than 90 days apart during the first two years following installation

Compatibility Testing and Report

29. In the event of a major process change or change of a coal source, DPC shall analyze the ash for compatibility with the GCL. The compatibility test protocol shall be proposed to the Department for review and approval prior to starting the compatibility testing. Compatibility testing shall assess the impact of the ash leachate on the bentonite minerals of the GCL, particularly concerning geochemical changes and subsequent permeability changes.

30. Beginning during the first year of filling, DPC shall perform testing of the coal ash for compatibility with the GCL by taking a representative sample of the ash quarterly and then blending it to make one composite sample. The composite sample shall be tested annually using the synthetic leachate analysis procedures in Appendix J of the feasibility submittal. At a minimum the compatibility test protocol shall include the following constituents be analyzed annually according to the referenced test methods:

Analyte	Units	Prep Method	Analysis Method
Boron	Ug/l	SW 846 3015	SW 846 6010B
Calcium	Ug/l	SW 846 3015	SW 846 6010B
Chromium	Ug/l	SW 846 3015	SW 846 6010B
Potassium	Ug/l	SW 846 3015	SW 846 6010B
Sodium	Ug/l	SW846 3015	SW 846 6010B
Chloride	Ug/l	EPA 300.0	EPA 300.0
Conductance, specific	Umhos/cm		EPA 120.1
Solids, total suspended	Mg/l	EPA 160.2	EPA 160.2
Sulfate	Mg/l	EPA 300.0	EPA 300.0

- a. The sample results shall be submitted electronically within 90 days of testing and can be included with another data submittal.
- b. After the third year, DPC shall analyze the trends and provide the Department with a recommendation whether additional testing or other modifications are warranted. The recommendation shall be submitted to the department within 90 days of the completion of testing.

The Department reserves the right to require the submittal of additional information and to modify this approval at any time, if in the Department's opinion, modifications are necessary. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

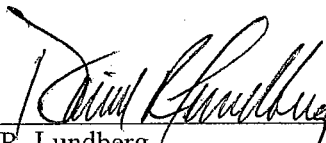
If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to ss. 227.52 and 227.53, Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

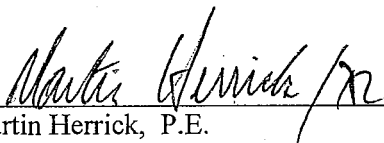
This notice is provided pursuant to s. 227.48(2), Stats.

Dated: May 15, 2001

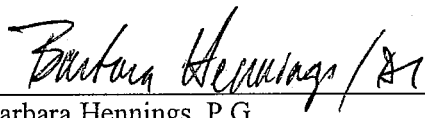
DEPARTMENT OF NATURAL RESOURCES
For the Secretary



David R. Lundberg
Waste Management Team leader
West Central Region



Martin Herrick, P.E.
Environmental Engineer
West Central Region



Barbara Hennings, P.G.
Hydrogeologist
West Central Region

TABLE 1
Summary of Indicator Preventive Action Limits

Well Name	Specific Conductance (umho/cm)	Chemical Oxygen Demand, Filtered (mg/l)	Hardness, Total Filtered (mg/l as CaCO ₃)	Alkalinity, Total Filtered (mg/l as CaCO ₃)
Station 1	700	30	410	390
W-42	680	--	410	390
P-42A	680	36	410	390
P-42B	660	31	410	390
W-100	1300	--	660	710
W-100A	870	--	490	650
W-101	670	39	400	380
W-101A	660	--	390	380
W-102	660	49	400	--
W-102A	640	33	390	370
W-104	660	36	390	380
W-104A	660	41	400	370
W-105	670	--	390	370
W-106	670	32	400	380
W-107	740	38	420	--

Note: Empty cells indicate insufficient data available to calculate PALs.

TABLE 2
Summary of Approved Alternative Concentration Limits

Well Name	Selenium, Filtered (ug/L) PAL = 10, ES = 50	Nitrate plus Nitrate, Filtered (mg/L as N) PAL = 2, ES = 10	Lead, Filtered (ug.L) PAL = 1.5, ES = 15
Station 1	23	--	--
P-42	23	--	--
P-42A	25	--	--
P-42B	24	--	--
W-100	56	4.4	--
W-100A	31	3.4	12
W-101	22	--	exemption rescinded
W-101A	20	--	--
W-102	20	--	--
W-102A	25	--	--
W-104	24	--	--
W-104A	26	--	--
W-105	24	--	--
W-106	25	--	--
W-107	--	2.8	--

Note: Empty cells denote no groundwater standard exemption.

License: 4126 Facility: DAIRYLAND POWER COOP PHASE IV-BELVIDERE

FID: 606043900 County: Buffalo City: BELVIDERE TN, WI

DNR Point ID	Point Name	Point Type	Point Status	WUWN	Linked	Gradient
1	STATION 1	12 Piezometer-Non Sub D Well	A	BX385	Y	Up
2	STATION 2	12 Piezometer-Non Sub D Well	A	BX386	Y	Up
17	W-42	11 WT Obs Well-Non Sub D	A	LO914		Side
18	P-42A	12 Piezometer-Non Sub D Well	A	LO915		Side
19	P-42B	12 Piezometer-Non Sub D Well	A	LO916		Side
20	W-43	11 WT Obs Well-Non Sub D	A	LO917		Down
21	W-100	11 WT Obs Well-Non Sub D	A	LO918		Down
22	W-100A	12 Piezometer-Non Sub D Well	A	LO919		Down
23	W-101	11 WT Obs Well-Non Sub D	A	LO920		Up
24	W-101A	12 Piezometer-Non Sub D Well	A	LO921		Up
25	W-102	11 WT Obs Well-Non Sub D	A	LO922		Side
26	W-102A	12 Piezometer-Non Sub D Well	A	LO923		Side
27	W-104	11 WT Obs Well-Non Sub D	A	LO924		Side
28	W-104A	12 Piezometer-Non Sub D Well	A	LO925		Side
29	W-105	11 WT Obs Well-Non Sub D	A	LO926		Side
30	W-106	11 WT Obs Well-Non Sub D	A	LO927		Side
31	W-107	11 WT Obs Well-Non Sub D	A	LO928		Up
32	PW-01	13 Private Well - Potable	A	LO929		Down
33	PW-02	99 Other	I			
40	W-100R	99 Other	I			

License: 4126 Facility: DAIRYLAND POWER COOP PHASE IV-BELVIDERE

FID: 606043900 County: Buffalo City: BELVIDERE TN, WI

DNR Point ID	Point Name	Point Type	Point Status	WUWN	Linked	Gradient
42	MW-100AR	99 Other	I			
44	W-102R	99 Other	I			
46	W-102AR	99 Other	I			
401	LEACHATE TANK	23 Leachate Collection Sys	I			
601	LH-1	24 Leachate Head Well	I			
604	LH-2	24 Leachate Head Well	I			
607	LH-3	24 Leachate Head Well	I			
610	LH-4	24 Leachate Head Well	I			
613	LH-5	24 Leachate Head Well	I			
616	LH-6	24 Leachate Head Well	I			
619	LH-7	24 Leachate Head Well	I			
622	LH-8	24 Leachate Head Well	I			
851	SG-1	36 Staff Gauge	I			
852	SG-2	36 Staff Gauge	I			
871	OUTFALL 001	34 Run-Off	I			
872	OUTFALL 002	34 Run-Off	I			
997	FIELD BLANK	99 Other	A			

License Number: 4126 Facility: DAIRYLAND POWER COOP PHASE IV-BELVIDERE
FID: 606043900 DNR Region: West Central Region County: Buffalo

PLAN OF OPERATION APPROVAL

Group Category: Groundwater Monitoring Well Group Description: Elevation only
Group Number: 2 Group Name: WELLS TO BE ABANDONED

Common Name	DNR ID #	Sample Frequency: Semi-Annual	Schedule Number: 2
-----	-----		
STATION 2	2	Sample Months: J F M-Yes A M J J A	S-Yes O N D
W-43	20	Parameter	

		72020 ELEVATION, GROUNDWATER (FEET ABOVE MSL)	

License Number: 4126 Facility: DAIRYLAND POWER COOP PHASE IV-BELVIDERE
 FID: 606043900 DNR Region: West Central Region County: Buffalo

PLAN OF OPERATION APPROVAL

Group Category: Private Well Group Description: water supply
 Group Number: 3 Group Name: WATER SUPPLY WELL

Common Name	DNR ID #	Sample Frequency:	Semi-Annual	Schedule Number:							
-----	-----	Sample Months:	J F M-Yes A M J J A	3	S-Yes	O	N	D			
PW-01	32										
PW-02	33										
		Parameter									

		1	COMMENT, SAMPLE ODOR								
		2	COMMENT, SAMPLE COLOR								
		3	COMMENT, SAMPLE TURBIDITY								
		10	TEMPERATURE, WATER (DEGREES CENTIGRADE)								
		94	SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)								
		340	CHEMICAL OXYGEN DEMAND, UNFILTERED (MG/L)								
		400	PH, FIELD (STANDARD UNITS)								
		410	ALKALINITY, TOTAL (MG/L AS CaCO3)								
		900	HARDNESS, TOTAL (MG/L AS CaCO3)								
		945	SULFATE, TOTAL (MG/L SO4)								
		1022	BORON, TOTAL (MG/L B)								
		1147	SELENIUM, TOTAL (UG/L SE)								

License Number: 4126 Facility: DAIRYLAND POWER COOP PHASE IV-BELVIDERE
 FID: 606043900 DNR Region: West Central Region County: Buffalo

PLAN OF OPERATION APPROVAL

Group Category: Leachate Group Description: collection tank
 Group Number: 4 Group Name: LEACHATE COLLECTION TANK

Common Name DNR ID # Sample Frequency: Semi-Annual Schedule Number: 4
 LEACHATE TANK 401 Sample Months: J F M-Yes A M J J A S-Yes O N D

Parameter

1 COMMENT, SAMPLE ODOR
 2 COMMENT, SAMPLE COLOR
 3 COMMENT, SAMPLE TURBIDITY
 94 SPECIFIC CONDUCTANCE, FIELD (UMHO/CM @ 25C)
 150 SOLIDS, TOTAL SUSPENDED (MG/L)
 310 BIOCHEMICAL OXYGEN DEMAND (MG/L, 5 DAY - 20DEG C)
 340 CHEMICAL OXYGEN DEMAND, UNFILTERED (MG/L)
 400 PH, FIELD (STANDARD UNITS)
 410 ALKALINITY, TOTAL (MG/L AS CaCO3)
 900 HARDNESS, TOTAL (MG/L AS CaCO3)
 940 CHLORIDE, TOTAL OR DISSOLVED IN WTR SMPL (MG/L CL)
 945 SULFATE, TOTAL (MG/L SO4)
 1022 BORON, TOTAL (MG/L B)
 1027 CADMIUM, TOTAL (UG/L CD)
 1051 LEAD, TOTAL (UG/L PB)
 1055 MANGANESE, TOTAL (UG/L MN)
 1147 SELENIUM, TOTAL (UG/L SE)
 71900 MERCURY, TOTAL (UG/L HG)
 74010 IRON, TOTAL (MG/L FE)

Sample Frequency: Annual Schedule Number: 5 ***** ACID / BASE Neutral Extractable *****
 Sample Months: J F M A M J J A S-Yes O N D

Parameter

License Number: 4126 Facility: DAIRYLAND POWER COOP PHASE IV-BELVIDERE
FID: 606043900 DNR Region: West Central Region County: Buffalo

PLAN OF OPERATION APPROVAL

Group Category: Leachate Group Description: collection tank

Group Number: 4 Group Name: LEACHATE COLLECTION TANK ***** GROUP CONTINUED FROM PREVIOUS PAGE *****

Common Name ----- DNR ID # -----

Sample Frequency: Monthly Schedule Number: 6
Sample Months: J-Yes F-Yes M-Yes A-Yes M-Yes J-Yes J-Yes A-Yes S-Yes O-Yes N-Yes D-Yes

Parameter

32 LEACHATE, VOLUME PUMPED (1000 GALLONS)

License Number: 4126 Facility: DAIRYLAND POWER COOP PHASE IV-BELVIDERE
FID: 606043900 DNR Region: West Central Region County: Buffalo

PLAN OF OPERATION APPROVAL

Group Category: Leachate Group Description: leachate head wells
Group Number: 5 Group Name: LEACHATE HEAD WELLS

Common Name	DNR ID #	Sample Frequency: Monthly	Schedule Number: 7
LH-1	601	Sample Months: J-Yes F-Yes M-Yes A-Yes M-Yes J-Yes J-Yes A-Yes S-Yes O-Yes N-Yes D-Yes	
LH-2	604	Parameter	
LH-3	607		
LH-4	610	31 LEACHATE, DEPTH IN FEET	
LH-5	613	99423 ELEVATION, LEACHATE (FEET ABOVE MEAN SEA LEVEL)	
LH-6	616		
LH-7	619		
LH-8	622		

License Number: 4126 Facility: DAIRYLAND POWER COOP PHASE IV-BELVIDERE
FID: 606043900 DNR Region: West Central Region County: Buffalo

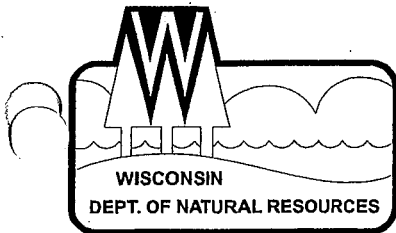
PLAN OF OPERATION APPROVAL

Group Category: Surface Water Group Description: sed ponds

Group Number: 6 Group Name: STAFF GAGES

Common Name	DNR ID #	Sample Frequency: Semi-Annual	Schedule Number: 8
-----	-----		
SG-1	851	Sample Months: J F M-Yes A M J J A	S-Yes O N D
SG-2	852	Parameter	

		72020 ELEVATION, GROUNDWATER (FEET ABOVE MSL)	



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Scott McCallum, Governor
Darrell Bazzell, Secretary
Scott A. Humrickhouse, Regional Director

West Central Region Headquarters
1300 W. Clairemont Avenue
PO Box 4001
Eau Claire, Wisconsin 54702-4001
Telephone 715-839-3700
FAX 715-839-6076
TDD 715-839-2786

March 11, 2002

Mr. Robert Carothers
Dairyland Power Cooperative
JPM Station
500 Old State Highway 35
Alma, WI. 54610

FID # 606009360
Buffalo Co.
SW/APPRV File

Subject: Construction Documentation Approval for Phase IV Liner , Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County, License # 4126.

Dear Mr. Carothers:

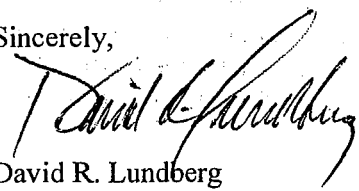
We have completed our review of your report entitled " Dairyland Power Cooperative Phase IV Cell I Liner Construction Documentation Report." The report was prepared by RMT and was dated November 2001. The report was received on December 7, 2001. At this time we are approving the construction documentation for the Phase IV liner.

Conditions have been included requiring placement of four feet of ash by December 1, 2002, and inspection and repair of the drainage blanket as necessary. Additionally, Dairyland Power Cooperative has requested to increase the moisture content of the ash being placed on the Phase IV liner. A performance standard relating wheel rutting to moisture content of the ash being placed has also been established as a condition of the approval.

This approval should be attached to your May 15, 2001 Plan of Operation Approval.

Please contact Martin Herrick at (608) 789-5518 if you have any questions regarding this approval.

Sincerely,


David R. Lundberg
Waste Management Team Leader
West Central Region

cc: WA/3 - Files
Jack Tritt - WCR
Brian Kalvelage/Marty Herrick - LAX
Tony McKimmy - Dairyland Power Cooperative, 3200 East Avenue South, PO Box 817,
LaCrosse, WI 54602-0817
Bernie Krantz - RMT

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL
PHASE IV, LINER

FOR THE

DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY,
LICENSE # 4126

FINDINGS OF FACT

The Department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates a nonhazardous solid waste disposal facility located in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin,
2. The Department issued a conditional plan of operation approval for the facility on May 15, 2001.
3. The information submitted in connection with the construction documentation includes the following:
 - a. A report entitled " Dairyland Power Cooperative Phase IV Liner Construction Documentation Report" and 15 associated engineering drawings dated November 2001.
4. Additional information considered in the review of the construction documentation;
 - a. July 18, 2001, Dairyland Power Cooperative-Alma Offsite Disposal Facility (License #4126) Phase IV Disposal Area, Cell 1 Preconstruction Report,
 - b. August 1, 2001, Dairyland Power Cooperative -Alma Offsite Disposal Facility (License #4126) Phase IV Disposal Area Cell 1 Preconstruction Report-Addendum #1,
 - c. January 31, 2002 Fax from Tony McKimmy of Dairyland Power providing information on the status of the high capacity well and financial responsibility for the landfill,
 - d. March 4, 2002 response from RMT to a February 5, 2002 letter from Martin Herrick of the Department requesting additional information.
5. Construction inspections were performed by the Department for the following on:
 - a. Low permeability barrier soils placement on September 8, 2001
 - b. Geomembrane and GCL liner installation on September 14, 2001
 - c. Sand Drainage blanket and leachate collection system installation on September 13, 2001
 - d. Electrical resistivity testing of the liner on October 18, 2001.
6. On December 4, 2001 the Department submitted invoice # SWK-0262 to Dairyland Power Cooperative. The invoice included \$1000 for review of the construction documentation and \$2000 for four construction inspections. Full payment was received on December 26, 2001.

CONCLUSIONS OF LAW

1. The Department has authority under ss. 289.43(7) and 289.43(8), Stats., and ch. NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the May 15, 2001 Conditional Plan of Operation Approval.
2. If the conditions of approval set forth below are complied with the applicant will have demonstrated that the facility has been constructed in substantial compliance with the NR 500 to NR 590 Series of the Wisconsin Administrative Code and the May 15, 2001 Conditional Plan of Operation Approval.
3. The Department has authority under s. 289.30(6), Stats., to modify a plan of operation approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500- 590, Wis. Adm. Code

CONDITIONS OF APPROVAL

The Department hereby approves the construction documentation for the Dairyland Power Cooperative Phase IV Liner at the Alma Off-Site Ash Disposal Facility subject NR 500-590, Wis. Adm. Code, the May 15, 2001 Conditional Plan of Operation Approval and the following conditions:

1. Dairyland Power Cooperative shall inspect the sand drainage blanket of Phase IV on a monthly basis and make repairs as necessary. Inspections and repair of the sand drainage blanket shall continue until there has been enough waste placed to prevent it from eroding.
2. The depth of wheel rutting from the haul trucks placing the ash shall be used as a performance measure to limit the moisture content of the ash placed in Phase IV. When ash is being placed no wheel ruts deeper than 2 inches shall be allowed.
3. Dairyland Power Cooperative shall place four feet of ash on the bottom and initial 10 ft of slope for the newly constructed module by December 1, 2002.

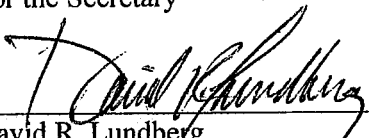
The Department retains the jurisdiction to either require the submittal of additional information or to modify this approval at any time if, in the Department's opinion, conditions warrant further modifications. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

NOTIFICATION OF APPEAL RIGHTS

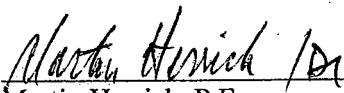
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Dated: March 11, 2002

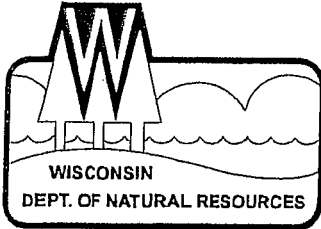
Department of Natural Resources
For the Secretary



David R. Lundberg
Waste Management Team Leader
West Central Region



Martin Herrick, P.E.
Environmental Engineer
West Central Region



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Scott Hassett, Secretary
Scott A. Humrickhouse, Regional Director

West Central Region Headquarters
1300 W. Clairemont Avenue
PO Box 4001
Eau Claire, Wisconsin 54702-4001
Telephone 715-839-3700
FAX 715-839-6076
TDD 715-839-2786

March 4, 2004

Mr. Robert Carothers
Dairyland Power Cooperative
JPM Station
500 Old State Highway 35
Alma, WI, 54610

FID # 606009360
Buffalo Co.
SW/APPRV File

Subject: Conditional Plan Modification to the Plan of Operation Approval for the Phase IV Cap,
Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County, License #
4126

Dear Mr. Carothers:

We have completed our review of your report entitled "Plan of Operation Modification Dairyland Power Cooperative Phase IV Disposal Area - License 4126, Alma Off-Site Ash Disposal facility, Town of Belvedere, Buffalo County, Wisconsin." The January 2004 report was prepared by RMT, and received by the Department on January 26, 2004. At this time we are conditionally approving the proposed plan modification for the Phase IV cap.

Conditions have been included for submittal of cap details, payment of the plan review fee, revised closure costs and construction activities. This approval should be attached to your May 15, 2001 Plan of Operation Approval.

Please contact Martin Herrick at (608) 789-5518 if you have any questions regarding this approval.

Sincerely,

David R. Lundberg
Waste Management Team Leader
West Central Region

cc: Jack Tritt - WCR
Brian Kalvelage/Marty Herrick - LAX
Tony McKimmy - Dairyland Power Cooperative, 3200 East Avenue South, PO Box 817,
La Crosse, WI 54602-0817
Bernie Krantz - RMT, 744 Heartland Trail 53717-1934; PO Box 8923, Madison, WI 53708-8923
Bob Grefe-WA/3

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
CONDITIONAL PLAN OF OPERATION MODIFICATION
PHASE IV, CAP
FOR THE

DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY,
LICENSE # 4126

FINDINGS OF FACT

The Department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates a nonhazardous solid waste disposal facility located in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin.
2. The Department issued a conditional plan of operation approval for the facility on May 15, 2001.
3. The information submitted in connection with the construction documentation includes the following:
 - a. A report entitled " Plan of Operation Modification Dairyland Power Cooperative Phase IV Disposal Area- License #4126 Alma Off-Site Ash Disposal Facility Town of Belvedere Buffalo County, Wisconsin." The report was dated January 2004.
4. On February 24, 2004 the Department submitted invoice # 0007307 for \$1500 to Dairyland Power Cooperative. The invoice of \$1500 was for review of the proposed plan of operation modification.

CONCLUSIONS OF LAW

1. The Department has authority under s. 289.30(6) Stats. to modify a plan of operation approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500-590, Wis. Adm. Code.
2. The Department has authority to approve a plan operation modification with special conditions if the conditions are needed to ensure compliance with the applicable portions of chs. NR 500-590, Wis. Adm. Code.
3. The conditions of approval set forth below are needed to ensure compliance with the applicable portions of chs. NR 500- 590, Wis. Adm. Code
4. In accordance with the foregoing, the Department has authority under ch. 289., Stats., to issue the following conditional plan of operation approval.

CONDITIONS OF APPROVAL

The Department hereby approves the proposed plan modifications for the Dairyland Power Cooperative Phase IV Cap at the Alma Off-Site Ash Disposal Facility subject to NR 500-590, Wis. Adm. Code, the May 15, 2001 Conditional Plan of Operation Approval and the following conditions:

1. The closure costs are revised as follows:

CLOSURE COSTS

Item	Quantity	Unit Cost	Estimated Cost
Barrier Layer (24 in) Fine Grained Soil	40,170 cy	\$6.5/cy	\$261,100
Geomembrane 40 mil VFPE	542,300 sf	\$.36/sf	\$195,200
Granular Drainage Layer (12in)	60,260 cy	\$5.57/cy	\$335,700
Vegetative Layer (18 in)	90,390cy	\$1.26/cy	\$113,900
Topsoil (6 in)	10,000 cy	\$1.50/cy	\$15,000
Surface Water Control System			\$50,000
Seed, Fertilize, Mulch	12.4 acre	\$1350/acre	\$16,700
Construction Plans			\$20,000
Construction Observation	16 weeks	\$5500/week	\$88,000
Documentation Report			\$20,000
Contingencies (25%)			\$278,900
Total Cost			\$1,394,500

2. The Department's inspection schedule in Condition 9 of the May 15, 2001 Plan of Operation Approval is revised as follows:

	<u>Liner Construction</u>	<u>Cap Construction</u>
Cells	1, 2A, 2B, 3, 4A, 4B	1,2A, 2B, 3, 4A, 4B
Inspections	Subase & Barrier Soils	Placing/compacting Select Flyash Layer
	Place GCL & Geomembrane	Place Geomembrane
	Leachate Collection System Components	Drainage Layer
	Drainage Blanket	Topsoil Placement

3. Detail Drawings for the following items shall be provided to the Department within 60 days from the date of this approval:
- a. Transition details between the cap and the liner,
 - b. Revised surface features,
 - c. Cross section of the interior berm.
4. Rock size for the drainage layer material shall be limited to two inches in size or smaller.
5. Payment of the February 24, 2004, plan review fee, Invoice # 0007307, shall be made to the Department within 30 days from the date it was received.

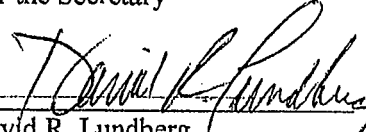
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NOTIFICATION OF APPEAL RIGHTS

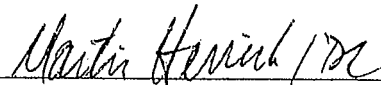
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Dated: March 4 2004

Department of Natural Resources
For the Secretary



David R. Lundberg
Waste Management Team Leader
West Central Region



Martin Herrick, P.E.
Environmental Engineer
West Central Region



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Scott Hassett, Secretary
Scott Humrickhouse, Regional Director

West Central Region Headquarters
1300 W. Clairemont Avenue
PO Box 4001
Eau Claire, Wisconsin 54702-4001
Telephone 715-839-3700
FAX 715-839-6076
TTY Access via relay - 711

September 22, 2006

COPY

Mr. Bill Kowalski
Dairyland Power Cooperative
3200 East Avenue South
PO Box 817
La Crosse, WI 54601-0817

FID# 606009360
License # 4126
Buffalo County
SW/Approvals

Subject: WDNR approval of proposed PAL/ACL calculations for the Dairyland Power Cooperative Phase IV Ash Disposal Facility, Town of Belvidere, Buffalo County Wisconsin. (License No. 4126)

Dear Mr. Kowalski:

On May 12, 2006 the Department received your report entitled "Proposed PAL and ACL Values for wells W100AR, W100R, W102AR and W102R". This report was submitted on your behalf by your environmental consultant, RMT, Inc. This report proposed PAL and ACL calculation values for specific replacement wells at the landfill facility.

On July 21, 2006 the Department received additional information with respect to the proposed PAL/ACL calculations. This additional information submittal clarified some issues and also withdrew the requested ACL for mercury at monitoring wells W100AR, W100R and W102AR. The Department has completed our review of the requested modifications to the plan of operation for the Dairyland Phase IV Landfill. You will be pleased to know that, with minor exceptions, the proposed PALs/ACLs have been accepted subject to the conditions listed in the attached approval.

Section 4 of the above-mentioned report requests exemptions to NR 140.28, Wis. Adm. Code for specific parameters. Exemptions for Barium, Cadmium and Mercury are not warranted, and therefore not approved, because sampling results of these parameters did not exceed the NR 140 PAL value on two or more occasions. An exemption to NR 140.28, Wis. Adm. Code for "Nitrate + Nitrite" parameter is approved subject to the approved ACL values in the attached approval.

Please remember that all future PAL/ACL calculation submittals are considered separate plan modifications and are also subject to the requirements of NR 500.05, 507.18, 507.27, and 520.15 Wis. Adm. Codes.

If you have questions regarding this approval, please contact Brian Kalvelage at (608) 785-9983.

Sincerely,


David R. Lundberg
Waste Program Manager

cc: Brian Kalvelage/Martin Herrick-WDNR, La Crosse Service Center
Dave Lundberg/Sue Brumberg-WDNR, Eau Claire Service Center

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

PAL/ACL PLAN MODIFICATION APPROVAL
FOR
DAIRYLAND POWER COOPERATIVE
PHASE IV DISPOSAL AREA
ALMA OFFSITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, WISCONSIN
WDNR LICENSE # 4126

FINDINGS OF FACT

The Department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates an ash disposal landfill in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin
2. The Department issued a conditional plan of operation approval for the facility on May 15, 2001 under which the landfill is currently operating (including all subsequent plan modification approvals).
3. On May 12, 2006 the Department received a report submitted on your behalf by your environmental consultant, RMT, Inc. The report was entitled, "Proposed PAL and ACL Values for Wells W100AR, W100R, W102AR and W102R".
4. On May 30, 2006 the Department sent an email request for additional information. This information request was sent to Bernie Krantz and Tom Koch of RMT, Inc.
5. On May 31, 2006 the Department received full payment of \$1650 for invoice # 0008068 related to the review of the May 12, 2006 report.
6. On July 21, 2006 Waste Program staff in the WDNR La Crosse Service Center received additional information related to the proposed PAL/ACL calculation proposal. This document provided answers to the Department's May 30, 2006 request for additional information, and also withdrew all the requested ACLs for Mercury (parameter).
7. On September 20, 2006 the Department sent a draft of this approval to Dairyland Power Cooperative for review and comment. On September 21, 2006 the Department received comments on the draft.
8. Additional documents considered in the review of the plan of operation include the following:
 - a. The Department's May 15, 2001 Conditional Plan of Operation Approval.

- b. July 24, 2003 Groundwater exceedance notification for the DPC-Phase IV, Alma Ash Disposal Landfill.
 - c. The Department's March 21, 2001 memorandum from Steve Karklins. This memo discussed initial PALs and ACLs for the Plan of Operation.
 - d. Groundwater information contained within the March 10, 2004 document entitled "2003 Annual Report for the Alma Off-site Ash Landfill, License #4126.
 - e. Department paper and electronic files for the Dairyland Power Cooperative-Phase IV-Alma Offsite Ash Disposal Landfill (#4126).
9. Based on an examination of the groundwater quality data for the existing facility, and the information listed in the preceding Findings of Fact, the Department finds the following:

- a. Baseline concentrations for detection monitoring indicator parameters were established for the following substances at the wells listed below:

<u>Substances</u>	<u>Wells</u>
Alkalinity	W-100AR, W-100R, W-102AR, and W-102R
COD	W-100AR, W-100R, W-102AR, and W-102R
Spec. Conductance	W-100AR, W-100R, W-102AR, and W-102R
Hardness	W-100AR, W-100R, W-102AR, and W-102R

- b. Baseline concentrations for detection monitoring parameters were established for the following substances at the wells listed below:

<u>Substances</u>	<u>Wells</u>
Nitrate+Nitrite (as N)	W-100AR and W-100R

- 10. The special condition set forth below is needed to assure that the facility is operated in an environmentally sound manner and will not inhibit compliance with the standards set forth in the applicable provisions of chs. NR 500-538, Wis. Adm. Code.
- 11. If the special conditions set forth below are complied with, the proposal will meet the requirements of chs. NR 500-538, Wis. Adm. Code.

GRANT OF EXEMPTIONS

- 1. Pursuant to s. NR 140.28, Wis. Adm. Code, Dairyland Power Cooperative has demonstrated circumstances which warrant exemptions to groundwater quality standards at certain wells for nitrate+nitrite (as N), in chapter NR 140, Wis. Adm. Code, as specified in NR 140.28, Wis. Adm. Code, at its Phase IV-Alma Offsite Landfill. Therefore, the Department grants the exemptions to the groundwater standards. The exemptions apply to wells and parameters specified in Finding of Fact 9 of this document. The Department may modify this approval, based on additional information.

CONCLUSIONS OF LAW

1. The Department has the authority to approve a modification to the plan of operation with special conditions if the conditions are needed to ensure compliance with the applicable portions of chs. NR 500 to 538, Wis. Adm. Code.
2. The Department has the authority under s. 160.15(3), Stats., and s. NR 140.20, Wis. Adm. Code, to establish preventive action limits for indicator parameters.
3. The Department has the authority under s. 160.19(8), Stats., and s. NR 140.28, Wis. Adm. Code, to grant exemptions to groundwater standards and to specify terms and conditions under which the department may seek remedial action relating to standards for which an exemption has been granted. This may include establishing alternative concentration limits.
4. The conditions of approval set forth below are needed to assure compliance with ch. NR 140, Wis. Adm. Code and applicable portions of chs. NR 500 through 538, Wis. Adm. Code.

In accordance with the foregoing, the Department has authority under chs. 160 and 289, Stats., to issue the following conditional approval for modifying the plan of operation/closure plan.

CONDITIONAL PLAN OF OPERATION APPROVAL

The Department hereby approves the proposed PAL and ACL calculations/plan modification for the Dairyland Phase IV-Alma Offsite Landfill, subject to compliance with chs. NR 500-538, Wis. Adm. Code, and the following conditions:

1. The preventive action limits (PALs) for indicator parameters at this facility are established as detailed in the table below:

PREVENTIVE ACTION LIMITS

DNR ID #	Well Name	Alkalinity (mg/L)	Spec. Conductance (umho/cm @25 C)	Hardness (mg/L)	COD (ug/L)
042	W-100AR	420	790	440	34
040	W-100R	400	760	420	31
046	W-102AR	370	700	390	31
044	W-102R	370	700	380	30

2. The alternative concentration limits (ACLs) for parameters at this facility are established as detailed in the table below:

ALTERNATIVE CONCENTRATION LIMITS

DNR ID #	Well Name	Nitrate + Nitrite (as N) mg/L
042	W-100AR	3.0
040	W-100R	3.1

The Department retains the right to require the submittal of additional information or to modify this approval at any time if, in the Department's opinion, further modifications are necessary. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

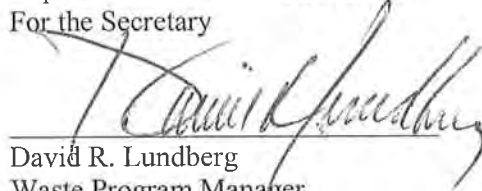
NOTICE OF APPEAL RIGHTS

If you believe you have a right to challenge this decision made by the Department, you should know that Wisconsin statutes, administrative codes and case law establish time periods and requirements for reviewing Department decisions.

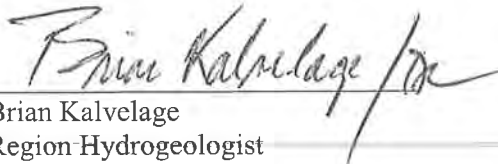
To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats., establish criteria for filing a petition for judicial review. Such a petition shall be filed with the appropriate circuit court and shall be served on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: Sept. 22, 2006 *SB*

Department of Natural Resources
For the Secretary



David R. Lundberg
Waste Program Manager
West Central Region



Brian Kalvelage
Region Hydrogeologist
West Central Region



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
 Scott Hassett, Secretary
 Scott Humrickhouse, Regional Director

West Central Region Headquarters
 1300 W. Clairemont Avenue
 PO Box 4001
 Eau Claire, Wisconsin 54702-4001
 Telephone 715-839-3700
 FAX 715-839-6076
 TTY Access via relay - 711

March 28, 2007

Mr. Robert Carothers
 Dairyland Power Cooperative
 JPM Station
 500 Old State Highway 35
 Alma, WI. 54610

FID # 606009360
 Buffalo County
 SW/APPRV File

Subject: Construction Documentation Approval for Phase IV Cell 2A Liner, Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County, License # 4126.

Dear Mr. Carothers:

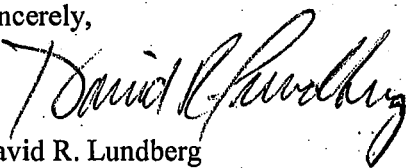
We have completed our review of your report entitled "Dairyland Power Cooperative Phase IV Cell 2A Liner Construction Documentation Report." The report was prepared by RMT and was dated January 2007. The report was hand delivered to the La Crosse Service Center on January 25, 2007. At this time we are approving the construction documentation for the Phase IV Cell 2A liner.

Conditions have been included for placement of four feet of ash by December 1, 2007, inspection and repair of the drainage blanket, associated surface water control features and review of the closure and long term care costs for the landfill. Note that the condition in the March 11, 2002 construction documentation approval establishing no wheel rutting from haul trucks as a basis for the maximum moisture content of the ash still exists and is repeated in this approval.

This approval should be attached to your May 15, 2001 Plan of Operation Approval.

Please contact Martin Herrick at (608) 789-5518 if you have any questions regarding this approval.

Sincerely,


 David R. Lundberg
 Waste Program Manager
 West Central Region

cc: Brian Kalvelage/Marty Herrick-LAX
 Wendy Berndt, Dairyland Power Cooperative, 3200 East Avenue South, PO Box 817,
 La Crosse, WI 54602-0817
 Bernie Krantz, RMT

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
CONSTRUCTION DOCUMENTATION APPROVAL
PHASE IV, CELL 2A LINER
FOR THE
DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY,
LICENSE # 4126

FINDINGS OF FACT

The Department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates a nonhazardous solid waste disposal facility located in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin,
2. The Department issued a conditional plan of operation approval for the facility on May 15, 2001.
3. The Department issued a conditional construction documentation approval for the first cell's liner on March 11, 2002.
4. The information submitted in connection with the construction documentation includes the following:
 - a. A report entitled "Phase IV, Cell 2A Liner Construction Dairyland Power Cooperative Documentation Report Alma Off-site Disposal Facility" and 15 associated engineering drawings dated January 2007.
5. Additional information considered in the review of the construction documentation:
 - a. August 15, 2006 Dairyland Power Cooperative-Alma Offsite Disposal Facility (License #4126) Phase IV Disposal Area, Cell 2A Preconstruction Report.
 - b. September 29, 2006 Dairyland Power Cooperative-Alma Offsite Disposal Facility (License #4126) Phase IV Disposal Area Cell 1 Preconstruction Report-Addendum #1.
 - c. March 31, 2006 Report for Coal Ash testing for GCL Compatibility Phase IV Disposal Area, License # 4126-Dairyland Power Cooperative.
 - d. 2006 Annual Report for the Alma Off-site Ash Landfill, License #04126.
6. Construction inspections were performed by the Department as follows:
 - a. Low permeability barrier soils placement on August 10, 2006 by Martin Herrick,
 - b. Geomembrane and GCL liner installation on September 12, 2006 by Martin Herrick,
 - c. Sand Drainage blanket and leachate collection system installation on October 18, 2006 by Martin Herrick,
 - d. Electrical resistivity testing of the liner on October 26, 2006 by Brian Kalvelage.
7. On January 29, 2007 the Department submitted invoice # 000-8247 to Dairyland Power Cooperative. The invoice included \$1100 for review of the construction documentation and \$2200 for four construction inspections. Full payment was received on February 23, 2007.

CONCLUSIONS OF LAW

1. The Department has authority under ss. 289.43(7) and 289.43(8), Stats., and ch. NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the May 15, 2001 Conditional Plan of Operation Approval.
2. If the conditions of approval set forth below are complied with the applicant will have demonstrated that the facility has been constructed in substantial compliance with the NR 500 to NR 590 Series of the Wisconsin Administrative Code and the May 15, 2001 Conditional Plan of Operation Approval.
3. The Department has authority under s. 289.30(6), Stats., to modify a plan of operation approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500- 590, Wis. Adm. Code

CONDITIONS OF APPROVAL

The Department hereby approves the construction documentation for the Dairyland Power Cooperative Phase IV Cell 2A Liner at the Alma Off-Site Ash Disposal Facility subject NR 500-590, Wis. Adm. Code, the May 15, 2001 Conditional Plan of Operation Approval and the following conditions:

1. Dairyland Power Cooperative shall inspect the sand drainage blanket of Phase IV Cell 2A on a monthly basis and make repairs as necessary. Inspections and repair of the sand drainage blanket shall continue until there has been enough waste placed to prevent it from eroding.
2. The depth of wheel rutting from the haul trucks placing the ash shall be used as a performance measure to limit the moisture content of the ash placed in Phase IV Cell, 2A. When ash is being placed no wheel ruts deeper than 2 inches shall be allowed.
3. Dairyland Power Cooperative shall place four feet of ash on the bottom and initial 10 ft of slope for the newly constructed cell by December 1, 2007.
4. Erosion of the surface water control features shall be repaired as necessary.
5. The closure and long term care costs for the Phase IV landfill shall be reviewed and updated as necessary. If revisions are required they shall be submitted to the Department within 90 days from the date of this approval.

The Department retains the jurisdiction to either require the submittal of additional information or to modify this approval at any time if, in the Department's opinion, conditions warrant further modifications. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

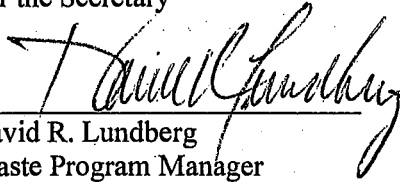
NOTIFICATION OF APPEAL RIGHTS

If you believe that you have the right to challenge this decision made by the Department, you should know that Wisconsin statutes, administrative codes and case law establish time periods and requirements for reviewing Department decisions.

To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats. establish criteria for filing a petition for judicial review. Such a petition shall be filed with the appropriate circuit court and shall be served on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: March 28, 2007

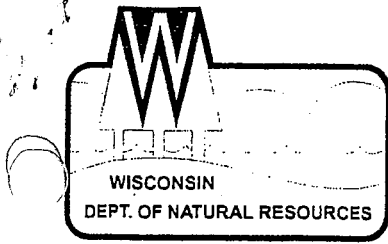
Department of Natural Resources
For the Secretary



David R. Lundberg
Waste Program Manager
West Central Region



Martin Herrick, P.E.
Environmental Engineer
West Central Region



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Matthew J. Frank, Secretary
Scott A. Humrickhouse, Regional Director

West Central Region Headquarters
1300 W. Clairemont Avenue
PO Box 4001
Eau Claire, Wisconsin 54702-4001
Telephone 715-839-3700
FAX 715-839-6076
TDD 715-839-2786

March 21, 2008

Mr. Robert Carothers
Dairyland Power Cooperative
JPM Station
500 Old State Highway 35
Alma, WI. 54610

FID # 606009360
Buffalo Co.
SW/APPRV File

Subject: Construction Documentation Approval for Phase IV Cell 2B Liner, Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County, License # 4126.

Dear Mr. Carothers:

We have completed our review of your report entitled "Dairyland Power Cooperative Phase IV Cell 2B Liner Construction Documentation." The report was prepared by RMT and was dated January 2008. The report was received in the La Crosse Service Center on February 4, 2008. At this time we are approving the construction documentation for the Phase IV Cell 2B liner.

Conditions have been included for payment of the plan review and construction inspections invoice, placement of four feet of ash by December 1, 2009, inspection and repair of the drainage blanket, associated surface water control features and review of the closure and long term care costs for the landfill.

This approval should be attached to your May 15, 2001 Plan of Operation Approval.

Please contact Martin Herrick at (608) 789-5518 if you have any questions regarding this approval.

Sincerely,

David R. Lundberg
Waste Management Team Leader
West Central Region

cc: Brian Kalvelage/Marty Herrick-LAX
Wendy Berndt-Dairyland Power Cooperative, 3200 East Avenue South, PO Box 817,
La Crosse, WI 54602-0817
Curt Madsen - RMT, 744 Heartland Trail, Madison, WI 53717

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL
PHASE IV, CELL 2B LINER

FOR THE
DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY,
LICENSE # 4126

FINDINGS OF FACT

The Department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates a nonhazardous solid waste disposal facility located in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin,
2. The Department issued a conditional plan of operation approval for the facility on May 15, 2001.
3. The Department issued conditional construction documentation approvals for the cell's I and 2A liners on March 11, 2002 and March 28, 2007 respectively.
4. The information submitted in connection with the construction documentation includes the following:
 - a. A report entitled " Phase IV, Cell 2B Liner Construction Dairyland Power Cooperative Documentation Report Alma Off-site Disposal Facility" and 12 associated engineering drawings dated January 2008.
5. Additional information considered in the review of the construction documentation;
 - a. June 18, 2007 Dairyland Power Cooperative-Alma Offsite Disposal Facility (License #4126) Phase IV Disposal Area, Cell 2B Preconstruction Report,
 - b. September 29, 2006 Dairyland Power Cooperative -Alma Offsite Disposal Facility (License #4126) Phase IV Disposal Area Cell 1 Preconstruction Report-Addendum #1,
 - c. March 31, 2006 Report for Coal Ash testing for GCL Compatibility Phase IV Disposal Area, License # 4126-Dairyland Power Cooperative,
 - d. March 12, 2008 Annual Report for the Alma Off-site Ash Landfill, License #04126.
6. Construction inspections were performed by the Department for the following on:
 - a. Subbase preparation on 3/23/2007 by Martin Herrick,
 - b. Low permeability barrier soils placement on 6/26/2007 by Martin Herrick,
 - c. Geomembrane and GCL liner installation on 8/02/2007 and 8/14/2007 by Martin Herrick,
 - d. Sand Drainage blanket and leachate collection system installation on 9/10/2007 by Martin Herrick,

7. On February 5, 2008 the Department submitted invoice # 000-8565 to Dairyland Power Cooperative. The invoice included \$1100 for review of the construction documentation and \$2200 for four construction inspections.

CONCLUSIONS OF LAW

1. The Department has authority under ss. 289.43(7) and 289.43(8), Stats., and ch. NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the May 15, 2001 Conditional Plan of Operation Approval.
2. If the conditions of approval set forth below are complied with the applicant will have demonstrated that the facility has been constructed in substantial compliance with the NR 500 to NR 590 Series of the Wis. Adm. Code and the May 15, 2001 Conditional Plan of Operation Approval.
3. The Department has authority under s. 289.30(6), Stats., to modify a plan of operation approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500- 590, Wis. Adm. Code

CONDITIONS OF APPROVAL

The Department hereby approves the construction documentation for the Dairyland Power Cooperative Phase IV Cell 2B Liner at the Alma Off-Site Ash Disposal Facility subject NR 500-590, Wis. Adm. Code, the May 15, 2001 Conditional Plan of Operation Approval and the following conditions:

1. Dairyland Power Cooperative shall inspect the sand drainage blanket of Phase IV Cell 2B after major storm events and on a monthly basis and make repairs as necessary. Inspections and repair of the sand drainage blanket shall continue until there has been enough waste placed to prevent it from eroding.
2. The depth of wheel rutting from the haul trucks placing the ash shall be used as a performance measure to limit the moisture content of the ash placed in Phase IV Cell, 2B. When ash is being placed no wheel ruts deeper than 2 inches shall be allowed.
3. Dairyland Power Cooperative shall place four feet of ash on the bottom and initial 10 ft of slope for the newly constructed cell by December 1, 2009.
4. Cleaning and restoration of the surface water control features shall be performed as necessary.
5. The closure and long term care costs for the Phase IV landfill shall be reviewed and updated as necessary. If revisions are required they shall be submitted to the Department within 90 days from the date of this approval.

The Department retains the jurisdiction to either require the submittal of additional information or to modify this approval at any time if, in the Department's opinion, conditions warrant further modifications. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

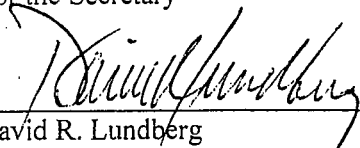
NOTIFICATION OF APPEAL RIGHTS

If you believe that you have the right to challenge this decision made by the Department, you should know that Wisconsin statutes, administrative codes and case law establish time periods and requirements for reviewing Department decisions.


To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats. establish criteria for filing a petition for judicial review. Such a petition shall be filed with the appropriate circuit court and shall be served on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: March 21, 2008

Department of Natural Resources
For the Secretary

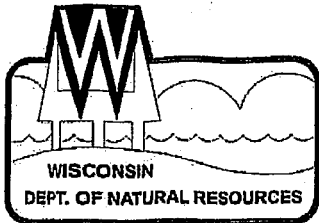


David R. Lundberg
Waste Management Team Leader
West Central Region



Martin Herrick, P.E.
Environmental Engineer
West Central Region

FGD Approval
12-21-09



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Matthew Frank, Secretary
Scott A. Humrickhouse, Regional Director

West Central Region Headquarters
1300 W. Clairemont Avenue
PO Box 4001
Eau Claire, Wisconsin 54702-4001
Telephone 715-839-3700
FAX 715-839-6076
TDD 715-839-2786

December 4, 2009

Mr. Robert Carothers
Dairyland Power Cooperative
JPM Station
500 Old State Highway 35
Alma, WI. 54610

FID # 606009360
Buffalo Co.
SW/APPRV File

Subject: Conditional Plan Modification to the Plan of Operation Approval for the Phase IV
Landfill, Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County,
License # 4126.

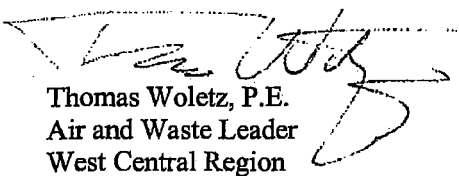
Dear Mr. Carothers:

We have completed our review of your May 4, 2009 letter and April 15, 2009 addendum requesting to add another coal combustion byproduct and eliminate the annual coal testing for geocomposite liner (GCL) compatibility. The letter requests an expedited modification to the plan of operation for these items. The addendum which was prepared by RMT provides a leaching potential and GCL compatibility analysis of Sherco #3 flue gas desulfurization (FGD) scrubber material. The Sherco #3 FGD scrubber material is believed to be similar to the DPC Genoa Station Unit 3 FGD scrubber which is under construction. While the report was submitted as an expedited plan modification we are conditionally approving the addition of the FGD material and eliminating the annual GCL compatibility testing for the Phase IV Landfill.

Conditions have been included for characterization of the material at the time it is generated and payment of the plan review fee. This approval should be attached to your May 15, 2001 Plan of Operation Approval.

Please contact Martin Herrick at (608) 789-5518 if you have any questions regarding this approval.

Sincerely,


Thomas Woletz, P.E.
Air and Waste Leader
West Central Region

cc: Brian Kalvelage/Marty Herrick-LAX
Curt Madsen, RMT, 744 Heartland Trail 53717-1934, PO Box 8923, Madison, WI 53708-8923



BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONDITIONAL PLAN OF OPERATION MODIFICATION
WASTE ADDITION
FOR
PHASE IV

DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY,
LICENSE # 4126

FINDINGS OF FACT

The Department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates a nonhazardous solid waste disposal facility located in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin.
2. The Department issued a conditional plan of operation approval for the facility on May 15, 2001.
3. On May 4, 2009 DPC submitted a letter to the Department requesting that the annual GCL compatibility testing be dropped and add the FGD material from the Genoa Station # 3 scrubber to the Phase IV landfill. The FGD material will be generated from the operation of new air pollution control equipment.
4. On December 3, 2009 the Department submitted invoice # 4206-9139 for \$1650 to Dairyland Power Cooperative for plan review of the May 4, 2009 report and April 15, 2009 Addendum.

CONCLUSIONS OF LAW

1. The Department has authority under s. 289.30(6) Stats. to modify a plan of operation approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500-590, Wis. Adm. Code.
2. The Department has authority to approve a plan operation modification with special conditions if the conditions are needed to ensure compliance with the applicable portions of chs. NR 500-590, Wis. Adm. Code.
3. The conditions of approval set forth below are needed to ensure compliance with the applicable portions of chs. NR 500- 590, Wis. Adm. Code
4. In accordance with the foregoing, the Department has authority under ch. 289., Stats., to issue the following conditional plan of operation approval.

CONDITIONS OF APPROVAL

1. Payment of the \$1650 plan review fee, Invoice # 4206-9139, shall be made to the Department within 30 days from the date it was received.
2. The results of the FGD material characterization from DPC Genoa Station Unit 3 shall be submitted to the Department within 90 days of being generated. The characterization shall include but not be limited to the following analytics:
 - a. Gradation with fraction greater than P200,
 - b. Moisture Content,
 - c. Total Metals per Table 1B in NR 538, Wis. Adm. Code,
 - d. Water Leach Test per Table 2A in NR 538, Wis. Adm. Code, where constituents exceed the 20:1 ratio for totals to TCLP values in the NR 600, Wis. Adm. Code.

The Department retains the jurisdiction to either require the submittal of additional information or to modify this approval at any time if, in the Department's opinion, conditions warrant further modifications. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

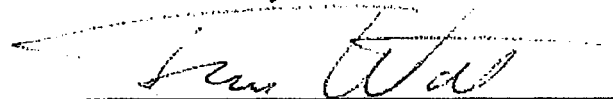
NOTIFICATION OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin statutes, administrative codes and case law establish time periods and requirements for reviewing Department decisions.

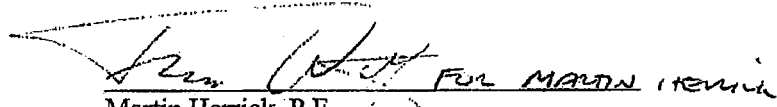
To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats., establish criteria for filing a petition for judicial review. Such a petition shall be filed with the appropriate circuit court and shall be served on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: December 4, 2009

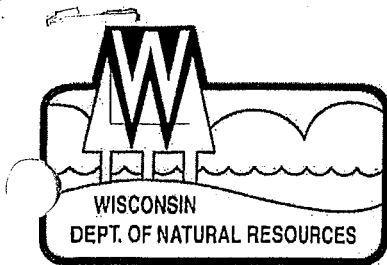
DEPARTMENT OF NATURAL RESOURCES
For the Secretary



Thomas Woletz, P.E.
Air and Waste Leader
West Central Region



Martin Herrick, P.E.
Environmental Engineer
West Central Region



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Matthew J. Frank, Secretary
Scott Humrickhouse, Regional Director

West Central Region Headquarters
1300 W. Clairemont Avenue
PO Box 4001
Eau Claire, Wisconsin 54702-4001
Telephone 715-839-3700
FAX 715-839-6076
TTY Access via relay - 711

January 29, 2010

Mr. Robert Carothers
Dairyland Power Cooperative
JPM Station
500 Old State Highway 35
Alma, WI. 54610

FID # 606009360
Buffalo Co.
SW/APPRV File

Subject: Construction Documentation Approval for Phase IV Cell 1 Final Cover Alma Off-Site
Ash Disposal Facility, Town of Belvidere, Buffalo County, License # 4126.

Dear Mr. Carothers:

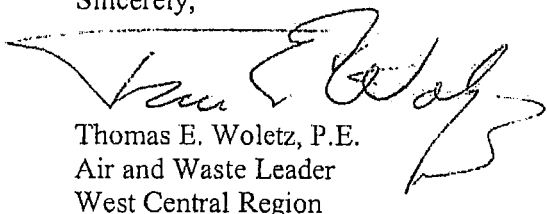
We have completed our review of your report entitled "Phase IV, Cell 1, Final Cover Construction Documentation Report, WDNR license No. 4126, Dairyland Power Cooperative Alma Off-site Ash Disposal Facility." The report was prepared by RMT and was dated January 2010. The report was received in the La Crosse Service Center on January 22, 2010. At this time we are approving the construction documentation for the Phase IV Cell 1 cap.

Conditions have been included for payment of the plan review and construction inspections invoice, inspection and repair of the topsoil and associated surface water control features.

This approval should be attached to your May 15, 2001 Plan of Operation Approval.

Please contact Martin Herrick at (608) 789-5518 if you have any questions regarding this approval.

Sincerely,



Thomas E. Woletz, P.E.
Air and Waste Leader
West Central Region

cc: Brian Kalvelage/Marty Herrick-LAX
Bill Kowalski, Dairyland Power Cooperative, 3200 East Avenue South, PO Box 817,
La Crosse, WI 54602-0817
Curt Madsen, RMT, 744 Heartland Trail, Madison, WI 53717

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL
PHASE IV, CELL 1 CAP

FOR THE
DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY,
LICENSE # 4126

FINDINGS OF FACT

The Department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates a nonhazardous solid waste disposal facility located in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin.
2. The Department issued a conditional plan of operation approval for the facility on May 15, 2001.
3. The Department issued a conditional plan modification to the May 15, 2001 Plan of Operation Approval on March 4, 2004 allowing the use of two feet of select fly ash to be substituted for the GCL (geocomposite liner) in the cap.
4. The Department issued a conditional plan modification to the May 15, 2001 Plan of Operation Approval on September 21, 2009 adding soil borrow areas for select granular fill, general fill and topsoil for the cap.
5. The Department issued conditional construction documentation approvals for the cell's 1 and 2A liners on March 11, 2002 and March 28, 2007 respectively.
6. The information submitted in connection with the construction documentation includes the following:
 - a. A report entitled Phase IV, Cell 1, Final Cover Construction documentation report, WDNR License No. 4126, Dairyland Power Cooperative Alma Off-site Disposal Facility" and 11 associated engineering drawings dated January 2008.
7. Additional information considered in the review of the construction documentation;
 - a. August 31, 2009 Dairyland Power Cooperative-Alma Offsite Disposal Facility (License #4126) Phase IV Disposal Area, Cell 1 Preconstruction Report,
8. Construction inspections were performed by the Department for the following on:
 - a. Placement of select fly ash by Martin Herrick on July 9, 2009,
 - b. Grading of select fly ash by Martin Herrick on August 20, 2009,
 - c. Placing geomembrane by Martin Herrick on September 30, 2009,
 - d. Placing drainage layer by Martin Herrick on October 12, 2009.
9. On January 28, 2010 the Department submitted invoice # 4206-9174 to Dairyland Power

Cooperative. The invoice included \$ 1100 for review of the construction documentation and \$2200 for four construction inspections.

CONCLUSIONS OF LAW

1. The Department has authority under ss. 289.43(7) and 289.43(8), Stats., and ch. NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the May 15, 2001 Conditional Plan of Operation Approval.
2. If the conditions of approval set forth below are complied with the applicant will have demonstrated that the facility has been constructed in substantial compliance with the NR 500 to NR 590 Series of the Wis. Adm. Code and the May 15, 2001 Conditional Plan of Operation Approval.
3. The Department has authority under s. 289.30(6), Stats., to modify a plan of operation approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500- 590, Wis. Adm. Code

CONDITIONS OF APPROVAL

The Department hereby approves the construction documentation for the Dairyland Power Cooperative Phase IV Cell 1 Cap at the Alma Off-Site Ash Disposal Facility subject to NR 500-590, Wis. Adm. Code, the May 15, 2001 Conditional Plan of Operation Approval and subsequent plan modifications and the following conditions:

1. Dairyland Power Cooperative shall inspect the Cell 1 cap after major storm events and on a monthly basis and make repairs as necessary.
2. Cleaning and restoration of the surface water control features shall be performed as necessary.

The Department retains the jurisdiction to either require the submittal of additional information or to modify this approval at any time if, in the Department's opinion, conditions warrant further modifications. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

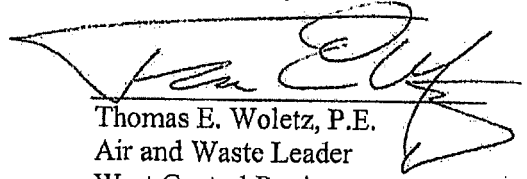
NOTIFICATION OF APPEAL RIGHTS

If you believe that you have the right to challenge this decision made by the Department, you should know that Wisconsin statutes, administrative codes and case law establish time periods and requirements for reviewing Department decisions.

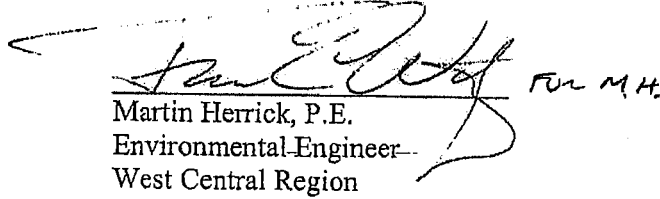
To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats. establish criteria for filing a petition for judicial review. Such a petition shall be filed with the appropriate circuit court and shall be served on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: JANUARY 29, 2010

Department of Natural Resources
For the Secretary



Thomas E. Woletz, P.E.
Air and Waste Leader
West Central Region

 for M.H.

Martin Herrick, P.E.
Environmental Engineer
West Central Region

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Wisconsin Department of Natural Resources
3550 Mormon Coulee Road
LaCrosse WI 54601

Scott Walker, Governor
Cathy Stepp, Secretary
Scott Humrickhouse, Regional Director
Telephone 608-789-9000
FAX 608-785-9990
TTY 608-785-9000



March 14, 2011

Mr. Robert Carothers
Dairyland Power Cooperative
JPM Station
500 Old State Highway 35
Alma, WI 54610

Subject: Conditional Plan Modification to Plan of Operation Approval for the Phase IV Cap, Alma Off-Site Disposal Facility, Town of Belvidere, Buffalo County, License # 4126

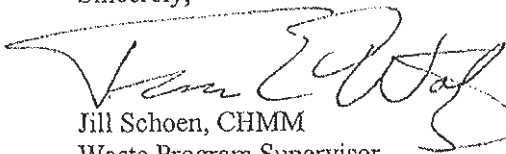
Dear Mr. Carothers:

We have completed our review of your plan modification request to delete electrical resistivity testing from the Phase IV landfill cap construction documentation. The request was made by letter dated March 3, 2011 which also included a Wisconsin Professional Engineer certification by Curt Madsen of RMT.

The Department concurs with your proposal as the landfill liner sections will be leak location tested in accordance with NR 516.07(2)(d), Wis. Adm. Code. The Department is approving your proposed plan modification with conditions for payment of the plan review fee and deletion of the cap leak location testing. This approval should be attached to your May 15, 2001 Plan of Operation Approval.

Please contact Martin Herrick at (608) 789-5518 if you have any questions regarding this approval.

Sincerely,


Jill Schoen, CHMM
Waste Program Supervisor
West Central Region

CC: Bill Kowalski – Dairyland Power Cooperative, 3200 East Avenue South, PO Box 817, La Crosse, WI 54602
Curt Madsen – RMT, Heartland Trail 53717-1934, PO Box 8923, Madison, WI 53708-8923

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONDITIONAL PLAN OF OPERATION MODIFICATION
PHASE IV CLOSURE PLAN

FOR THE

DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY
LICENSE #4126

FINDINGS OF FACT

The Department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates a non hazardous solid waste disposal facility located in the NE ¼ of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County Wisconsin.
2. The Department issued a Conditional Plan of Operation Approval for the facility on May 15, 2001.
3. On March 3, 2011 DPC submitted a letter to Martin Herrick of the Department requesting a modification to the May 15, 2001 Plan of Operation Approval to delete the electrical resistivity leak location testing from the Phase IV geomembrane cap construction. The letter included a Wisconsin Professional Engineer certification by Curt Madsen of RMT.
4. NR 516.072(d), Wis. Adm. Code requires leak location testing be performed on geomembrane liners in landfills.
5. On March 10, 2011 the Department issued invoice #4206-9452 for \$1650 to DPC for the plan review of the proposed plan modification.

CONCLUSIONS OF LAW

1. The Department has authority under s. 289.30(6) Stats. to modify a plan of operation approval if the modifications would not inhibit compliance with the applicable portions of the NR 500 Series Wisconsin Administrative Code.
2. The Department has authority to approve a plan of operation modification with special conditions if the conditions are needed to ensure compliance with the applicable portions of the NR 500 Series Wisconsin Administrative Code.
3. The conditions of approval set forth below are needed to ensure compliance with the applicable portion of the NR 500 Series, Wisconsin Administrative Code.
4. In accordance with the foregoing, the Department has authority under ch.289., Stats., to issue the following conditional plan of operation approval modification.

CONDITIONS OF APPROVAL

The Department hereby approves the proposed plan modification for the DPC Phase IV Cap at the Alma Off-Site Ash Disposal Facility subject to the NR 500 Series, Wis. Adm. Code, the May 15, 2001 Conditional Plan of Operation Approval and the following conditions:

1. Payment of invoice #4206-9452 shall be made to the Department within 30 days from the date of receipt.
2. Electrical resistivity leak location testing for the cap construction documentation of the Phase IV Landfill is rescinded.

The Department retains the jurisdiction to either require the submittal of additional information or to modify this approval at any time if, in the Department's opinion, conditions warrant further modifications. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

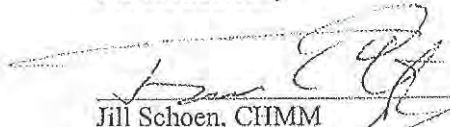
NOTICE OF APPEAL RIGHTS

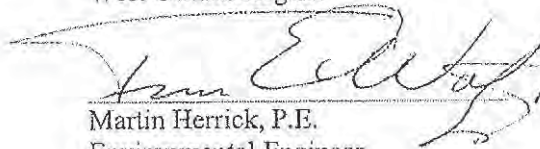
If you believe you have a right to challenge this decision made by the Department, you should know that Wisconsin statutes and administrative codes establish time periods and requirements for reviewing Department decisions.

To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats., establish criteria for filing a petition for judicial review. You have 30 days after the decision is mailed or otherwise served by the Department to file your petition with the appropriate circuit court and serve the petition on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: MARCH 14, 2011

Department of Natural Resources
For the Secretary


Jill Schoen, CHMM
Waste Program Supervisor
West Central Region


Martin Herrick, P.E.
Environmental Engineer
West Central Region

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Wisconsin Department of Natural Resources
PO Box 4001
Eau Claire, WI 54702

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711



January 20, 2012

Mr. Robert Carothers
Dairyland Power Cooperative
JPM Station
500 Old State Highway 35
Alma, WI 54610

FID# 606043900
Buffalo Co.
SW/APPRV File

Subject: Construction Documentation Approval for Phase IV Cell 2A Final Cover Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County, License # 4126

Dear Mr. Carothers:

We have completed our review of your report entitled "Phase IV, Cell 2A, Final Cover Construction Documentation Report WDNR license No. 4126 Dairyland Power Cooperative Alma Off-Site Ash Disposal Facility." The report was prepared by TRC and was dated December 2011. The report was received in the La Crosse Service Center on January 09, 2012. At this time we are approving the construction documentation for the Phase IV Cell 2A cap.

Conditions have been included for payment of the plan review and construction inspections invoice, a plan sheet showing existing surface water management, inspection and repair of the topsoil and associated surface water control features.

This approval should be attached to your May 15, 2001 Plan of Operation Approval.

Please contact Martin Herrick at (608) 789-5518 if you have any questions regarding this approval.

Sincerely,

A handwritten signature in cursive script that reads "Jill Schoen".

Jill Schoen, CHMM
Waste & Materials Management Program Supervisor
West Central Region

cc: Brian Kalvelage/Marty Herrick-LAX
Bill Kowalski-Dairyland Power Cooperative, 3200 East Avenue South, PO Box 817,
La Crosse, WI 54602-0817
Curt Madsen - TRC, 708 Heartland Trail, Suite 3000, Madison, WI 53717

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL
PHASE IV, CELL 2A CAP

FOR THE
DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY,
LICENSE # 4126

FINDINGS OF FACT

The Department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates a nonhazardous solid waste disposal facility located in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin.
2. The Department issued a conditional plan of operation approval for the facility on May 15, 2001.
3. The Department issued a conditional plan modification to the May 15, 2001 Plan of Operation Approval on March 4, 2004 allowing the use of two feet of select fly ash to be substituted for the GCL (geocomposite liner) in the cap.
4. The Department issued a conditional plan modification to the May 15, 2001 Plan of Operation Approval on September 21, 2009 adding soil borrow areas for select granular fill, general fill and topsoil for the cap.
5. The Department issued conditional construction documentation approvals for the Phase IV cell's 1 and 2A liners on March 11, 2002 and March 28, 2007 respectively.
6. The Department issued a conditional construction documentation approval for the Phase IV Cell 1 cap on January 29, 2010.
7. The Department issued a conditional plan modification on March 14, 2011 allowing the deletion of the resistivity testing for the Phase IV cap.
8. The information submitted in connection with the construction documentation includes the following:
 - a. A report entitled "Phase IV, Cell 2A, Final Cover Construction Documentation Report WDNR License No. 4126, Dairyland Power Cooperative Alma Off-Site Ash Disposal Facility" and ten associated engineering drawings dated December 2011."
9. Additional information considered in the review of the construction documentation:
 - a. August 3, 2011 Dairyland Power Cooperative-Alma Offsite Disposal Facility (License #4126) Phase IV Disposal Area, Cell 2A Preconstruction Report,
 - b. July 12, 2009 E-mail from Bill Kowlaski of DPC to Marty Herrick of the Department requesting the use of G-3 fly ash in the Phase IV cap,
 - c. July 14, 2011 E-mail from Terry Halena of TRC to Marty of Herrick of the Department regarding cross seams in geomembrane panel placement,

- d. July 21, 2011 E-mail from Terry Halena of TRC to Marty Herrick of the Department requesting to eliminate environmental stress crack resistance.
10. Construction inspections were performed by the Department for the following on:
- a. Placement of the select fly ash by Martin Herrick on July 13, 2011,
 - b. Installation of the geomembrane by Martin Herrick on August 18, 2011,
 - c. Placement of the sand drainage blanket by Martin Herrick on August 26, 2011,
 - d. Placement of topsoil and seeding by Martin Herrick on September 21, 2011.
11. On January 12, 2012 the Department submitted invoice # 4206-9671 to Dairyland Power Cooperative. The invoice included \$1100 for review of the construction documentation and \$2200 for four construction inspections.

CONCLUSIONS OF LAW

1. The Department has authority under ss. 289.43(7) and 289.43(8), Stats., and ch. NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the May 15, 2001 Conditional Plan of Operation Approval.
2. If the conditions of approval set forth below are complied with the applicant will have demonstrated that the facility has been constructed in substantial compliance with the NR 500 to NR 590 Series of the Wis. Adm. Code and the May 15, 2001 Conditional Plan of Operation Approval.
3. The Department has authority under s. 289.30(6), Stats., to modify a plan of operation approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500- 590, Wis. Adm. Code.

CONDITIONS OF APPROVAL

The Department hereby approves the construction documentation for the Dairyland Power Cooperative Phase IV Cell 2A Cap at the Alma Off-Site Ash Disposal Facility subject to NR 500-590, Wis. Adm. Code, the May 15, 2001 Conditional Plan of Operation Approval and subsequent plan modifications and the following conditions:

1. Dairyland Power Cooperative shall inspect the Cell 2A cap after major storm events and on a monthly basis and make repairs as necessary.
2. Cleaning and restoration of the surface water control features shall be performed as necessary.
3. Payment of invoice #4206-9671 shall be made to the Department within 30 days of receipt.
4. A plan sheet showing the existing surface water management features shall be provided to the Department within 60 days from the date of this approval.

This approval is based on the information available to the Department as of the date of approval. If additional information, project changes or other circumstances indicate a possible need to modify this approval, the Department may ask you to provide further information relating to this activity. Likewise, you may request a modification of this approval based on additional information, project changes or other circumstances as provided for in state statues and administrative codes. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

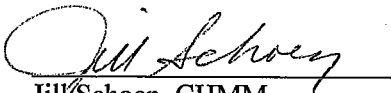
NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision made by the Department, you should know that Wisconsin statutes and administrative codes establish time periods and requirements for reviewing Department decisions.

To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats. establish criteria for filing a petition for judicial review. You have 30 days after the decision is mailed or otherwise served by the Department to file your petition with the appropriate circuit court and serve the petition on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: January 20, 2012

DEPARTMENT OF NATURAL RESOURCES
For the Secretary



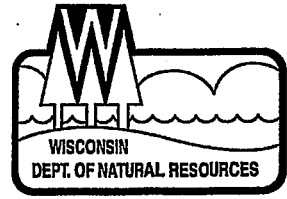
Jill Schoen, CHMM
Waste & Materials Management Program Supervisor
West Central Region



Martin Herrick, P.E.
Environmental Engineer
West Central Region

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
1300 W Clairemont Avenue
Eau Claire, WI 54701

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711



March 7, 2013

Mr. Robert Carothers
Dairyland Power Cooperative
JPM Station
500 Old State Highway 35
Alma, WI 54610

FID# 606043900
Buffalo Co.
SW/APPRV File

Subject: Construction Documentation Approval for Phase IV Cell 3A Liner Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County, License # 4126

Dear Mr. Carothers:

We have completed our review of your report entitled "Phase IV, Cell 3A Liner Construction Documentation Report Dairyland Power Cooperative Alma Off-Site Ash Disposal Facility." The report was prepared by TRC and was dated January 2013. The report was received in the La Crosse Service Center on January 28, 2013. At this time we are approving the construction documentation for the Phase IV Cell 3A liner and you can begin filling in the cell.

Conditions have been included for payment of the plan review and construction inspections invoice, placement of four feet of ash by December 1, 2014, inspection and repair of the drainage blanket, associated surface water control features and review of the closure and long term care costs for the landfill.

This approval should be attached to your May 15, 2001 Plan of Operation Approval.

Please contact Martin Herrick at (608) 789-5518 if you have any questions regarding this approval.

Sincerely,

Jill Schoen, CHMM
Waste & Materials Management Program Supervisor
West Central Region

cc: Brian Kalvelage/Marty Herrick-LAX
Bill Kowalski-Dairyland Power Cooperative, 3200 East Avenue South, PO Box 817,
La Crosse, WI 54602-0817
~~Curt Madsen - TRC, 708 Heartland Trail, Suite 3000, Madison, WI 53717~~

**BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES**

**CONSTRUCTION DOCUMENTATION APPROVAL
PHASE IV, CELL 3A LINER**

**FOR THE
DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY,
LICENSE # 4126**

FINDINGS OF FACT

The Department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates a nonhazardous solid waste disposal facility located in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin.
2. The Department issued a conditional plan of operation approval for the facility on May 15, 2001.
3. The Department issued conditional construction documentation approvals for the Phase IV cell's 1, 2A and 2B liners on March 11, 2002, March 28, 2007 and March 21, 2008 respectively.
4. On June 20, 2012 Terry Halena of TRC sent an email to Martin Herrick of the Department requesting that the conformance testing for environmental stress crack resistance from the geomembrane vendor (GSE) be substituted for the requirement in Condition No. 5 of the Department's May 15, 2001 Conditional Plan of Operation Approval. On June 27, 2012 Martin Herrick of the Department sent a response email concurring.
5. On September 4, 2012 a geomembrane preconstruction meeting was held at the Phase IV Landfill.
6. The information submitted in connection with the construction documentation includes the following:
 - a. A report entitled "Phase IV, Cell 3A Liner Construction Documentation Report Dairyland Power Cooperative Alma Off-Site Ash Disposal Facility," and sixteen associated engineering drawings dated January 2013.
7. Additional information considered in the review of the construction documentation:
 - a. A report entitled "August 14, 2012 Dairyland Power Cooperative-Alma Offsite Disposal Facility (License #4126) Preconstruction Report: Liner Construction - Phase IV, Cell 3A,
 - b. Department files for the Dairyland Power Cooperative – Alma Offsite Ash Disposal Facility, Phase IV.

8. Construction inspections were performed by the Department for the following on:
 - a. Subbase preparation on June 13, 2012 by Martin Herrick,
 - b. Low permeability barrier soils placement on September 4, 2012 by Martin Herrick,
 - c. Geomembrane and GCL liner installation on September 21, 2012 by Martin Herrick,
 - d. Sand Drainage Blanket and leachate collection system installation on November 26, 2012 by Martin Herrick.
9. On March 1, 2013 the Department submitted invoice #4206-10053 to Dairyland Power Cooperative. The invoice included \$1100 for review of the construction documentation and \$2200 for four construction inspections.

CONCLUSIONS OF LAW

1. The Department has authority under ss. 289.43(7) and 289.43(8), Stats., and ch. NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the May 15, 2001 Conditional Plan of Operation Approval.
2. If the conditions of approval set forth below are complied with the applicant will have demonstrated that the facility has been constructed in substantial compliance with the NR 500 to NR 590 Series of the Wis. Adm. Code and the May 15, 2001 Conditional Plan of Operation Approval.
3. The Department has authority under s. 289.30(6), Stats., to modify a plan of operation approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500- 590, Wis. Adm. Code.

CONDITIONS OF APPROVAL

The Department hereby approves the construction documentation for the Dairyland Power Cooperative Phase IV Cell 3A liner at the Alma Off-Site Ash Disposal Facility subject to NR 500-590, Wis. Adm. Code, the May 15, 2001 Conditional Plan of Operation Approval and subsequent plan modifications and the following conditions:

1. Dairyland Power Cooperative shall inspect the sand drainage blanket and liner of Phase IV Cell 3A after major storm events and on a monthly basis and make repairs as necessary. Inspection and repair of the sand drainage blanket and liner shall continue until enough material has been placed to prevent it from eroding.
2. The depth of wheel rutting from haul trucks placing the ash shall be used as a performance measure to limit the moisture content of the ash placed in Phase IV Cell, 3A. When ash is being placed no wheel ruts deeper than 2 inches shall be allowed.
3. Payment of invoice #4206-10053 shall be made to the Department within 30 days of receipt.
4. Dairyland Power Cooperative shall place four feet of ash on the bottom and initial 10 ft. of slope for the newly constructed cell by January 1, 2014.
5. Cleaning and restoration of the surface water control features shall be performed as necessary.
6. The closure and long term care costs for the Phase IV landfill shall be reviewed and updated as necessary. If revisions are required they shall be submitted to the Department within 90 days from the date of this approval.

This approval is based on the information available to the Department as of the date of approval. If additional information, project changes or other circumstances indicate a possible need to modify this approval, the Department may ask you to provide further information relating to this activity. Likewise, you may request a modification of this approval based on additional information, project changes or other circumstances as provided for in state statutes and administrative codes. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

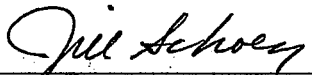
NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision made by the Department, you should know that Wisconsin statutes and administrative codes establish time periods and requirements for reviewing Department decisions.

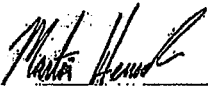
To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats. establish criteria for filing a petition for judicial review. You have 30 days after the decision is mailed or otherwise served by the Department to file your petition with the appropriate circuit court and serve the petition on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: March 7, 2013

DEPARTMENT OF NATURAL RESOURCES
For the Secretary



Jill Schoen, CHMM
Waste & Materials Management Program Supervisor
West Central Region



Martin Herrick, P.E.
Environmental Engineer
West Central Region

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Wisconsin Department of Natural Resources
1300 W Clairmont Avenue
Eau Claire, WI 54701

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711



December 2, 2013

Mr. Brian Treadway
Dairyland Power Cooperative
JPM Station 500 Old State Highway 35
Alma, WI 54610

FID # 606009360
Buffalo Co.
SW/APPRV FILE

Subject: Conditional Plan Modification to the Plan of Operation Approval for the Phase IV Landfill, Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County, License #4126

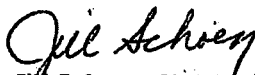
Dear Mr. Treadway:

We have completed our review of your November 4, 2013 plan modification request to add waste sources to the Phase IV Alma Off-Site Ash Disposal Facility. The request was prepared by TRC Environmental Corporation (TRC) on behalf of Dairyland Power Cooperative (DPC) and was received in the La Crosse Service Center on November 6, 2013.

Conditions have been included for characterization of the material at the time it is generated and payment of the plan review fee. Note that while we are not including any conditions on the placement methods for the new materials added to the Phase IV Landfill we are recommending that they be placed in large horizontal lifts in order to provide additional time for the material to set up.

This approval should be attached to your May 15, 2001 Plan of Operation Approval. Please contact Martin Herrick at (608) 789-5518 if you have any questions regarding this approval.

Sincerely,


Jill Schoen, CHMM
Waste Program Supervisor
West Central Region

cc: Brian Kalvelage/Marty Herrick-LAX
Curt Madsen, TRC, 708 Heartland Trail, Suite 3000, Madison, WI 53717
Bill Kowalski-Dairyland Power Cooperative, 3200 East Avenue South, PO Box 817, LaCrosse, WI 54602

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONDITIONAL PLAN OF OPERATION MODIFICATION
WASTE ADDITION
FOR
PHASE IV
DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY,
LICENSE # 4126

FINDINGS OF FACT

The Department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates a nonhazardous solid waste disposal facility located in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin,
2. The Department issued a conditional plan of operation approval for the facility on May 15, 2001.
3. On November 4, 2013 TRC on behalf of DPC submitted a plan modification request to the Department to add the following waste streams from the respective sources:

J. P. Madgett Power Plant (Alma, WI)

Genoa Unit 3 Power Plant (Genoa, WI)

Dry Sorbent Injection
Activated Carbon Injection
Selective Catalytic Reduction

Activated Carbon Injection
Selective Non-Catalytic Reduction

The submittal included a narrative and partial characterization of the respective wastes.

4. On November 26, 2013 the Department submitted invoice #4206-10259 for \$1650 to DPC for plan review of the November 4, 2013 report.

CONCLUSIONS OF LAW

1. The Department has authority under s. 289.30(6) Stats. to modify a plan of operation approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500-590, Wis. Adm. Code.
2. The Department has authority to approve a plan operation modification with special conditions if the conditions are needed to ensure compliance with the applicable portions of chs. NR 500-590, Wis. Adm. Code.
3. The conditions of approval set forth below are needed to ensure compliance with the applicable portions of chs. NR 500- 590, Wis. Adm. Code
4. In accordance with the foregoing, the Department has authority under ch. 289., Stats., to issue the following conditional plan of operation approval.

CONDITIONS OF APPROVAL

The Department hereby approves the proposed plan modification for the additional waste streams at the DPC Phase IV Alma Off-Site Ash Disposal Facility subject to the NR 500 Series, Wis. Adm. Code, the May 15, 2001 Conditional Plan of Operation Approval, subsequent modifications and the following conditions:

1. Payment of invoice # 4206-10259 shall be made to the Department within 30 days from the date of receipt.
2. At the time of generation the following waste streams shall be physically and chemically characterized

J. P. Madgett Power Plant (Alma, WI)

Genoa Unit 3 Power Plant (Genoa, WI)

Dry Sorbent Injection

Activated Carbon Injection

Activated Carbon Injection

Selective Non-Catalytic Reduction

Selective Catalytic Reduction

The characterization shall include but not be limited to the following analytics:

- a. Gradation with fraction greater than P200,
- b. Moisture Content,
- c. Total Metals per Table 1B in NR 538, Wis. Adm. Code,
- d. Water Leach Test per Table 2A in NR 538, Wis. Adm. Code, where constituents exceed the 20:1 ratio for totals to TCLP values in the NR 600 Series, Wis. Adm. Code.

The results of the respective characterizations shall be submitted to the Department within 90 days from their initial generation.

This approval is based on the information available to the Department as of the date of approval. If additional information, project changes or other circumstances indicate a possible need to modify this approval, the Department may ask you to provide further information relating to this activity. Likewise, you may request a modification of this approval based on additional information, project changes, or other circumstances as provided for in state statutes and administrative codes. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision made by the Department, you should know that Wisconsin statutes and administrative codes establish time periods and requirements for reviewing Department decisions.

To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats. establish criteria for filing a petition for judicial review. You have 30 days after the decision is mailed or otherwise served by the Department to file your petition with the appropriate circuit court and serve the petition on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: December 2, 2013

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Jill Schoen

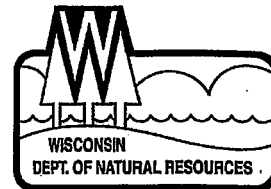
Jill Schoen, CHMM
Waste Program Supervisor
West Central Region

Martin Herrick

Martin Herrick, P.E.
Environmental Engineer
West Central Region

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Wisconsin Department of Natural Resources
1300 W Clairemont Avenue
Eau Claire, WI 54701

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711



August 19, 2014

Mr. Brian Treadway
Dairyland Power Cooperative
JPM Station 500 Old State Highway 35
Alma, WI 54610

FID # 606009360
Buffalo Co.
SW/APPR FILE

Subject: Conditional Plan Modification to the Plan of Operation Approval for the Phase IV Landfill, Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County, License #4126

Dear Mr. Treadway:

We have completed our review of your June 30, 2014 expedited plan modification request to revise the sub-base under Cell 3B of the Phase IV Alma Off-Site Ash Disposal Facility. The request was prepared by TRC Environmental Corporation (TRC) on behalf of Dairyland Power Cooperative (DPC) and was received in the La Crosse Service Center on July 1, 2014.

Note that we are approving this as a conditional plan modification and not as an expedited plan modification approval because an exemption is being granted for this proposal in accordance with NR 514.09 9(1)(a), Wis. Adm. Code. A low hazard grant of exemption for the placement of the dredged material from the Mississippi River is being issued under a separate approval.

Conditions have been included for construction documentation of the dredged materials placement as liner sub-base and payment of the plan review fee.

This approval should be attached to your May 15, 2001 Plan of Operation Approval. Please contact Martin Herrick at (608) 789-5518 if you have any questions regarding this approval.

Sincerely,

Jill Schoen, CHMM
Waste & Materials Management Program Supervisor
West Central Region

cc: Brian Kalvelage/Marty Herrick-LAX
Curt Madsen, TRC, 708 Heartland Trail, Suite 3000, Madison, WI 53717
Bill Kowalski, Dairyland Power Cooperative, 3200 East Avenue South, PO Box 817,
La Crosse, WI 54602

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONDITIONAL PLAN OF OPERATION MODIFICATION
LINER SUB BASE
FOR
PHASE IV, CELL 3B

DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY,
LICENSE # 4126

FINDINGS OF FACT

The Department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates a nonhazardous solid waste disposal facility located in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin,
2. The Department issued a conditional plan of operation approval for the facility on May 15, 2001.
3. On June 30, 2014 TRC on behalf of DPC submitted a plan modification request to the Department to revise the sub-base soils for Cell 3B of the Phase IV Landfill. The submittal included a narrative, characterization of the dredged material from the Mississippi River and 8 plan sheets.
4. On July 10, 2014 Bill Kowalski of Dairyland Power Cooperative requested a low hazard grant of exemption for the Alma Off-Site Ash Disposal Facility Phase IV Landfill to accept dredged material from the Grand Encampment storage facility located in the Mississippi River near Alma, Wisconsin. The dredged material would be substituted for the in-situ sub-base soils in Cell 3B.
5. On August 13, 2014 the Department submitted invoice # 4206-10472 for \$ 1650 to DPC for plan review of the June 30, 2014 report.

CONCLUSIONS OF LAW

1. The Department has authority under s. 289.30(6) Stats. to modify a plan of operation approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500-590, Wis. Adm. Code.
2. The Department has authority to approve a plan operation modification with special conditions if the conditions are needed to ensure compliance with the applicable portions of chs. NR 500-590, Wis. Adm. Code.
3. The conditions of approval set forth below are needed to ensure compliance with the applicable portions of chs. NR 500- 590, Wis. Adm. Code
4. In accordance with the foregoing, the Department has authority under ch. 289, Stats., to issue the following conditional plan of operation approval.

CONDITIONS OF APPROVAL

The Department hereby approves the proposed plan modification for the additional waste streams at the DPC Phase IV Alma Off-Site Ash Disposal Facility subject to the NR 500 Series, Wis. Adm. Code, the May 15, 2001 Conditional Plan of Operation Approval, subsequent modifications and the following conditions:

1. Payment of invoice # 4206-10472 shall be made to the Department within 30 days from the date of receipt.
2. Documentation of the placement of the sub-base materials shall be included with the Cell 3B liner construction documentation report.

This approval is based on the information available to the Department as of the date of approval. If additional information, project changes or other circumstances indicate a possible need to modify this approval, the Department may ask you to provide further information relating to this activity. Likewise, you may request a modification of this approval based on additional information, project changes, or other circumstances as provided for in state statutes and administrative codes. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision made by the Department, you should know that Wisconsin statutes and administrative codes establish time periods and requirements for reviewing Department decisions.

To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats. establish criteria for filing a petition for judicial review. You have 30 days after the decision is mailed or otherwise served by the Department to file your petition with the appropriate circuit court and serve the petition on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: August 19, 2014

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Jill Schoen
Jill Schoen, CHMM
Waste & Materials Management Program Supervisor
West Central Region

As for Martin Herrick
Martin Herrick, P.E.
Environmental Engineer
West Central Region

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
1300 W Clairemont Avenue
Eau Claire WI 54701

COR - FILE:

PS
Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711



October 23, 2014

Mr. Brian Treadway
Dairyland Power Cooperative
JPM Station 500 Old State Highway 35
Alma WI 54615

FID#606043900
SW/APPR
Buffalo Co.

Subject: Grant of Exemption, Low Hazard Waste Dredged Material Disposal Site at the Phase IV Landfill, Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County, License #4126

Dear Mr. Treadway:

The Department has reviewed and is approving your request to use low hazard dredge material as sub-base under the Alma Off-Site Phase IV Ash Disposal Facility. On July 10, 2014 the Department received an email request from Bill Kowalski of Dairyland Power Cooperative (DPC) for a low hazard grant of exemption in accordance with s. 289.43, Wis. Statutes. On August 12, 2014 a public notice was placed in the Buffalo County Journal for an informational hearing on the proposed disposal site. On August 27, 2014 an information meeting was held for the proposed disposal site.

Approximately 50,000 yards of dredged material will be placed as sub-base backfill for the exhumed low permeability soils, which will be used in DPC's future liner construction in Cells 3B and 4A of the Phase IV Landfill. The dredged material will occupy 2.76 acres of the landfill's 32.1 acre footprint. The Phase IV landfill is located in the NE ¼ of the NE ¼ of Section 19 and portions of Sections 18 and 20, Township 21N, Range 12W, Town of Belvidere, Buffalo County. The Phase IV Landfill is part of a 1113 acres parcel own by DPC. The dredge material is sediment from the U.S. Army Corps of Engineers Grand Encampment facility near Alma, Wisconsin.

This exemption is being granted under s. 289.43(8), Wis. Statutes., and is subject to conditions of the attached exemption document. Conditions have been included for payment of the plan review fee and operational activities associated with the placement of the dredged sediment material. Please note that this grant of exemption does not relieve you of the obligation to comply with all other applicable federal, state and local laws.

If you have any questions regarding this grant of exemption please contact Martin Herrick at (608) 789-5518.

Sincerely,

Jill Schoen, CHMM
Waste & Materials Management Program Manager
West Central Region

CC-LIST

PROJECT SUMMARY

DPC has requested a low hazard exemption from the Department for the placement of up to 50,000 yards of dredged sediment from the Mississippi River on 2.76 acres of land located in the NE ¼ of the NE ¼ of Section 19, Portions of Section 18 and Portions of Section 20, Township 21N, 12W, Town of Belvidere, Buffalo County Wisconsin. The proposed disposal site is in the sub-base of the Phase IV landfill and is part of a 1113 acre parcel of land owned by DPC.

On July 10, 2014 DPC requested the low hazard exemption via email. Supplemental information was submitted prior to this date to other Department programs. On August 12, 2014 the Department published a notice for an informational hearing in the Buffalo County Journal for the proposed disposal of dredged material in the sub-base of the Phase IV Landfill. On August 27, 2014 the Department held an informational hearing on the proposed disposal site. Attendees included the public, Hoffman Construction, the U.S. Army Corps of Engineers and Jill Schoen, Sarah Strassman and Martin Herrick of the Department.

The dredged sediment is material from the U.S. Army Corps of Engineers 9 foot channel maintenance program on the Mississippi River. The sediment was previously dredged and stockpiled on the Grand Encampment site located in the Mississippi River near the marina in Alma, Wisconsin. The Grand Encampment material will be dredged to the river's shore and then transferred via trucks to the DPC property. The route taken for the trucks will be on State Highway 35. Trucks will be tarped when transporting on the highway. The proposed hours of operation are from 7:00 am to 6:00 pm Monday through Friday.

Prior to the initial dredging, the sediment was sampled in-situ in the Mississippi River. Maximum concentrations of [.18 ppm] PCBs, [.4 ppm] Hg, [28 ppm] Pb, and [11.2 ppm] As were detected. The averages of the mercury and lead samples are [.091] and [7.7] ppm respectively and mobilization of constituents from the dredged material is not expected. The dredged material is composed primarily of medium sized sand particles, with minimal amounts of coarse and fine grained material. The dredged material will undergo additional dewatering as a result of the second dredging process.

Placement of the sediment in the disposal site will be in accordance with Department's August 19, 2014 Conditional Plan Modification Approval and DPC's June 30, 2014 Plan of Operation Modification submittal. Stormwater management for the project is addressed by the Department's May 15, 2001 Plan of Operation Approval. Zoning for the project is addressed through Buffalo County's conditional use permit.

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONDITIONAL GRANT OF SOLID WASTE EXEMPTION
FOR
DISPOSAL OF DREDGED MATERIAL
LINER SUB BASE
FOR
PHASE IV, CELL 3B
DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY
LICENSE #4126

FINDINGS OF FACT

The Department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates a nonhazardous solid waste disposal facility located in the NE ¼ of the NE ¼ of Section 19 and portions of Sections 18 and 20, Township 21 N, Range 12W, Town of Belvidere, Buffalo County, Wisconsin. DPC is proposing to use approximately 2.76 acres of the facility's 32.1 acre footprint for disposal of nonhazardous dredged material. The total contiguous property is 1113 acres.
2. The U.S. Army Corps of Engineers (COE) has stockpiled approximately 600,000 yards of dredged sediment from the Mississippi River at their Grand Encampment facility located off shore near the Alma Marina in Alma, Wisconsin. The dredging is part of the COE 9 foot channel maintenance in the Mississippi River. The Grand Encampment site is used to consolidate and store material from multiple dredging locations prior to final disposal. Previously removal of the stockpiled sediment has occurred on 10 to 15 year intervals.
3. On July 10, 2014 Bill Kowalski of DPC requested a low hazard grant of exemption for Cell 3B of the Phase IV Alma Off-Site Ash Disposal Facility to accept dredged material from the Grand Encampment Storage Facility. DPC is proposing to substitute approximately 50,000 yards of sediment for the low permeability soils located below the Phase IV landfill liner. The exhumed low permeability soils will be used in the landfill's composite liner. The submittal included the following:
 - a. A July 10, 2014 email with drawings from Bill Kowalski of DPC to Martin Herrick of the Department,
 - b. COE sampling summary for the Grand Encampment, Table 6 contaminant data for pool 4 of the upper Mississippi River, which was received via email from Carrie Olson of the Department to Martin Herrick of the Department on January 21, 2014,
 - c. A September 25, 2014 email with drawings from Bill Kowalski of DPC to Martin Herrick of the Department.
4. On August 12, 2014 the Department public noticed an informational hearing in the Buffalo County Journal in accordance with Ch. 289.54, Wis. Stats.
5. On August 19, 2014 the Department issued a Conditional Plan of Operation Modification for the Alma Off-Site Ash Disposal Facility Phase IV, Cell 3B liner sub-base approving the use of the dredged material.

6. On August 27, 2014 Martin Herrick of the Department held an informational meeting at the Buffalo County Courthouse to discuss the proposed low hazard grant of exemption. Staff from DPC, Hoffman Construction, and the COE were in attendance and provided background information on the project.
7. On October 23, 2014 the Department submitted invoice no. 4206-10519 for \$550 to DPC for the review of the requested low hazard grant of exemption.
8. Additional documents considered in connection with the exemption request include the following:
 - a. Department guidance on Dredged Material Disposal Approvals Public Meeting Requirement- Ch.289.54 Stats.,
 - b. The Department's Waste and Materials Management site inspection by Martin Herrick on August 21, 2014.
9. Additional facts relevant to the exemption request include the following:
 - a. For purposes of this document, the term "dredged material" means any material that is excavated or dredged from the bed of any waterway.
 - b. Dredged material is considered a solid waste under Wisconsin Statutes and case law. In accordance with s. 289, Wis. Stats, no person may operate a solid waste disposal facility unless the person obtains a written approval from the Department.
 - c. Dredged material may contain contaminants that are harmful to human health and the environment.
10. The Department has considered the environmental impacts of the proposal and has complied with the requirements of ch. NR 150, Wis. Adm. Code, and s 1.22. Stats., and, consistent with social, economic, and other essential considerations, the Department has adopted all practical means to avoid or minimize environmental harm.
11. The proposal would not be within an area where there is a reasonable probability that the facility would cause:
 - a) A significant adverse impact on wetlands as provided in Ch. NR 103, Wis. Adm. Code;
 - b) A significant adverse impact on critical habitat areas;
 - c) A detrimental effect on any surface water;
 - d) A detrimental effect on groundwater quality, if the facility is designed, constructed and operated in accordance with the proposal and any conditions(s) set forth below.
12. If the conditions set forth below are complied with, the disposal of nonhazardous dredged material will not result in environmental pollution as defined in s. 289.01(8), Stats.
13. The Department has conducted a continuing review of the potential hazard to public health and the environment of solid waste disposal facilities in general as well as this specific proposal. Based upon this review, the Department finds that regulation under s. 289, Stats., is not warranted in light of the low potential hazard to public health or the environment.

CONCLUSIONS OF LAW

1. Based on the foregoing, the Department has the authority under s. 289.43(7), Stats., and ss. NR 500.08(5), Wis. Adm. Code, to issue a grant of exemption if the exemption would not inhibit compliance with the applicable provisions of ch. 30, 31, 160, and 280 to 299, and ss. 1.11, 23.40, 59.692, 59.693, 60.627, 61.351, 61.354, 62.231, 62.234, and 87.30, Stats.
2. The Department has authority to approve a grant of exemption with conditions if the conditions are needed to ensure compliance with the applicable provisions of ch. 30, 31, 160, and 280 to 299, and ss. 1.11, 23.40, 59.692, 59.693, 60.267, 61.351, 61.354, 62.231, 62.234, and 87.30, Stats.
3. The conditions set forth below are needed to ensure compliance with the applicable provisions of ch. 30, 31, 160, and 280 to 299, and ss. 1.11, 23.40, 59.692, 59.693, 60.627, 61.351, 61.354, 62.231, 62.234 and 87.30 Stats.

In accordance with the foregoing, the Department has the authority under s. 289.43(8), Wis. Stats., and s. NR 500.08(4), Wis. Adm. Code, to issue the following conditional grant of exemption.

CONDITIONAL GRANT OF EXEMPTION

The Department hereby exempts the dredged material disposal facility on the DPC Alma Off-Site Ash Disposal Facility Phase IV Cell 3 B liner sub-base from the feasibility report, plan of operation, and solid waste facility licensing requirements of ch. 289, Stats, and from the annual licensing fees imposed under ss. 289.41 and 289.61, Wis. Stats., and authorizes DPC to dispose of dredged material, subject to the following conditions:

1. Only nonhazardous dredged material from the COE Grand Encampment facility shall be disposed of at the property.
2. Within 60 days of completing the closure of the disposal area, a report shall be submitted to the Department containing, at a minimum, the following information:
 - a. Volume of dredged material placed for the Cell 3B sub-base liner. - Volume placed from Randy
 - b. Surveyed topographic plan drawings indicating the specific location of this material, recorded by horizontal and vertical coordinates, on this property. - Two maps that Randy can print for me.
3. DPC shall pay invoice no. 4206-10519 within 30 days of its receipt.
4. Access to the property shall be restricted, as necessary, through the use of natural barriers or fencing.
5. Dredged material shall be transported in manner preventing releases. Should releases occur, they shall be cleaned up, and the cause of the problem shall be rectified.
6. The dredged material disposal facility shall be operated, maintained and closed in a nuisance-free manner.
7. Fugitive dust shall be controlled in accordance with s. NR 415.04, Wis. Adm. Code.
8. No action related to the disposal of the dredged material may be taken which will cause a significant adverse impact on wetlands as provided in ch. NR 103, Wis. Adm. Code.

9. No action related to the disposal of dredged material may be taken which will cause a significant adverse impact on critical habitat areas, as defined in NR 500.03(62), Wis. Adm. Code.
10. No action related to the disposal of the dredged material may be taken which will cause a detrimental effect on any surface water, as defined in s. NR 500.03(62), Wis. Adm. Code.
11. No action related to the disposal of dredged material may be taken which will cause a detrimental effect on groundwater, as defined in s. NR 500.03(62), Wis. Adm. Code, or will cause or exacerbate an attainment or exceedance of any preventive action limit or enforcement standard at a point of standards application as defined in ch. NR 140, Wis. Adm. Code.
12. No action related to the disposal of dredged material may be taken which will cause an exceedance of a soil cleanup standard in ch. NR 720, Wis. Adm. Code.
13. This grant of exemption shall expire on December 31, 2017, unless the Department extends or rescinds the grant of exemption in writing prior to that date.

This approval is based on the information available to the Department as of the date of approval. If additional information, project changes, or other circumstances indicate a possible need to modify this approval, the Department may ask you to provide further information relating to this activity. Likewise, the Department accepts proposals to modify approvals, as provided for in state statutes and administrative codes.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision made by the Department, you should know that Wisconsin statutes, administrative codes establish time periods and requirements for reviewing Department decisions.

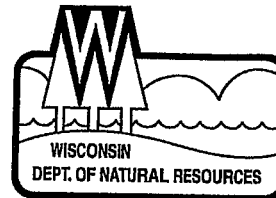
To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats. establish criteria for filing a petition for judicial review. You have 30 days after the decision is mailed or otherwise served by the Department to file your petition with the appropriate circuit court and serve the petition on the Department. The petition shall name the Department of Natural Resources as the respondent.

Dated: October 23, 2014

Jill Schoen

Jill Schoen, CHMM
Waste & Materials Management Program Manager
West Central Region

As for Martin Herrick
Martin Herrick, P.E.
Environmental Engineer
West Central Region



November 11, 2015

Mr. Robert Carothers
Dairyland Power Cooperative
JPM Station
500 Old State Highway 35
Alma, WI 54610

FID# 606043900
Buffalo Co.
SW/APPRV File

Subject: Construction Documentation Approval for Phase IV Cell 3B Liner Alma Off-Site Ash Disposal Facility, Town of Belyvidere, Buffalo County, License # 4126

Dear Mr. Carothers:

We have completed our review of your report entitled "Phase IV, Cell 3B Liner Construction Documentation Report Dairyland Power Cooperative Alma Off-Site Ash Disposal Facility." The report was prepared by TRC and was dated October 2015. The report was received in the La Crosse Service Center on October 27, 2015. At this time we are approving the construction documentation for the Phase IV Cell 3B liner and you can begin filling in the cell.

Conditions have been included for payment of the plan review and construction inspections invoice, placement of four feet of ash by December 1, 2016, inspection and repair of the drainage blanket, associated surface water control features and review of the closure and long term care costs for the landfill.

This approval should be attached to your May 15, 2001 Plan of Operation Approval.

Please contact Martin Herrick at (608) 789-5518 if you have any questions regarding this approval.

Sincerely,

A handwritten signature in cursive script that reads "Jill Schoen".

Jill Schoen, CHMM
Waste & Materials Management Program Supervisor
West Central Region

cc: Brian Kalvelage/Marty Herrick-LAX
Bill Kowalski-Dairyland Power Cooperative, 3200 East Avenue South, PO Box 817,
La Crosse, WI 54602-0817
Curt Madsen - TRC, 708 Heartland Trail, Suite 3000, Madison, WI 53717

**BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES**

**CONSTRUCTION DOCUMENTATION APPROVAL
PHASE IV, CELL 3B LINER**

**FOR THE
DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY,
LICENSE # 4126**

FINDINGS OF FACT

The department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates a nonhazardous solid waste disposal facility located in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin.
2. On May 15, 2001, the department issued a conditional plan of operation approval for the facility.
3. On June 20, 2012, Terry Halena of TRC sent an email to Martin Herrick of the department requesting that the conformance testing for environmental stress crack resistance from the geomembrane vendor GSE be substituted for the requirement in Condition No. 5 of the department's May 15, 2001 Conditional Plan of Operation Approval. On June 27, 2012, Martin Herrick of the department sent a response email concurring.
4. On August 19, 2014, the department issued a Conditional Plan Modification to the May 15, 2001 Plan of Operation Approval revising the sub-base of the Alma Off-Site Phase IV Liner to accept dredged sediments from the Mississippi River.
5. On October 23, 2014, the department issued a conditional grant of exemption to use low hazard dredge material as sub-base material under the Alma Off-Site Phase IV Liner.
6. On May 12, 2015, Martin Herrick of the department, via E-mail, concurred with DPC's request for reduced testing of the dredged sediments being placed under the Alma Off-Site Phase IV Landfill.
7. The information submitted in connection with the construction documentation includes the following:
 - a. A report entitled "Dairyland Power Cooperative -Alma Off-Site Disposal Facility (License #4126) Preconstruction Report: Liner Construction -Phase IV, Cell 3B."
 - b. A report entitled "Phase IV, Cell 3B Liner Construction Documentation Report Dairyland Power Cooperative Alma Off-Site Ash Disposal Facility," and thirteen associated engineering drawings dated October 2015.
 - c. A letter dated October 7, 2015, from TRC on behalf of DPC to Martin Herrick of the department, documenting the placement of the dredged sediments under the Alma Off-Site Phase IV Landfill. The letter included three plan sheets.

8. Additional information considered in the review of the construction documentation:
 - a. Department files for the Dairyland Power Cooperative – Alma Offsite Ash Disposal Facility, Phase IV.
9. Construction inspections were performed by the Department for the following on:
 - a. Subbase preparation on April 23, 2015, by Martin Herrick,
 - b. Low permeability barrier soils placement on July 9, 2015, by Martin Herrick,
 - c. Geomembrane and GCL liner installation on August 5, 2015, by Martin Herrick,
 - d. Sand Drainage Blanket and leachate collection system installation on August 21, 2015, by Martin Herrick.
10. On November 5, 2015, the department submitted invoice #4206-10794 to Dairyland Power Cooperative. The invoice included \$1100 for review of the construction documentation and \$2200 for four construction inspections.

CONCLUSIONS OF LAW

1. The department has authority under ss. 289.43(7) and 289.43(8), Stats., and ch. NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the May 15, 2001 Conditional Plan of Operation Approval.
2. If the conditions of approval set forth below are complied with the applicant will have demonstrated that the facility has been constructed in substantial compliance with the NR 500 to NR 590 Series of the Wis. Adm. Code and the May 15, 2001 Conditional Plan of Operation Approval.
3. The department has authority under s. 289.30(6), Stats., to modify a plan of operation approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500- 590, Wis. Adm. Code.

CONDITIONS OF APPROVAL

The department hereby approves the construction documentation for the Dairyland Power Cooperative Phase IV Cell 3B liner at the Alma Off-Site Ash Disposal Facility subject to NR 500-590, Wis. Adm. Code, the May 15, 2001 Conditional Plan of Operation Approval and subsequent plan modifications and the following conditions:

1. Dairyland Power Cooperative shall inspect the sand drainage blanket and liner of Phase IV Cell 3B after major storm events and on a monthly basis and make repairs as necessary. Inspection and repair of the, sand drainage blanket and liner shall continue until enough material has been placed to prevent it from eroding.
2. The depth of wheel rutting from haul trucks placing the ash shall be used as a performance measure to limit the moisture content of the ash placed in Phase IV Cell, 3B. When ash is being placed no wheel ruts deeper than 2 inches shall be allowed.
3. Payment of invoice #4206-10794 shall be made to the department within 30 days of receipt.
4. Dairyland Power Cooperative shall place four feet of ash on the bottom and initial 10 ft. of slope for the newly constructed cell by December 1, 2016.
5. Cleaning and restoration of the surface water control features shall be performed as necessary.

6. The closure and long term care costs for the Phase IV landfill shall be reviewed and updated as necessary. If revisions are required they shall be submitted to the Department within 90 days from the date of this approval.

This approval is based on the information available to the Department as of the date of approval. If additional information, project changes or other circumstances indicate a possible need to modify this approval, the Department may ask you to provide further information relating to this activity. Likewise, you may request a modification of this approval based on additional information, project changes or other circumstances as provided for in state statues and administrative codes. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

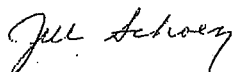
NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision made by the department, you should know that Wisconsin statues and administrative codes establish time periods and requirements for reviewing department decisions.

To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats. establish criteria for filing a petition for judicial review. You have 30 days after the decision is mailed or otherwise served by the department to file your petition with the appropriate circuit court and serve the petition on the department. The petition shall name the Department of Natural Resources as the respondent.

Dated: November 11, 2015

DEPARTMENT OF NATURAL RESOURCES
For the Secretary



Jill Schoen, CHMM
Waste & Materials Management Program Supervisor
West Central Region



Martin Herrick, P.E.
Environmental Engineer
West Central Region

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Wisconsin Department of Natural Resources
3550 Mormon Coulee Road
LaCrosse WI 54601

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711



July 19, 2016

Mr. Brian Treadway
Dairyland Power Cooperative
JPM Station 500, Old State Highway 35
Alma, WI 54610

FID # 606009360
Buffalo Co.
SW/APPRV FILE

Subject: Conditional Plan Modification to the Plan of Operation Approval for the Phase IV Landfill, Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County, License #4126

Dear Mr. Treadway:

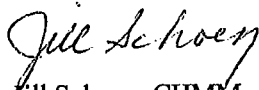
We have completed our review of your June 13, 2016 plan modification request to revise the final cover for the Phase IV Disposal Area at the Alma Off-Site Ash Disposal Facility. The request, which was dated June 13, 2016, was prepared by TRC Environmental Corporation (TRC) on behalf of Dairyland Power Cooperative (DPC) and was received in the LaCrosse Service Center on June 16, 2016. The submittal included a narrative and attachments for the HELP model and a water budget for the Phase IV landfill.

The proposed revisions to the Phase IV Landfill cap include a test section of cap where the 2004 alternate cap revision is being modified by substituting 2 feet of moisture conditioned baghouse coal combustion residual (CCR) for the approved 2 feet of select fly ash. The test section is laterally limited to 2.8 acres of cap. For additional area to be capped with proposed configuration a successful demonstration of the test results and subsequent plan modification to the May 15, 2001 Plan of Operation will be required.

Conditions have been included for the lateral extent of the proposed area of capping, submittal of plan sheets delineating the proposed capping area, construction documentation and payment of the plan review fee.

This approval should be attached to your May 15, 2001 Plan of Operation Approval. Please contact Martin Herrick at (608) 789-5518 if you have any questions regarding this approval.

Sincerely,


Jill Schoen, CHMM
Waste Program Supervisor
West Central Region

cc: Brian Kalvelage/Marty Herrick-LAX
Curt Madsen, TRC, 708 Heartland Trail, Suite 3000, Madison, WI 53717
Mike McCullick-Dairyland Power Cooperative, 3200 East Avenue South, PO Box 817, LaCrosse, WI 54602

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONDITIONAL PLAN OF OPERATION MODIFICATION
FINAL CAP
FOR
PHASE IV LANDFILL

DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY,
LICENSE # 4126

FINDINGS OF FACT

The Department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates a nonhazardous solid waste disposal facility located in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin,
2. The department issued a conditional plan of operation approval for the facility on May 15, 2001.
3. On March 4, 2004 the department issued a conditional plan modification to the May 15, 2001 Plan Operation Approval revising the landfill cap whereby the Geocomposite Liner (GCL) and 6 inch grading layer were substituted with 2 feet of select fly ash.
4. On June 13, 2016 TRC on behalf of DPC submitted a plan modification request to the department to revise the final cap for the Phase IV Landfill. The submittal included a narrative, a HELP model analysis and a water budget for the landfill.
5. On June 23, 2016, the department submitted invoice #4206 -109088 for \$1650 to DPC for plan review of the June 13, 2016 report.

CONCLUSIONS OF LAW

1. The department has authority under s. 289.30(6) Stats. to modify a plan of operation approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500-590; Wis. Adm. Code.
2. The department has authority to approve a plan operation modification with special conditions if the conditions are needed to ensure compliance with the applicable portions of chs. NR 500-590, Wis. Adm. Code.
3. The conditions of approval set forth below are needed to ensure compliance with the applicable portions of chs. NR 500- 590, Wis. Adm. Code
4. In accordance with the foregoing, the department has authority under ch. 289., Stats., to issue the following conditional plan of operation approval.

CONDITIONS OF APPROVAL

The department hereby approves the proposed plan modification for the additional barrier layer source for the final cap at the DPC Phase IV Alma Off-Site Ash Disposal Facility subject to the NR 500 Series, Wis. Adm. Code, the May 15, 2001 Conditional Plan of Operation Approval, subsequent modifications and the following conditions:

1. Payment of invoice #4206 -10988 shall be made to the department within 30 days from the date of receipt.
2. A plan sheet showing the proposed area to be capped for 2016 shall be submitted to the department with the geomembrane preconstruction report.
3. A maximum of 2.8 acres can be constructed with the proposed alternative cap.
4. When obtaining CCR samples for the permeameter testing the samples shall be from a discrete material and not composited.
5. The proctor curves shall be developed for discrete CCR materials and account for the moisture conditioning prior to and after placement in order to be representative of field conditions.

This approval is based on the information available to the department as of the date of approval. If additional information, project changes or other circumstances indicate a possible need to modify this approval, the department may ask you to provide further information relating to this activity. Likewise, you may request a modification of this approval based on additional information, project changes, or other circumstances as provided for in state statues and administrative codes. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision made by the department, you should know that Wisconsin statues and administrative codes establish time periods and requirements for reviewing department decisions.

To seek judicial review of the department's decision, sections 227.52 and 227.53, Stats. establish criteria for filing a petition for judicial review. You have 30 days after the decision is mailed or otherwise served by the department to file your petition with the appropriate circuit court and serve the petition on the department. The petition shall name the Department of Natural Resources as the respondent.

Dated: _____

July 19, 2016

DEPARTMENT OF NATURAL RESOURCES
For the Secretary

Jill Schoen

Jill Schoen, CHMM
Waste Program Supervisor
West Central Region

for Martin Herrick

Martin Herrick, P.E.
Environmental Engineer
West Central Region

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Wisconsin Department of Natural Resources
3550 Mormon Coulee Road
LaCrosse WI 54601

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711



March 15, 2017

Mr. Brian Treadway
Dairyland Power Cooperative
JPM Station
500 Old State Highway 35
Alma WI 54610

FID # 606009360
Buffalo Co.
SW/APPRV File

Subject: Construction Documentation Approval for Phase IV Area C Final Cover Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County, License # 4126

Dear Mr. Treadway:

We have completed our review of your report entitled "Phase IV, Area C Final Cover Construction Documentation Report Dairyland Power Cooperative Alma Off-Site Ash Disposal Facility, License No. 4126, February 2017." The report was prepared by TRC and was dated February 2017. The report was received in the La Crosse Service Center on February 17, 2017. At this time we are approving the construction documentation for the Phase IV Area C cap.

Area C is a 2.8 acre test section of the landfill allowing a revised cap as conditioned by the department's July 19, 2016 conditional plan modification to the May 15, 2001 Plan of Operation Approval. Plan sheet 10 of 13 dated August 4, 2016, which was prepared by TRC, delineates Area C and the associated 2016 cap construction. The modification allowed a change to the 2004 alternate cap revision whereby two feet of moisture conditioned baghouse coal combustion residual is substituted for two feet of the previously approved select flyash. Note that a successful demonstration of this test and a plan modification will be required for this design to be implemented on the rest of the Phase IV landfill cap.

Conditions have been included for payment of the plan review and construction inspections invoice, inspection of the cap and maintenance of surface water control features and limiting the use of this design to Area C. This approval should be attached to your May 15, 2001 Plan of Operation Approval. Please contact Martin Herrick at (608) 789-5518 if you have any questions regarding this approval.

Sincerely,

A handwritten signature in cursive script that reads "Jill Schoen".

Jill Schoen, CHMM
Waste Program Supervisor
West Central Region

cc: Marty Herrick-LAX
Leif Tolokken-Dairyland Power Cooperative, 3200 East Avenue South, PO Box 817,
La Crosse, WI 54602-0817
Curt Madsen - TRC, 708 Heartland Trail, Suite 3000, Madison, WI 53717

BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

CONSTRUCTION DOCUMENTATION APPROVAL
PHASE IV, AREA C CAP
FOR THE
DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY,
LICENSE # 4126

FINDINGS OF FACT

The department finds that:

1. Dairyland Power Cooperative (DPC) owns and operates a nonhazardous solid waste disposal facility located in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin,
2. The department issued a conditional plan of operation approval for the facility on May 15, 2001.
3. The department issued a conditional plan modification to the May 15, 2001 Plan of Operation Approval on March 4, 2004 allowing the use of two feet of select flyash to be substituted for the GCL (geocomposite liner) in the cap.
4. The department issued a conditional plan modification to the May 15, 2001 Plan of Operation Approval on September 21, 2009, adding soil borrow areas for select granular fill, general fill and topsoil for the cap.
5. The department issued a conditional plan modification on March 14, 2011, allowing the deletion of the resistivity testing for the Phase IV cap.
6. The department issued a conditional plan modification to the May 15, 2001 Plan of Operation Approval on July 19, 2016, allowing a substitution in the 2004 alternate cap revision whereby two feet of moisture conditioned baghouse coal combustion residual is substituted for two feet of approved select flyash. The plan modification allows a test of this design in the Area C cap for a lateral extent of 2.8 acres as shown in TRC's plan sheet 10 of 13 dated August 4, 2016.
7. The information submitted in connection with the construction documentation includes the following:
 - a. A report entitled " Phase IV, Area C Final Cover Construction Documentation Report, Dairyland Power Cooperative Alma Off-Site Ash Disposal Facility License 4126, February 2017 " and ten associated engineering drawings dated February 2017.
8. Additional information considered in the review of the construction documentation;
 - a. Dairyland Power Cooperative-Alma Offsite Disposal Facility (License #4126) Phase IV Disposal Area, Cell C Preconstruction Report, dated August 4, 2016,
 - b. July 12, 2009 E-mail from Bill Kowlaski of DPC to Marty Herrick of the department requesting the use of G-3 fly ash in the Phase IV cap,
 - c. July 14, 2011 E-mail from Terry Halena of TRC to Marty of Herrick of the department, regarding cross seams in geomembrane panel placement,
 - d. July 21, 2011 E-mail from Terry Halena of TRC to Marty Herrick of the department, requesting to eliminate environmental stress crack resistance.
9. Construction inspections were performed by the department for the following on:
 - a. Placement of the grading layer by Martin Herrick on August 11, 2016,
 - b. Installation of the geomembrane by Martin Herrick on August 31, 2016,
 - c. Placement of the sand drainage blanket by Martin Herrick on September 13, 2016,
 - d. Placement of topsoil and seeding by Martin Herrick on October 4, 2016.

10. On March 3, 2017, the department submitted invoice #4206-1188 to Dairyland Power Cooperative. The invoice included \$ 1100 for review of the construction documentation and \$2200 for four construction inspections.

CONCLUSIONS OF LAW

1. The department has authority under ss. 289.43(7) and 289.43(8), Stats., and ch. NR 516, Wis. Adm. Code, to require that the owner of a solid waste disposal facility demonstrate that the facility has been constructed in substantial compliance with the May 15, 2001 Conditional Plan of Operation Approval.
2. If the conditions of approval set forth below are complied with the applicant will have demonstrated that the facility has been constructed in substantial compliance with the NR 500 to NR 590 Series of the Wis. Adm. Code and the May 15, 2001 Conditional Plan of Operation Approval.
3. The department has authority under s. 289.30(6), Stats., to modify a plan of operation approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500- 590, Wis. Adm. Code

CONDITIONS OF APPROVAL

The department hereby approves the construction documentation for the Dairyland Power Cooperative Phase IV Area C Cap at the Alma Off-Site Ash Disposal Facility subject to NR 500-590, Wis. Adm. Code, the May 15, 2001 Conditional Plan of Operation Approval and subsequent plan modifications and the following conditions:

1. Dairyland Power Cooperative shall inspect the Area C cap after major storm events and on a monthly basis and make repairs as necessary.
2. Cleaning and restoration of the surface water control features shall be performed as necessary.
3. Payment of invoice # 4206-11188 shall be made to the department within 30 days of receipt.
4. The substitution of the two foot moisture conditioned baghouse coal combustion residual for the select flyash in the Phase IV cap is only allowed for the area C test as delineated in TRC's plan sheet 10 of 13 dated August 4, 2016.

This approval is based on the information available to the department as of the date of approval. If additional information, project changes or other circumstances indicate a possible need to modify this approval, the department may ask you to provide further information relating to this activity. Likewise, you may request a modification of this approval based on additional information, project changes or other circumstances as provided for in state statutes and administrative codes. Unless specifically noted, the conditions of this approval do not supersede or replace any previous conditions of approval for this facility.

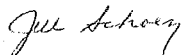
NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision made by the department, you should know that Wisconsin statutes and administrative codes establish time periods and requirements for reviewing department decisions.

To seek judicial review of the department's decision, sections 227.52 and 227.53, Stats. Establish criteria for filing a petition for judicial review. You have 30 days after the decision is mailed or otherwise served by the department to file your petition with the appropriate circuit court and serve the petition on the department. The petition shall name the Department of Natural Resources as the respondent.

Dated: March 15, 2017

DEPARTMENT OF NATURAL RESOURCES
For the Secretary



Jill Schoen, CHMM
Waste Program Supervisor
West Central Region



Martin Herrick, P.E.
Environmental Engineer
West Central Region

Appendix C: Performance Standards Demonstrations

Wetland Demonstrations



DPC Project Area Surface Water Data Viewer Map



Legend

- Wetland Indicators
- Wetland Class Areas
- Wetland Class Points
- Dammed pond
- Excavated pond
- Filled/draind wetland
- Wetland too small to delineate
- Filled excavated pond
- Filled Points
- Wetland Class Areas
- Wetland Class Points
- Dammed pond
- Excavated pond
- Filled/draind wetland
- Wetland too small to delineate
- Filled excavated pond
- Filled Points
- Wetland Class Areas
- Filled Areas
- Wetland Identifications and Confirmations
- NRCS Wetspots
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water
- Index to EN_Image_Basemap_Leaf_Off

Notes

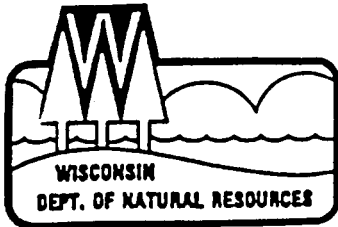
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1: 7,920

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: <http://dnr.wi.gov/legal/>

Non-Navigable Stream Determination



George E. Meyer
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

2004 Highland Avenue
Eau Claire, WI 54701-4346
TELEPHONE 715/839-3777
TELEFAX 715/839-1605

October 26, 1994

File Ref: 4400

Mr. John Toepfer
Dairyland Power Cooperative
P.O. Box 817
3200 East Avenue South
LaCrosse, WI 54601

SUBJECT: Initial Site Inspection - Proposed Dairyland Power Cooperative
Solid Waste Disposal Facility

Dear Mr. Toepfer:

On August 18, RMT, Inc. provided the Department with a written request on behalf of Dairyland Power Cooperative for an initial site inspection for a proposed coal ash solid waste disposal facility. The proposed site is located in the NE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of Section 19, Township 21N, Range 12W, and the SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 18, Township 21 North, Range 12 West, Buffalo County, Wisconsin.

Copies of correspondence from the State Historical Society and the Bureau of Endangered Resources indicate the proposed location complies with the requirements of Wisconsin's historic preservation laws and that no endangered threatened, special concern species, natural communities nor any state natural areas would be impacted by the project.

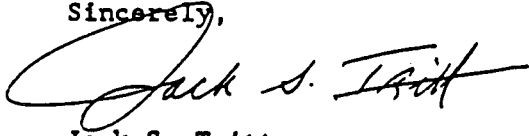
An initial site inspection of the property was completed on August 24 in the company of representatives from RMT, Inc. and you. The property was also inspected on September 22 by personnel from the Department's Water Regulations and Zoning program. Purpose of the inspection was to determine navigability of ephemeral waterways near the proposed project location. As a result of the site inspections, it was determined that the ephemeral waterways are non-navigable and that no Chapter 30 permits are necessary and that the proposed project locations meet the location and performance standards specified in ss NR 504.04 Wisc. Admin. Code. Dairyland Power Cooperative may proceed with citing and licensing the proposed coal ash landfill in accordance with the Department's solid waste management rules and s. 144.44 Wisc. Stats.

To: Mr. John Toepfer - October 26, 1994

-2-

If you have any questions, please feel free to contact me at (715) 839-3768.

Sincerely,



Jack S. Tritt
Waste Management Specialist

JST/jh

c: Dave Lundberg
Sue Fisher - SW/3
Curt Madsen - RMT, Inc.
Chairman, Town of
Buffalo County Zoning Administrator

Date: May 11, 1995

COPY

File Number 21-12-18 (19) 20, 24, 30)-14

Application Number 95-28

THIS CERTIFIES THAT A

SPECIAL USE PERMIT

HAS BEEN ISSUED TO:

DAIRYLAND POWER CO

IN COMPLIANCE WITH REQUIREMENTS OF THE BUFFALO COUNTY ZONING ORDINANCE FOR:

ASH DISPOSAL SITE

located at: 1/4 1/4 Sec.s: 18, 19, 20, 24, 30 T. 21 N. R. 12 W. Subdivision

town of: Belvidere

Zoning District Agriculture

With the Following Conditions:

1. Landfill site is approved for areas referred to as Phases 1, 2, & 3 in the DNR landfill permit located in the NE 1/4 and NW of SW 1/4 of Section 19, T. 21 N., R. 12 W., Town of Belvidere.
2. Materials other than those approved of in Dairyland Power's DNR landfill permit cannot be deposited.
3. Continuous reclamation will be practiced.
4. Contingent upon the Buffalo County Board approving rezone #95-27 from the Recreation to Agriculture District.

Nathan Sawyer
Zoning Administrator

Appendix D: Locational Criteria Demonstration

2018 Location Restriction Demonstration



Location Restrictions Demonstrations

Alma Off-Site Disposal Facility, Phase IV Landfill Buffalo County, Wisconsin

May 2018

*Prepared For
Dairyland Power Cooperative*

A handwritten signature in blue ink that reads 'Jonathan N. Hotstream'.

Jonathan N. Hotstream, P.E., P.G.
Senior Geological Engineer

A handwritten signature in blue ink that reads 'Todd W. Martin'.

Todd Martin
Principal Project Manager

*TRC Environmental Corporation | Dairyland Power Cooperative
Location Restrictions Demonstrations – Alma Off-Site Disposal
Facility, Phase IV Landfill
Final*

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Appendix A	Supporting Material for §257.60
Appendix B	Supporting Material for §257.61
Appendix C	Supporting Material for §257.62
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Section 1

Introduction

This location restrictions demonstrations report (Report) was prepared by TRC Environmental Corporation (TRC) on behalf of Dairyland Power Corporation (DPC) for the Alma Off-Site Disposal Facility, Phase IV Landfill (Landfill) where coal combustion residuals (CCR) are disposed. The 32.1 acre Landfill is located in the NE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of Section 19 and portions of Sections 18 and 20, T21N, R12W, the W $\frac{1}{2}$ of the NE $\frac{1}{4}$, Section 23, T26N, R7E, Town of Belvidere, Buffalo County, Wisconsin (refer to Figure 1). DPC owns and operates the permitted Landfill in compliance with the Plan of Operation (POO) (RMT, 2000) approved by the Wisconsin Department of Natural Resources (WDNR).

The purpose of this Report is to demonstrate the compliance of the existing Landfill footprint and planned future lateral expansions to the Landfill with the location restrictions required by the U.S. Environmental Protection Agency's (USEPA) CCR rule, Title 40 Code of Federal Regulations (40 CFR) Parts 257 and 261 Subpart D-“Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments” (Federal Register §257.60 through §257.64). Currently, Cells 1 through 3 of the Landfill have been constructed and have received CCR. Future lateral expansions include Cell 4A and Cell 4B (refer to Figure 2). These two cells compose the lateral expansions in this Report. This document includes information from site permitting data, previously completed work, a desktop study, and engineering calculations to evaluate the Landfill concerning its location above the uppermost aquifer (§257.60), wetlands (§257.61), fault areas (§257.62), seismic impact zones (§257.63), and unstable areas (§257.64).

Supporting documents are provided in appendices to this report. Such documents include components of the Feasibility Report (FR), Plan of Operation (POO), and environmental monitoring data which were reviewed to evaluate site setting and conditions.

Section 2

Location Restrictions

The location restrictions required by the federal CCR rule are presented below with a demonstration to show compliance with each restriction. The location restrictions address separation from the uppermost aquifer, wetlands, fault areas, seismic impact zones, and unstable areas. Supporting information for the demonstrations are attached as appendices to this report.

2.1 §257.60 – Placement Above the Uppermost Aquifer

The federal CCR rule requires that the Landfill lateral expansions must be constructed with a base that is located no less than 5 feet above the upper limit of the uppermost aquifer or must demonstrate that there will not be intermittent, recurring, or sustained hydraulic connection between any portion of the base of the Landfill. To determine the proximity of the upper limit of the uppermost aquifer in relation to the base of the lateral expansions, groundwater elevation data for the monitoring wells surrounding the Landfill for the period between November 1995 and September 2017 were reviewed to determine the upper limit of the uppermost aquifer. The upper limit of the uppermost aquifer was compared to the proposed subbase grades of the lateral expansions in the approved POO.

Data from seven groundwater monitoring wells and piezometers installed between 1994 and 1997 located at the south side (wells W-100/W-100R, W-100A/W-100AR, and W-105), west side (well W-42), east side (wells W-102 and W-102A), and north side (well W-107) of the Landfill indicate that the observed groundwater elevation in the uppermost aquifer has been relatively constant over a 22 year period (1995 through 2017; Appendix A). The Landfill design grades and slopes at the upgradient and downgradient locations were reviewed to determine the distance between the subbase grades (bottom of liner grades) and the upper limit of the groundwater elevation. The Landfill grades slope from the north to the south, following the site topography. The south end subbase grade is a minimum elevation of 782 feet Mean Sea Level (MSL), and the north end subbase grade is a minimum elevation of 862 feet MSL (Appendix A).

Based on the monitoring results, the maximum groundwater elevation of the south side wells was 737.97 feet MSL (W-100/W-100R in June 2001), and the maximum groundwater elevation of the north side well was 831.82 feet MSL (W-107 in September 2017). The engineering cross sections from the POO were included in Appendix A to present the bottom of the Landfill in comparison to the groundwater level. The groundwater level monitoring indicates that the

groundwater levels shown on POO cross sections are representative of the current conditions. These comparisons show that there is over 5 feet of separation between the bottom of the Landfill and the observed upper limit of the uppermost aquifer.

Based on this evaluation, the future lateral expansions of the Landfill will be constructed with a base that is greater than 5 feet above the upper limit of the uppermost aquifer. Therefore, the future lateral expansions of Landfill are in compliance with the requirements of §257.60.

2.2 §257.61 – Wetlands

The federal CCR rule requires that the Landfill lateral expansions cannot be located in wetlands. To determine if the Landfill, and therefore planned lateral expansions, are located in a wetland, the approved FR for the Landfill and more recent sources were reviewed.

Section 7 of the FR (Appendix B) approved by the WDNR contains an Ecological Assessment which concluded no wetlands are known to be present within the approved Landfill footprint. In addition the Feasibility Determination (Appendix B) noted that “ephemeral waterways, which flow in direct response to precipitation, route surface water from the uplands and steep slopes into the central valley,” and “the nearest wetlands are located approximately 1 mile south of the proposed site along the Mississippi River.”

The WDNR Surface Water Data Viewer (2017) and hydric soil classifications from the United States Department of Agriculture (2017) were consulted to determine the presence of potential additional wetlands in the area. Wetlands were not identified in the area of the lateral expansions. The water data viewer identifies wetlands too small to map within the existing landfill footprint which is not representative of the current conditions since the landfill has been constructed in these areas. The soil types within the proposed lateral expansions were mapped as ‘not hydric’ (Appendix B). The mapped soil types, Norden silt loam, worthen silt loam, churchtown silt loam, and Urne fine sandy loam, have a hydric rating of zero, and are well drained (Appendix B). These soil units, except for the Worthen silt loam, have steep slopes that range from 12 to 45 percent. These soil conditions suggest there are not wetland soils and flat or nearly flat areas where ponding would occur. The WDNR surface Water Data Viewer shows intermittent streams in the area of the landfill which supports the conclusion of the Feasibility Determination. The hydric rating map, shows one stream to the east of the existing landfill which has been previously diverted around the existing landfill. Therefore, this desktop study indicates the lateral expansions of the Landfill comply with the requirements of §257.61. A wetlands delineation will be performed if requested by the regulatory agencies to confirm the conclusions of this desktop study.

2.3 §257.62 – Fault Areas

The federal CCR rule requires that the Landfill lateral expansions must not be located within 200 feet of the outermost damage zone of a fault that has had displacement in Holocene time (11,700 years ago to present). To determine recent fault activity in the area, the subsurface exploration data and USGS Earthquake Fault Map were reviewed.

The subsurface investigation performed in the FR included rock coring. Faulting was not observed in the rock cores (Appendix C). Additionally, the USGS Quaternary Earthquake Fault Map (Appendix C) does not map faults occurring within the past 1.6 million years in the region of the Landfill or lateral expansions.

No evidence of active faulting during the Holocene within 200 feet of the Landfill has been identified; therefore, the lateral expansions comply with the requirements of §257.62.

2.4 §257.63 – Seismic Impact Zones

Federal CCR rule §257.63 requires that lateral expansions must not be located in seismic impact zones. The USGS Earthquake Hazards Program was consulted to determine the earthquake hazard for the site.

The 2015 National Earthquake Hazards Reduction Program (NEHRP) U.S. seismic design maps website (USGS 2015; Appendix D) indicates a mapped peak ground acceleration of 0.023g. Using a site adjustment factor of 1.6 based on the peak ground acceleration, and subsurface conditions, a design peak ground acceleration of 0.036g was calculated (Appendix D). This design peak ground acceleration is below the 0.1g lower limit specified by the federal CCR rule for seismic impact zones; therefore, this site is not located in a seismic impact zone as defined in §257.53. Because the site is not located in a seismic impact zone, the lateral expansions comply with the requirements of §257.63.

2.5 §257.64 – Unstable Areas

The federal CCR rule states that existing CCR units and lateral expansions may not be located in an unstable area. Risks presented by unstable areas caused by soil conditions, geologic or geomorphologic features, and human made features must be evaluated to be in compliance with the federal CCR rule. This analysis was performed by evaluating the results of the geotechnical exploration within the Landfill footprint during the siting and evaluation of the Landfill design.

A siting study was performed in the FR application to evaluate the potential for unstable conditions. The geotechnical exploration performed for the FR observed silt and lean clay

overlying medium to dense silty sand and sand to termination of soil borings, which ranged up to depths of 152 feet below the ground surface (Appendix C). Weathered bedrock consisting mainly of sandstone or dolomite were encountered in some borings. Within the footprint of the Landfill, the dolomite bedrock has been weathered away and the soils are underlain by sandstone. These observations do not suggest unstable foundation conditions considering the existing conditions and lateral expansions.

The Landfill design was performed by a professional engineer applying generally accepted good engineering practices. Global slope stability calculations were performed indicating acceptable factors of safety for critical slopes (RMT, 2000 POO; Appendix E). The subgrade of the existing Landfill was graded and prepared to provide suitable subgrade conditions according to the project specifications under the observation of an engineer's representative. The construction was performed and documented in accordance with the plans and specifications and certified by a professional engineer in the State of Wisconsin (RMT, 2001; RMT, 2008; TRC, 2013; and TRC, 2015).

Similar subgrade conditions are expected based on site activities and the results of the siting study. During construction, the subgrade for the lateral expansions will be prepared in a similar manner to comply with the POO.

Based on these analyses, the existing Landfill and lateral expansions are not located in an unstable area and comply with the requirements of §257.64.

Section 3

Conclusions

Based upon the demonstrations provided in this report, the existing Landfill and planned future lateral expansions are in compliance with the location restrictions required by the CCR rule. No additional action or justification is required after this document has been placed in the operating record, posted to the publicly accessible website, and government notifications have been provided.

Section 4 References

- Lundberg, D.R. Waste Management Team Leader, Wisconsin Department of Natural Resources, to Johnston, George, Dairyland Power Cooperative. 1999. *Feasibility Determination for the Proposed Dairyland Power Cooperative Phase IV Ash Disposal Facility, Town of Belvidere, Buffalo County, Wisconsin. License No. 4126*. September 10. [letter].
- RMT. 1997. Feasibility Report for the Phase IV Ash Disposal Area. September 19, 1997.
- RMT. 2000. Plan of Operation for the Phase IV Ash Disposal Area. October 19, 2000.
- RMT. 2001. Phase IV, Cell 1 Liner Construction Documentation Report. November 2001.
- RMT. 2007. Phase IV, Cell 2A Liner Construction Documentation Report. January 2007.
- RMT. 2008. Phase IV, Cell 2B Liner Construction Documentation Report. January 2008.
- RMT. 2015. Construction Documentation Report, Phase IV, Cell 3B Liner Construction Letter Report. November 2015.
- TRC. 2013. Phase IV, Cell 3A Liner Construction Documentation Report. January 2013.
- TRC. 2015. Phase IV, Cell 3B Liner Construction Documentation Report. October 2015.
- United States Department of Agriculture. 2017. Soil Survey Staff, Natural Resources Conservation Service, Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed [01/30/2017].
- United States Geological Survey (USGS). 2015. U.S. Seismic Design Maps: 2015 National Earthquake Hazards Reduction Program Provisions. Available Online at <http://earthquake.usgs.gov/designmaps/beta/us/>. Accessed [04/06/2017].
- Wisconsin Department of Natural Resources (WDNR). 2017. "Surface Water Data Viewer." Available online at <https://dnr.wi.gov/topic/surfacewater/swdv/>. Accessed [3/1/2018].

Engineer's Certifications

Pursuant to 40 CFR 257 Subpart D and by means of this certification I attest that:

- (i) I am familiar with the requirements of the CCR rule (40 CFR §257);
- (ii) the information in this demonstration is in accordance with current, good, and accepted engineering practices;
- (iii) the existing Landfill complies with the location restriction for unstable areas (40 CFR §257.64);
- (iv) the proposed lateral expansions within the footprint presented in the Plan of Operation (RMT, 2000) comply with the location restrictions of 40 §CFR 257.60 through 40 CFR §257.64.

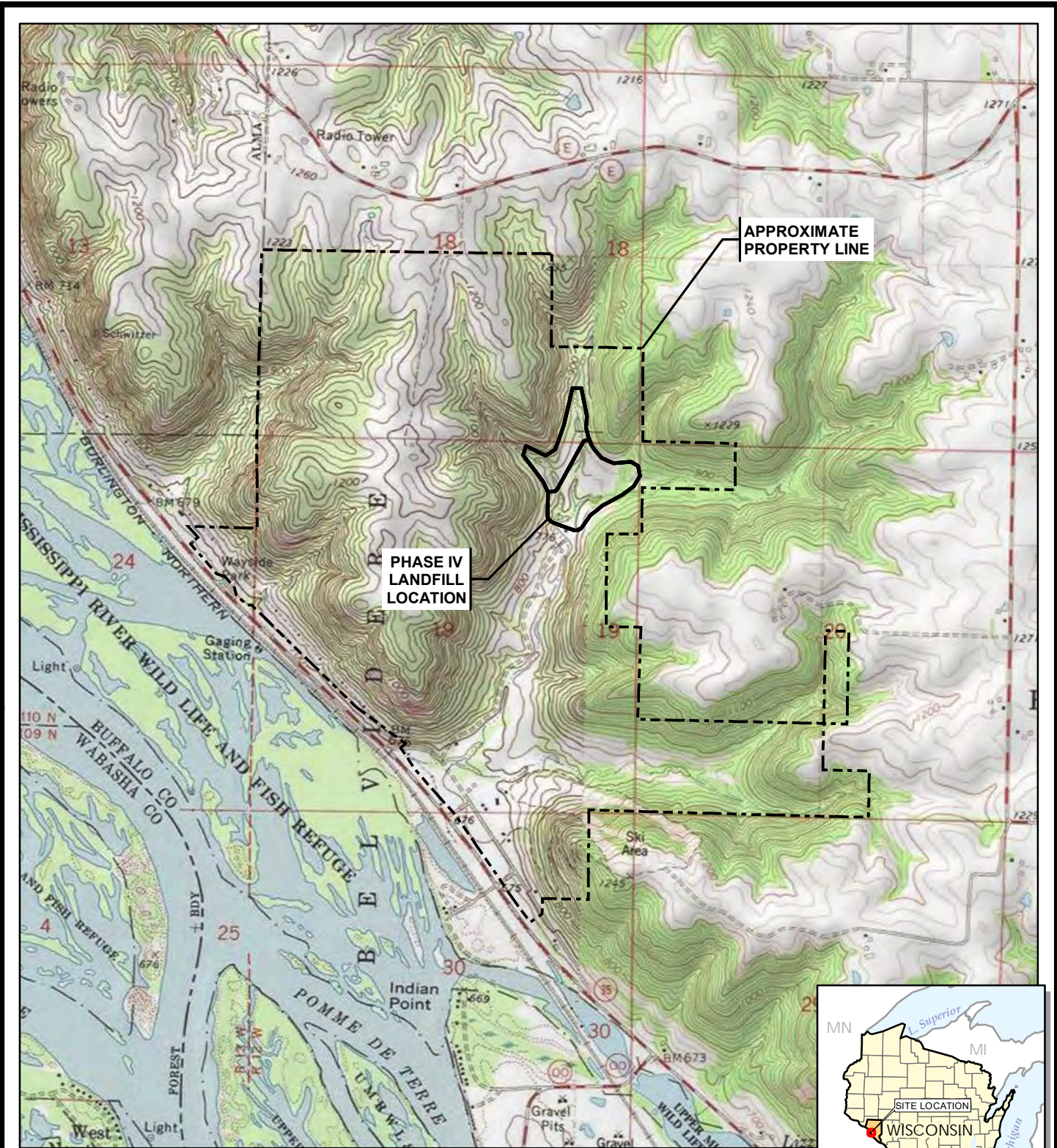
For the purpose of this document, "certify" and "certification" shall be interpreted and construed to be a "statement of professional opinion." The certification is understood and intended to be an expression of my professional opinion as a Wisconsin licensed professional engineer, based upon knowledge, information, and belief. The statement(s) of professional opinion are not and shall not be interpreted or construed to be a guarantee or a warranty of the analysis herein.



Signature of Registered Professional Engineer

Registration No. 42745-6 State: Wisconsin





BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.



708 Heartland Trail
Suite 3000
Madison, WI 53717
Phone: 608.826.3600

TRC - GIS

PROJECT: **DAIRYLAND POWER COOPERATIVE
ALMA OFF-SITE DISPOSAL FACILITY, PHASE IV LANDFILL
LOCATIONS RESTRICTIONS DEMONSTRATIONS
BUFFALO COUNTY, WISCONSIN**

TITLE:





SITE LOCATION MAP

DRAWN BY:	R. SUENMIGHT
CHECKED BY:	J. HOTSTREAM
APPROVED BY:	T. MARTIN
DATE:	MAY 2018
PROJ. NO.:	243332.0003
FILE:	243332-004slm.mxd

FIGURE 1

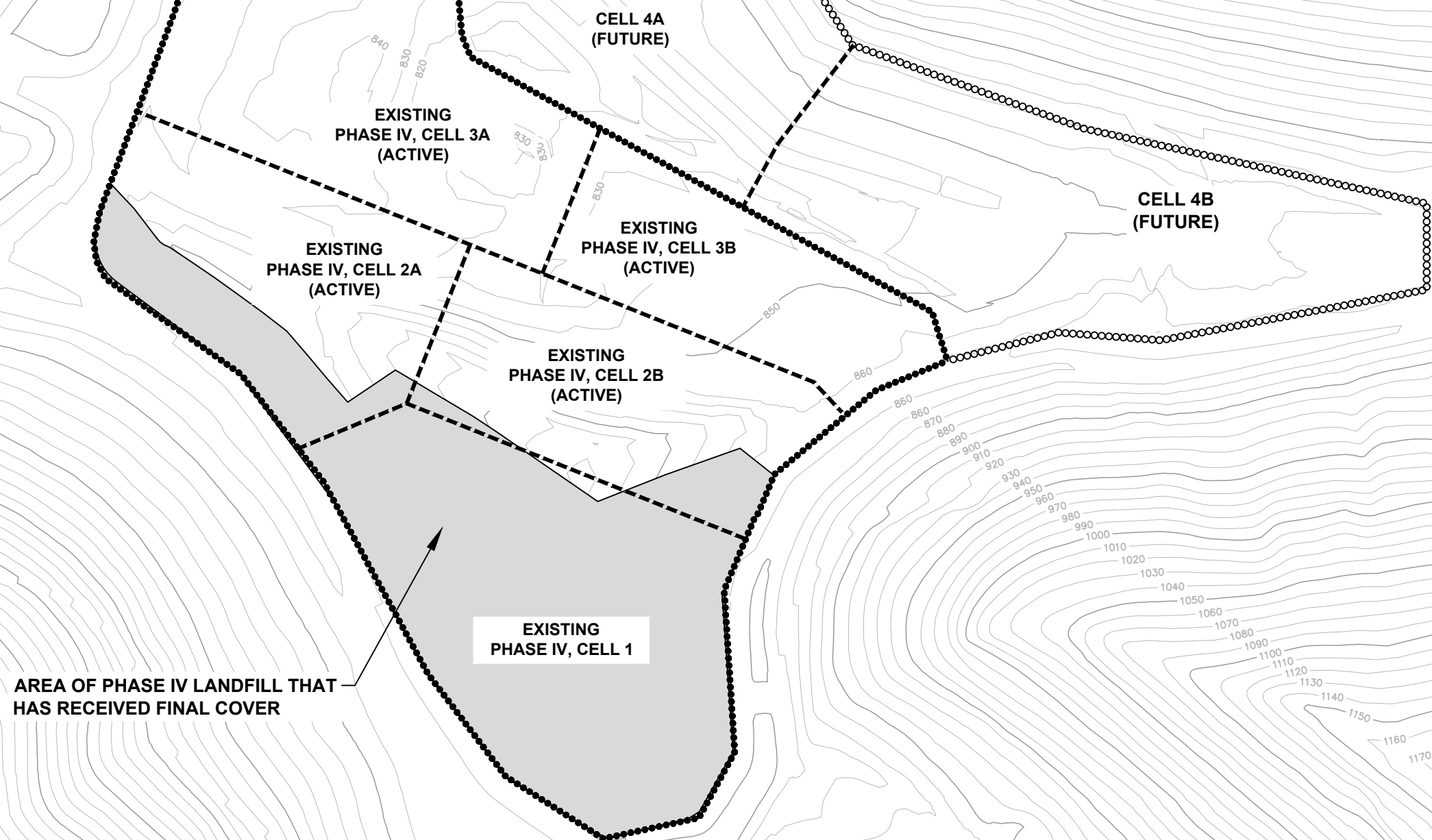
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Version: 2017-10-21

LEGEND

-  890 EXISTING 10' CONTOUR
-  LIMITS OF CCR DISPOSAL (EXISTING LANDFILL)
-  LIMITS OF LATERAL EXPANSION
-  PHASE LINE


NOTES

1. THE BASE MAP WAS MODIFIED FROM THE CELL 3B LINER CONSTRUCTION DOCUMENTATION REPORT (OCTOBER, 2016).
2. THE HORIZONTAL DATUM IS REFERENCED TO THE WISCONSIN STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NORTH AMERICAN DATUM 1983, US SURVEY FEET.
3. VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM 1988. CONTOUR INTERVAL IS 10 FEET.



AREA OF PHASE IV LANDFILL THAT HAS RECEIVED FINAL COVER



PROJECT: LOCATION RESTRICTIONS DEMONSTRATIONS ALMA OFF-SITE PHASE IV LANDFILL BUFFALO COUNTY, WISCONSIN	
TITLE: EXISTING CONDITIONS	
DRAWN BY: L. STORMER	PROJ NO.: 243332.0003
CHECKED BY: J. HOTSTREAM	FIGURE 2
APPROVED BY: T. MARTIN	
DATE: MAY 2018	
	
708 Heartland Trail Suite 3000 Madison, WI 53717 Phone: 608.826.3600	
FILE NO.:	243332.0003.01.dwg

Appendix A

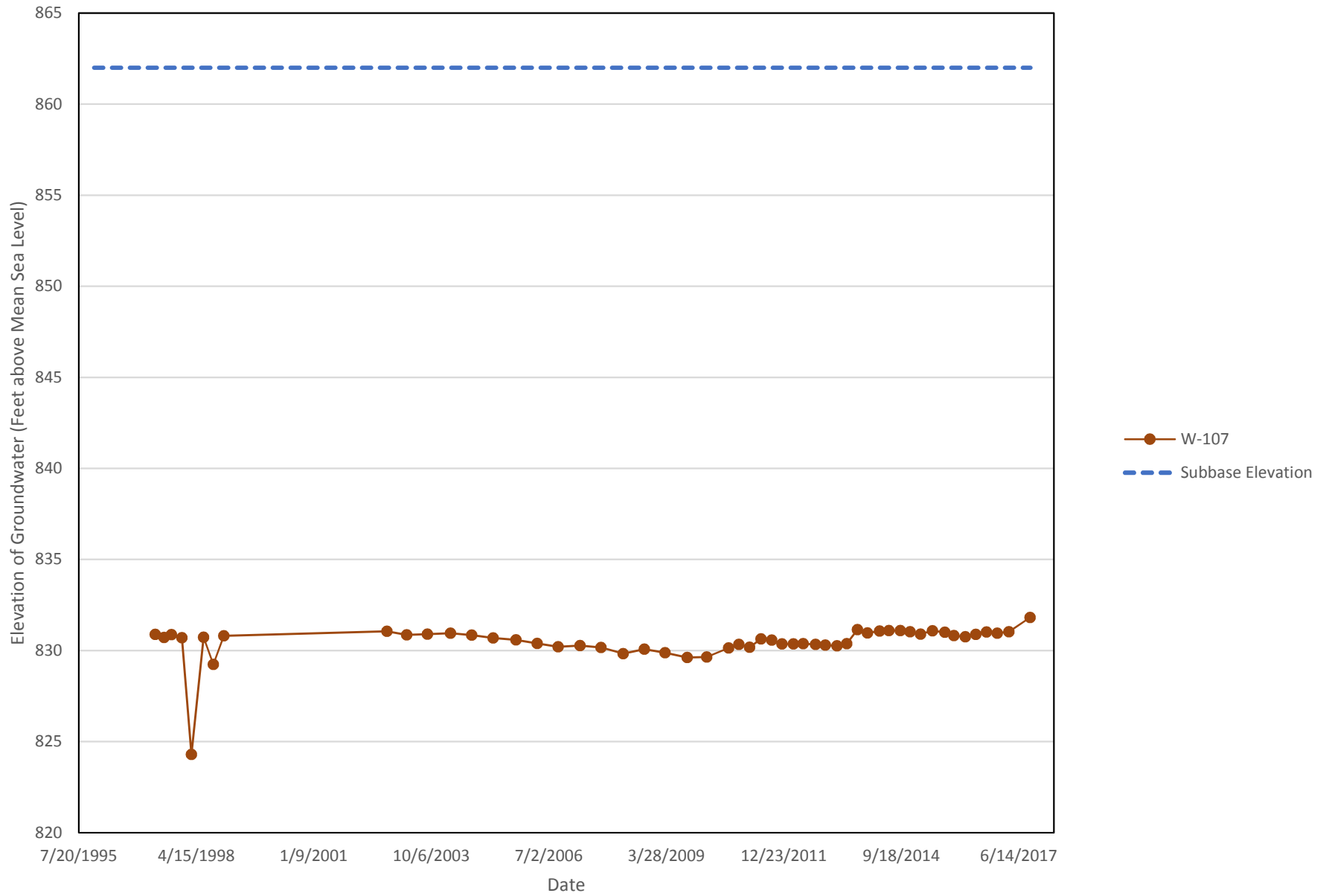
Supporting Material for §257.60

Table of Contents

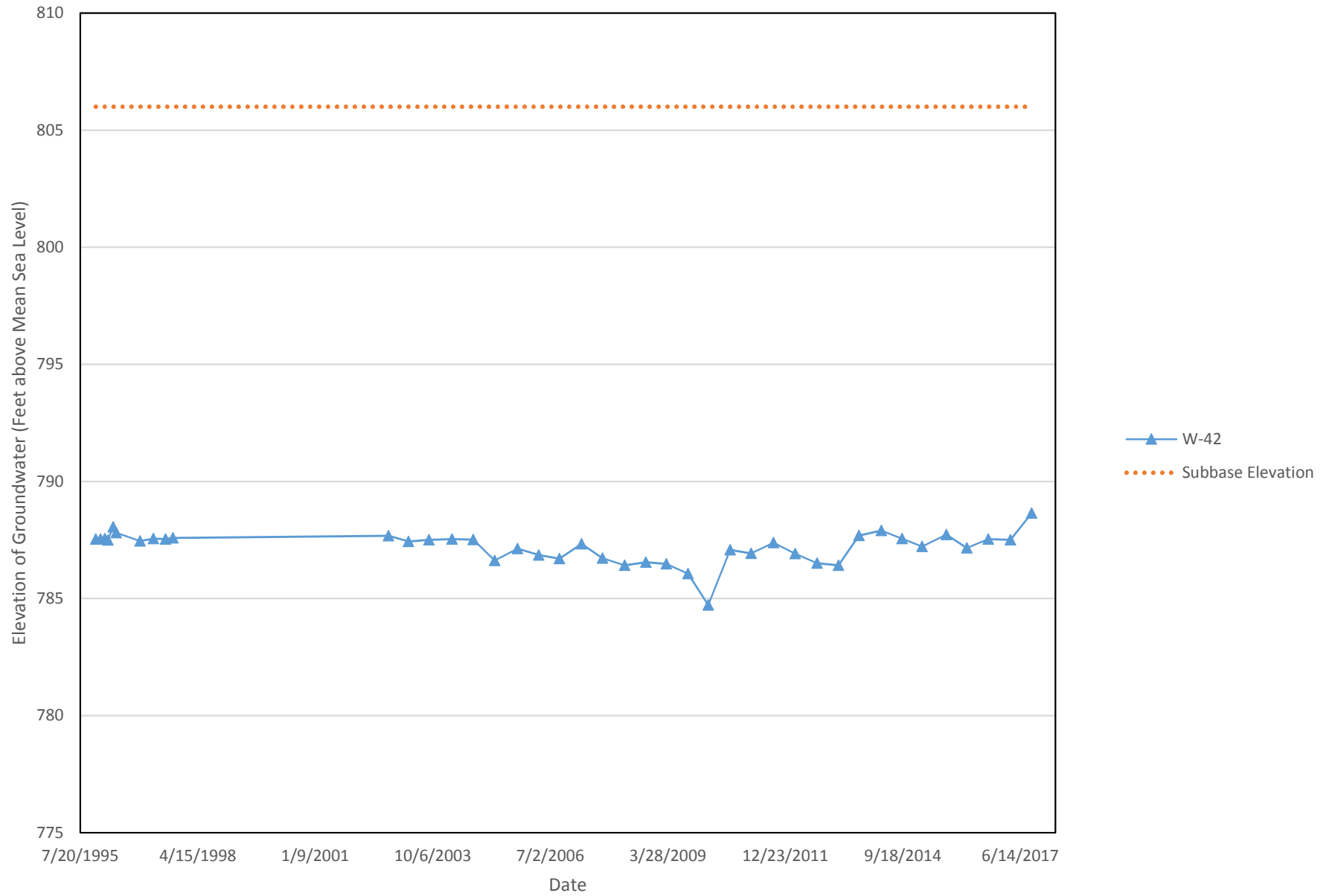
- Appendix A-1: Groundwater Elevations (1995-2017)
- Appendix A-2: Landfill Subbase Grades (RMT 2000)

Appendix A-1 Groundwater Elevations (1995-2017)

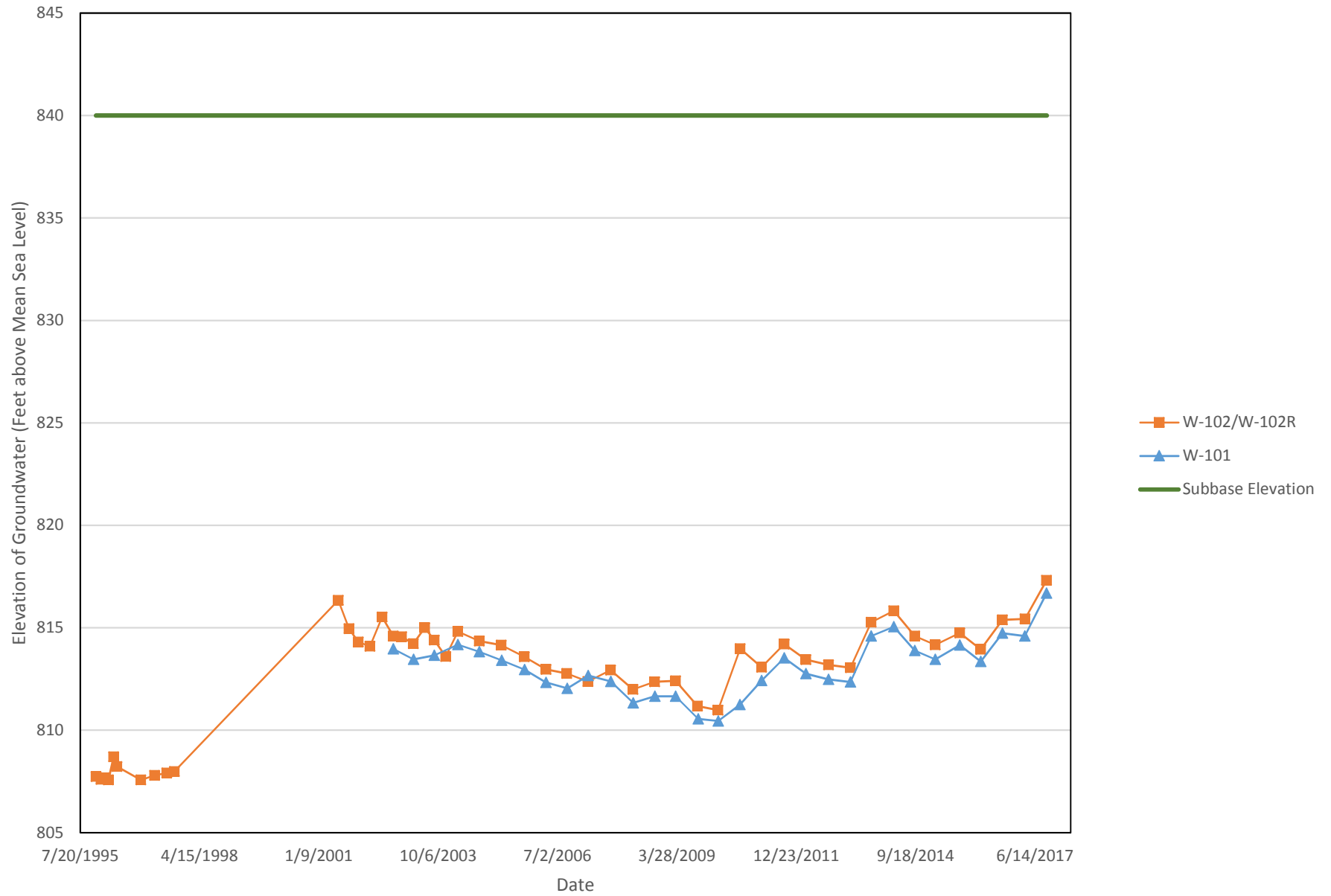
North Side of Landfill Groundwater Elevations (1995 - 2017)



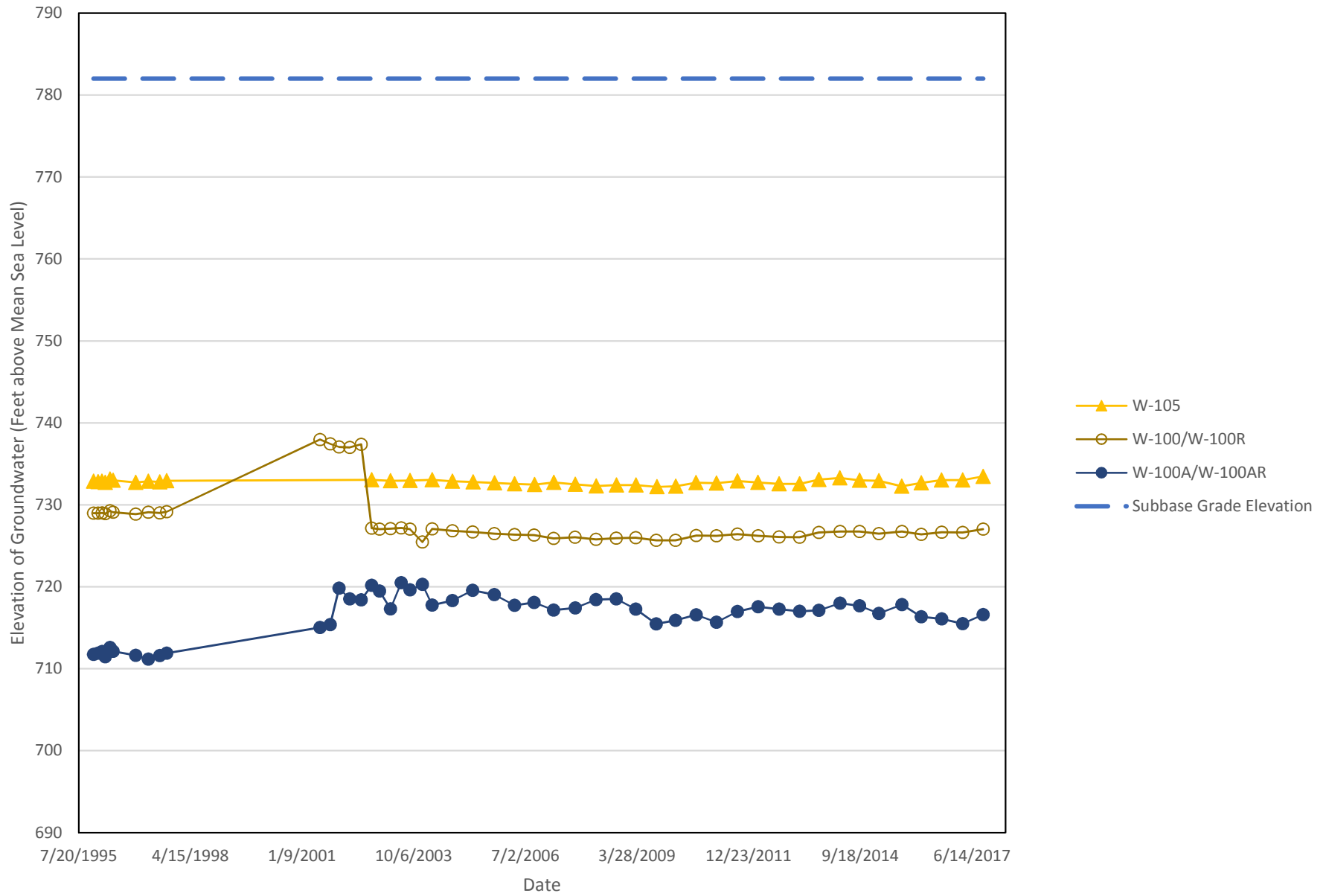
West Side of Landfill Groundwater Elevations (1995 - 2017)



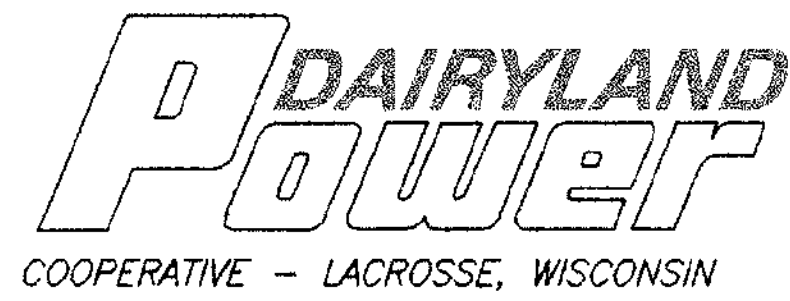
East Side of Landfill Groundwater Elevations (1995 - 2017)



South Side of Landfill Groundwater Elevations (1995 - 2017)



Appendix A-2
Landfill Subbase Grades (RMT 2000)



DAIRYLAND POWER COOPERATIVE

PLAN OF OPERATION PHASE IV DISPOSAL AREA ALMA OFF-SITE ASH DISPOSAL FACILITY

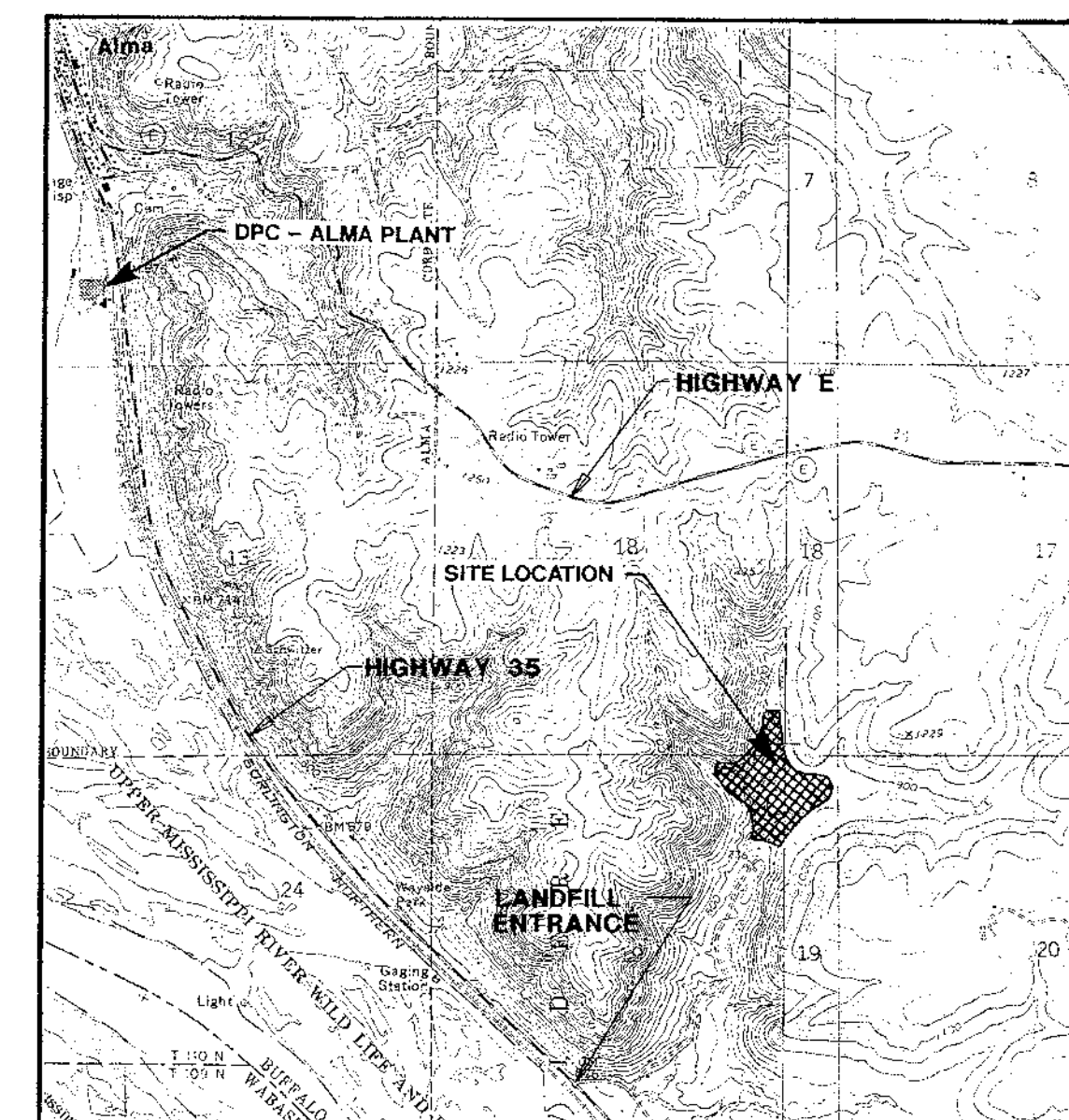
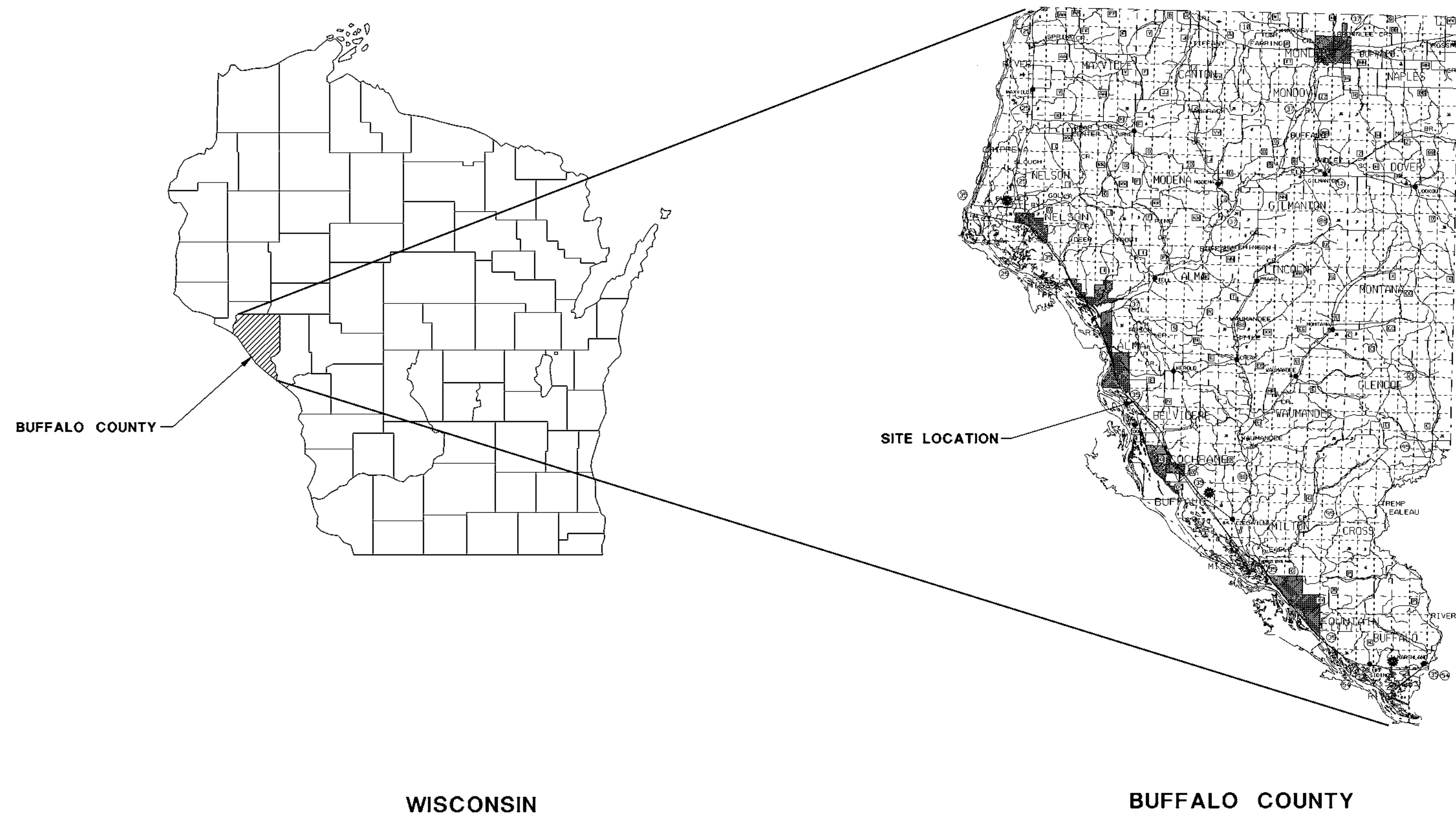
**PREPARED FOR: DAIRYLAND POWER COOPERATIVE
LACROSSE, WISCONSIN**

INDEX

**PREPARED BY: RMT, INC.
MADISON, WISCONSIN**

DATE: OCTOBER 2000

SHEET NUMBER	SHEET TITLE
1	TITLE SHEET/INDEX
2	STANDARD LEGEND AND NOTES
3	EXISTING CONDITIONS MAP
4	PROPOSED SUBBASE GRADES
5	PROPOSED BASE GRADES
6	PHASING PLAN- CELL 1 ACTIVE
7	PHASING PLAN- CELL 1 CLOSED CELL 2A ACTIVE
8	PHASING PLAN- CELL 1 AND 2A CLOSED CELL 2B ACTIVE
9	PHASING PLAN- CELL 1, 2A, AND 2B CLOSED CELL 3 ACTIVE
10	PHASING PLAN- CELL 1, 2A, 2B AND 3 CLOSED CELL 4A ACTIVE
11	PHASING PLAN- CELL 1, 2A, 2B, 3 AND 4A CLOSED CELL 4B ACTIVE
12	PROPOSED FINAL GRADES
13	PROPOSED ENVIRONMENTAL MONITORING PLAN
14	LONG TERM CARE PLAN
15	ENGINEERING CROSS SECTIONS 171700N AND 172200N
16	ENGINEERING CROSS SECTIONS 1477340E AND 1477710E
17	DETAILS- LINER AND COLLECTION PIPES
18	DETAILS- LEACHATE STORAGE TANK AND MANHOLE
19	DETAILS- FINAL COVER
20	DETAILS- DOWNSLOPE FLUMES
21	DETAILS- DOWNSLOPE FLUMES
22	DETAILS- SEDIMENTATION BASINS
23	DETAILS- MISCELLANEOUS

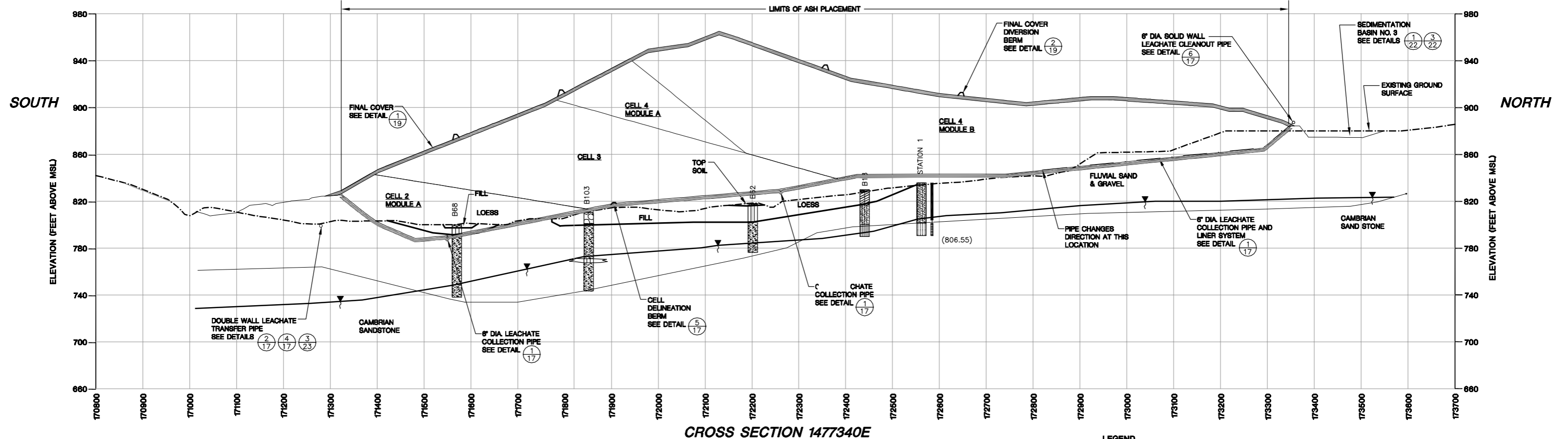


MAP SOURCE: U.S.G.S. CREAM AND ALMA 7.5' QUADRANGLES, DATE 1974.

SITE LOCATION

NOTE: THESE PLANS ARE ACCOMPANIED BY A REPORT OF THE SAME TITLE. THESE DOCUMENTS ARE INTERRELATED AND ARE INTENDED TO BE USED AND REVIEWED TOGETHER. (NOT FOR CONSTRUCTION)





CROSS SECTION 1477340E

LEGEND

	PROPOSED FINAL COVER/BASE LINER		EXISTING GROUND SURFACE
	6" DIA. PERFORATED GRADIENT CONTROL/LEACHATE COLLECTION PIPE		WATER TABLE LINE
	APPROXIMATE DIVERSION BERM LOCATION		STRATIGRAPHIC BOUNDARY, DASHED WHERE INFERRED
	MAIN GRADIENT CONTROL TRANSFER PIPE (745.03)		
	WATER TABLE OR PIEZOMETRIC ELEVATION		
	UNIT B AND C BOUNDARY		
	B61 BORING OR WELL NUMBER		

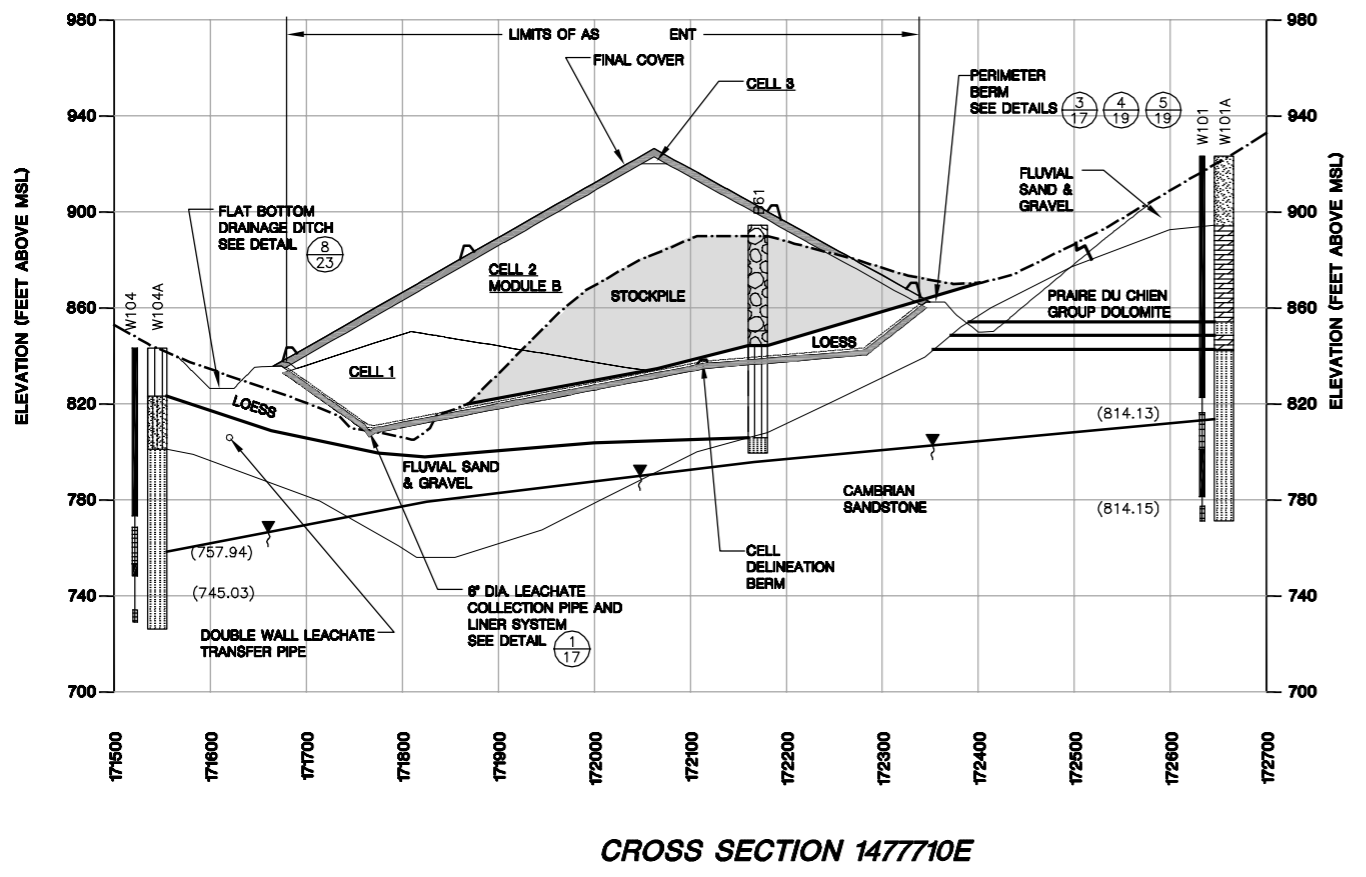
- NOTES**
- EXISTING GROUND SURFACE TAKEN FROM PLAN SHEET 3.
 - ELEVATION REFERENCED TO USGS MEAN SEA LEVEL (MSL) DATUM, 1929.
 - GROUNDWATER ELEVATIONS BASED ON MEASUREMENTS OBTAINED BY DPC ON APRIL 26, 1996.
 - THE STRATUM LINES ARE BASED ON INTERPOLATION BETWEEN BORINGS AND ON INFORMATION CONTAINED ON THE HIGHWATER TABLE CONTOUR MAP (PLAN SHEET 12) AND THE TOP OF COMPETENT BEDROCK CONTOUR MAP (PLAN SHEET 13) IN THE FEASIBILITY REPORT, AND ON THE BOTTOM OF LOESS EXISTING CONDITIONS (FIGURE 2) SHEET INCLUDED IN THE APRIL 30, 1999, SUPPLEMENTAL INFORMATION TO SUPPORT FEASIBILITY DETERMINATION. ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS MAY VARY. CORRELATIONS ARE SHOWN IN MORE DETAIL IN FEASIBILITY REPORT PLAN SHEETS 4-10 (RMT, SEPTEMBER 1997).
 - SOIL BORINGS AND WELLS HAVE BEEN PROJECTED ONTO THE CROSS SECTION.
 - SEE SHEET 4 FOR SUBBASE GRADES, SHEET 5 FOR BASE GRADES AND SHEET 12 FOR FINAL GRADES.

WELL CONSTRUCTION

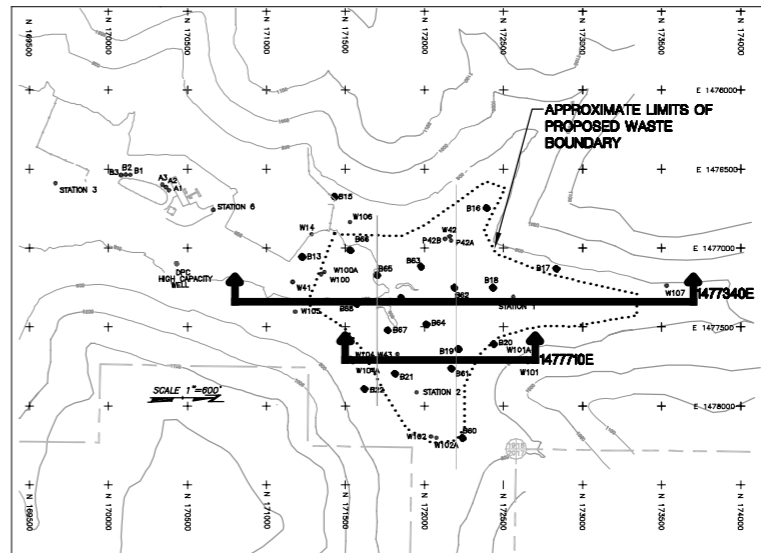
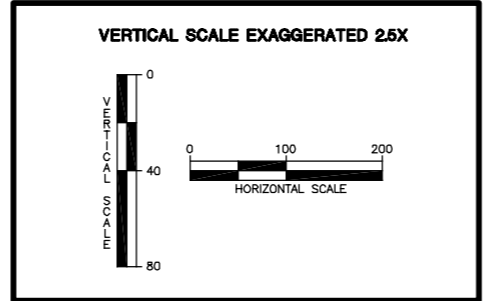
- WELL SEAL
- WELL CASING
- WELL SCREEN

LITHOLOGIC UNITS (USCS CLASSIFICATION)

	TOPSOIL		POORLY GRADED GRAVEL
	FILL		SILTY GRAVEL WITH SAND (GM)
	SILT (ML)		SILTY SAND WITH GRAVEL (SM)
	CLAY (CL)		SILTY SAND (SM)
	SILTY CLAY (CL)		SANDSTONE
	CLAYEY SILT (ML)		DOLOMITE
	SAND (SP)		SANDY SILT



CROSS SECTION 1477710E



CROSS SECTION LOCATOR MAP

NOTE: THESE PLANS ARE ACCOMPANIED BY A REPORT OF THE SAME TITLE. THESE DOCUMENTS ARE INTERRELATED AND ARE INTENDED TO BE USED AND REVIEWED TOGETHER. THESE DOCUMENTS ARE INTENDED TO BE USED FOR REGULATORY PURPOSES ONLY. (NOT FOR CONSTRUCTION)

3.				
2.				
1.				
NO.	BY	DATE	REVISION	APP'D.
PROJECT: DAIRYLAND POWER COOPERATIVE PLAN OF OPERATION BUFFALO COUNTY, WISCONSIN				
SHEET TITLE: ENGINEERING CROSS SECTIONS 1477340E AND 1477710E				
DRAWN BY: DEFOEJ	SCALE: HORIZ. 1"=100	PROJ. NO. 3081.40		
CHECKED BY: DM	VERT. 1"=40'	FILE NO. 30814002.DWG		
APPROVED BY: BJK	DATE PRINTED:			
DATE: OCTOBER 2000		SHEET 16 OF 23		

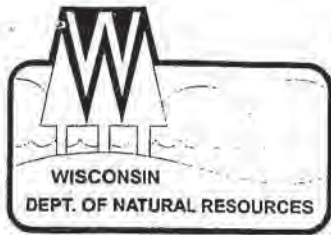
Appendix B

Supporting Material for §257.61

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- Appendix B-1: Feasibility Determination (Lundberg, 1999)
- Appendix B-2: Excerpts from Feasibility Report (RMT, 1997)
- Appendix B-3: WDNR Surface Water Data Viewer Map
- Appendix B-4: USDA Hydric Rating Map

Appendix B-1
Feasibility Determination (Lundberg, 1999)



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Tommy G. Thompson, Governor
George E. Meyer, Secretary
Scott A. Humrickhouse, Regional Director

West Central Region Headquarters
1300 W. Clairemont Avenue
PO Box 4001
Eau Claire, Wisconsin 54702-4001
Telephone 715-839-3700
FAX 715-839-6076
TDD 715-839-2786

September 10, 1999

Mr. George Johnston
Dairyland Power Cooperative
3200 East Avenue South, P.O. Box 817
La Crosse, WI 54602-0817

FID# 606009360
License # 4126
Buffalo County
SW
Approval

Subject: Feasibility Determination for the Proposed Dairyland Power Cooperative Phase IV Ash Disposal Facility, Town of Belvidere, Buffalo County, Wisconsin. License No. 4126

Dear Mr. Johnston:

We have determined that the proposed Phase IV disposal area, Alma Off-Site Ash Disposal Facility is feasible, subject to certain conditions; and that it should provide for satisfactory solid waste disposal. We have also determined that the Wisconsin Environmental Policy Act requirements have been met through the preparation of an Environmental Assessment. An Environmental Impact Statement is not needed for this project.

This favorable determination entitles you to submit a plan of operation, which meets the conditions set forth in the feasibility report and subsequent addenda, the attached determination and chapter NR 514, Wis. Adm. Code. This determination does not guarantee that we will approve a plan of operation, or license your proposed facility. When preparing your plan of operation, we advise you to carefully review the requirements of chs. NR 500 through 538, Wis. Adm. Codes.

Dairyland Power Cooperative requested an exemption to s. NR 504.04(3)(f), Wis. Adm. Code, for one (1) water supply well (PW-1) located downgradient and within 1,200 feet of the limits of filling for the proposed Phase IV development. This water supply well is approximately 410 feet deep and is cased to a depth of 113 feet below the ground surface. Due to its location downgradient of the proposed landfill no exemption will be granted for this well. This well must be abandoned in accordance with ch. NR 812.26, Wis. Adm. Code, prior to waste placement in the Phase IV development. If an exemption request is made to the Department outlining non-potable uses for this well which can be independently confirmed prior to waste placement in the Phase IV development, an exemption may be considered at that time.

Dairyland Power Cooperative requested an exemption to the locational criteria of s. NR 504.04(3)(f), Wis. Adm. Code, for a proposed high capacity well (PW-2). This well would be located a minimum of 250 feet from the limits of waste and situated hydraulically upgradient/sidegradient of the proposed Phase IV development. The well design would include steel casing down to an elevation of at least 650 M.S.L. which would place the bottom of casing approximately 170 feet below the top of bedrock. The remainder of the well would be constructed as an open borehole in the bedrock and would extend to between 450 and 500 feet below the ground surface. For these reasons the Department is granting this exemption to the separation distance in s. NR 812.08(4)(g)(1), and the locational criteria in s. NR 504.04(3)(f), Wis. Adm. Code.

Dairyland Power Cooperative – Off-Site Phase IV Ash Landfill
Feasibility Determination
09/10/99

Dairyland Power Cooperative requested an exemption to s. NR 512.11(3), Wis. Adm. Code, regarding the submittal of a bedrock piezometric map. It has been shown that the groundwater flow direction is the same in the fluvial sand and gravel as it is in the underlying Cambrian Sandstone and the water table intersects both the unconsolidated sediment and bedrock. For these reasons the Department is granting this exemption.

Dairyland Power Cooperative requested an exemption under s. NR 140.28, Wis. Adm. Code, for a number of monitoring wells based on the background quality data. We have granted groundwater quality exemptions at specific monitoring wells where elevated concentrations of certain parameters have been detected during the four (4) rounds of background groundwater sampling. The following criteria as established in s. NR 507.18(2)(b), Wis. Adm. Code, were used to determine if granting groundwater quality exemptions were appropriate:

1. Any of the values from the background sampling exceed a parameter's enforcement standard (ES), or
2. Two or more of the values exceed a parameter's preventive action limit (PAL), or
3. The average of a parameter's value is greater than the PAL.

Landfill owners must perform baseline groundwater monitoring in accordance with s. NR 507.18, Wis. Adm. Code and report any exceedances to Wisconsin's groundwater standards. At sixteen (16) different monitoring locations the groundwater data indicated elevated concentrations above the ch. NR 140, Wis. Adm. Code, groundwater standards for the parameters listed in ch. NR 507, Table 3. We have granted exemptions to the State's groundwater quality standards for specific monitoring wells where elevated concentrations of certain parameters have been detected. Alternate concentration limits (ACLs) will need to be established in accordance with s. NR 705.29 for these wells and parameters. To determine what these ACLs shall be, this approval requires that more baseline data be collected in order to have at least eight (8) rounds of data for the calculations. Elevated concentrations of sulfate at Sta. 6 are related to filling and housekeeping activities of the now closed Phase II area. The Department will grant an exemption to the groundwater standard for sulfate at Sta. 6 for the proposed Phase IV development and allow an ACL to be calculated. However, no calculated ACL for sulfate may be applied to existing landfill phases 1, 2, and 3 (license number 2927, FID number 606009360). Dairyland Power Cooperative must continue to monitor the sulfate concentrations at this well location.

Dairyland Power Cooperative requested an exemption to s. NR 507.21, Wis. Adm. Code, for leachate quality monitoring since the leachate will be disposed at the Dairyland Power Cooperative waste water treatment plant in Alma, Wisconsin. Leachate analytical data provides pertinent information regarding conditions within the landfill. Further, in your October 7, 1998, "Additional Information requested for Feasibility Determination" report was a letter dated September 24, 1998 from the alternate leachate disposal facility – La Crosse Wastewater Utility. In this letter, the La Crosse Wastewater Utility specified that they be routinely provided with leachate analytical data. Therefore, an exemption for leachate quality monitoring will not be granted.

Dairyland Power Cooperative requested an exemption to s. NR 512.15(2)(b), Wis. Adm. Code, for the number of samples analyzed from each clay borrow source test pit. Due to the relatively thin nature of the clay deposit at the on-site borrow source, only one sample was collected and analyzed from most of the test pits. This clay will not be needed if the proposal for a geosynthetic clay liner (GCL) is approved for the liner and cover. For these reasons the Department is granting this exemption.

Dairyland Power Cooperative – Off-Site Phase IV Ash Landfill
Feasibility Determination
09/10/99

The proposed Phase IV development will be situated within a valley at the juncture of four surface water drainage ways. The bluff top land surrounding this landfill location is approximately 450 feet above the valley. In a heavy precipitation storm event, the amount and velocity of run-off water flowing from the uplands down into this valley can become quite significant. The landfill owner should be aware a potential exists for high velocity water flows from the higher elevations to erode and/or washout surface water controls during the different phases of construction. It will be imperative that the surface water structures are assessed and repaired, if necessary, as quickly as possible following any heavy storms.

If you have any questions regarding this determination, please contact Mark Stephenson, Hydrogeologist at (608) 785-9983; Marty Herrick, Environmental Engineer, at (608) 789-5518; or Jack Tritt, Waste Management Specialist from our Eau Claire office at (715) 839-3768.

Sincerely,



David R. Lundberg
Waste Management Team Leader
West Central Region

cc: Mark A. Osten, RMT Inc., 744 Heartland Trail, P.O. Box 8923, Madison, WI 53708-8923
Paul Huebner – WA/3
Dennis Mack – WA/3
Chuck Leveque – LC/5
Mark Stephenson – La Crosse
Marty Herrick – La Crosse
Jack Tritt – WCR
Jack Connelly/Bureau File – WA/3
Jim Pardee – EA/6
Patti Cronin – Waste Facility Siting Board
Sandra Ebert – Buffalo County Clerk, P.O. Box 58, Alma, WI 54610
Lyle Hofer – Town of Belvidere Clerk, P.O. Box 216, Cochrane, WI 54622
Nathan D. Sampson – Zoning Administrator, P.O. Box 492, Alma, WI 54610-0492

PROJECT SUMMARY
GENERAL SITE INFORMATION

Proposed Facility Name: Dairyland Power Cooperative Phase IV Ash Disposal Area

Authorized Contact: Mr. George Johnston
Dairyland Power Cooperative
P.O. Box 817
3200 East Avenue South
La Crosse, Wisconsin 54601
(608) 787-1322

Site Location and Area: Dairyland Power Cooperative (DPC) is proposing to site and develop a noncontiguous coal ash disposal area (Phase IV) at their existing Alma off-site disposal facility. This disposal facility would be located in the NE1/4 of the NE1/4 of Section 19 and portions of Section 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin. The proposed limits of filling would cover 32.1 acres within a parcel of 1,113 acres owned by DPC. The proposed site is located adjacent, but not connected to, DPC's current off-site ash disposal facility. The site is located approximately 4,000 ft. east of State Trunk Highway (STH) "35" and 3,200 ft. south of County Road "E". The area surrounding the proposed disposal site is generally sparsely populated agricultural land. Access to the facility is along a private entrance road from STH 35.

One water supply well is located within 1200 feet of the proposed limits of fill. This well would be abandoned prior to waste placement in the Phase IV development.

Proposed Capacity and Site Life: The proposed Phase IV disposal area has a design capacity of approximately 3,011,000 cubic yards. The estimated site life is 13.9 years but may be influenced by the demand for both fly ash and bottom ash as beneficial reuse materials.

Proposed Service Area, Waste Types and Leachate Characteristics: The proposed site will be owned and operated as a private industrial solid waste disposal facility. Waste disposal will, for the most part, be limited to fly ash and bottom ash from the burning of coal. This material will be produced at the Alma Units 1 – 5, the John P. Madgett (JPM), and the Genoa Station No.3 generating facilities owned and operated by DPC. A small quantity (less than 1% of the total waste stream) of asbestos from power plant renovations and waste water treatment plant sludge from DPC's Alma power generating station will also be disposed at this site. The chemical characteristics of the leachate produced within the site are expected to be the same as for the existing Phase III.

Present Land Use and Zoning: DPC is currently using a portion of their property for coal ash disposal operations in Phases I through III. Phases I, II, and III are located 1,000 feet, 100 feet, and 1,400 feet respectively to the south/southwest of the proposed landfill footprint. Phase I was closed in 1993. Phase II was closed in October 1997. Phase III is approximately 7 acres in size and depending on ash generation rates and anticipated beneficial reuse demands, is expected to reach capacity by the year 2004. The 1,113 acre parcel is zoned as an agricultural district as is the surrounding land.

Topography and Hydrology: The site is located within the Mississippi River drainage basin in a valley, at the juncture of four surface water drainage-ways. The lower (southern) end of the valley is currently being used for ash disposal under previous approvals. The bluff top land surrounding this site is primarily used for agricultural purposes and extends roughly 450 feet above the valley floor where the landfill would be situated.

Ephemeral waterways, which flow only in direct response to precipitation, route surface water from the uplands and steep slopes into the central valley. These waters then flow through ditches and culverts toward the Mississippi River located approximately 1 mile south. The nearest wetlands are located approximately 1 mile south of the proposed site along the Mississippi River.

Regional and Site Specific Geology: The surficial soil at the proposed site generally consists of a sand and silty sand with lenses of gravel. Additionally, several borings contained layers of finer grained soil including silt and clay ranging from a few feet to as much as 40 feet in thickness. The sandy soil typically extends to bedrock at depths ranging from 15 to 60 feet below the existing ground surface. The sandy soil is primarily the result of fluvial deposition; however, some of the sand near the bedrock surface appears to be the result of *in situ* weathering of the sandstone bedrock.

Bedrock in the area is composed of the Prairie du Chien Group Dolomite, which acts as a cap rock overlying Cambrian Sandstone. In the proposed landfill footprint, however, the Prairie du Chien has been removed by erosion.

Cambrian Sandstone underlies the unconsolidated sediment in the landfill footprint. This bedrock type is fine-grained with interbedded lenses of dark brown sandstone and calcareous, shaley partings. The bedrock surface mimics the surface topography only at higher relief. The top of bedrock is substantially deeper in the central portion of the landfill footprint than along the valley slope area.

Hydrogeology: The groundwater table beneath the site is present both within the unconsolidated sandy sediment and within the sandstone bedrock. The overlying sand and gravel aquifer is hydraulically connected to the sandstone bedrock. The depth to groundwater varies from 27.5 feet in the northeastern portion of the site to 110 feet below ground surface on the northern end of the site. The minimum separation between the proposed subbase grades and the high water table is approximately 30 feet. Groundwater flows into the central portion of the valley and then toward the Mississippi River approximately 1 mile south/southwest of the site.

The *in situ* hydraulic conductivity of the fluvial sand and gravel across the site ranges from 5.3×10^{-3} to 2.8×10^{-4} cm/sec. The geometric mean horizontal hydraulic conductivity in this unit is approximately 1.4×10^{-3} cm/sec. The *in situ* hydraulic conductivity in the Cambrian Sandstone ranged from 2.5×10^{-5} to 1.0×10^{-2} cm/sec. The geometric mean horizontal hydraulic conductivity within the geologic unit is 1.1×10^{-3} cm/sec.

Baseline groundwater quality results, for indicator parameters and public health and welfare parameters for the proposed site were provided as part of the feasibility report. In one or more wells installed at the site the concentrations of lead, manganese, nitrogen (nitrate + nitrite), selenium and sulfate attained or exceeded the preventive action limit (PAL) or enforcement standard (ES) established in ch. NR 140, Wis. Adm. Code. The Department is granting an exemption under s. NR 140.28, Wis. Adm. Code for the baseline exceedances of the parameters

listed above at these monitoring wells. Calculations of PAL's for detection parameters and alternative concentration limits (ACLs) for wells granted exemptions to the groundwater standards, should be prepared in accordance with chs. NR 507.27 and NR 507.29, Wis. Adm. Code. As part of the plan of operation, Dairyland Power Cooperative should propose PALs for detection monitoring parameters and ACLs for the parameters granted exemption to the groundwater standards.

Proposed Design: The proposed Phase IV ash disposal facility would be developed in 4 phases with filling beginning in a 6 acre tract along the east central portion of the site and generally progressing westward. The proposed area of ash disposal would cover approximately 32 acres and provide 3,011,000 cubic yards of design capacity.

The proposed surface water control system is designed for a 100-year, 24-hour storm event. Surface water control will include the phased construction beginning prior to landfill construction of the permanent surface water controls around the site perimeter supplemented with temporary surface water controls where necessary.

The proposed design would include a geosynthetic clay liner (GCL) installed over a 2-foot thick, low permeability subbase and overlain by a 60-mil high density polyethylene (HDPE) geomembrane. The low permeability subbase soil would come from on-site material excavated within the Phase IV footprint.

An alternate liner design was included in the feasibility report. This alternate design included a 4-foot thick compacted clay liner in lieu of the GCL. The HDPE geomembrane would be installed over the clay liner and tested in accordance with ss. NR 504.06 (2) (a) and (f), Wis. Adm. Code.

Regardless of which liner type is installed, a leachate collection system would be constructed in an overlying coarse-grained drainage layer material. Leachate that would accumulate in a collection tank would be recycled for the purpose of sluicing ash waste into the disposal area. Excess leachate will be trucked to Dairyland Power's own wastewater treatment plant at the Alma, Wisconsin generation station or to the alternate treatment plant (La Crosse Wastewater Utility) in the City of La Crosse, Wisconsin. This landfill would not be classified as a zone of saturation landfill because the minimum separation between the subbase grades and the high water table is approximately 30 feet.

Final cover would consist of a 6-inch soil grading layer over the ash, followed by a GCL, a 40-mil very flexible polyethylene (VFPE) geomembrane, a 1-foot sand drainage layer, a 1-foot general soil cover layer and a 6-inch topsoil layer. Final grades are designed at a maximum of 4H:1V slope

An alternate final cover design was also included in the feasibility report. This alternate design consists of a 2-foot thick compacted clay layer in lieu of the grading layer, GCL and geomembrane in accordance with NR 504.07, Wis. Adm. Code. A 2.5-foot thick general soil cover layer would be placed over the clay followed by a 6-inch thick layer of topsoil.

The ash to be disposed at this site is biologically inert; thus, a gas management system was not included in the project design.

The planned final use for the Phase IV ash disposal area will be as open green space.

Environmental Monitoring: The proposed ash landfill would include an environmental monitoring program to measure groundwater levels and quality, surface water quality and leachate quantity and quality. Samples would be taken semi-annually from groundwater monitoring wells installed at various depths and locations around the site. Leachate head wells and the leachate collection tank will also be monitored on a regular basis. All environmental monitoring data including groundwater, leachate quality and leachate head measurements and surface water monitoring would be reported to the Department electronically on diskettes.

Groundwater analysis would include those parameters specified in NR 507, Appendix 1, Table 2, Wis. Adm. Code. Leachate analysis would include those parameters specified in NR 507, Appendix 1, Table 4, Wis. Adm. Code.

BEFORE THE STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

DETERMINATION OF SITE FEASIBILITY
DAIRYLAND POWER COOPERATIVE
PHASE IV ASH DISPOSAL FACILITY
TOWN OF BELVIDERE, BUFFALO COUNTY, WISCONSIN
WDNR LICENSE # 4126

FINDINGS OF FACT

The Department finds that:

- 1) Dairyland Power Cooperative (DPC) has proposed to construct and operate an ash disposal landfill in the NE1/4 of the NE1/4 of Section 19 and portions of Sections 18 and 20, Township 21 North, Range 12 West, Town of Belvidere, Buffalo County, Wisconsin.
- 2) The proposed ash disposal facility is intended to serve the needs of DPC as a private industrial solid waste disposal facility. Waste disposal at this site will consist of fly and bottom ash which is produced at the Alma Units 1 – 5, the John P. Madgett (JPM), and the Genoa Station No. 3 (G-3) power generation facilities owned and operated by DPC.
- 3) The proposed ash disposal landfill would have a design capacity of 3,011,000 cubic yards with an approximate operational life of 13.9 years.
- 4) The Department made an initial site inspection of the proposed site on August 24, 1994.
- 5) On April 25, 1995, the Department received an Initial Site Report (ISR) dated April 1995, and submitted by RMT, Inc., on behalf of DPC.
- 6) On July 17, 1995, the Department determined that the ISR was complete and issued an opinion that the proposed site may have potential for development as an industrial solid waste disposal facility.
- 7) The Department considered the following documents in its review of the feasibility of the proposed ash disposal landfill:
 - (a) A Feasibility Report, dated September 19, 1997, and received by the Department on September 19, 1997, prepared by RMT, Inc., on behalf of DPC.
 - (b) A DPC Feasibility Report Clarification dated November 25, 1997, and received by the Department on November 26, 1997, prepared by RMT, Inc., on behalf of DPC.
 - (c) A Feasibility Report Addendum – Geotechnical Testing Results dated December 15, 1997, and received by the Department on December 16, 1997, prepared by RMT, Inc., on behalf of DPC.

- (d) An Additional Information Requested for Feasibility Determination report dated October 7, 1998, and received by the Department on October 8, 1998, prepared by RMT, Inc., on behalf of DPC.
 - (e) A Supplemental Information to Support Feasibility Determination report dated April 30, 1999 and received by the Department on May 3, 1999, prepared by RMT, Inc., on behalf of DPC.
 - (f) A Request for Approval of High Capacity Well Location report dated August 19, 1999, and received by the Department on August 20, 1999, prepared by RMT, Inc., on behalf of DPC.
- 8) The Feasibility Report review fee of \$20,000 was received by the Department on October 28, 1997.
- 9) On June 22, 1998, the Department determined that the Feasibility Report was complete; however, additional information was requested to aid in the feasibility determination.
- 10) On January 5, 1999 and January 27, 1999, the Department requested additional information to aid in the feasibility determination.
- 11) A public notice under s. 289.25 (3) Stats., was published in The Buffalo County Journal on July 2, 1998. The Department did not receive any responses to the public notice.
- 12) The proposed landfill expansion would not be located within:
- (a) 1,000 feet of any navigable lake, pond, or flowage;
 - (b) 300 feet of a navigable river or stream;
 - (c) a floodplain;
 - (d) 1,000 feet of the nearest edge of the right-of-way of any state trunk highway, interstate, federal aid primary highway, or the boundary of any public park;
 - (e) 10,000 feet of any airport runway end used or planned to be used by turbojet aircraft or within 5,000 feet of any airport runway end used by piston type aircraft or within an area where the design or operation of the landfill would pose a significant bird hazard to aircraft;
 - (f) within 200 feet of a fault that has had displacement in Holocene time;
 - (g) within a seismic impact zone; or
 - (h) within an unstable area.
- 13) The proposed limits of fill of the ash disposal landfill would be located within 1,200 feet of the DPC high-capacity water supply well (PW-1) for which an exemption to s. NR 504.04 (3) (f), Wis. Adm. Code, was requested. The Department has determined that the exemption is

not warranted and that this well must be abandoned prior to waste placement in the Phase IV disposal area.

- 14) A new well (PW-2) is proposed for construction and would be located a minimum of 250 feet hydraulically upgradient/sidegradient to the Phase IV disposal area. An exemption to s. NR 504.04 (3) (f), Wis. Adm. Code is requested for this well. The Department has determined that the exemption is warranted because of the proposed design and location.
- 15) The proposed ash disposal landfill, if designed, constructed, and operated in accordance with the feasibility report and the conditions set forth below, would not be within an area where there is a reasonable probability that the facility will cause:
 - (a) a significant adverse impact on wetlands as provided in ch. NR 103, Wis. Adm. Code;
 - (b) a significant adverse impact on critical habitat areas;
 - (c) a detrimental effect on any surface water;
 - (d) a detrimental effect on groundwater quality;
 - (e) the migration of explosive concentrations of gases in any facility structure or in the soil or air beyond the facility boundary; or
 - (f) the emission of any hazardous air contaminants in excess of standards contained in s. NR 445.03, Wis. Adm. Code.
- 16) The Department considered the following information while reviewing the need for exemptions to groundwater standards at this facility:
 - (a) baseline groundwater monitoring data provided in the Feasibility Report and Addenda to the Feasibility Report;
 - (b) well construction details and boring logs provided in the Feasibility Report;
 - (c) well location plan sheets and water table maps provided in the Feasibility Report and Addenda to the Feasibility Report;
 - (d) the landfill design specifications provided in the Feasibility Report and Addenda to the Feasibility Report as conditioned herein.
- 17) Based on an examination of site conditions, the Department finds the following:
 - (a) Groundwater concentrations of arsenic, lead, manganese, nitrogen (nitrate + nitrite), selenium, silver and sulfate at the site area are found at concentrations exceeding the ch. NR 140, Wis. Adm. Code, groundwater standards. These exceedances are due to baseline groundwater quality associated with natural hydrogeologic conditions or substances released by other human activities on, or near, the proposed facility.

- (b) The elevated concentrations of sulfate at Station 6 reflects groundwater quality related to the Phase II ash disposal area.

18) Based on an examination of the groundwater quality data for the proposed facility for substances of public health concern, and the information listed in Findings of Fact 16 and 17, the Department finds the following:

- (a) Mean baseline concentrations above the preventive action limit (PAL) but below the enforcement standard (ES) established for the following substances of public health concern were observed in groundwater samples from the monitoring wells listed below:

<u>SUBSTANCE</u>	<u>WELL NUMBER</u>
lead	W-100A, W-101
nitrogen (nitrate + nitrite)	W-100, W-100A, W-107
selenium	Sta. 6, W-100, W-100A, W-102A, W-104A

- (b) The mean concentration of samples analyzed for arsenic in well W-107 does not attain the PAL established in NR 140, Wis. Adm. Code.
- (c) The mean concentration of samples analyzed for manganese in monitoring wells W-42, W-100A, W-104A, and W-107 do not attain the PAL established in NR 140, Wis. Adm. Code. Therefore, the requested exemption to the groundwater standard for manganese is not necessary.
- (d) The concentration of silver in the duplicate sample obtained from Station 1, on February 14, 1996, was not detected in the regular sample obtained from Station 1, on the same date and was not detected more than once during the sampling period. Therefore, an exemption to the groundwater standard for this well is not necessary.
- (e) The proposed facility will not cause the concentration of lead, nitrogen (nitrate + nitrite) and selenium to exceed the ES for these substances at a point of standards application because of the landfill design.
- (f) The proposed facility is designed to achieve the lowest possible concentrations for lead, nitrogen (nitrate + nitrite) and selenium which are technically and economically feasible.

19) Based on an examination of the groundwater quality data for the proposed facility for substances of public welfare concern and Findings of Fact 16 and 17 above, the Department finds the following:

- (a) Mean baseline concentrations above the ES established for the following substance of public welfare concern was observed in groundwater samples from the monitoring well listed below:

<u>SUBSTANCE</u>	<u>WELL NUMBER</u>
sulfate	Sta. 6

- (b) The proposed facility is designed to achieve the lowest possible concentration of sulfate, which is technically and economically feasible.
 - (c) The anticipated increase in the concentration of sulfate does not present a threat to public health or welfare because of the landfill design.
- 20) Granting the exemptions that are set forth below will not inhibit compliance with the Wisconsin solid waste management standards in chs. NR 500 through 538, Wis. Adm. Code.
- 21) Neither the applicant, nor any person owning a 10% or greater legal or equitable interest in the applicant or in the assets of the applicant:
- (a) is in noncompliance with a plan approval or order issued by the Department for a solid or hazardous waste facility in Wisconsin;
 - (b) owns or previously owned a 10% or greater legal or equitable interest in a person, or in the assets of a person, who is not in compliance with a plan approval or order issued by the Department for a solid or hazardous waste facility in Wisconsin.
- 22) The Department has complied with the requirements of chs. NR 150, Wis. Adm. Code, and s. 1.11, Stats., and has adopted all practical means to avoid or minimize environmental harm consistent with social, economic and other essential considerations.
- 23) The special conditions set forth below are needed to assure that the facility will not pose a substantial hazard to public health or welfare.

CONCLUSIONS OF LAW

1. The proposal will comply with the applicable requirements of chs. NR 500 through 538, Wis. Adm. Code, provided that the conditions of the feasibility determination set forth below are met.
2. The procedural requirements of ss. 1.11 and 289.21 to 289.29, Stats., have been complied with.
3. The Department has the authority to determine that a site is feasible with special conditions, if the conditions are needed to ensure compliance with chs. NR 500 through 538, Wis. Adm. Code.
4. The Department has the authority to deny a landfill design that does not meet the requirements of s. NR 140.28 and s. NR 504.06 (1), Wis. Adm. Code.
5. The Department has the authority under s. NR 140.28, Wis. Adm. Code, and ss. 160.19 (8) and (9), Stats., to grant exemptions to the groundwater standards for lead, nitrogen (nitrate + nitrite), selenium and sulfate.

6. The Department has the authority under s. NR 504.04 (2), Wis. Adm. Code, to grant exemptions to the location criterion of s. NR 504.04 (3) (f), Wis. Adm. Code, regarding the siting of a solid waste land disposal facility within 1,200 feet of any private water supply well.
7. The Department has the authority under s. NR 812.43 (1), Wis. Adm. Code, to grant variances to the location criterion of s. NR 812.08 (4) (g) (1), Wis. Adm. Code, regarding private water supply wells located within 1,200 feet of a proposed landfill.
8. As provided for under s. 289.28 (1), Stats., sufficient need for the proposed ash disposal facility has been established.
9. In accordance with the foregoing, the Department has the authority under s. 289, Stats., to issue the following grant of exemptions, determination of need and design capacity, and conditional feasibility determination.

GRANT OF EXEMPTIONS

1. Dairyland Power Cooperative (DPC) has demonstrated circumstances which warrant an exemption to the groundwater standards for lead, nitrogen (nitrate + nitrite), selenium and sulfate in ch. NR 140, Wis. Adm. Code as specified in s. NR 140.28, Wis. Adm. Code. Therefore, the Department grants an exemption to allow the landfill expansion to be developed in an area where a preventive action limit or enforcement standard has been attained or exceeded. Exemptions are, therefore, granted for these parameters and the wells listed in Findings of Facts 18 and 19. DPC must establish alternative concentration limits (ACLs) for the wells and substances listed in Findings of Facts 18 and 19 when sufficient rounds of baseline groundwater quality samples have been collected. These alternative concentration limit calculations must be presented to the Department for approval prior to waste placement in the Phase IV ash disposal area. The sulfate concentration found in Sta. 6 is related to filling activities associated with the now close Phase II area. An ACL may be calculated and applied for sulfate concentrations at Sta. 6 associated only with the proposed Phase IV development. The calculated ACL for Sta. 6 may not be applied to the other ash disposal landfills (Phases I, II, or III, License No. 2927, FID No. 606009360) at the Alma, Wisconsin off-site facility.
2. Dairyland Power Cooperative has demonstrated circumstances which warrant an exemption from s. NR 504.04 (3) (f), Wis. Adm. Code and a variance from s. NR 812.08 (4) (g) (1), Wis. Adm. Code, to allow construction of a solid waste landfill where the proposed limits of filling are within 1,200 feet of any private water supply well. An exemption is hereby granted for the proposed well (PW-2) provided that the conditions set forth in the August 27, 1999 variance approval letter from the Department of Natural Resources, Bureau of Drinking Water and Groundwater are met.
3. Dairyland Power Cooperative has demonstrated circumstances which warrant an exemption from s. NR 512.11 (3), Wis. Adm. Code, regarding the submittal of a bedrock piezometric map. An exemption is hereby granted.

4. Dairyland Power Cooperative has demonstrated circumstances which warrant an exemption from s. NR 512.15 (2) (b), Wis. Adm. Code, for the number of samples analyzed from each clay borrow source test pit. An exemption is hereby granted.

DETERMINATION OF NEED AND DESIGN CAPACITY

The Department hereby determines as follows:

1. There is sufficient need within the anticipated service area for the proposed Dairyland Power Cooperative, Phase IV Ash Disposal Area in the Town of Belvidere, Buffalo County, Wisconsin.
2. A design capacity of 3,011,000 cubic yards for the proposed Phase IV Ash Disposal Facility will provide for an expected operational life of approximately 13.9 years.

CONDITIONAL FEASIBILITY DETERMINATION

The Department hereby determines that the proposed Dairyland Power Cooperative, Phase IV Disposal Area, Alma Off-Site Ash Disposal Facility, Town of Belvidere, Buffalo County, Wisconsin is environmentally feasible and has the potential for use as an industrial solid waste disposal landfill. This determination is contingent on the fact that the following conditions are complied with and the Plan of Operation is prepared in accordance with chs. NR 500 through NR 538, Wis. Adm. Codes.

GENERAL:

1. The maximum design capacity of the proposed Dairyland Power Cooperative, Phase IV Ash Disposal Area shall not exceed 3,011,000 cubic yards.
2. The Plan of Operation, at a minimum, shall comply with the requirements of chs. NR 500 through 538, Wis. Adm. Code, the Feasibility Report, and conditions of this approval. Additionally, supporting justification shall be provided if the plan differs from the provisions of the Administrative Code.

FACILITY DESIGN:

3. This Feasibility Determination is in part based on the use of a geosynthetic clay liner (GCL). The GCL is a new technology and installation, quality assurance (QA) and quality control (QC) standards have not been codified in the NR 500 series, Wis. Adm. Code. Consequently the Bureau of Waste Management's "Guidance for the Use of Geosynthetic Clay Liners (GCLs) at Solid Waste Facilities" should be followed as well as the manufacturers recommendations when submitting final design for the GCL in the Plan of Operation. The compatibility of the anticipated waste stream with respect to the GCL has been addressed in the Feasibility Report. If waste stream characteristics change from those presented in the Feasibility Report then the compatibility of those changes may have to be readdressed.

ENVIRONMENTAL MONITORING:

4. A minimum of 8 rounds of baseline groundwater sampling data, which represent background groundwater conditions, shall be provided for the substances and wells requiring an exemption from the groundwater standards of ch. NR 140, Wis. Adm. Code. The results of this monitoring, justification for use or removal of any baseline monitoring results in the calculation of alternative concentration limits (ACL) and the ACL calculations shall be submitted with the Plan of Operation.
5. The facility environmental monitoring plan, including groundwater, leachate, and surface water shall be included in the Plan of Operation and shall be consistent with that outlined in the environmental monitoring section of the attached feasibility summary. Detection monitoring shall comply with ch. NR 507, Wis. Adm. Code, including using the analytical methods specified in Appendix II.
6. A revised sampling plan shall be included in the Plan of Operation. The plan shall comply with ch. NR 507.16, Wis. Adm. Code. The months of sampling and order of sampling wells shall be defined in the sampling plan.
7. Detection leachate monitoring shall be conducted in accordance with ch. NR 507, Appendix I, Table 4. The months of sampling shall be defined in the sampling plan.
8. The environmental monitoring program shall meet the requirements of NR 507, Wis. Adm. Code, or provide justification for not doing so. The monitoring points assigned to the Phase IV ash disposal area are detailed in Attachment A, Tables 1, 2 and 3.
9. As part of the Plan of Operation, Dairyland Power Cooperative shall provide a plan to protect existing monitoring devices during construction of the Phase IV ash disposal area.
10. Dairyland Power Cooperative shall propose inspection of erosion control measures on a regular basis and/or following major precipitation events. Include a timeline for making any necessary repairs.
11. As part of the Plan of Operation, Dairyland Power Cooperative shall specify the sequencing of erosion control and stormwater control structures with regard to landfill sequencing.
12. As part of the Plan of Operation, Dairyland Power Cooperative shall include a timeline for proper abandonment of water supply well PW-1, or justification for continued use of this well. If the Department does not approve continued use as a non-potable water supply, the well shall be abandoned on accordance with ch. NR 812.26, Wis. Adm. Code prior to waste placement in the Phase IV development.

The Department retains the jurisdiction either to require the submittal of additional information or to modify this approval at any time if, in the Department's opinion, conditions warrant further modifications.

NOTICE OF APPEAL RIGHTS

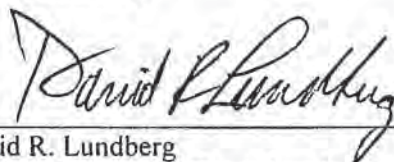
If you believe you have a right to challenge this decision, you should know that Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

For judicial review of a decision pursuant to sections 227.52 and 227.53, Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

This notice is provided pursuant to section 227.48(2), Stats.

Dated Sept. 10, 1999

DEPARTMENT OF NATURAL RESOURCES
For the Secretary



David R. Lundberg
Waste Management Team Leader
West Central Region



Mark Stephenson
Plan Review Hydrogeologist

ATTACHMENT "A"

TABLE 1

ENVIRONMENTAL MONITORING SUMMARY
 DAIRYLAND POWER COOPERATIVE PHASE IV ASH DISPOSAL AREA

ASH DISPOSAL LANDFILL DETECTION MONITORING, FILTERED SAMPLES:

WELL NAME	DNR I.D. #	WUWN	Selenium Dissolved 1145	Alkalinity Total 39036	Boron Dissolved 1020	COD 341	Specific Conduct. 94	Field pH 400	Ground-water Temp. 10	Ground-water Elevation 72020	Hardness Total 22413	Sulfate Dissolved 946
Station 1	1	BX385	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Station 2	2	BX386	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Station 6	16	IM717	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-42	17	LO914	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
P-42A	18	LO915	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
P-42B	19	LO916	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-43	20	LO917	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-100	21	LO918	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-100A	22	LO919	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-101	23	LO920	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-101A	24	LO921	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-102	25	LO922	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-102A	26	LO923	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-104	27	LO924	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-104A	28	LO925	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-105	29	LO926	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-106	30	LO927	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
W-107	31	LO928	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA

WUWN = Wisconsin Unique Well Number
 SA = Semi-Annual Sampling

TABLE 2

HIGH CAPACITY WATER SUPPLY WELL
 MONITORING SUMMARY

WELL NAME	DNR I.D. #	WUWN	Selenium Total 1147	Alkalinity Unfilter 410	Boron Total 1022	COD Unfiltered 340	Specific Conduct. 94	Field pH 400	Ground-water Temp. 10	Hardness Unfiltered 900	Sulfate Total 945
PW-2	*	NG834**	SA	SA	SA	SA	SA	SA	SA	SA	SA

WUWN = Wisconsin Unique Well Number
 * - To be assigned upon completion of well installation

Dairyland Power Cooperative - Off-Site Phase IV Ash Landfill
 Feasibility Determination

9/10/1999

** - Well number assigned by Dept. of Natural Resources, Bureau of Drinking Water and Groundwater in a letter dated August 27, 1999 to Dairyland Power Cooperative.

SA = Semi-Annual Sampling

TABLE 3

LEACHATE MONITORING SUMMARY

LEACHATE COLLECTION SYSTEM, UNFILTERED SAMPLES

PARAMETER	PARAMETER #	FREQUENCY
BOD ₅	310	SA
Field Conductivity	94	SA
Field pH	400	SA
Alkalinity, Total	410	SA
Boron, Total	1022	SA
Cadmium, Total	1027	SA
Chloride	940	SA
COD, Total	340	SA
Hardness, Total	900	SA
Iron, Total	74010	SA
Lead, Total	1051	SA
Manganese, Total	1055	SA
Mercury, Total	71900	SA
Selenium, Total	1147	SA
Sulfate	945	SA
Total Suspended Solids	150	SA
*Leachate Volume Pumped	32	MONTHLY

SA = Semi-Annually

* = The volume of the leachate removed shall be recorded at least monthly (reported semi-annually).

Appendix B-2
Excerpts from Feasibility Report (RMT, 1997)

FEASIBILITY REPORT

DAIRYLAND POWER COOPERATIVE PHASE IV DISPOSAL AREA ALMA OFF-SITE ASH DISPOSAL FACILITY TOWN OF BELVIDERE BUFFALO COUNTY, WISCONSIN

Prepared For
Dairyland Power Cooperative

Prepared By
RMT, Inc.
Madison, Wisconsin

September 1997



Peter D. Creamer, P.E.
Senior Project Engineer



Mark A. Osten, P.G., C.P.G.
Project Manager



RMT, INC. — MADISON, WI
744 HEARTLAND TRAIL • 53717-1934
P.O. Box 8923 • 53708-8923
608/831-4444 • 608/831-3334 FAX



Section 7

Ecological Assessment

7.1 Wetlands

The proposed site is located in an upland area with no perennial streams, and is located approximately 2 miles north of the Mississippi River. No wetlands are known to be present on or near the site. The nearest wetlands are located adjacent to the Mississippi River. The WDNR was approached on the need to conduct a wetlands inventory. On February 20, 1997, Brad Wolbert (WDNR) indicated that he had spoken with the wetlands staff and that no wetlands inventory would be required (Appendix A).

7.2 Critical Habitat

In letters dated September 22, 1994, and August 20, 1997 (Appendix A), the WDNR Bureau of Endangered Resources (BER) indicated that their "Natural Heritage Inventory" data files contain no occurrence records of Endangered, Threatened, or Special concern species or natural communities, nor any State Natural Areas for the proposed landfill site or clay borrow area.

Appendix B-3
WDNR Surface Water Data Viewer Map



LEGEND

- EXISTING LANDFILL LIMITS
- LATERAL EXPANSION BOUNDARY
- WETLAND CLASS AREAS
- WETLAND INDICATORS
- FILLED/DRAINED WETLAND
- WETLAND TOO SMALL TO DELINEATE
- WDNR STREAM/RIVER

- NOTES**
1. BASE MAP IMAGERY FROM ESRI/DIGITAL GLOBE, 2017.
 2. WWI WETLANDS FROM WDNR SURFACE WATER DATA VIEWER.
 3. NHD FLOWLINE DATA ACQUIRED FROM USGS.

N

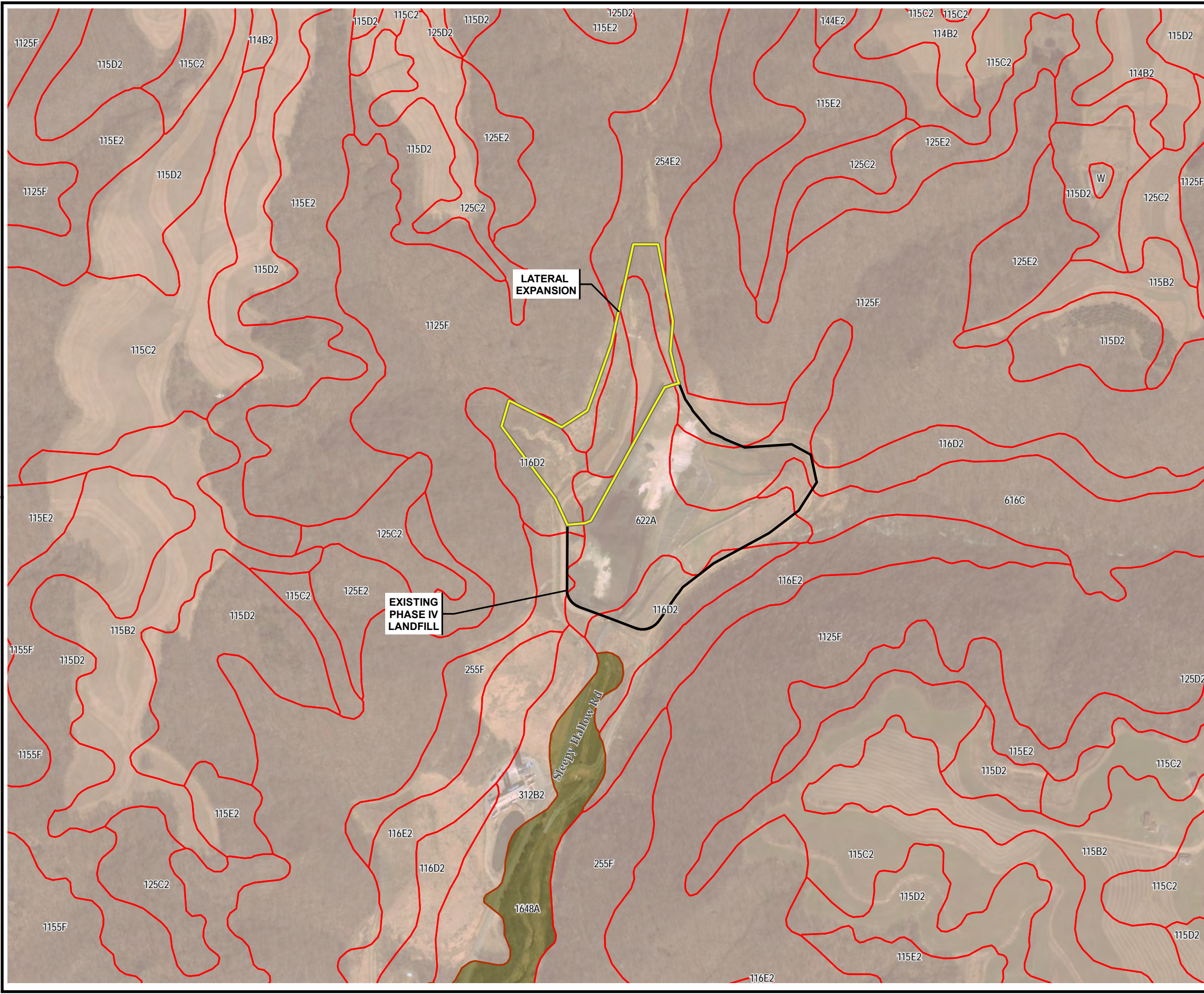
0 500 1,000
Feet

1" = 500'
1:6,000

PROJECT:		DAIRYLAND POWER COOPERATIVE ALMA OFF-SITE DISPOSAL FACILITY, PHASE IV LANDFILL LOCATIONS RESTRICTIONS DEMONSTRATIONS BUFFALO COUNTY, WISCONSIN	
TITLE:		WATERBODY MAP	
DRAWN BY:	B. DEEGAN	PROJ. NO.:	243332.0004
CHECKED BY:	J. HOTSTREAM	FIGURE 1	
APPROVED BY:	T. MARTIN		
DATE:	MAY 2018		
		708 Heartland Trail Suite 3000 Madison, WI 53717 Phone: 608.826.3600	
FILE NO.:		243332-002.mxd	

Appendix B-4 USDA Hydric Rating Map

TRC - GIS
 Coordinate System: NAD 1983 StatePlane Wisconsin Central FIPS 4802 Feet (Foot US)
 Map Rotation: 0
 Plot Date: 5/14/2018, 10:33:48 AM by BDEEGAN -- LAYOUT: ANSIB(11"x17")
 Path: E:\DairylandPower\Alma\12018_243332\243332-003.mxd



LEGEND

- EXISTING LANDFILL LIMITS
- LATERAL EXPANSION BOUNDARY

HYDRIC SOIL PERCENTAGE

- 0 %
- 96 %

NOTES

- BASE MAP IMAGERY FROM ESRI/DIGITAL GLOBE, 2017.
- SOILS DATA ACQUIRED FROM USDA/NRCS SSURGO SOILS DATABASE.

0 500 1,000 Feet
 1" = 500'
 1:6,000

PROJECT: **DAIRYLAND POWER COOPERATIVE
 ALMA OFF-SITE DISPOSAL FACILITY, PHASE IV LANDFILL
 LOCATIONS RESTRICTIONS DEMONSTRATIONS
 BUFFALO COUNTY, WISCONSIN**

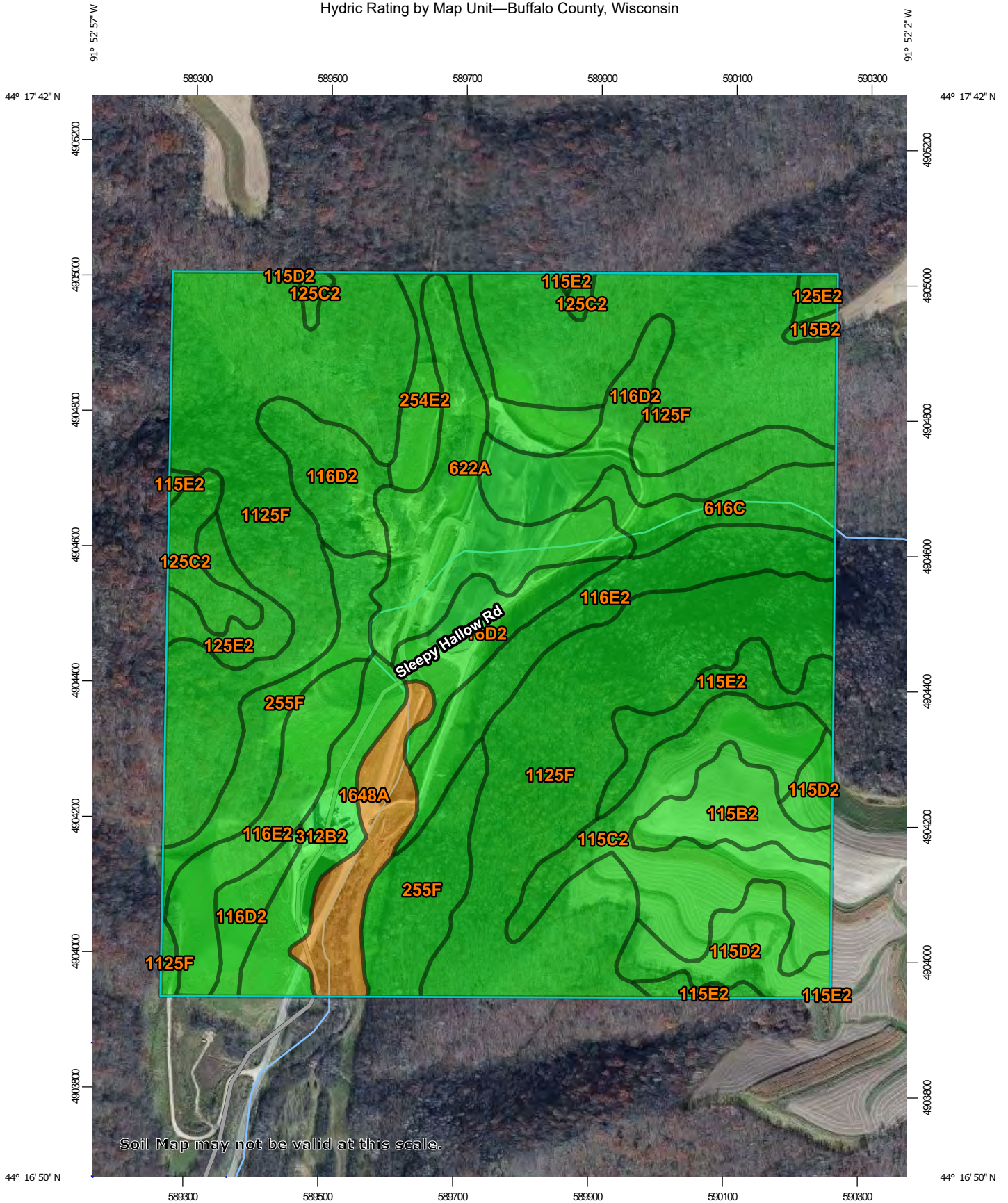
TITLE: **SOILS MAP**

DRAWN BY: B. DEEGAN	PROJ. NO.: 243332.0004
CHECKED BY: J. HOTSTREAM	FIGURE 2
APPROVED BY: T. MARTIN	
DATE: MAY 2018	

708 Heartland Trail
 Suite 3000
 Madison, WI 53717
 Phone: 608.826.3600

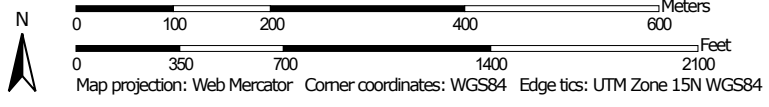
FILE NO.: 243332-003.mxd

Hydric Rating by Map Unit—Buffalo County, Wisconsin



Soil Map may not be valid at this scale.

Map Scale: 1:7,780 if printed on A portrait (8.5" x 11") sheet.









MAP LEGEND

Area of Interest (AOI)







 Area of Interest (AOI)

Soils







Soil Rating Polygons

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available


Soil Rating Lines

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available





Soil Rating Points

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available


Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Buffalo County, Wisconsin
 Survey Area Data: Version 10, Sep 28, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 1, 2010—Nov 2, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydric Rating by Map Unit

Hydric Rating by Map Unit— Summary by Map Unit — Buffalo County, Wisconsin (WI011)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
115B2	Seaton silt loam, ridge phase, 2 to 6 percent slopes	0	6.8	2.6%
115C2	Seaton silt loam, driftless ridge, 6 to 12 percent slopes, moderately eroded	0	18.0	6.8%
115D2	Seaton silt loam, driftless ridge, 12 to 20 percent slopes, moderately eroded	0	8.2	3.1%
115E2	Seaton silt loam, driftless valley, 20 to 30 percent slopes, moderately eroded	0	6.9	2.6%
116D2	Churchtown silt loam, 12 to 20 percent slopes, moderately eroded	0	27.6	10.5%
116E2	Churchtown silt loam, 20 to 30 percent slopes, moderately eroded	0	21.7	8.3%
125C2	Pepin silt loam, 6 to 12 percent slopes, moderately eroded	0	4.8	1.8%
125E2	Pepin silt loam, 20 to 30 percent slopes, moderately eroded	0	5.0	1.9%
254E2	Norden silt loam, 20 to 30 percent slopes, moderately eroded	0	7.2	2.7%
255F	Urne fine sandy loam, 30 to 45 percent slopes	0	16.2	6.2%
312B2	Festina silt loam, 2 to 6 percent slopes, moderately eroded	0	8.5	3.2%
616C	Chaseburg silt loam, 4 to 12 percent slopes, occasionally flooded	0	6.3	2.4%
622A	Worthen silt loam, 0 to 2 percent slopes, occasionally flooded	0	16.4	6.2%
1125F	Dorerton, very stony-Elbaville complex, 30 to 60 percent slopes	0	101.0	38.4%

Hydric Rating by Map Unit— Summary by Map Unit — Buffalo County, Wisconsin (WI011)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1648A	Northbend-Ettrick silt loams, 0 to 3 percent slopes, frequently flooded	96	8.1	3.1%
Totals for Area of Interest			262.8	100.0%

Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Rating Options

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Appendix C

Supporting Material for §257.62

Table of Contents

- Appendix C-1: Excerpts from Feasibility Report (RMT 1997)
- Appendix C-2: USGS Quaternary Earthquake Fault Map (USGS 2015)

Appendix C-1
Excerpts from Feasibility Report (RMT 1997)

FEASIBILITY REPORT

DAIRYLAND POWER COOPERATIVE
PHASE IV DISPOSAL AREA
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE
BUFFALO COUNTY, WISCONSIN

Prepared For
Dairyland Power Cooperative

Prepared By
RMT, Inc.
Madison, Wisconsin

September 1997



Peter D. Creamer, P.E.
Senior Project Engineer



Mark A. Osten, P.G., C.P.G.
Project Manager



RMT, INC. — MADISON, WI
744 HEARTLAND TRAIL • 53717-1934
P.O. Box 8923 • 53708-8923
608/831-4444 • 608/831-3334 FAX



Section 8

Hydrogeologic Investigation

8.1 Site Field Investigation

8.1.1 Soil Borings

The subsurface exploration program was designed to fulfill the requirements for submittal of a Feasibility Report as specified in NR 512. For the proposed 32.1-acre landfill, NR 512.09 (1) requires that 22 borings be sampled to a depth 25 feet below the proposed subbase grade. Prior to the Feasibility Report investigation, 23 soil borings had been completed at the site. Of these 23 soil borings, three borings (B15, B16, and B17) were located greater than the 300-foot distance requirement of NR 512.09, and five borings (B18, B19, B20, B21, and B22) did not meet the depth requirement. Station 6 (not one of the 23 borings noted above) was drilled as part of a separate evaluation during the October/November 1994 field activities to document groundwater conditions downgradient (south) of the existing Phase II disposal area. To supplement these data and provide data from across the proposed Phase IV disposal area, borings at 15 additional locations were drilled (B60, B61, B62, B63, B64, B65, B66, B67, B68, W100A, W101A, W104/104A, W105, W106, and W107). Test pits TP36, TP37, TP38, TP41, and TP42, excavated for previous investigations, were also used in the evaluation.

The borings used in the Feasibility Report, their installation dates, their distances from limits of fill, and the reasons for their installation are listed in Table 8-1. The locations of the soil borings are shown on Plan Sheet 2. Appendix A contains correspondence from the WDNR approving modification to the standard NR 512 geotechnical program.

The soil borings were extended using hollow-stemmed auger drilling or mud rotary drilling techniques. Rock drilling was conducted using air-rotary and coring techniques. Soil boring logs are included in Appendix E. Water used in drilling and decontamination of drilling equipment was obtained from the DPC on-site production well. A sample of this water was tested. Analytical results are included in Appendix F. An experienced geologist was on-site to observe and direct drilling, sampling, and related activities.

8.1.6 Inventory of Water Supply Wells

An inventory of public and private water supply wells within 1,200 feet of the proposed site was conducted. The only water supply well located within 1,200 feet of the proposed limits of fill is the DPC on-site supply well located approximately 1,000 feet downgradient of the proposed site (Plan Sheet 3). The well log, construction data, and pumping information for this well are contained in Appendix E.

8.2 Site Conditions

8.2.1 Topography and Hydrology

Plan Sheet 3 presents an existing conditions map that shows the topography of the area within a minimum of 1,500 feet of the proposed limits of fill. The map was prepared from portions of the Cream and Alma, Wisconsin, USGS topographic maps and an aerial survey flown by Aero-Metric Engineering, Inc., of Sheboygan, Wisconsin, on April 3, 1993. The aerial survey covered the proposed landfill area. The USGS topographic maps covered the surrounding areas.

A significant amount of topographic relief occurs across the site. The topographic map (Plan Sheet 3) reveals that the topography slopes steeply into a central valley. Surface water runoff from the uplands and slopes surrounding the site drains into ditches within the central valley that extend from the site area to the Mississippi River. Culverts along the path of the ditches within the central valley aid in controlling surface water runoff. The nearest wetlands are located approximately 1 mile south of the site along the Mississippi River.

The site is located within the Mississippi River drainage basin. There are no navigable streams located within approximately 1 mile of the site. The nearest navigable stream is the Mississippi River.

8.2.2 Soil and Geology

Evaluation of soil boring logs indicates that sand and silty sand are the predominant soil types on site. However, several borings contain a layer of finer grained soil, including silt and clay above the sandy soil, ranging from a few feet to as much as 40 feet thick at boring B20 and abandoned well W14. The sandy soil typically extends to bedrock, at depths ranging between 15 and 60 feet below the ground surface. There are also a few isolated areas where fill is present. The fill is associated with the existing landfill footprints at Phases I, II, and III, located south of the proposed disposal area, and with the soil stockpile (in the center of the proposed Phase IV disposal area footprint near

boring B19). Except at the existing landfill phases and the soil stockpile, the fill is generally less than 10 feet deep.

The sandy soil is primarily the result of fluvial deposition. However, some of the sand, near the bedrock surface, appears to have resulted from *in situ* weathering of the sandstone bedrock present beneath most of the site. This soil generally consists of fine- to coarse-grained silty sand, poorly graded sand with gravel, and/or poorly graded gravel with sand; is typically very dense, and is brownish-yellow (10 YR 6/6) in color. The silty and clayey soil overlying the sandy deposits appears to be the result of a combination of loess deposits and, to a lesser degree, isolated lacustrine deposition. This soil is generally described as soft to medium stiff, dark yellowish-brown (10 YR 4/6) to brown (7.5 YR 4/2) silt or silty clay. Rust-colored mottling is common within this unit.

The results of the laboratory testing of selected soil samples (from both the loess/lacustrine silt and clay and the fluvial sand and gravel) for grain-size distribution, Atterberg limits, and laboratory hydraulic conductivity are summarized in Table 8-2. The soil test data sheets are contained in Appendix G.

Bedrock in the site area is composed of the Prairie du Chien Group Dolomite, that acts as a cap rock overlying the Cambrian Sandstones. Prairie du Chien Group Dolomite was observed in W101 on the ridge top in the northern portion of the site (Plan Sheets 7 and 8). The contact between the dolomite and Cambrian Sandstones was observed in well W101 at approximately 844 feet M.S.L. The Prairie du Chien Group Dolomite at W101 was found to be highly fractured and weathered. In the proposed landfill footprint, the Prairie du Chien has been removed by erosion.

Cambrian Sandstones underlie the unconsolidated sediment in this area. The Cambrian Sandstones include the Jordan Sandstone; the St. Lawrence Formation; the Franconia, Galesville, Eau Claire, and Mount Simon Sandstones; and the Dresbach Formation. The Cambrian Sandstone beneath the site was found to be fine grained, fissile, friable, and glauconitic with interbedded lenses of dark-brown sandstone and calcareous shaley partings. Bedrock cores of this formation were obtained from W101A, W106, and W107.

Plan Sheet 12 is a map of the top of the competent bedrock surface in the site area. This surface is also depicted on Geologic Cross Sections A-A' through L-L' shown on Plan Sheets 4 through 10. The surface mimics the topography, only at higher relief. The top of bedrock is substantially deeper in the central part of the valley, beneath the proposed disposal area footprint, than the valley slope areas.

Facility/Project Name Dairyland Power 3081.23			License/Permit/Monitoring Number 2927		Boring Number W101A
Boring Drilled By (Firm name and name of crew chief) Boart Longyear, Crew Chief: Eric Shoenberg			Date Drilling Started 10/23/95	Date Drilling Completed 10/30/95	Drilling Method Air
DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level 813.0 Feet MSL	Surface Elevation 923.1 Feet MSL	Borehole Diameter 6.0 Inches
Boring Location State Plane 172652.00 N, 1477729.00 E			Lat 0' "	Local Grid Location (If applicable) <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
County Buffalo County			DNR County Code 06	Civil Town/City/ or Village Belvidere	

Sample Number	Length (In) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	
			30	Blind drilled to 30.0 feet. See log of W101 for sample descriptions.										
			31	DOLOMITE/LIMESTONE , hard, fractured, highly weathered, fractures filled with silt/sand.										
			32											
			33											
			34											
			35											
			36											
			37											
			38											
			39											
			40											
			41											
			42											
			43											
			44											
			52	As above.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: *Daniel D. Reid* Firm: **RMT**
 744 Heartland Trail, Madison Wisconsin
 Tel: 608-831-4444, Fax: 608-831-3334

This form is authorized by Chapters 144, 147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Boring Number **W101A** Use only as an attachment to Form 4400-122.

Page 2 of 4

Sample Number	Sample Length (In) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					Comments						
									Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200							
			55																	
			56																	
			57																	
			58																	
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			96																	

SANDSTONE, olive green, glauconitic, soft, fissile, friable, fine to medium grained.

DOLOMITE/LIMESTONE, hard, dense, highly weathered.

SANDSTONE, olive green, glauconitic, interbedded with dark brown-black sandstone and white lenses, fine grained, fissile, medium friable, recovery = 94%, RQD = 50%, FF = 3.

Recovery = 99%, RQD = 55%, FF = 6.

As above, but also contains tan sandstone, very fine with lenses of shaley consistency, bottom 3.5 feet well cemented.

RC

RC



Facility/Project Name Dairyland Power 3081.23			License/Permit/Monitoring Number 2927		Boring Number W106
Boring Drilled By (Firm name and name of crew chief) Boart Longyear, Crew Chief: Paul Dickinson			Date Drilling Started 11/2/95	Date Drilling Completed 11/7/95	Drilling Method 8" MUD ROTARY
DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level 773.6 Feet MSL	Surface Elevation 848.3 Feet MSL	Borehole Diameter 8.0 Inches
Boring Location State Plane 171530.00 N, 1476837.00 E			Lat 0 0 "	Local Grid Location (If applicable) <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
County Buffalo County			DNR County Code 06	Civil Town/City/ or Village Belvidere	
NE 1/4 of NE 1/4 of Section 19 T 21 N,R 12W			Long 0 0 "	Feet <input type="checkbox"/> S Feet <input type="checkbox"/> W	

Sample Number	Length (In) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					Comments	
									Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200		
1	20	12	1-5	SILTY SAND WITH GRAVEL (SM), fine to coarse, 15-30% silt, 10YR 6/6 yellowish brown, medium dense, (Fill).	SM					M					SS
2	18	19	5-10	As above.											SS
3	14	38	10-15	As above.											SS
4	14	20	15-20	As above.											SS

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Firm: RMT
744 Heartland Trail, Madison Wisconsin
Tel: 608-831-4444, Fax: 608-831-3334

This form is authorized by Chapters 144, 147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Facility/Project Name Dairyland Power 3081.30		License/Permit/Monitoring Number 2927		Boring Number W107	
Boring Drilled By (Firm name and name of crew chief) Boart Longyear, Crew Chief: T. Schmalfeldt		Date Drilling Started 4/29/97		Date Drilling Completed 5/1/97	
DNR Facility Well No.		WI Unique Well No.		Common Well Name	
Final Static Water Level Feet MSL		Surface Elevation 906.2 Feet MSL		Borehole Diameter 6.0 Inches	
Boring Location State Plane 173527.44 N, 1477214.99 E		Lat 03° N		Local Grid Location (If applicable) <input type="checkbox"/> N <input type="checkbox"/> E	
NE 1/4 of NE 1/4 of Section 19 T 21 N,R 12W		Long 03° W		Feet <input type="checkbox"/> S Feet <input type="checkbox"/> W	
County Buffalo County		DNR County Code 06		Civil Town/City/ or Village Belvidere	

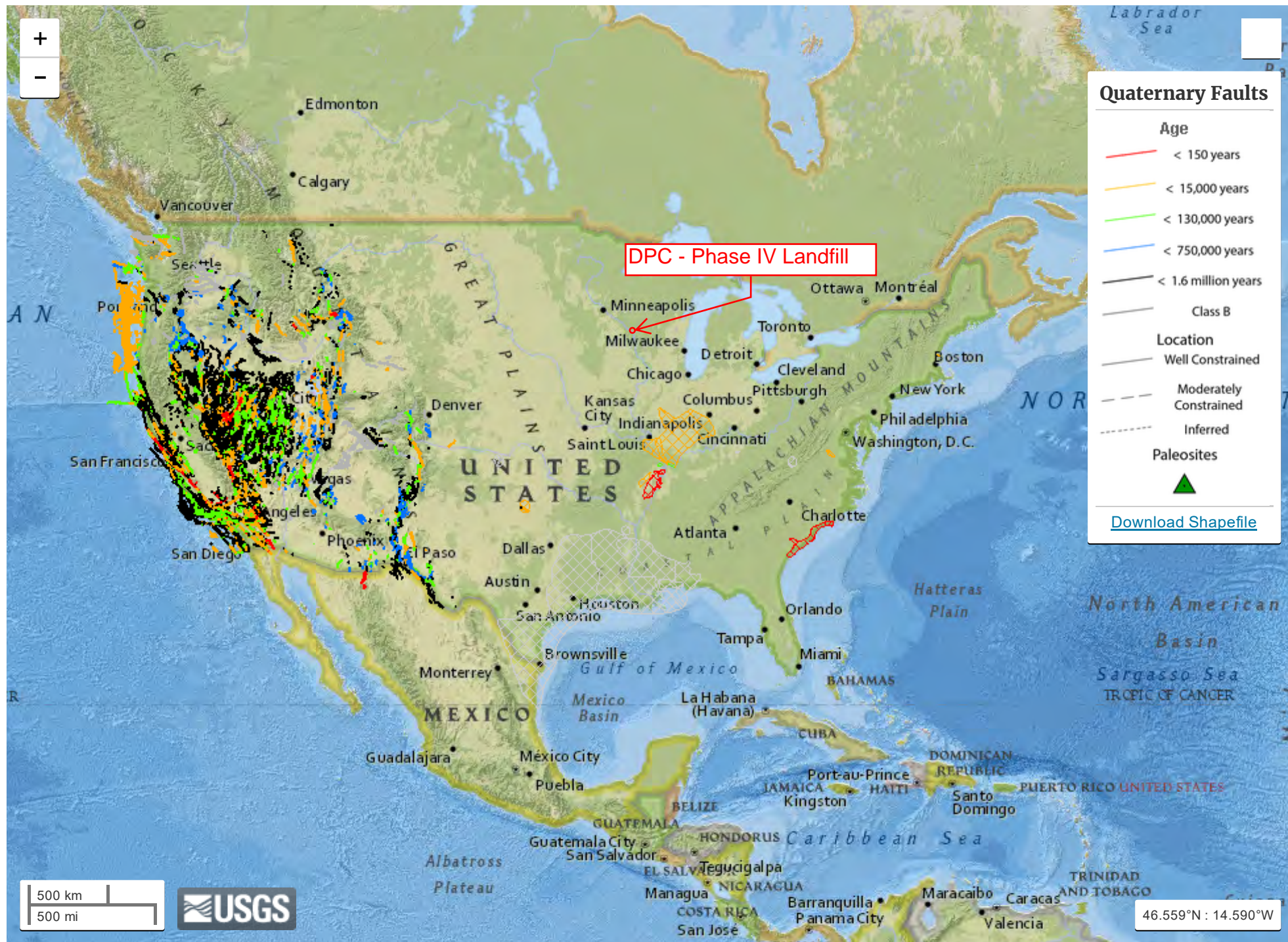
Sample Number	Length (In) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	
			1	SILT (ML), 5% fine to coarse sand, 5% fine gravel, 10-15% clay, slightly plastic, stiff, 7.5YR 4/4 brown. POORLY GRADED SAND WITH GRAVEL (SP) to SILTY SAND WITH GRAVEL (SM), fine to coarse, 10-20% silt, 15-20% fine to coarse gravel, 5% cobbles, 10YR 6/6 brownish yellow, medium dense.						M				
			2							M				
1	8	26	3			SP								SS
			4											
			5	As above. As above, but with boulder at ~12.0-13.5 feet. POORLY GRADED SAND WITH SILT (SP/SM), 10% silt, 10% fine to medium gravel (angular fragments), 10YR 6/6 brownish yellow, medium dense.										
			6											
2	24	56	7											SS
			8											
			9											
			10											
			11											
			12											
			13											
			14											
			15											
3	15	36	16										SS	
			17											
			18											
			19							M				
			20		SP/SM									
4	18	26	21											
			22											
			23											
			24											
			25											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature <i>David R. Leid</i>	Firm RMT 744 Heartland Trail, Madison Wisconsin Tel: 608-831-4444, Fax: 608-831-3334
-----------------------------------	--

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Appendix C-2
USGS Quaternary Earthquake Fault Map (USGS, 2015)



Appendix D

Supporting Material for §257.63

U.S. Geological Survey - Earthquake Hazards Program

Alma Offsite Facility, Phase IV Landfill

Latitude = 44.290°N, Longitude = 91.876°W

Location



Reference Document

2015 NEHRP Provisions

Site Class

D (determined): Stiff Soil

Risk Category

IV e.g. (Essential Facilities)

$$S_S = 0.047 \text{ g}$$

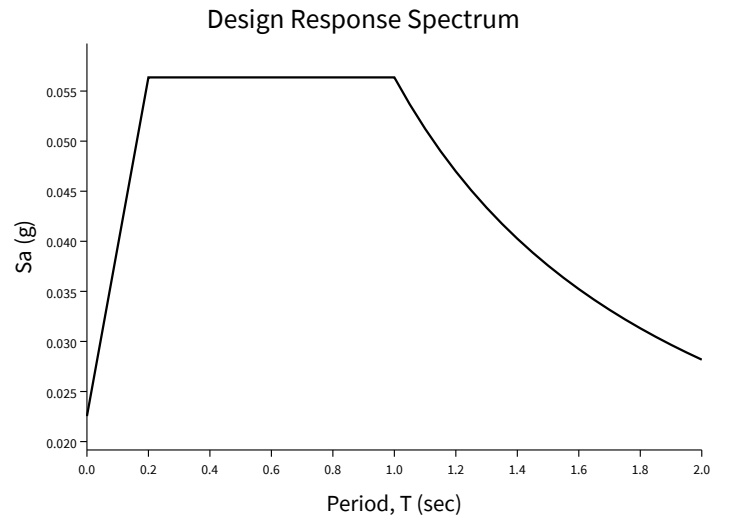
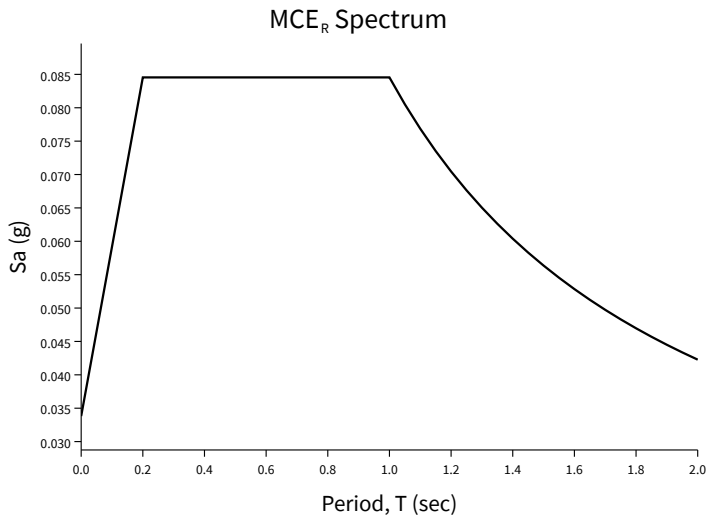
$$S_{MS} = 0.075 \text{ g}$$

$$S_{DS} = 0.050 \text{ g}$$

$$S_1 = 0.035 \text{ g}$$

$$S_{M1} = 0.085 \text{ g}$$

$$S_{D1} = 0.056 \text{ g}$$



Since $S_{MS} < S_{M1}$, for this response spectrum S_{MS} has been set equal to S_{M1} in accordance with Section 11.4.3.

Since $S_{MS} < S_{M1}$, for this response spectrum S_{MS} has been set equal to S_{M1} (and hence S_{DS} has been set equal to S_{D1}), in accordance with Section 11.4.3.

Mapped Acceleration Parameters, Long-Period Transition Periods, and Risk Coefficients

Note: The S_5 and S_1 ground motion maps provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_5) 1.3 (to obtain S_1).

- [FIGURE 22-1 \$S_5\$ Risk-Targeted Maximum Considered Earthquake \(\$MCE_R\$ \) Ground Motion Parameter for the Conterminous United States for 0.2 s Spectral Response Acceleration \(5% of Critical Damping\), Site Class B](#)
- [FIGURE 22-2 \$S_1\$ Risk-Targeted Maximum Considered Earthquake \(\$MCE_R\$ \) Ground Motion Parameter for the Conterminous United States for 1.0 s Spectral Response Acceleration \(5% of Critical Damping\), Site Class B](#)
- [FIGURE 22-9 Maximum Considered Earthquake Geometric Mean \(\$MCE_G\$ \) PGA, %g, Site Class B for the Conterminous United States](#)
- [FIGURE 22-14 Mapped Long-Period Transition Period, \$T_L\$ \(s\), for the Conterminous United States](#)
- [FIGURE 22-18 Mapped Risk Coefficient at 0.2 s Spectral Response Period, \$C_{RS}\$](#)
- [FIGURE 22-19 Mapped Risk Coefficient at 1.0 s Spectral Response Period, \$C_{R1}\$](#)

Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site class as Site Class , based on the site soil properties in accordance with Chapter 20.

Table 20.3-1 Site Classification

Site Class	\bar{v}_s	\bar{N} or \bar{N}_{ch}	\bar{s}_u
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
	Any profile with more than 10 ft of soil having the characteristics: <ul style="list-style-type: none"> • Plasticity index $PI > 20$ • Moisture content $w \geq 40\%$, and • Undrained shear strength $\bar{s}_u < 500$ psf 		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		
For SI: 1ft/s = 0.3048 m/s 1lb/ft ² = 0.0479 kN/m ²			

Site Coefficients and Risk-Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters

Risk-targeted Ground Motion (0.2 s)

$$C_{RS}S_{SUH} = 0.942 \times 0.050 = 0.047 \text{ g}$$

Deterministic Ground Motion (0.2 s)

$$S_{SD} = 1.500 \text{ g}$$

$$S_S \equiv \text{“Lesser of } C_{RS}S_{SUH} \text{ and } S_{SD}\text{”} = 0.047 \text{ g}$$

Risk-targeted Ground Motion (1.0 s)

$$C_{R1}S_{1UH} = 0.877 \times 0.040 = 0.035 \text{ g}$$

Deterministic Ground Motion (1.0 s)

$$S_{1D} = 0.600 \text{ g}$$

$$S_1 \equiv \text{“Lesser of } C_{R1}S_{1UH} \text{ and } S_{1D}\text{”} = 0.035 \text{ g}$$

Table 11.4-1: Site Coefficient F_a

Site Class	Spectral Reponse Acceleration Parameter at Short Period					
	$S_S \leq 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S = 1.25$	$S_S \geq 1.50$
A	0.8	0.8	0.8	0.8	0.8	0.8
B (measured)	0.9	0.9	0.9	0.9	0.9	0.9
B (unmeasured)	1.0	1.0	1.0	1.0	1.0	1.0
C	1.3	1.3	1.2	1.2	1.2	1.2
D (determined)	1.6	1.4	1.2	1.1	1.0	1.0
D (default)	1.6	1.4	1.2	1.2	1.2	1.2
E	2.4	1.7	1.3	1.2 [*]	1.2 [*]	1.2 [*]
F	See Section 11.4.7					

* For Site Class E and $S_S \geq 1.0$ g, see the requirements for site-specific ground motions in Section 11.4.7 of the 2015 NEHRP Provisions. Here the exception to those requirements allowing F_a to be taken as equal to that of Site Class C has been invoked.

Note: Use straight-line interpolation for intermediate values of S_S .

Note: Where Site Class B is selected, but site-specific velocity measurements are not made, the value of F_a shall be taken as 1.0 per Section 11.4.2.

Note: Where Site Class D is selected as the default site class per Section 11.4.2, the value of F_a shall not be less than 1.2 per Section 11.4.3.

For Site Class = D (determined) and $S_S = 0.047$ g, $F_a = 1.600$

Table 11.4-2: Site Coefficient F_v

Site Class	Spectral Response Acceleration Parameter at 1-Second Period					
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 = 0.50$	$S_1 \geq 0.60$
A	0.8	0.8	0.8	0.8	0.8	0.8
B (measured)	0.8	0.8	0.8	0.8	0.8	0.8
B (unmeasured)	1.0	1.0	1.0	1.0	1.0	1.0
C	1.5	1.5	1.5	1.5	1.5	1.4
D (determined)	2.4	2.2 ¹	2.0 ¹	1.9 ¹	1.8 ¹	1.7 ¹
D (default)	2.4	2.2 ¹	2.0 ¹	1.9 ¹	1.8 ¹	1.7 ¹
E	4.2	3.3 ¹	2.8 ¹	2.4 ¹	2.2 ¹	2.0 ¹
F	See Section 11.4.7					

¹ For Site Class D or E and $S_1 \geq 0.2$ g, site-specific ground motions might be required. See Section 11.4.7 of the 2015 NEHRP Provisions.

Note: Use straight-line interpolation for intermediate values of S_1 .

Note: Where Site Class B is selected, but site-specific velocity measurements are not made, the value of F_v shall be taken as 1.0 per Section 11.4.2.

For Site Class = D (determined) and $S_1 = 0.035$ g, $F_v = 2.400$

Site-adjusted MCE_R (0.2 s)

$$S_{MS} = F_a S_S = 1.600 \times 0.047 = 0.075 \text{ g}$$

Site-adjusted MCE_R (1.0 s)

$$S_{M1} = F_v S_1 = 2.400 \times 0.035 = 0.085 \text{ g}$$

Design Spectral Acceleration Parameters

Design Ground Motion (0.2 s)

$$S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 0.075 = 0.050 \text{ g}$$

Design Ground Motion (1.0 s)

$$S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 0.085 = 0.056 \text{ g}$$

Design Response Spectrum

Long-Period Transition Period = $T_L = 12$ s

Figure 11.4-1: Design Response Spectrum

Since $S_{MS} < S_{M1}$, for this response spectrum S_{MS} has been set equal to S_{M1} (and hence S_{DS} has been set equal to S_{D1}), in accordance with Section 11.4.3.

Spectral Response Acceleration, S_a (g)

Period, T (sec)

MCE_R Response Spectrum

The MCE_R response spectrum is determined by multiplying the design response spectrum above by 1.5.
Since $S_{MS} < S_{M1}$, for this response spectrum S_{MS} has been set equal to S_{M1} in accordance with Section 11.4.3.

Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

Table 11.8-1: Site Coefficient for F_{PGA}

Site Class	Mapped MCE Geometric Mean (MCE_G) Peak Ground Acceleration					
	PGA ≤ 0.10	PGA = 0.20	PGA = 0.30	PGA = 0.40	PGA = 0.50	PGA ≥ 0.60
A	0.8	0.8	0.8	0.8	0.8	0.8
B (measured)	0.9	0.9	0.9	0.9	0.9	0.9
B (unmeasured)	1.0	1.0	1.0	1.0	1.0	1.0
C	1.3	1.2	1.2	1.2	1.2	1.2
D (determined)	1.6	1.4	1.3	1.2	1.1	1.1
D (default)	1.6	1.4	1.3	1.2	1.2	1.2
E	2.4	1.9	1.6	1.4	1.2	1.1
F	See Section 11.4.7					

Note: Use straight-line interpolation for intermediate values of PGA

Note: Where Site Class D is selected as the default site class per Section 11.4.2, the value of F_{pga} shall not be less than 1.2.

For Site Class = D (determined) and PGA = 0.023 g, $F_{PGA} = 1.600$

Mapped MCE_G

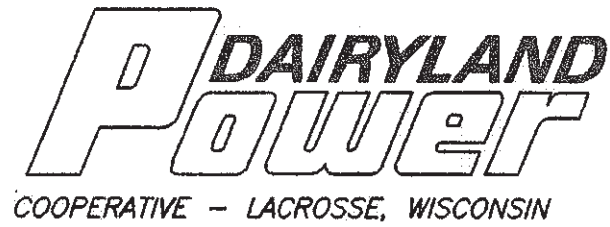
PGA = 0.023 g

Site-adjusted MCE_G

$$PGA_M = F_{PGA} PGA = 1.600 \times 0.023 = 0.036 \text{ g}$$

Appendix E

Supporting Material for §257.64



PLAN OF OPERATION

**PHASE IV DISPOSAL AREA
ALMA OFF-SITE ASH DISPOSAL FACILITY
TOWN OF BELVIDERE
BUFFALO COUNTY, WISCONSIN**

**PREPARED FOR
DAIRYLAND POWER COOPERATIVE**

**PREPARED BY
RMT, INC.
MADISON, WISCONSIN**

October 2000

**Purpose/Approach/Methodologies/Assumptions/
Results/References**



COMPUTATION SHEET

SHEET 1 OF 5

744 Heartland Trail (537)717-8923 P. O. Box 8923 (537)08-8923 Madison, WI (608) 831-4444 FAX: (608) 831-3334 VOICE: (608) 831-1989

PROJECT/PROPOSAL NAME Dairyland Power Cooperative	PREPARED		CHECKED		PROJECT/PROPOSAL NO. 3081.40
	By:	Date:	By:	Date:	
	JDH	9/97	PDC	9/97	
	Rev. BJK	9/00			

GLOBAL SLOPE STABILITY

Purpose

To evaluate the global slope stability of the liner and final slopes.

Approach

The global stability analysis was performed by evaluating the following worst-case slope conditions:

Liner Slope

The worst-case slope of the liner consists of an 83-foot-high 3H:1V slope with a 2-foot-thick low-permeability soil layer, a GCL, a geomembrane, and a 1-foot-thick granular drainage layer (approximately Coordinate N172500, E147700, west slope [see Figure J-1]).

Final Cover Slope

The worst-case slope of the final cover consists of a 36-foot-high, 4H:1V slope (approximately Coordinate N172000, E1477000, west slope [see Figure J-2]). Conditions are modeled for ash waste.

Methodologies

- The analyses have been performed using the computer program XSTABL, which was developed at Purdue University and subsequently modified by Interactive Software Designs, Inc., of Moscow, Idaho (1994). XSTABL is used to perform the iterative task of identifying the worst-case failure scenario for each case using the Modified Bishops Method. XSTABL uses a two-dimensional static equilibrium method to determine a factor of safety against failure.
- The failure mode considered for the stability analysis was the circular or rotational failure of the waste, subgrade, natural formations, and compacted embankments (*i.e.*, perimeter berm, liner, and cover).
- The circular trial failure surface generator performs a search for the critical failure surface based on failure initiation and termination points established by the user, and is often used when no well-defined weak zone exists in the profile being evaluated. This failure mode is used in evaluating the stability of the liner and final slopes.
- The worst-case (lowest factor of safety) is identified by varying the limits of the failure generation locations. In cases where both types of failure are used to analyze the stability, the failure mode resulting in the most critical (lowest) factor of safety is presented in the results.

DPC Liner Slope

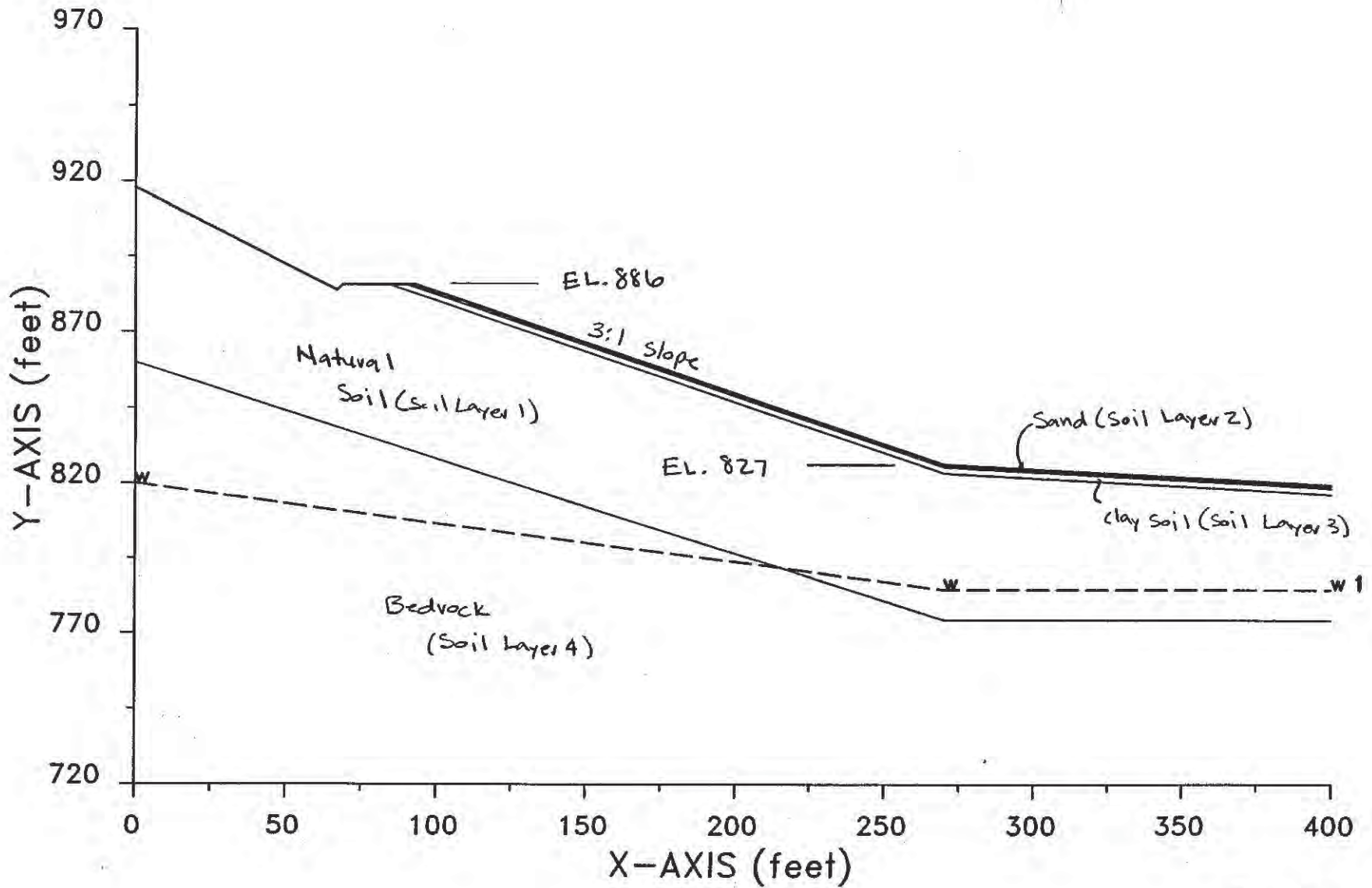


FIGURE J-1
DPC 3081.28

DPC Final Cover Slope

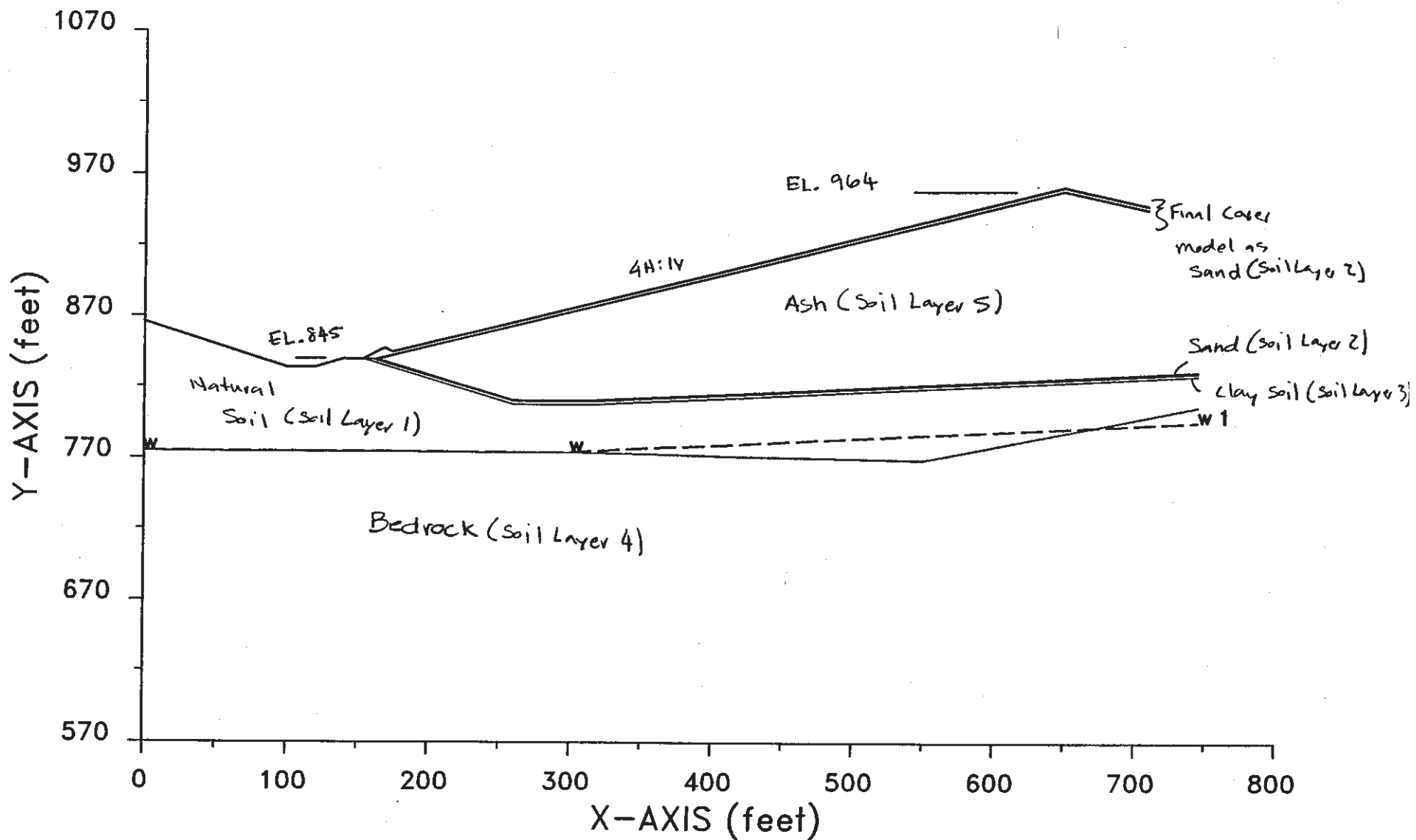


FIGURE J-2
DPC 3081.28



COMPUTATION SHEET

SHEET 4 OF 5

744 Heartland Trail (53717-8923) P. O. Box 8923 (53708-8923) Madison, WI (608) 831-4444 FAX: (608) 831-3334 VOICE: (608) 831-1989

PROJECT/PROPOSAL NAME Dairyland Power Cooperative	PREPARED		CHECKED		PROJECT/PROPOSAL NO. 3081.40
	By: JDH Rev. BJK	Date: 9/97 9/00	By: PDC	Date: 9/97	

Assumptions

- Profile - The cross sections selected to be analyzed are representative of worst-case profiles with regard to slope stability. The longest and highest slopes were selected for modeling. The geologic setting and subgrade information was based on the information found on the geologic cross sections contained in this report.
- To simplify the analysis, the final cover is modeled as a single layer of soil, using sand soil characteristics. This assumption is minor due to the small thickness of the final cover relative to the thickness of waste.
- Groundwater - The water table is estimated to be at varying elevations of 775 to 799 feet through the cross section based on the groundwater elevation maps found in this report.
- A factor of safety of at least 1.3 is acceptable against global slope failures.
- The shear strength of the ash is based on published results of fly ash materials (Oweis, 1990). The results of these tests are as follows:

MATERIAL	MC (%)	γ_d (pcf)	c (psf)	ϕ (degrees)
DPC ash waste	40	50	130	20

Notes:

MC = moisture content.

γ_d = dry unit weight.

c = cohesion (psf).

ϕ = friction angle.

- Soil Parameters - Unit weight, friction angles, and cohesive strength parameters were estimated based on information gathered from boring logs contained in Appendix C of Addendum 3 for the Initial Site Report (RMT, 1995) and on geologic cross sections. Parameters were chosen based on their correlation with pocket penetration numbers and Plasticity Indices. Published values and engineering judgment were also considered to conservatively estimate the clay, soil, and waste characteristics, as presented in the following table:

MATERIAL	γ (pcf)	γ_{Sat} (pcf)	ϕ (degrees)	c (psf)
Natural soil	120	120	20	200
Sand	110	110	30	0
Clay soil	125	125	25	400
Bedrock	145	145	45	10000
Ash waste	80	80	20	130



COMPUTATION SHEET

SHEET 5 OF 5

744 Heartland Trail (53717-8923) P. O. Box 8923 (53708-8923) Madison, WI (608) 831-4444 FAX: (608) 831-3334 VOICE: (608) 831-1989

PROJECT/PROPOSAL NAME Dairyland Power Cooperative	PREPARED		CHECKED		PROJECT/PROPOSAL NO. 3081.40
	By: JDH Rev. BJK	Date: 9/97 9/00	By: PDC	Date: 9/97	

Results

- The results of the slope stability analysis are summarized below.

Factors of Safety Against Circular Failure

	FACTOR OF SAFETY
Liner slope	1.6
Final cover slope	1.8

- Based on the assumed soil strength parameters and slope conditions, the slopes of the liner and final cover will be stable under the specified modeled conditions.

References

Oweis, I. S. and R.P. Khera. 1990. Geotechnology of waste management. Butterworths, London.

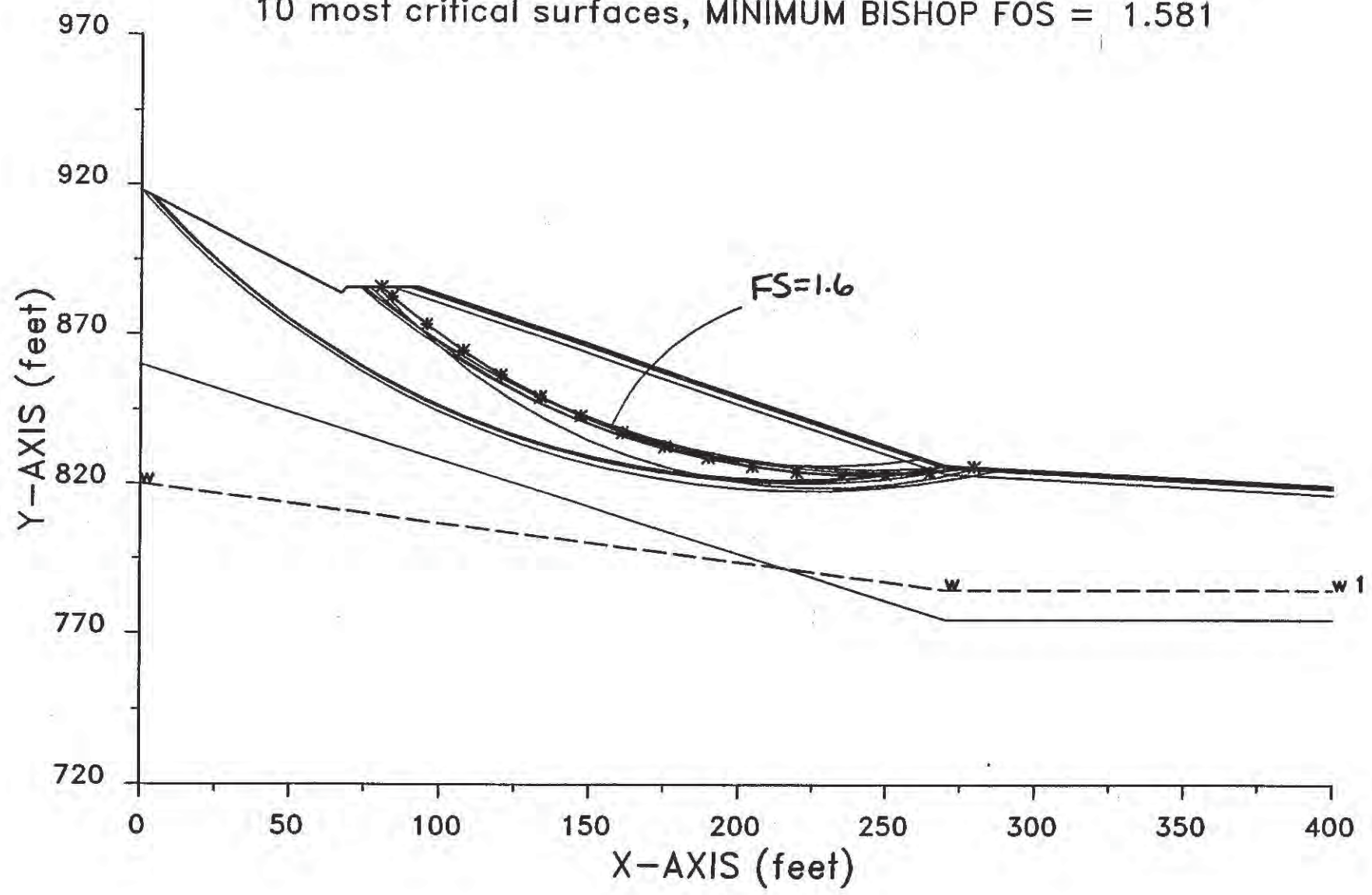
RMT, Inc. 4/1995. Initial site report for Dairyland Power Cooperative.

Interactive Software Designs. 1994. XSTABL Slope Stability Computer Program. Moscow, Idaho.

XSTABL Outputs

DPC Liner Slope

10 most critical surfaces, MINIMUM BISHOP FOS = 1.581



```

*****
*           X S T A B L           *
*           *                     *
*      Slope Stability Analysis    *
*      using the                   *
*      Method of Slices           *
*           *                     *
*      Copyright (C) 1992 - 96     *
*      Interactive Software Designs, Inc. *
*      Moscow, ID 83843, U.S.A.    *
*           *                     *
*      All Rights Reserved        *
*           *                     *
*      Ver. 5.200                 96 - 1460 *
*****
    
```

Problem Description : DPC Liner Slope

 SEGMENT BOUNDARY COORDINATES

✓
 704
 8177

7 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	918.0	67.0	884.0	1 ✓
2	67.0	884.0	69.0	886.0	1 ✓
3	69.0	886.0	84.0	886.0	1 ✓
4	84.0	886.0	90.0	886.0	3
5	90.0	886.0	93.0	886.0	2 ✓
6	93.0	886.0	270.0	827.0	2 ✓
7	270.0	827.0	400.0	820.0	2 ✓

6 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	90.0	886.0	270.0	826.0	3 ✓
2	270.0	826.0	400.0	819.0	3 ✓
3	84.0	886.0	270.0	824.0	1 ✓
4	270.0	824.0	400.0	817.0	1 ✓
5	.0	860.0	270.0	775.0	4 ✓
6	270.0	775.0	400.0	775.0	4 ✓

 ISOTROPIC Soil Parameters

4 Soil unit(s) specified

Soil Unit No.	Unit Weight (pcf)	Moist Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Constant (psf)	Water Surface No.
1	120.0	120.0	200.0	20.00	.000	.0	1 - Natural Soil
2	110.0	110.0	.0	30.00	.000	.0	1 - Sand
3	125.0	125.0	400.0	25.00	.000	.0	1 - Clay Soil
4	145.0	145.0	10000.0	45.00	.000	.0	1 - Bedrock

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 3 coordinate points

PHREATIC SURFACE,

Point No.	x-water (ft)	y-water (ft)
1	.00	820.00
2	270.00	785.00
3	400.00	785.00

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

400 trial surfaces will be generated and analyzed.

20 Surfaces initiate from each of 20 points equally spaced along the ground surface between x = 250.0 ft and x = 290.0 ft

Each surface terminates between x = .0 ft and x = 90.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

15.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
 Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

***** SIMPLIFIED BISHOP METHOD *****

The most critical circular failure surface is specified by 16 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	279.47	826.49
2	264.59	824.66
3	249.61	823.77
4	234.61	823.79
5	219.64	824.75
6	204.76	826.63
7	190.02	829.43
8	175.49	833.14
9	161.21	837.74
10	147.25	843.21
11	133.65	849.54
12	120.46	856.70
13	107.75	864.66
14	95.55	873.39
15	83.92	882.86
16	80.52	886.00

**** Simplified BISHOP FOS = 1.581 ****

The following is a summary of the TEN most critical surfaces

Problem Description : DPC Liner Slope

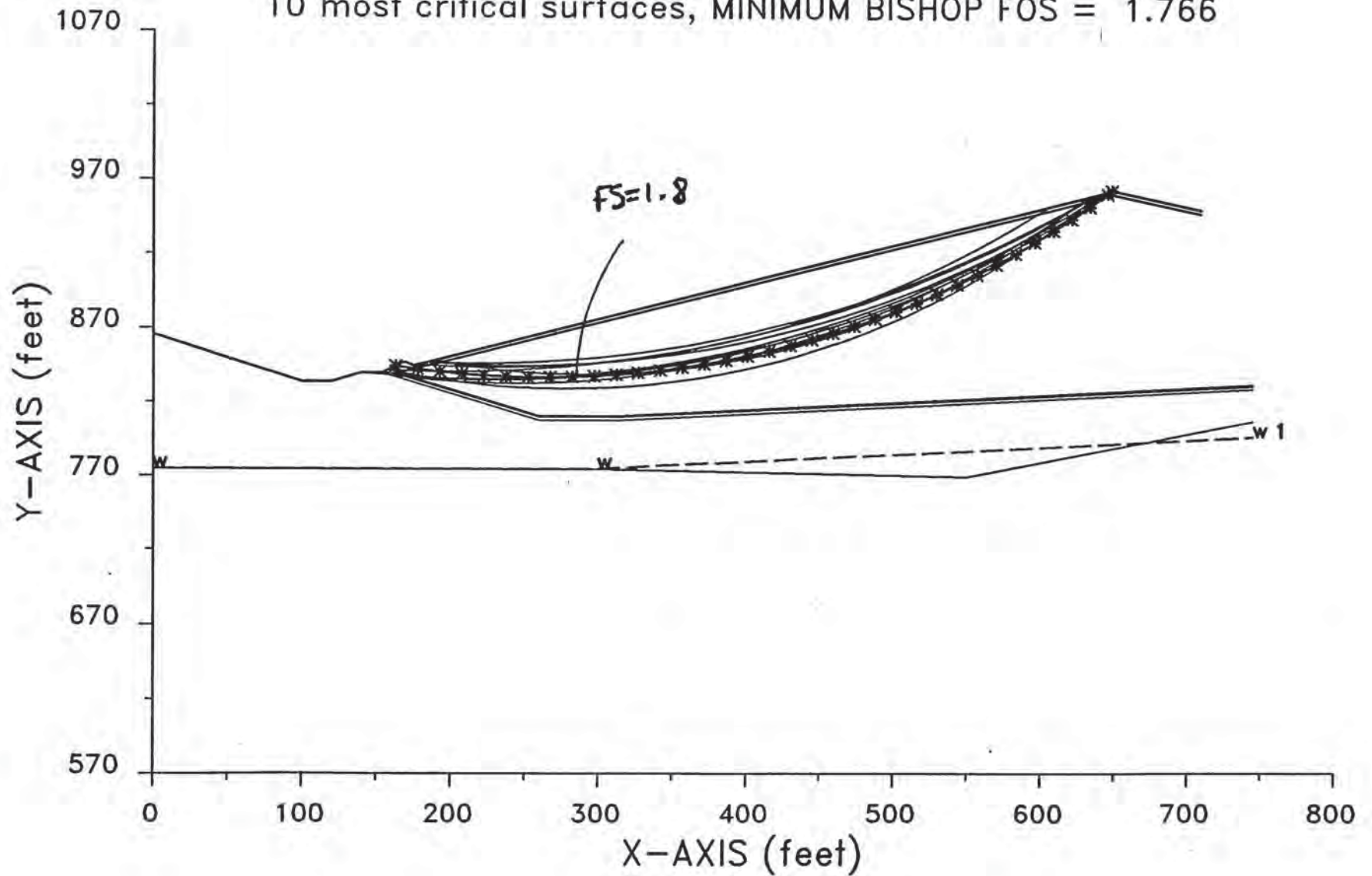
	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.581	242.58	1065.87	242.21	279.47	80.52	4.571E+07
2.	1.583	240.37	1080.10	256.18	277.37	73.34	5.172E+07
3.	1.588	217.22	1112.22	290.31	271.05	2.88	9.804E+07
4.	1.588	222.43	1115.96	297.80	290.00	.10	1.125E+08
5.	1.589	245.92	1099.38	273.91	273.16	74.27	5.033E+07

6.	1.590	228.19	1018.10	199.02	281.58	79.45	4.717E+07
7.	1.590	246.76	1096.56	272.04	279.47	74.66	5.171E+07
8.	1.590	219.48	1112.23	291.43	277.37	4.12	1.004E+08
9.	1.592	215.31	1104.38	282.98	271.05	4.55	9.690E+07
10.	1.592	227.51	1048.57	221.91	262.63	76.64	4.135E+07

*** END OF FILE ***

DPC Final Cover Slope

10 most critical surfaces, MINIMUM BISHOP FOS = 1.766



```

*****
*           X S T A B L           *
*                                     *
*      Slope Stability Analysis      *
*      using the                     *
*      Method of Slices              *
*                                     *
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*      Ver. 5.200                    96 - 1460 *
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Problem Description : DPC Final Cover Slope

 SEGMENT BOUNDARY COORDINATES

*✓ 2014
8/97*

9 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	866.0	100.0	834.0	1-
2	100.0	834.0	120.0	834.0	1-
3	120.0	834.0	140.0	840.0	1-
4	140.0	840.0	154.0	840.0	1-
5	154.0	840.0	168.0	847.0	2-
6	168.0	847.0	170.0	847.0	2-
7	170.0	847.0	175.0	845.0	2-
8	175.0	845.0	650.0	964.0	2-
9	650.0	964.0	710.0	951.0	2

17 SUBSURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	162.0	839.4	650.0	961.5	2-
2	650.0	961.5	710.0	948.5	2-
3	164.5	839.6	650.0	961.0	5-
4	650.0	961.0	710.0	948.0	5-
5	164.5	839.6	260.0	811.0	2-
6	260.0	811.0	315.0	811.0	2-
7	315.0	811.0	745.0	833.0	2-
8	154.0	840.0	160.0	840.0	3-
9	160.0	840.0	260.0	810.0	3-
10	260.0	810.0	315.0	810.0	3-

11	315.0	810.0	745.0	832.0	3
12	154.0	840.0	260.0	808.0	1
13	260.0	808.0	315.0	808.0	1
14	315.0	808.0	745.0	830.0	1
15	.0	775.0	300.0	775.0	4
16	300.0	775.0	550.0	770.0	4
17	550.0	770.0	745.0	808.0	4

ISOTROPIC Soil Parameters

5 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Constant (psf)	Water Surface No.	
1	120.0	120.0	200.0	20.00	.000	.0	1	Natural Soil
2	110.0	110.0	.0	30.00	.000	.0	1	Sand
3	125.0	125.0	400.0	25.00	.000	.0	1	Clay Soil
4	145.0	145.0	10000.0	45.00	.000	.0	1	Bedrock
5	80.0	80.0	130.0	20.00	.000	.0	1	Ash

1 Water surface(s) have been specified

Unit weight of water = 62.40 (pcf)

Water Surface No. 1 specified by 3 coordinate points

PHREATIC SURFACE,

Point No.	x-water (ft)	y-water (ft)
1	.00	775.00
2	300.00	775.00
3	745.00	797.00

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

400 trial surfaces will be generated and analyzed.

20 Surfaces initiate from each of 20 points equally spaced along the ground surface between x = 100.0 ft and x = 200.0 ft

Each surface terminates between x = 550.0 ft

and $x = 650.0$ ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is $y = .0$ ft

15.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees
Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

***** SIMPLIFIED BISHOP METHOD *****

The most critical circular failure surface is specified by 36 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	163.16	844.58
2	178.01	842.44
3	192.90	840.65
4	207.83	839.20
5	222.79	838.10
6	237.77	837.34
7	252.76	836.93
8	267.76	836.86
9	282.76	837.14
10	297.75	837.77
11	312.72	838.74
12	327.66	840.06
13	342.57	841.72
14	357.43	843.72
15	372.25	846.06
16	387.00	848.75
17	401.70	851.78
18	416.31	855.14
19	430.85	858.84
20	445.30	862.87
21	459.65	867.24
22	473.89	871.94
23	488.03	876.96

24	502.04	882.31
25	515.93	887.98
26	529.68	893.97
27	543.29	900.27
28	556.75	906.89
29	570.06	913.81
30	583.20	921.04
31	596.17	928.57
32	608.97	936.40
33	621.58	944.52
34	634.00	952.93
35	646.23	961.63
36	649.10	963.77

**** Simplified BISHOP FOS = 1.766 ****

The following is a summary of the TEN most critical surfaces

Problem Description : DPC Final Cover Slope

	FOS (BISHOP)	Circle Center x-coord (ft)	Circle Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.766	263.14	1487.27	650.42	163.16	649.10	3.560E+08
2.	1.772	245.10	1579.89	735.11	184.21	644.14	3.177E+08
3.	1.781	291.69	1377.57	538.73	189.47	631.14	2.805E+08
4.	1.782	277.11	1389.77	560.64	157.89	638.35	3.532E+08
5.	1.786	228.21	1584.42	749.38	142.11	647.53	4.003E+08
6.	1.786	201.38	1697.08	856.23	157.89	639.17	3.588E+08
7.	1.790	222.48	1597.73	761.99	142.11	642.84	3.896E+08
8.	1.790	219.39	1665.49	818.94	184.21	636.06	3.063E+08
9.	1.791	244.31	1492.11	659.28	147.37	633.16	3.638E+08
10.	1.791	233.61	1533.39	689.57	178.95	605.85	2.576E+08

*** END OF FILE ***

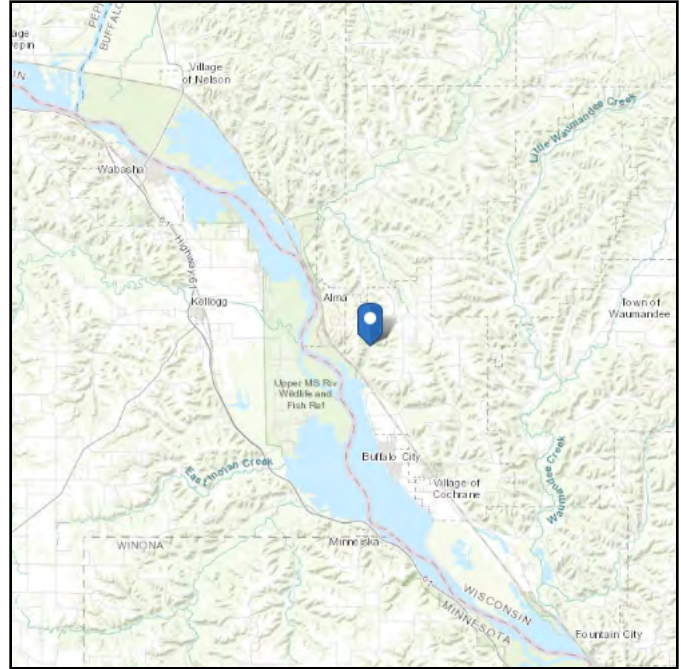
Revised Location Demonstrations Studies

ASCE 7 Hazards Report

Address:
No Address at This
Location

Standard: ASCE/SEI 7-22
Risk Category: III
Soil Class: D - Stiff Soil

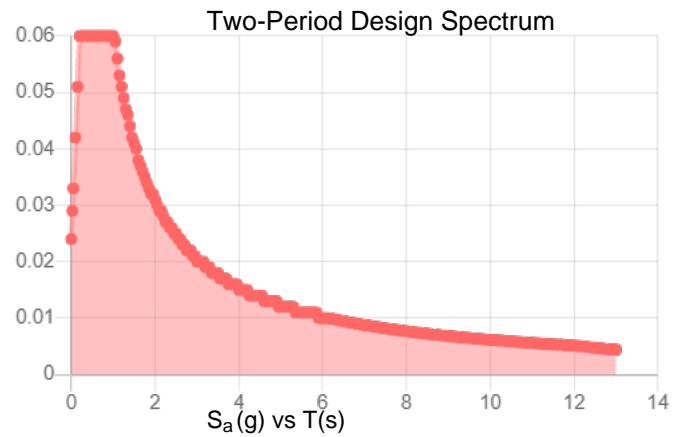
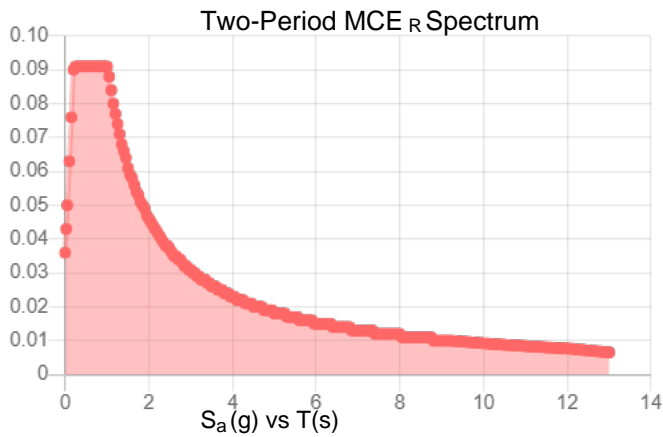
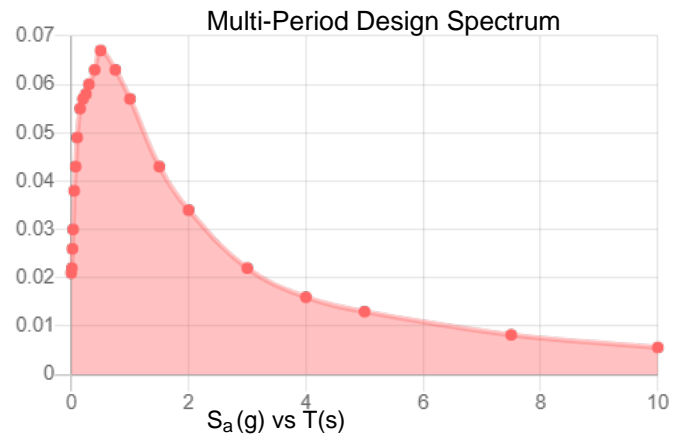
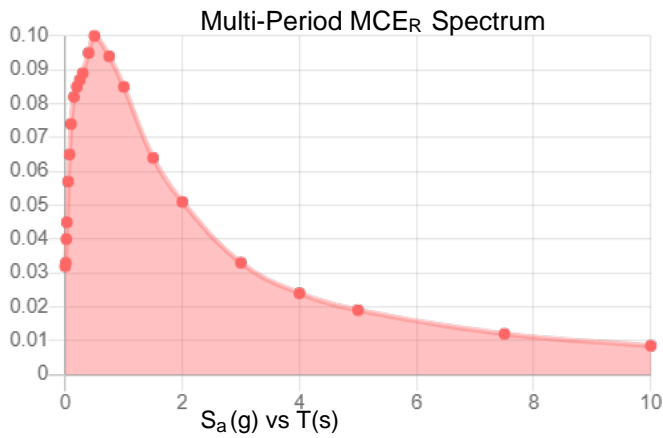
Elevation: 810.56 ft (NAVD 88)
Latitude: 44.29
Longitude: -91.876



Site Soil Class:

Results:

PGA _M :	0.029	T _L :	12
S _{MS} :	0.091	S _s :	0.056
S _{M1} :	0.092	S ₁ :	0.04
S _{DS} :	0.06	S _{DC} :	
S _{D1} :	0.061	V _{S30} :	260



MCE_R Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.



Data Accessed: Tue Oct 18 2022

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-22 and ASCE/SEI 7-22 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-22 Ch. 21 are available from USGS.

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2022 Earthquake Fault Map



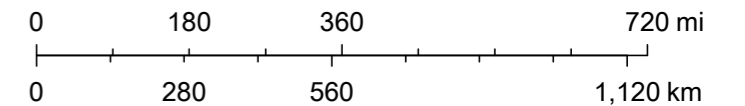
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Fault Areas

- Class B
- historic
- late Quaternary
- latest Quaternary
- middle and late Quaternary
- National Database
- Historic (< 150 years), well constrained location

- Historic (< 150 years), moderately constrained location
- Historic (< 150 years), inferred location
- Latest Quaternary (<15,000 years), well constrained location
- Latest Quaternary (<15,000 years), moderately constrained location
- Latest Quaternary (<15,000 years), inferred location
- Late Quaternary (< 130,000 years), well constrained location
- Late Quaternary (< 130,000 years), moderately constrained location
- Late Quaternary (< 130,000 years), inferred location
- Middle and late Quaternary (< 750,000 years), well constrained location
- Middle and late Quaternary (< 750,000 years), moderately constrained location
- Middle and late Quaternary (< 750,000 years), inferred location
- Undifferentiated Quaternary (< 1.6 million years), well constrained location
- Undifferentiated Quaternary (< 1.6 million years), moderately constrained location
- Undifferentiated Quaternary (< 1.6 million years), inferred location

1:18,489,298



National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.