September 26, 2003

TO: INTERESTED PARTIES

RE: Red Wing Ash Disposal Facility, SW-307

Enclosed is the Environmental Assessment Worksheet (EAW) for the proposed Red Wing Ash Disposal Facility, SW-307, Goodhue County. The EAW was prepared by the Minnesota Pollution Control Agency (MPCA) and is being distributed for a 30-day review and comment period pursuant to the Environmental Quality Board (EQB) rules. The comment period will begin the day the EAW availability notice is published in the EQB Monitor, which will likely occur in the September 29, 2003, issue.

Comments received on the EAW will be used by the MPCA in evaluating the potential for significant environmental effects from this project and deciding on the need for an Environmental Impact Statement (EIS).

A final decision on the need for an EIS will be made by the MPCA Commissioner after the end of the comment period. If a request for an EIS is received during the comment period, or if the Commissioner recommends the preparation of an EIS, the MPCA Citizens' Board (Board) will make the final decision. The final EIS need decision will also be made by the Board if so requested by the project proposer, other interested parties or MPCA staff and if this request is agreed to by one or more members of the Board or the MPCA Commissioner. The Board meets once a month, usually the fourth Tuesday of each month, at the MPCA office in St. Paul. Meetings are open to the public and interested persons may offer testimony on Board agenda items. A listing of Board members is available on request by calling (651) 296-7306.

Please note that comment letters submitted to the MPCA do become public documents and will be part of the official public record for this project.

If you have any questions on the EAW, please contact Kevin Kain of my staff at (651) 296-7432.

Sincerely,

Beth G. Lockwood
Supervisor, Environmental Review Unit
Operations and Environmental Review Section
Regional Environmental Management Division

BGL:gs

Enclosure

ENVIRONMENTAL ASSESSMENT WORKSHEET

Note to reviewers: The Environmental Assessment Worksheet (EAW) provides information about a project that may have the potential for significant environmental effects. This EAW was prepared by the Minnesota Pollution Control Agency (MPCA), acting as the Responsible Governmental Unit (RGU), to determine whether an Environmental Impact Statement (EIS) should be prepared. The project proposer supplied reasonably accessible data for, but did not complete the final worksheet. Comments on the EAW must be submitted to the MPCA during the 30-day comment period which begins with notice of the availability of the EAW in the *Minnesota Environmental Quality Board (EQB) Monitor*. Comments on the EAW should address the accuracy and completeness of information, potential impacts that are reasonably expected to occur that warrant further investigation, and the need for an EIS. A copy of the EAW may be obtained from the MPCA by calling (651) 296-7398. An electronic version of the completed EAW is available at the MPCA Web site http://www.pca.state.mn.us/news/eaw/index.html#open-eaw.

1. Project Title: Red Wing RDF Ash Disposal Facility, SW-307

2. Proposer: Northern States Power (NSP) doing business as Xcel Energy

Contact Person Mike Thomas

and Title

Address 414 Nicollet Mall, Ren. Square 5

Minneapolis, Minnesota 55401

Phone (612) 330-7657

Fax (612) 330-6556

3. RGU: Minnesota Pollution Control Agency

Contact Person Kevin J. Kain

and Title Project Manager

Address 520 Lafayette Road North

St. Paul, Minnesota 55155

Phone (651) 296-7432

Fax (651) 296-7782

4. Reason for EAW Preparation:

EIS Scoping		Mandatory EAW	X	Citizen Petition		RGU Discretion		Proposer Volunteered	

If EAW or EIS is mandatory give EQB rule category subpart number and name: Minn. R. 4410.4300 subp. 17.G.

For the construction or expansion of a mixed solid waste energy recovery facility ash landfill receiving ash from an incinerator that burns refuse derived fuel or mixed municipal solid waste.

5. Project Location: County Goodhue City/Twp Red Wing

SE 1/2 NE 1/4 Section 35 Township 113N Range 15W

Tables, Figures, and Appendices attached to the EAW:

- Exhibit 1: A state map;
- Exhibit 2: A county map showing the general location of the project;
- Exhibit 3: Copy of U. S. Geological Survey 7.5 minute, 1:24,000 scale map indicates project boundaries;
- Exhibit 4: An existing conditions site plan showing all significant project and natural

features;
- Exhibit 5: Phasing Plan for East Cell;
- Exhibit 6: Composite Liner Section;
- Exhibit 7: Leachate Collection Trench Section and Piping Detail;
- Exhibit 8: Surface Water Management Plan;
- Exhibit 9: Environmental Monitoring System;
- Exhibit 10: Leachate Monitoring Results;
- Exhibit 11: Minnesota Department of Natural Resources (DNR) Landfill Expansion Approval Letter; and
- Exhibit 12: Minnesota Historical Society Letter (December 16, 1991).

6. Description:

a. Provide a project summary of 50 words or less to be published in the *EQB Monitor*.

Northern States Power Company (NSP), doing business as Xcel Energy, operates a refuse derived fuel (RDF) ash disposal facility near Red Wing, Minnesota. NSP is re-permitting the ash disposal facility, and at the same time, designing an expansion to the east cell of the existing landfill of approximately two acres or 232,100 cubic yards of airspace volume. This expansion would provide approximately three additional years of site life at current fill rates.

b. Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of existing structures. Indicate the timing and duration of construction activities.

BACKGROUND

NSP, doing business as Xcel Energy, receives RDF from the Newport Resource Recovery Facility, and burns this fuel at its Red Wing Generating Plant located in Red Wing, Minnesota. The resulting waste combustor ash is disposed at the Red Wing RDF Ash Disposal Facility (Ash Landfill). (Exhibits 2 and 3)

NSP received a solid waste permit for the construction and operation of the Ash Landfill from the MPCA on July 28, 1987. Facility development under this permit included a west disposal cell, with a permitted capacity of 592,000 cubic yards. The MPCA certified the facility for operation in April 1988, and the operation of the site began in May 1988.

NSP submitted an application for permit reissuance in 1992 and an EAW was prepared for the expansion of the west cell. The MPCA permit was issued on June 8, 1993, which expired on June 7, 1998. This permit approved horizontal and vertical expansion of the existing facility, which resulted in expanding the life of the existing west cell until the year 2000 (based on the ash production rates experienced through 1996). The west cell was closed in 2000 and contains 592,000 cubic yards of waste and cover materials.

An EAW was prepared in 1998 for the expansion of the facility's east cell. The cell was divided into three construction phases; Phases 1A, 1B, Phases 2A, 2B, and Phases 3A, 3B. Phase 1A, was constructed in 1999. Phase 2A was constructed in 2001 and is currently in operation.

DESIGN AND OPERATION

Site Description

The Ash Landfill is located approximately 1.5 miles south of U.S. Highway 61 on Goodhue County Road 1. The facility is located on property adjacent to the city of Red Wing's (City) municipal solid waste and waste combustor ash landfills. The area shows a wide range in relief characterized by bluffs and ravines rising above the Mississippi River. Elevations range from 670 feet to over 1,100 feet above Mean Sea Level (MSL). The NSP site lies at approximately 800 to 900 feet MSL. The area for the east cell expansion lies in a steep, "amphitheater-like" valley sidewall, separated from the existing site by a ridge. The site is situated at the head of a small, intermittent stream, which flows eastward approximately one-half mile to join Hay Creek. The existing conditions at the site are shown on Exhibit 4.

The ash produced from the Red Wing Generating Plant is combined RDF ash, which is a mixture of fly ash, bottom ash, and lime scrubber solids resulting from the combustion of RDF. NSP's Ash Landfill only accepts ash and ash contaminated material, such as dust masks, shop rages and other material that has come into contact with the ash, from NSP's Red Wing Generating Plant.

The east cell, as it is currently designed, had enough space to operate for approximately nine years. The proposed expansion, if approved, would result in enough space to operate the site for approximately twelve years. A phasing plan for the east cell is attached as Exhibit 5.

Liner Design

For the base, a Type O liner, which exceeds MPCA requirements for a landfill with the leachate characteristics of the Ash Landfill, has been installed on Phase 1A and 2A and will be installed on Phases (1B, 2B, 3A, and 3B). A detail of the composite liner and the tie-in to the proposed sideslope liner is provided as Exhibit 6. The Type O liner consists of, from top to bottom:

- 60-mil HDPE,
- Geonet,
- 60-mil HDPE, and
- 2 feet of clay at a permeability of $\leq 1 \times 10^{-7}$ cm/sec.

For the side slopes, Minn. R. ch. 7035.2885, subp. 11 states that a Type N liner can be used if the ash leaching characteristics meet the requirements of the table, Minn. R. ch. 7035.2885, subp. 5. Available data for the site shows the leaching characteristics of the ash to meet the requirements for the use of a Type N liner, which consists of a composite liner. The Type N liner system that has been installed on Phases 1A and 2A, consists of from top to bottom:

- 60-mil (0.060 inch) high density polyethylene (HDPE) liner, and
- 3-foot compacted clay liner.

However, an alternative liner is proposed for the sideslopes of the remaining Phases (1B, 2B, 3A, and 3B). The proposed alternative liner consists of; from top to bottom:

- 60-mil HDPE liner,
- Geosynthitic clay liner, and
- 12 inches of clay at a permeability of less than or equal to 1×10^{-7} cm/sec.

Leachate Collection System

The facility produces leachate, consisting predominantly of rain and snowmelt, which infiltrates through the ash to the leachate collection system. The leachate collection system consists of perforated pipes bedded in coarse aggregate. The leachate collection system collects and conveys leachate from the liner to a collection sump at the lowest point of the base liner. Leachate from the east cell is pumped to the existing leachate tank for the west cell by means of a double-wall, solid HDPE forcemain, buried to a depth to prevent freezing. These tanks are periodically emptied into tank trucks, which haul the leachate off-site for treatment. No other wastewater is produced or treated at the site.

It is expected that leachate from the proposed east cell expansion would have a composition similar to the leachate collected from the west cell, since the ash would continue to come from the current source. The quality of the leachate is presented as part of Item 18 of the EAW, and leachate monitoring results are provided in Exhibit 10.

Final Cover Placement

The cover soils will consist of 18 inches of on-site soil or topsoil. The upper six inches will be topsoil capable of sustaining vegetation. The final cover topsoil layer will be mulched and seeded with shallow-rooted, drought-tolerant grasses. In addition to the MPCA criteria, vegetation on the east cell final cover will also comply with DNR criteria for non-invasive native species.

The final cover is designed to contain or divert precipitation from filled areas of the site. The efficiency of the cover system is defined as the amount of precipitation that is rejected or contained in the cover system, and must be at least 90 percent. Hydrologic Evaluation of Landfill Performance (HELP) model calculations show the cover system design efficiency to be 99.74 percent.

Surface-water Management

Landfill development typically increases the natural volume of run-off from the site. The final cover run-off produced at this site will be directed through sedimentation basins, which will manage, although not contain, the complete volume of the storm event, which is the 25-year, 24-hour Type II storm event of 5.0 inches. Sedimentation pond overflow pipes have been designed to allow for controlled discharge.

Site Security and Reporting

NSP will maintain adequate security at the site to control unauthorized access and allow only ash disposal.

Post Closure

A series of monitoring wells have been placed around the ash disposal facility to detect any ground-water contamination throughout the proposed site life and for 30 years after the site is closed. This is consistent with current regulations. Future regulations may change this time period.

ENVIRONMENTAL MONITORING

The environmental monitoring system for the site is shown in Exhibit 9 and is summarized in Exhibit 10. The following paragraphs provide a summary of those programs used by NSP to monitor the Red Wing RDF Ash Disposal Facility.

Leachate Monitoring Program

The Ash Landfill was designed so that all of the water that runs over the surface of the ash (contact water) and the water which percolates through the ash (leachate) is collected in two 10,000-gallon collection tanks. These two 10,000-gallon tanks were replaced in 1996 with one 20,000-gallon tank. The contents of this tank, also referred to as leachate, is delivered via tanker truck to a sewer line leading to the Red Wing Wastewater Treatment Plant (WWTP). There it is treated along with municipal wastewater from the City.

Leak Detection System - Lysimeters

Each cell of the Ash Landfill will be equipped with a leak detection system which will be designed to collect any leachate that may leak through to the low point of the liner. The leak detection system includes a geotextile liner beneath the clay barrier of the leachate sump. This geotextile liner was underlain by a geonet drainage layer, which will be underlain by 60-mil HDPE. The leak detection system drains to a collection pipe to the east edge of the bottom of the leachate collection sump. Within the leak detection system, a six-inch perforated pipe encased in coarse aggregate collects any inflow and transfers it to the leak detection standpipe. The leachate collected in the leak detection system is stored in one of two reservoirs, located adjacent to the Ash Landfill.

Ash Evaluation Program

In Minnesota, the ash from the combustion of mixed municipal solid waste was classified as a "solid waste" and under state law was not subject to regulation as a potential hazardous waste. RDF ash had to be stored and managed in accordance with the "Municipal Solid Waste Combustor Ash Rules" (Pt 7035.2885). However, in May of 1994, the United States Supreme Court ruled that combustor ash was not exempt from regulation as a hazardous waste. As a result, facilities generating waste combustor ash were required to test the ash generated at their facilities on a quarterly basis. NSP has complied with this requirement. The results from the testing of the ash generated from the Ash Landfills showed that the ash is not hazardous; therefore, it may be disposed of in accordance with the rules promulgated by the MPCA in April 1992.

Owners and operators of MSW incineration facilities in Minnesota are also required by the MPCA's Waste Combustor Ash Rules (Pt 7035.2910) to conduct an ash evaluation program. This program requires that facility owners collect, process, and analyze on a quarterly basis, composite samples of incinerator ash collected over a seven-day period. During this period, NSP collects discrete samples of fly ash and combined ash. NSP has completed ash testing since 1989. The ash evaluation program consists primarily of total composition analyses for inorganic parameters and Toxicity Characteristic Leaching Procedure (TCLP) Leach Tests. Results obtained from NSP's ash evaluation program showed that trace metals are present in RDF ash. However, concentrations of these elements in the leachate approximate the drinking water standards.

The MPCA issued a variance to the ash testing requirements in 1996. This MPCA variance indicated that testing to-date has shown that concentrations of contaminants have been consistently below regulatory thresholds. Consequently, TCLP testing, as well as other requirements, may be reduced in frequency.

The Ash Landfill will be inspected and monitored during operation and for at least 30 years following closure. NSP will provide financial assurance for closure, contingency action, and the long-term monitoring and maintenance of the site.

c. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The purpose of the project is to allow for the expansion of the originally permitted east disposal cell, and the addition of approximately 232,100 cubic yards of additional airspace volume. This expansion would provide approximately three-years of site life at current fill rates.

d. Are future stages of this development including development on any outlots planned or likely to happen? ☐Yes ☒No
If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

There is little potential for future expansion at the site due to the limited amount of space that would be available after this proposed expansion is constructed.

e. Is this project a subsequent stage of an earlier project? ☒ Yes ☐ No
If yes, briefly describe the past development, timeline and any past environmental review.

The MPCA prepared an EAW in 1998 for the site expansion of the facility's east cell, covering an area of approximately ten acres with a total capacity of 629,200 cubic yards of air space.

7. Project Magnitude Data

Total Project Area (acres) 2 or Length (miles) NA
Number of Residential Units: Unattached NA Attached NA maximum units per building NA
Commercial/Industrial/Institutional Building Area (gross floor space): total square feet NA
Indicate area of specific uses (in square feet):

Office	0	Manufacturing	0
Retail	0	Other Industrial	0
Warehouse	0	Institutional	0
Light Industrial	0	Agricultural	0
Other Commercial (specify)	80 (Ash Landfill)		

Building height _____ If over 2 stories, compare to heights of nearby buildings NA

8. Permits and approvals required. List all known local, state and federal permits, approvals and financial assistance for the project. Include modifications of any existing permits, governmental review of plans, and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure.

Unit of Government	Type of Application	Status
MPCA	Permit Reapplication and Expansion of Permit No. SW-307	Pending
MPCA	National Pollutant Discharge Elimination System (NPDES) General Construction Permit	To be obtained
MPCA	NPDES Industrial Discharge permit	Pending
Goodhue County	Transport License	Obtained
Goodhue County	Solid Waste License	Pending outcome of EAW Review
City of Red Wing	Conditional Use Permit	Pending
City of Red Wing	Leachate Treatment	Pending

The following variances have been granted and/or are pending for the Ash Landfill:

Type of Variance	Description	Status
*Property Line Setback	Variance to place ash within 200 feet of the property line.	Pending
**Alternative Liner Design	Geo-Clay Liner in lieu of 2 of the 3 feet of clay on slopes (Variance from Type N Liner requirements).	Pending
Permeability of the Final Cover Drainage Layer	Substituting drainage layer material of 5x10-3cm/s rather than 1x10-2cm/s.	Approved in 1998 Permit Application. Pending approval in the 2003 Permit Application.
Slope of Final Cover	4H:1V final cover slope vs. 5H:1V	Approved in the 1998 Permit Application. Pending approval in the 2003 Permit Application.
Certified Operator	Site remains open for acceptance of ash on a 24-hour basis and over long holiday weekends without a certified operator on site.	Approved October 24, 1997.
Ash Sampling	Variance in ash sampling protocols.	Approved October 18, 1996.

* A variance is needed for the 66-foot setback on the north side of the site. The adjacent property is designated open space on the City future land use plan and cannot be developed.

** A Type O liner is constructed on the base of the facility where a higher leachate head build-up occurs. The Type O design is more protective than the liner prescribed in the Minnesota Rules. The Type O liner is installed on the Ash Landfill base to create an opportunity to evaluate the performance of the primary liner by assessing the leachate collection volume in the secondary system. The barrier layer will consist of a 40-mil, low-level density polyethylene liner, or equivalent. A 12-inch thick drainage layer, with a minimum permeability of $5x10^{-3}$ cm/sec, will overlie the liner. The final cover design and permeability specified for the drainage layer in the 2003 permit application is consistent with the final cover design permitted in 1998. The final cover design requires a variance since it does not meet the permeability criteria of $1x10^{-2}$ cm/sec specified in the Minnesota Rules for ash combustor landfills.

9. Land use. Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

The expansion area lies adjacent to the existing Ash Landfill, as well as near undeveloped land or farmland. The Ash Landfill has been operating since 1988 with no conflicts with surrounding land use. The environmental monitoring that has been ongoing at the site (ground and surface water) has indicated no landfill related exceedances of the indicator parameters listed in the existing permit.

The demolition debris and Municipal Solid Waste (MSW) cells of the City owned Ash Landfill, to the east of the NSP site, were closed by order of the MPCA due to ground-water impacts. However, the City's ash landfill cell remains open. This closed site was at least partially unlined, and the contaminants of concern at this site are volatile organic compounds, not metals.

10. Cover Types. Estimate the acreage of the site with each of the following cover types before and after development:

	Before	After		Before	After
Types 1-8 wetlands	0	0	Lawn/landscaping	0	0
Wooded/forest	36	34	Impervious Surfaces	0	0
Brush/grassland	26	26	Other (describe)	18	20
Cropland	0	0	(Ash Landfill)		
			TOTAL	80	80

11. Fish, Wildlife, and Ecologically Sensitive Resources.

a. Identify fish and wildlife resources and habitats on or near the site and describe how they would be affected by the project. Describe any measures to be taken to minimize or avoid impacts.

No fish exist near the site. The area contains a variety of mammal species, including deer, raccoons, skunks, etc. Bird species include turkeys, pheasants, hawks, and songbirds. Hay Creek, in the reaches downstream of the Ash Landfill, is listed as a designated trout stream. The runoff from the Ash Landfill does not discharge directly into Hay Creek. Runoff discharges to an intermittent stream which flows into a drainage ditch that gets commingled with several other sources of runoff, including the city of Red Wing's Ash Landfill, before it eventually reaches Hay Creek. The Ash Landfill development has been designed to minimize sediment release with the incorporation of sedimentation ponds. During construction events that take place at the site, additional erosion protection measures, such as silt fencing and/or straw waddles would be incorporated. See Item 16 and 17 of the EAW for additional information regarding runoff issues.

b. Are any state (endangered or threatened) species, rare plant communities or other sensitive ecological

resources such as native prairie habitat, colonial waterbird nesting colonies or regionally rare plant communities on or near the site? ☒ Yes ☐ No
If yes, describe the resource and how it would be affected by the project. Indicate if a site survey of the resources has been conducted and describe the results. If the DNR Natural Heritage and Nongame Research program has been contacted give the correspondence reference number. 91-0044
Describe measures to minimize or avoid adverse impacts.

Preliminary surveys identified the potential of an endangered prairie plant, referred to as bladder pod, on the 80 acres owned by NSP. NSP has worked closely with the DNR to survey the location of these plants, and respond accordingly to ensure the protection of these plants to the satisfaction of the DNR. The bladder pod area was mapped, and the DNR has approved construction of the east cell, provided a ten-foot buffer is provided from the plants and colonies. The DNR approval of the east cell landfill expansion and associated Bladder Pod Protection Plan are included as Exhibit 11. NSP re-surveyed the location of the bladder pod colonies during design of the proposed expansion and determined the colony locations were unchanged from the previous survey.

12. Physical Impacts on Water Resources. Will the project involve the physical or hydrologic alteration (dredging, filling, stream diversion, outfall structure, diking, and impoundment) of any surface waters such as a lake, pond, wetland, stream or drainage ditch? ☐ Yes ☒ No
If yes, identify water resource affected. Describe alternatives considered and proposed mitigation measures to minimize impacts. Give the DNR Protected Waters Inventory (PWI) number(s) if the water resources affected are on the PWI.

13. Water Use. Will the project involve installation or abandonment of any water wells, connection to or changes in any public water supply or appropriation of any ground or surface water (including dewatering)? ☐ Yes ☒ No
If yes, as applicable, give location and purpose of any new wells; public supply affected, changes to be made, and water quantities to be used; the source, duration, quantity and purpose of any appropriations; and unique well numbers and DNR appropriation permit numbers, if known. Identify any existing and new wells on the site map. If there are no wells known on site, explain methodology used to determine.

14. Water-related land use management districts. Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? ☐ Yes ☒ No
If yes, identify the district and discuss project compatibility with district land use restrictions.

15. Water Surface Use. Will the project change the number or type of watercraft on any water body? ☐ Yes ☒ No
If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other uses.

16. Erosion and Sedimentation. Give the acreage to be graded or excavated and the cubic yards of soil to be moved: **2** acres; **85,000** cubic yards. Describe any steep slopes or highly erodible soils and identify them on the site map. Describe any erosion and sedimentation control measures to be used during and after project construction.

Sediment and erosion control would be implemented to minimize the potential for erosion. The approximately 85,000 cubic yards of earthen material scheduled to be excavated during expansion of the east cell would be used as controlled fill for embankment and berm construction.

All soils adjacent to the Ash Landfill are susceptible to severe erosion potential, if vegetation is removed. Any soils where vegetation is disturbed or removed would be revegetated by seeding and mulching. Moderate to steep sloping terrain characterizes the drainage area at the site and upland from the site. Soils

are predominantly in the hydrologic soil group B, with silt loam and loam textures. Ground cover consists of grass, with woods and some brush cover in upland areas. All surfaces are currently unpaved.

Construction activities at the Ash Landfill will require preparation of an erosion control plan, and an NPDES construction activity permit will be obtained if more than one acre is disturbed. Erosion and sedimentation control measures to be employed during and after construction include mulching, rapid-growing vegetation, fabric mats, hay bales, filter barriers, and sediment traps. The cap of the Ash Landfill would be planted to shallow rooted native prairie grasses and forbs. An expansion of the current sedimentation pond is included in the design of the Ash Landfill to accommodate additional runoff as a result of the expansion. Drainage ditches will generally be grass-lined. Where high run-off velocities are expected, ditches will be rock-lined to provide further erosion protection. Minimizing the amount of land to be graded at any one time will also control run-off erosion and sedimentation. Wind erosion during construction will be minimized by the use of water, as necessary.

Slopes on the final cover of the facility will range from a minimum of 3 percent on top, to 25 percent on the sideslopes. The maximum of 25 percent slope is a variance from the Minnesota Rules which allow a 20 percent slope unless otherwise approved. The strength characteristics of the ash and cover materials allow the use of a steeper slope. The highest elevation will be 958 feet.

Erosion on the final cover will be controlled by strategic placement of drainage swales, collection piping, erosion control mats, and riprap. Run-off will be directed by the final cover drainage swales to two sedimentation basins. Underneath the final cover drainage swales, there is a slotted, four-inch, corrugated, polyethylene pipe to intercept and collect the flow from the drainage layer. The drainage swales are lined with erosion control matting.

17. Water Quality – Surface-water Runoff.

a. Compare the quantity and quality of site runoff before and after the project. Describe permanent controls to manage or treat runoff. Describe any storm-water pollution prevention plans.

As previously discussed in Question 6 of this EAW, landfill development typically increases the natural volume of run-off from the site. There will be few water quality impacts since the surface water run-off will not come into contact with the deposited waste material. The final cover run-off produced at this site will be directed through sedimentation basins, which will manage, although not contain, the complete volume of the design storm event, which is the 25-year, 24-hour Type II storm event of 5.0 inches. Sedimentation pond overflow pipes have been designed to allow for controlled discharge. The quality of run-off may be temporarily impacted during construction of future cells and during the placement of final cover due to unavoidable erosion. However, requirements in the NPDES Permits will address the erosion control measures that must be used during and after construction.

Drainage swales were designed to produce a maximum velocity of four feet per second (fps) during peak flow condition. Downslope drainage structures were designed to accept flow from the drainage swales, and carry the water down the slope without causing significant erosion. Each downslope drainage structure will be lined with geotextile and rock riprap**.** Flow exits the ditch at the toe of the southern perimeter berm, into an eight-foot flat bottom open channel. The eight-foot flat drainage channel accepts flow from both east swale downslope structures. As the east combines flows with the lower east downslope structure, it produces a peak flow velocity of 3.6 fps. All other perimeter open channels will be vegetated and lined with an erosion control blanket to help prevent erosion.

Sediment trapping efficiency of the lower basin is such that particles larger than 0.05 mm (coarse silt) will be removed, as will most medium silts. The sedimentation basin outlets through an existing

culvert to the existing intermediate stream, which in turns flows into Hay Creek. The stream outlet is equipped with a precast concrete energy dissipater surrounded by Class IV riprap.

The drainage swales and underlying subsurface collection pipes both outlet at the same location. No run-on will be allowed to occur from previously closed areas. Run-off from off-site and undeveloped areas will be collected in external perimeter channels and natural drainage pathways, and routed away from the site.

Water moving through the drainage layer, which is not collected in the drainage swale collection pipes, will be outleted through the coarse aggregate at the toe of the final cover drainage layer.

b. Identify routes and receiving water bodies for runoff from the site; include major downstream water bodies as well as the immediate receiving waters. Estimate impact runoff on the quality of receiving waters.

The receiving water is an intermittent stream that flows into Hay Creek. Hay Creek is approximately one-half mile east of the site, and ultimately discharges to the Mississippi River. Hay Creek, in the reaches down stream of the Ash Landfill, is listed as a designated trout stream. The runoff from the Ash Landfill does not discharge directly to Hay Creek. Runoff discharges to an intermittent stream which flows into a drainage ditch that gets commingled with several other runoff sources before it eventually reaches Hay Creek. Runoff quality is expected to improve because of the presence of the proposed surface water control features at the Ash Landfill site as discussed above.

18. Water Quality – Wastewater.

a. Describe sources, composition and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.

The east cell leachate collection system has been designed to collect and convey leachate from the composite liner to a collection sump at the lowest point of the base liner, which has a capacity of 20,600 gallons. Leachate from the east cell will be conveyed to the existing leachate tank for the west cell by a double-wall, solid HDPE forcemain, buried at depth to prevent freezing.

It is expected that the maximum leachate generation will occur during the operation of Phase 3B of the east cell. At that time, a maximum generation rate of approximately 1,688,000 gallons of leachate per year is expected, based upon the HELP model. This corresponds to an actual generation rate from existing operations of 1,614,000 gallons, as reported in the 2001 Annual Report prepared for the facility.

b. Describe waste treatment methods or pollution prevention efforts and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies, and estimate the discharge impact on the quality of receiving waters. If the project involves on-site sewage systems, discuss the suitability of site conditions for such systems.

The Red Wing Ash Disposal Facility has been in operation since June 2, 1988. To prevent the addition of leachate from NSP's ash disposal facility from negatively impacting the effectiveness of the WWTP, certain discharge guidelines were established. A leachate management and contingency plan was adopted to provide appropriate responses to changes in leachate quality. NSP analyzes quarterly composite samples prepared from samples from all the discharge events occurring during that month. The results of the analyses of the monthly composites are used to manage the discharge rates of the leachate into the WWTP.

NSP routinely monitors the chemical composition of the leachate collected at the Ash Landfill. NSP has compiled extensive data on the leachate generated at this facility. The analysis of this leachate has indicated that the leachate contains no detectable levels of organic materials such as dioxins, furans, and polycyclic aromatic hydrocarbons. While the quarterly leachate composites suggest that the concentrations of most metals present in leachate generally approximate drinking water standards, leachate is an industrial wastewater, and as an industrial wastewater, it is not expected to meet these standards.

The leachate is not treated on-site. It is hauled off-site and discharged to the City's sewer system for treatment as described below. If required, the pH can be lowered prior to shipment through the use of a carbon dioxide injection system, which is located in the storage tank.

Maximum Leachable Contaminant Levels (MLCLs) have been defined for arsenic, barium, boron, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, and zinc. In addition, more stringent standards have been set for acceptance of leachate at the City's WWTP. These standards are detailed in the Leachate Management Plan, dated January 2003. Exhibit 10 provides the chemical analysis leachate data for 2002.

c. If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pretreatment provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying any improvements necessary.

NSP is permitted to discharge the leachate generated from this facility into the Red Wing WWTP. The discharge of the leachate into the system is accomplished in accordance with the MPCA Solid Waste Permit, SW-307, the Minnesota Municipal Solid Waste Combustor Ash Rules, the MPCA approved Leachate Management and Contingency Plan, and the Red Wing Landfill Leachate Treatment Agreement. Leachate is hauled off-site in a 6,000-gallon tanker truck and discharged to the City's sewer system at a manhole location approved by the City. The leachate flows to the Red Wing WWTP, where it is treated with other wastewater from the City. The WWTP effluent is discharged to the Mississippi River.

Under the terms of NSP's current agreement with the City, NSP is allowed to discharge a maximum of 30,000 gallons of leachate per day to the WWTP. The discharge volume may be increased if arrangements are made with the City.

Concentrations of various leachate constituents are limited in order to prevent the leachate discharge from adversely impacting the effectiveness of the WWTP. These discharge limitations are contained in the "Procedures Manual" and are based upon toxicity criteria set forth by the MPCA. If leachate concentrations of one or more constituents increase above allowable limits, the allowable leachate discharge rate is reduced correspondingly to prevent adverse impacts on the WWTP or excessive discharge of leachate constituents to the river.

No WWTP improvements would be required in order to continue the proposed leachate disposal program. The leachate can be treated effectively at the Red Wing WWTP.

d. If the project requires disposal of liquid animal manure, describe disposal technique and location and discuss capacity to handle the volume and composition of manure. Identify any improvements necessary. Describe any required setbacks for land disposal systems.

Not Appliable

19. Geologic hazards and soil conditions.

a. Approximate depth (in feet) to Ground water: 65 minimum; 100 average.
Bedrock: 10 minimum; 0 average.
Describe any of the following geologic site hazards to ground water and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due to any of these hazards.

There are no sinkholes, karst conditions, or abandoned wells at the site. As previously stated, an environmental monitoring system is in place to detect and minimize any potential impacts to the ground water. Historic water quality data show that the ground water at the site has not been impacted by landfill activities at the Ash Landfill.

b. Describe the soils on the site, giving SCS classifications, if known. Discuss soil granularity and potential for ground-water contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.

The surficial or unconsolidated soils at the Ash Landfill are generally 2 to 84-feet thick and consist primarily of alluvial silts and sand, with interbedded deposits of loess (windblown sediments), consisting of silt and very fine sand. Throughout the area, erosional valleys have been cut into the bedrock. The thicker sequences of unconsolidated deposits can be found in these ancient paleo-valleys. Lying below the unconsolidated sediments is a series of Cambrian-aged sedimentary rocks.

Bedrock Geology: The uppermost bedrock at the site is reportedly the Jordan Sandstone. It is of minor extent and is only found in the higher elevations north and south of the site (i.e., ridge tops). The Jordan is a medium to coarse-grained quartz sandstone, typically buff white or light yellow in color. In some parts of Minnesota, the Jordan is a significant aquifer. However, in the vicinity of the site, it exists only at the higher elevations and thus is not of much importance as a ground water source.

Conformably underlying the Jordan Sandstone is the St. Lawrence Formation. The St. Lawrence is a well-cemented, argillaceous, silty-sandy dolomitic limestone with interbedded shale. The unit typically shows a buff-white color, although the lower member of the formation, the Black Earth Member, is often times glauconitic (and thus greenish). In the vicinity of the site, the St. Lawrence ranges in thickness from absent to up to 50-feet thick, depending on the topography. Although the St. Lawrence shows a high degree of fracturing, both vertically and horizontally in the vicinity of the site, it has been determined that the ground water on site is monitorable. The St. Lawrence, although a dolomitic limestone, is not characterized by karst features in the Red Wing region.

Lying below the St. Lawrence Formation is the Franconia Formation, which represents the uppermost aquifer body, and thus the main formation of interest at the site. The Franconia is made up of four members, the Mazomanie, Reno, Tomah, and Birkmose Members, in descending order. In the vicinity of the expansion site, the Mazomanie is apparently not present. The Reno Member is described as a glauconitic, bioturbated (worm-bored), well-cemented, fine-grained quartz sandstone. The Reno represents the coarsest-grained material of the three Franconia members present at the site. Lying below the Reno is the Tomah Member. The Tomah is a fine-grained to very fine-grained, feldspathic, silty quartz sandstone with interbedded micaceous shale, and in some cases, glauconitic dolomite. The lowermost member of the Franconia is the Birkmose Member, a glauconitic, bioturbated, fine-grained quartz sandstone, with interbedded layers of silt and dolomite (Geology of Minnesota, 1972). The Franconia Formation is up to 170-feet thick in the vicinity of the site (Hickok, 1986).

Below the Franconia are the Ironton and Galesville Sandstones, collectively called the Ironton-Galesville Formation. The Ironton, deposited during a period of ancient oceanic transgression, is a medium-grained, well to poorly sorted, quartz sandstone, which can have significant amounts of fine-grained material (silt) throughout. The upper portions of the Ironton can be glauconitic. The Galesville, deposited during a period of oceanic regression, is a light grayish, white, quartzose sandstone, well to moderately sorted and medium-grained for the most part, with the exception of some interbedded fine-grained quartzose beds at its base.

Below the Ironton-Galesville, in descending order, are the Eau Claire and Mt. Simon Formations, which complete the Paleozoic rock sequence in this area.

Ground-water Monitoring

Ground-water monitoring under the current EMS at the existing Ash Landfill has been on-going since 1987. These wells are sampled during the spring, summer, and fall quarters. Samples obtained from the wells monitoring the existing site have been analyzed for many parameters, including, but not limited to: arsenic, barium, boron, cadmium, calcium, chloride, chromium, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, nitrate, potassium, pH, selenium, silver, sodium, specific conductance, sulfate, and zinc. The purpose of this monitoring is to assess the impact, if any, on the local ground water. In general, based on the ground-water performance standards, the monitoring wells on the existing site have not detected any significant leachate influence. Exceedances of the Intervention Limits for nitrate and manganese have occurred, but were found to have exceeded the Intervention Limits prior to operation of the newly constructed cell during background sampling of the wells. An Intervention Limit or Maximum Intervention Limit is an established standard/concentration, which, if exceeded at or beyond the compliance boundary, triggers further evaluation to determine the appropriate corrective actions.

Manganese is a natural occurring mineral found in ground water. It is not unusual for manganese to occur in ground water wells in this region of the state at levels found in the ground water samples at the Red Wing site. Nitrates are often found in ground water in agricultural regions where it is used as a fertilizer. Nitrates are not a byproduct of refuse derived fuel combustion, therefore, exceedences are not an indication of ash leachate contamination in the ground water. From this it can be concluded that these wells had preexisting water quality issues not related to the Ash Landfill. Over the entire period of monitoring at this site, no significant impacts to ground-water quality have occurred.

20. Solid Wastes, Hazardous Wastes, Storage Tanks.

a. Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.

None.

b. Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating ground water. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.

No toxic or hazardous materials, other than fuels and lubricants for operating equipment, will be used or present at the site. All fuels and lubricants would be properly stored to avoid spillage.

c. Indicate the number, location, size and use of any above or below ground tanks to store petroleum products or other materials, except water. Describe any emergency response containment plans.

One double-walled 20,000-gallon fiberglass underground tank is presently used to store collected leachate on the site. Leachate is pumped out of the storage tank to a tank trailer, which in turn is then transported to the Red Wing WWTP for treatment and disposal. Leachate from the proposed east cell will be conveyed to the existing leachate tank by double-wall, solid HDPE forcemain, buried at a depth to prevent freezing.

21. Traffic. Parking spaces added: 0 Existing spaces (if project involves expansion): _____ Estimated total average daily traffic generated: 10 Estimated maximum peak hour traffic generated (if known) and its timing: _____ Provide an estimate of the impact on traffic congestion affected roads and describe any traffic improvements necessary. If the project is within the Twin Cities metropolitan area, discuss its impact on the regional transportation system.

22. Vehicle-related Air Emissions. Estimate the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts. Note: If the project involves 500 or more parking spaces, consult *EAW Guidelines* about whether a detailed air quality analysis is needed.

Because operations are expected to be unchanged, no changes in vehicle-related air emissions are expected. Construction-related exhaust during construction of the east cell will be greater due to more trucks and heavy equipment operating at the site, but will be of a temporary duration.

23. Stationary Source Air Emissions. Describe the type, sources, quantities and compositions of any

emissions from stationary sources of air emissions such as boilers, exhaust stacks or fugitive dust sources. Include any hazardous air pollutants (consult *EAW Guidelines* for a listing), any greenhouse gases (such as carbon dioxide, methane, and nitrous oxides), and ozone-depleting chemicals (chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.

No stationary air emissions will be generated at this project.

24. Odors, noise and dust. Will the project generate odors, noise or dust during construction or during operation? ☒ Yes ☐ No

If yes, describe sources, characteristics, duration, quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify locations of nearby sensitive receptors and estimate impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

The nearest potential receptors (residences) for airborne dust, odors, or noise are about 1,550 feet to the northwest and 3,000 feet to the south (both separated from the Ash Landfill by high ridges). No parks or campgrounds are located within one mile of the Ash Landfill.

Dust: Dust can be generated by a number of sources on-site and off-site, both during and after construction. The issue of RDF incinerator ash dusting has been raised and evaluated in several previous EAWs or permits for ash storage facilities. Previous studies have determined that ash dusting would not occur in sufficient quantities to cause detrimental impacts to humans or the environment. The low concentrations of heavy metals and organics present in the ash would also minimize potential environmental impacts.

Since RDF incinerator ash is known to contain low concentrations of toxic components, such as heavy metals or organic products of incomplete combustion (e.g., dioxins), the concern exists that humans and animals may be exposed to these contaminants through various routes. Concerns have been raised that ash deposited on the site would be subject to wind erosion and, therefore, create fugitive dust emissions. NSP has conducted an air modeling study at its RDF ash landfill in Becker, Minnesota to determine the likelihood of wind erosion of RDF ash.

The ash delivered to the site by covered dump trucks would have a moisture content of 25 percent to 35 percent. The maximum rate of natural drying is 8 percent per day. Earth cover or moist ash would be applied to the deposited ash at least every seven days. Therefore, exposed ash would experience a maximum natural drying rate of 8 percent per day for seven days.

There is no definitive research that specifies a threshold moisture content at which exposed dried ash becomes susceptible to wind erosion. Modeling done by NSP at its RDF ash landfill in Becker indicates that a 17 mile per hour (mph) wind would initiate wind erosion at one percent moisture content. A 20 mph wind is needed to initiate wind erosion if the moisture content is 5 percent to 15 percent. Average wind speeds of this velocity are not common at this site for extended durations. Moisture conditions of roughly 4 percent should be sufficient enough to eliminate or minimize dust emissions.

A number of measures would be taken to ensure that fugitive dust is not a serious problem. The moisture content of the ash is similar to that of moist sand (22 to 29 percent) and is self-cementing. The ash would be compacted and moist ash would be periodically added to increase the moisture content. This would be the primary method used to prevent significant ash dusting. Site operations would be restricted during windy weather to prevent significant ash dusting problems. The exposed surfaces for ash filling would also be minimized and the site would be re-seeded after placement of intermediate and final cover. Observations at the Ash Landfill indicate that the combined bottom and fly ash tends to solidify on the surface layers. This crust would also help to prevent significant ash dusting. These factors, in conjunction with the proper operation of the Ash Landfill, reduce the potential for fugitive dust releases.

Odors: Ash landfills do not typically generate odors because there are no organic materials present that can decompose and cause odors.

Noise: Heavy construction equipment would be operated during landfill construction and operation. Operation would occur only during daytime hours; the City permit precludes evening traffic or operation. The bulldozers to be used at the Ash Landfill have been measured at a noise level of 84 dBA (decibels) at a distance of 50 feet and 64 dBA at a distance of 500 feet. This equipment would typically be operated at a distance of 500 feet or more from the NSP property line, where estimated noise levels would be in compliance with State of Minnesota Noise Standards (Chapter 7030). These noise levels should not be sustained for long durations. It is not expected that state noise standards would be violated at the facility.

25. Nearby resources. Are any of the following resources on or in proximity to the site?

a. Archaeological, historical, or architectural resources? ☐ Yes ☒ No
b. Prime or unique farmlands or land within an agricultural preserve? ☐ Yes ☒ No
c. Designated parks, recreation areas, or trails? ☐ Yes ☒ No
d. Scenic views and vistas? ☐ Yes ☒ No
e. Other unique resources? ☐ Yes ☒ No

If yes, describe the resource and identify any project-related impacts on the resources. Describe any measures to minimize or avoid adverse impacts.

NSP consulted the Minnesota Historical Society during preparation of the EAW in 1992 for expansion of the west cell. At that time, the Minnesota Historical Society reported the probability of historical and archeological properties existing on this site as low. Because the east cell expansion, for which this EAW is being prepared, will be confined to the same parcel of land for which the Minnesota Historical Society search was previously focused, no further investigation was deemed necessary at this time. The December 16, 1991, letter from the Minnesota Historical Society is presented in Exhibit 12.

26. Visual impacts. Will the project create adverse visual impacts during construction or operation? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks? ☐ Yes ☒ No
If yes, explain.

27. Compatibility with plans and land use regulations. Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency? ☐ Yes ☒ No
If yes, describe the plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain.

The property is currently zoned Agricultural/Residential by the City. The Ash Landfill conforms to present zoning. No conflicts with local zoning are anticipated. The zoning permit requires compliance with the MPCA solid waste permit, so as the latter is amended to approve the expansion, the zoning permit would be modified as well.

28. Impact on infrastructure and public services. Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project? ☐ Yes ☒ No
If yes, describe the new or additional infrastructure or services needed. (Note: any infrastructure that is a connected action with respect to the project must be assessed in the EAW; see *EAW Guidelines* for details.)

29. Cumulative impacts. Minn. R. 4410.1700, subp. 7, item B requires that the RGU consider the "cumulative potential effects of related or anticipated future projects" when determining the need for an environmental impact statement. Identify any past, present or reasonably foreseeable future projects that may interact with the project described in this EAW in such a way as to cause cumulative impacts. Describe the nature of the cumulative impacts and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to cumulative impacts (or discuss each cumulative impact under appropriate item(s) elsewhere on this form).

The proposed two-acre expansion of the east cell, along with the existing capacity of east cell, would allow the Ash Landfill to operate for approximately 12 years, based on current filling rates. Existing impacts, if any, associated with traffic, noise, dust, odor, and other issues related to landfill operations would continue, but are not expected to be cumulative.

30. Other Potential Environmental Impacts. If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

No other issues identified.

31. Summary of issues. List any impacts and issues identified above that may require further investigation before the project is begun. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.

None identified.

RGU CERTIFICATION.

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minn. R. 4410.0200, subps. 9b and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Name and Title of Signer: **Beth G. Lockwood, Supervisor, Environmental Review Unit**
Operations and Environmental Review Section
Regional Environmental Management Division

Date:

The format of the Environmental Assessment Worksheet was prepared by the staff of the Environmental Quality Board at Minnesota Planning. For additional information, worksheets or for *EAW Guidelines*, contact: Environmental Quality Board, 658 Cedar St., St. Paul, MN 55155, 651-296-8253, or at their Web site http://www.mnplan.state.mn.us.