



**National Pollutant Discharge  
Elimination System /State  
Disposal System (NPDES/SDS)  
Permit Program  
Statement of Basis**

**Permittee:** United States Steel, Minnesota Ore Operations  
**Name:** Keetac – Mining Operations  
**Permit Number:** MN0031879

**Current Permit Expiration:** May 31, 2011

**Public Comment Period Begins:** June 27, 2011  
**Period Ends:** August 12, 2011

**Receiving Water:** Welcome Lake; Welcome Creek to Reservoir 2  
North; Unnamed wetlands and creeks tributary to O'Brien Reservoir

**Proposed Action:** Permit Reissuance

**Permitting Contact**  
Brandon Smith  
520 Lafayette Road N.  
St. Paul, MN 55155  
Phone: 651-757-2740  
Fax: 651-296-8717

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## **Purpose and Participation**

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### **Purpose**

This Statement of Basis outlines the principal issues related to the preparation of this permit reissuance and documents the decisions that were made in the determination of the effluent limitations and conditions of this permit.

The permit will be reissued if the MPCA determines that the proposed Permittee or Permittees will, with respect to the facility or activity to be permitted, comply or undertake a schedule to achieve compliance with all applicable state and federal pollution control statutes and rules administered by the MPCA and the conditions of the permit and that all applicable requirements of Minn. Stat. ch. 116D and the rules promulgated thereunder have been fulfilled.

More detail on all requirements placed on the facility may be found in the Permit document.

## **Facility Description**

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### **Background Information**

#### Facility Location

The permitted facility includes the mining and processing operations for the U.S. Steel – Keetac facility, located to the north of Keewatin, Minnesota.

#### Outfall Locations

SD001: This outfall represents the discharge of filter backwash water from the potable water system to Welcome Lake. PLS coordinates are T57N, R21W, Section 19b.

SD002: The overflow discharge from Reservoir 5 treatment basin and diversion ditch treatment system is to Welcome Creek, south of Welcome Lake. PLS coordinates are T 57 N, R 21 W, Section 30b.

SD003: The Mesabi Chief dewatering outfall is located off the southwestern edge of the Mesabi Chief pit, PLS coordinates are T 57 N, R 22 W, Section 27a.

SD012: The Perry Pit dewatering outfall is located off the southwest side of the Perry Pit. PLS coordinates are T 57 N, R 22 W, Section 27b.

#### Changes to Facility or Operation

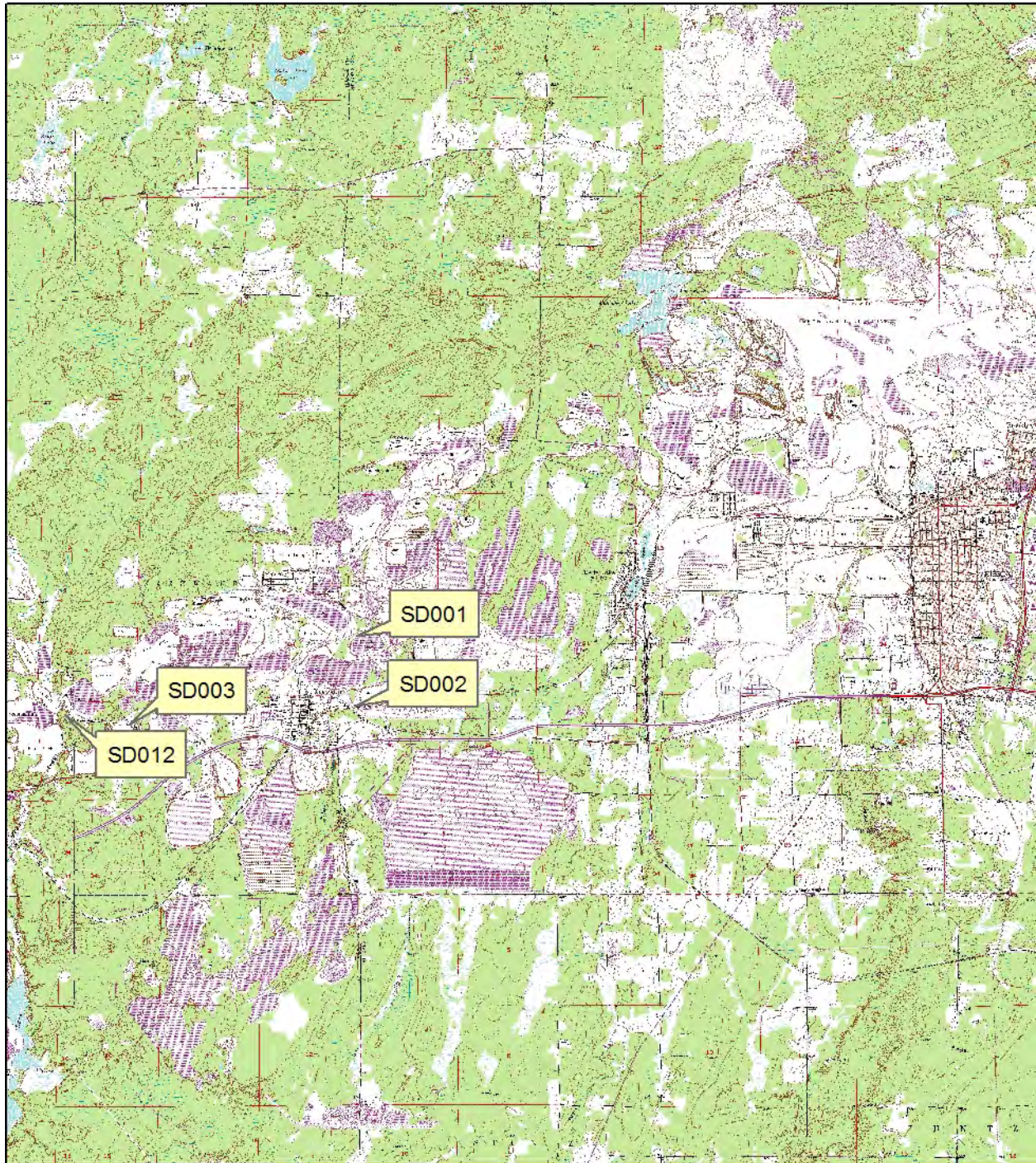
The facility has proposed an expansion of the taconite processing plant with which the permitted operations are associated.

#### Recent Compliance History

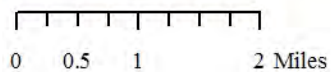
The Facility was inspected on May 10, 2010. No significant compliance issues were found that would affect modification of this permit.

### Topographic Map of Permitted Facility

MN003189, US Steel - Keewatin Taconite Operations, Mining  
St. Louis County & Itasca County, Minnesota



Map produced by: MPCA Staff, 4/15/2010  
Source: USGS Nashwauk, Keewatin, Hibbing,  
Pengilly, Silica, Riley Quads  
Scale: 1:24,000



## Receiving Waters

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### Use Classification

The receiving waters affected by this permit reissuance include Welcome Lake, Welcome Creek, O'Brien Creek, and the O'Brien Reservoir.

All waters of the state of Minnesota must be classified based on considerations of best usage in the interest of the public and in conformance with the requirements of the applicable statutes, as described in Minn. R. 7050.0140. Based on these considerations, Welcome Creek and O'Brien Creek are classified as Class 2C waters as listed in 7050.0470 Subpart 4.A. items (127) and (236), respectively. According to Minn. R. 7050.0410, any listed water in part 7050.0470 is also classified as a Class 3C, 4A, 4B, 5, and 6 water.

Welcome Lake and O'Brien Reservoir are not listed waters in Minn. R. 7050.0470. As detailed in Minn. R. 7050.0430, all surface waters of the state that are not listed in part 7050.0470 and that are not wetlands as defined in part 7050.0186, subpart 1a, are classified as Class 2B, 3C, 4A, 4B, 5, and 6 waters.

Based on the applicable classifications, the receiving waters named above are designated for use in the forms of aquatic life and recreation, industrial consumption, agriculture and wildlife, aesthetic enjoyment and navigation, and other uses.

### Impairments

Minnesota is required to maintain a list of impaired waters, pursuant to Section 303(d) of the Federal Clean Water Act. Impairments have been identified in the receiving waters affected by this permit modification for mercury. Permit conditions with regard to mercury for this permit modification are discussed later in this statement of basis.

## Proposed Permit Effluent Limits

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The MPCA may develop effluent limitations based on Minnesota state water quality standards for the receiving water use classification, federal categorical standards applicable to specific industrial categories, or combination of these standards to regulate discharge of industrial wastewater. In addition, the MPCA may derive standards that are specific to a particular discharge. These standards may be based on toxicity studies, best professional judgment analysis, technology based standards, and in some instances standards developed by other U.S. states or regulatory agencies. Minnesota Rules and the U.S. Code of Federal Regulations (CFR) require that the MPCA categorize industrial dischargers consistent with the U.S. Environmental Protection Agency federal categorical standards, and state standards if appropriate.

### Technology Based Effluent Limits

Minn. R. 7053.0225 subp. 1.A requires that all point source dischargers of industrial or other wastes shall comply with applicable federal standards, including those listed in 40 CFR parts 401 through 469. The MPCA has determined that the specific industrial category and federal effluent limitation guidelines (Categorical Standards) applicable to this facility are those described in 40 CFR pt. 440 subpt. A, for the iron ore mining and dressing point source category. The facility constitutes an existing source, and is therefore not subject to the New Source Performance Standards for this industry. The Categorical Standards for Best Practicable Control Technology currently available (BPT) and Best Available Technology economically achievable (BAT) have been applied for the conditions in this permit. These standards, along with Minnesota State Water Discharge Restrictions, have been used to develop the effluent limitations for discharge via permitted outfalls as summarized in the tables below.

**Table – Technology-Based Effluent Limitations Proposed for NPDES/SDS Permit No. MN0031879, Surface Discharge Station SD001: Water Treatment Plant Backwash**

<b><i>Effluent Characteristic</i></b>	<b><i>Effluent Limitation</i></b>	<b><i>Basis</i></b>
<b>pH</b>	6.0 Standard Units (SU) Instantaneous Minimum; 9.0 SU Instantaneous Maximum	Minn. Rule 7053.0225 Subp. 1.B.
<b>Total Suspended Solids</b>	30 mg/L Daily Maximum	Minn. Rule 7053.0225 Subp. 1.B.

Pursuant to Minnesota Rule 7053.0225, given that effluent limitations have not been promulgated for treatment plant backwash under 40 CFR 440, Minnesota State Water Discharge Restrictions are applied to ensure adequate treatment is achieved prior to discharge via SD001.

**Table – Technology-Based Effluent Limitations Proposed for NPDES/SDS Permit No. MN0031879, Surface Discharge Stations SD002 and SD003**

<b><i>Effluent Characteristic</i></b>	<b><i>Effluent Limitation</i></b>	<b><i>Basis</i></b>
<b>Iron, dissolved (as Fe)</b>	1.0 mg/L Calendar Month Average, 2.0 mg/L Daily Maximum	40 CFR 440.12(a), 40 CFR 440.13(a)
<b>Total Suspended Solids</b>	20 mg/L Calendar Month Average, 30 mg/L Daily Maximum	40 CFR 440.12(a)

Effluent from SD002 and SD003 consists primarily of industrial stormwater and mine drainage as described in 40 CFR 440. Effluent limitations have been included for total dissolved iron and total suspended solids to ensure that treatment requirements based on BAT and BPT considerations are achieved. Effluent limitations for pH based on water quality considerations have been determined to be more restrictive than the applicable limitations based on BAT and BPT.

**Table – Technology-Based Effluent Limitations Proposed for NPDES/SDS Permit No. MN0031879, Surface Discharge Station SD012: Perry Pit Dewatering**

<b><i>Effluent Characteristic</i></b>	<b><i>Effluent Limitation</i></b>	<b><i>Basis</i></b>
<b>pH</b>	6.0 Standard Units (SU) Instantaneous Minimum; 9.0 SU Instantaneous Maximum	40 CFR 440.12(a)
<b>Iron, dissolved (as Fe)</b>	1.0 mg/L Calendar Month Average, 2.0 mg/L Daily Maximum	40 CFR 440.12(a), 40 CFR 440.13(a)
<b>Total Suspended Solids</b>	20 mg/L Calendar Month Average, 30 mg/L Daily Maximum	40 CFR 440.12(a)

Effluent from SD012 consists of mine drainage from Perry Pit, which receives surface runoff from stripping and stockpiling activities associated with mining from Keetac operations. Therefore, effluent limitations have been included to reflect BAT and BPT for this waste stream.

**Table** – Technology-Based Effluent Limitations Proposed for NPDES/SDS Permit No. MN0031879, Waste Stream Station WS005: Internal Waste Stream

<b><i>Effluent Characteristic</i></b>	<b><i>Effluent Limitation</i></b>	<b><i>Basis</i></b>
<b>Carbonaceous Biochemical Oxygen Demand, 5 Day</b>	25 mg/L, 3.8 kg/day Calendar Month Average; 40 mg/L, 6.0 kg/day Daily Maximum	Minn. Rule 7053.0215 Subp. 1
<b>Fecal Coliform</b>	200 Organisms/100 mL Geometric Mean	Minn. Rule 7053.0215
<b>pH</b>	6.0 Standard Units (SU) Instantaneous Minimum; 9.0 SU Instantaneous Maximum	Minn. Rule 7053.0215
<b>Total Suspended Solids</b>	30 mg/L, 4.5 kg/day Calendar Month Average; 45 mg/L, 6.8 kg/day Daily Maximum	Minn. Rule 7053.0215

WS005 consists of treated effluent from an activated sludge package plant that commingles with pit drainage effluent prior to discharge. To ensure adequate treatment is applied prior to discharge as required by Minnesota Rules 7053.0215, the permit requires that effluent limitations for discharges of sewage are met prior to commingling with other waste sources.

#### **Water Quality Based Limits**

Effluent limitations based on Minnesota state water quality standards for the receiving water use classifications previously discussed have been included in the permit for surface discharge stations SD002, SD003, and SD012.

The MPCA has made the determination that, based on the information available at the time of this permit modification, sulfate from the facility's discharges via SD002, SD003, and SD012 reaches waters that are used for the production of wild rice. Pursuant to Minn. R. 7050.0224 Subpart 2, the available information at the time of this permit modification, and currently established permitting policies, the MPCA is including final effluent limitations for total sulfate based on a water quality standard of 10 mg/L total sulfate for these outfalls. The effluent limitations and associated reasonable potential calculations are detailed for each outfall in this section. The calculations are based on a zero-dilution factor, due to the fact that the receiving waters are above the currently supported water quality standard of 10 mg/L sulfate.

**Table** – Water Quality-Based Effluent Limitations Proposed for NPDES/SDS Permit No. MN0031879, Surface Discharge Station SD002: Weir Outfall

<b><i>Effluent Characteristic</i></b>	<b><i>Effluent Limitation</i></b>	<b><i>Basis</i></b>
<b>Ammonia, Unionized</b>	0.04 mg/L Calendar Month Average	Minn. R. 7050.0222 Subp. 5
<b>Oil and Grease</b>	0.5 mg/L Calendar Quarter Average; 5.0 mg/L Daily Maximum	Minn. R. 7050.0222 Subp. 5
<b>pH</b>	6.5 Standard Units (SU) Instantaneous Minimum; 8.5 SU Instantaneous Maximum	Minn. R. 7050.0222 Subp. 5, Minn. R. 7050.0224 Subp. 2
<b>Total Sulfate</b>	14 mg/L Calendar Month Average, 24 mg/L Daily Maximum	Minn. R. 7050.0224 Subp. 2, in combination with currently available information
<b>Turbidity</b>	25 Nephelometric Turbidity Units Calendar Month Average	Minn. R. 7050.0222 Subp. 5

Effluent limitations are included for the parameters listed in the table above based on reasonable potential analyses completed during previous permit actions. Reasonable potential analysis completed utilizing data collected for mercury and specific conductance indicated that effluent limitations were not necessary for those parameters, as detailed in the following table.

**Table – Reasonable Potential Calculations for SD002**

<b>PARAMETER</b>	<b>Hg (ng/l)</b>	<b>Sp. Conductance (µmhos/cm)</b>
<b>Maximum measured effluent value</b>	1.9	784
<b>Projected effluent quality (PEQ) @ n data points</b>	2.66 (18)	784 (38)
<b>Plant design flow (mgd)</b>	15.1	15.1
<b>Receiving water design flow (mgd)</b>	0	0
<b>Background concentration</b>	0	0
<b>Continuous standard (cs)</b>	6.9	700
<b>Maximum standard (ms)</b>	2400	
<b>Final acute value (FAV)</b>	4900	
<b>Mass Balance - cs</b>	6.9	700
<b>Mass Balance - ms</b>	2400	
<b>Coefficient Of Variation (CV)</b>	0.64	0.19
<b>Long Term Average: LTA cs</b>	5.31	924.78
<b>LTA ms</b>	732.48	
<b>Preliminary Effluent Limit (PEL): Daily Maximum</b>	17.4	1395
<b>Monthly Average</b>	10	1137
<b>Reasonable Potential PEQ&gt;PEL (Dmax/FAV)</b>	No	No

**Table – Water Quality-Based Effluent Limitations Proposed for NPDES/SDS Permit No. MN0031879,  
Surface Discharge Station SD003: Mesabi Chief Pit Dewatering**

<b>Effluent Characteristic</b>	<b>Effluent Limitation</b>	<b>Basis</b>
<b>Oil and Grease</b>	0.5 mg/L Calendar Quarter Average; 5.0 mg/L Daily Maximum	Minn. R. 7050.0222 Subp. 5
<b>pH</b>	6.5 Standard Units (SU) Instantaneous Minimum; 8.5 SU Instantaneous Maximum	Minn. R. 7050.0222 Subp. 5, Minn. R. 7050.0224 Subp. 2
<b>Total Sulfate</b>	14 mg/L Calendar Month Average, 24 mg/L Daily Maximum	Minn. R. 7050.0224 Subp. 2, in combination with currently available information

Effluent limitations are included for the parameters listed in the table above based on reasonable potential analyses completed during previous permit actions. Reasonable potential analysis completed utilizing data collected for mercury and specific conductance indicated that effluent limitations were not necessary for those parameters, as detailed in the following table.

Table – Reasonable Potential Calculations for SD003

<b>PARAMETER</b>	<b>Hg (ng/l)</b>	<b>Sp. Conductance (µmhos/cm)</b>
<b>Maximum measured effluent value</b>	5.2	702
<b>Projected effluent quality (PEQ) @ n data points</b>	7.28 (18)	702 (39)
<b>Plant design flow (mgd)</b>	5.85	5.85
<b>Receiving water design flow (mgd)</b>	0	0
<b>Background concentration</b>	0	0
<b>Continuous standard (cs)</b>	6.9	700
<b>Maximum standard (ms)</b>	2400	
<b>Final acute value (FAV)</b>	4900	
<b>Mass Balance - cs</b>	6.9	700
<b>Mass Balance - ms</b>	2400	
<b>Coefficient Of Variation (CV)</b>	0.62	0.15
<b>Long Term Average: LTA cs</b>	5.34	939.41
<b>LTA ms</b>	746.94	
<b>Preliminary Effluent Limit (PEL): Daily Maximum</b>	17.1	1309
<b>Monthly Average</b>	10	1109
<b>Reasonable Potential PEQ&gt;PEL (Dmax/FAV)</b>	No	No

Table – Water Quality-Based Effluent Limitations Proposed for NPDES/SDS Permit No. MN0031879, Surface Discharge Station SD012: Perry Pit Dewatering

<b>Effluent Characteristic</b>	<b>Effluent Limitation</b>	<b>Basis</b>
<b>Total Sulfate</b>	14 mg/L Calendar Month Average, 24 mg/L Daily Maximum	Minn. R. 7050.0224 Subp. 2, in combination with currently available information

With the exception of bicarbonate alkalinity, reasonable potential analyses completed during a permit modification in 2010 were used to determine the need for water quality-based effluent limitations due to the fact that the data are still representative of Perry Pit effluent quality. Effluent limitations are included for total sulfate based on those reasonable potential calculations.

As described in the previous permit, reasonable potential for bicarbonate alkalinity was recalculated following representative monitoring by the permittee. Based on the new information collected, an effluent limitation for bicarbonates is not warranted in this permit reissuance, as indicated in the table below.

Table – Reasonable Potential Calculations for SD012

PARAMETER	Hardness (mg/L)	TDS (mg/L)	Bicarb (meq/L)	Sp. Cond. (µmhos/cm)	Hg (ng/L)	Sulfate (mg/l)
Maximum measured effluent value	256	345	3.86	702	1.7	23.4
Projected effluent quality (PEQ) @ n data points	780 (3)	1035 (3)	5.404 (14)	842.4 (38)	4.42 (4)	60.84 (4)
Plant design flow (mgd)	4.32	4.32	4.32	4.32	4.32	4.32
Receiving water design flow (mgd)	0	0	0	0	0	0
Background concentration	0	0	0	0	0	0
Continuous standard (cs)	500	700	5	1000	6.9	10
Maximum standard (ms)					2400	-
Final acute value (FAV)					4900	-
Mass Balance - cs	500	700	5	1000	6.9	10
Mass Balance - ms					2400	-
Coefficient Of Variation (CV)	0.6	0.6	0.45	0.6	0.6	0.6
Long Term Average: LTA cs	390	546	4.15	780	5.4	7.8
LTA ms					771	-
Preliminary Effluent Limit (PEL): Daily Maximum	1215	1701	10.21	2430	17	24
Monthly Average	701	982	6.57	1403	10	14
Reasonable Potential PEQ>PEL (Dmax/FAV)	No	No	No	No	No	Yes

## Additional Requirements

### Compliance Schedule

The permit reissuance includes a schedule for attaining compliance with the final effluent limitations for total sulfate. The schedule requires attainment of compliance as soon as possible, and in no case later than August 17, 2019. The term of the compliance schedule is based on the time required for completion of evaluations by the permittee, as well as time for implementation of any final plans for attaining compliance, including time for obtaining various regulatory approvals. The compliance schedule has been developed in accordance with the requirements of 40 CFR 122.47.

## Nondegradation and Anti-Backsliding

### Anti-Backsliding

The effluent limitations contained in this permit modification are not less stringent than the effluent limitations in the existing permit, in accordance with the antibacksliding requirements found in 40 CFR 122.44(l) and Minn. R. 7053.0275.

### Nondegradation

In accordance with MPCA rules regarding nondegradation for all waters, the design flow of the facility as of January 1, 1988, and associated mass loading are the baseline design flow and mass loading. This baseline flow and mass loading are used to determine whether nondegradation review is required for any change in the discharge. Additional volume and pollutant loading associated with the discharge of Perry Pit dewatering effluent was reviewed in accordance with Minn. R. 7050.0185 as part of a permit modification completed on June 17, 2010, including consideration of the quantity and quality of the proposed discharge and the potential for violating water quality standards in the receiving water.

The permittee has not proposed expansion of any permitted discharges above the volumes and mass loadings authorized under previous permit actions.