MINNESOTA DEPARTMENT OF NATURAL RESOURCES

Draft Water Appropriation Permit

Permit Number
2016-1367

Project Name:
Poly Met Mining, Inc.

County:
St. Louis

Watershed:
St. Louis River

Resource:
Groundwater;
Dug Pit/Holding Pond;
Surface Water

Purpose of Permit:
Mine Processing (excludes sand/gravel)

Draft Authorized Action:
No actions are authorized in this document. No appropriation or use of water is authorized in this public comment draft, which has been prepared for the purposes of public review and input only. This document identifies proposed conditions that may apply to Poly Met Mining, Inc.'s application for a permit to withdraw up to 1200 million gallons of water per year for mine processing (excludes sand/gravel).

Appropriation amounts shall be in accordance with maximum rates and total volumes specifically detailed in Attachment A of this Permit. The volumes and rates detailed in Attachment A shall not be exceeded.

Exact points of taking and number of installations will be variable over time. Prior to pumping Permittee shall notify DNR of exact location and number of installations. Maximum authorized pumping rate shall not be exceeded by the addition of installations.

Discharge locations shall be in accordance with those noted in Attachment B.

Permittee:
POLY MET MINING, INC.
CONTACT: KEARNEY, CHRISTIE, (218) 471-2163
6500 CO RD 666
PO BOX 475
HOYT LAKES, MN 55750
(218) 471-2150

Authorized Agent:
N/A

To Appropriate From:
Groundwater: Category 1 Stockpile Groundwater Containment System construction: by means of a portable pump at a rate not to exceed 275 gpm
Point(s) of Taking
UTM zone 15N, 576213m east, 5274261m north
SWSW of Section 3, T59N, R13W

Groundwater: Category 1 Stockpile Groundwater Containment System operation: by means of a stationary pump at a rate not to exceed 14400 gpm

PUBLIC COMMENT DRAFT

Point(s) of Taking
UTM zone 15N, 576232m east, 5274265m north
SWSW of Section 3, T59N, R13W

Groundwater: Category 1 Waste Rock Stockpile foundation construction: by means of a portable pump at a rate not to exceed 3375 gpm
Point(s) of Taking
UTM zone 15N, 576188m east, 5274258m north
SWSW of Section 3, T59N, R13W

Groundwater: Category 2/3 Waste Rock Stockpile foundation, sumps and overflow ponds construction: by means of a portable pump at a rate not to exceed 1525 gpm
Point(s) of Taking
UTM zone 15N, 579110m east, 5274152m north
SWSW of Section 1, T59N, R13W

Dug Pit/Holding Pond: Category 2/3 Waste Rock Stockpile lined mine water drainage: by means of a portable pump at a rate not to exceed 430 gpm
Point(s) of Taking
UTM zone 15N, 579110m east, 5274153m north
SWSW of Section 1, T59N, R13W

Groundwater: Category 2/3 Waste Rock Stockpile underdrain operation: by means of a stationary pump at a rate not to exceed 50 gpm
Point(s) of Taking
UTM zone 15N, 579110m east, 5274153m north
SWSW of Section 1, T59N, R13W

Groundwater: Category 4 Waste Rock Stockpile foundation, sumps and overflow ponds construction: by means of a portable pump at a rate not to exceed 850 gpm
Point(s) of Taking
UTM zone 15N, 577323m east, 5274311m north
SESE of Section 3, T59N, R13W

Dug Pit/Holding Pond: Category 4 Waste Rock Stockpile lined mine water drainage: by means of a portable pump at a rate not to exceed 130 gpm
Point(s) of Taking
UTM zone 15N, 577321m east, 5274314m north
SESE of Section 3, T59N, R13W

Groundwater: Category 4 Waste Rock Stockpile underdrain operation: by means of a stationary pump at a rate not to exceed 25 gpm
Point(s) of Taking
UTM zone 15N, 577323m east, 5274311m north
SESE of Section 3, T59N, R13W

Groundwater: Construction of new buildings: by means of a portable pump at a rate not to exceed 50 gpm
Point(s) of Taking
UTM zone 15N, 577540m east, 5273462m north
SWNW of Section 11, T59N, R13W

Dug Pit/Holding Pond: lined EQ Basin and Construction Mine Water Basin: by means of a stationary pump at a rate not to exceed 75 gpm
Point(s) of Taking
UTM zone 15N, 577525m east, 5273266m north
NWSW of Section 11, T59N, R13W

Dug Pit/Holding Pond: haul roads, OSLA, RTH: by means of a portable pump at a rate not to exceed 470

PUBLIC COMMENT DRAFT

gpm
Point(s) of Taking
UTM zone 15N, 577019m east, 5273133m north
NWSE of Section 10, T59N, R13W

Groundwater: Minewater pond construction: by means of a portable pump at a rate not to exceed 200 gpm
Point(s) of Taking
UTM zone 15N, 577017m east, 5273148m north
NWSE of Section 10, T59N, R13W

Groundwater: Miscellaneous construction dewatering: by means of a portable pump at a rate not to exceed 100 gpm
Point(s) of Taking
UTM zone 15N, 577349m east, 5273307m north
SENE of Section 10, T59N, R13W

Groundwater: Ore Surge Pile foundation, sumps, and overflow construction ponds: by means of a portable pump at a rate not to exceed 200 gpm
Point(s) of Taking
UTM zone 15N, 577828m east, 5273646m north
SWNW of Section 11, T59N, R13W

Dug Pit/Holding Pond: Ore Surge Pile liner mine water drainage: by means of a stationary pump at a rate not to exceed 80 gpm
Point(s) of Taking
UTM zone 15N, 577826m east, 5273646m north
SWNW of Section 11, T59N, R13W

Groundwater: Ore Surge Pile underdrain operation: by means of a stationary pump at a rate not to exceed 25 gpm
Point(s) of Taking
UTM zone 15N, 577828m east, 5273646m north
SWNW of Section 11, T59N, R13W

Surface Water: Stormwater pond construction: by means of a portable pump at a rate not to exceed 750 gpm
Point(s) of Taking
UTM zone 15N, 576853m east, 5273032m north
NWSE of Section 10, T59N, R13W

Authorized Issuer: Title: Issued Date: Effective Date: Expiration Date:

PUBLIC COMMENT DRAFT

PROPOSED CONDITIONS:

LIMITATIONS: (a) Any violation of the terms and provisions of this permit and any appropriation of the waters of the state in excess of that authorized hereon shall constitute a violation of Minnesota Statutes, Chapter 103G. (b) This permit shall not be construed as establishing any priority of appropriation of waters of the state. (c) This permit is permissive only. No liability shall be imposed upon or incurred by the State of Minnesota or any of its employees, on account of the granting hereof or on account of any damage to any person or property resulting from any act or omission of the Permittee relating to any matter hereunder. This permit shall not be construed as estopping or limiting any legal claims or right of action of any person other than the state against the Permittee, for any damage or injury resulting from any such act or omission, or as estopping or limiting any legal claim or right of action of the state against the Permittee, for violation of or failure to comply with the provisions of the permit or applicable provisions of law. (d) In all cases where the doing by the Permittee of anything authorized by this permit shall involve the taking, using, or damaging of any property, rights or interests of any other person or persons, or of any publicly owned lands or improvements thereon or interests therein, the Permittee, before proceeding therewith, shall obtain the written consent of all persons, agencies, or authorities concerned, and shall acquire all property, rights, and interests necessary therefore. (e) This permit shall not release the Permittee from any other permit requirements or liability or obligation imposed by Minnesota Statutes, Federal Law, or local ordinances relating thereto and shall remain in force subject to all conditions and limitations now or hereafter imposed by law. (f) Unless explicitly specified, this permit does not authorize any alterations of the beds or banks of any public (protected) waters or wetlands. A separate permit must be obtained from the Department of Natural Resources prior to any such alteration.

WATER USE REPORTING: (a) FLOW METER The Permittee shall equip each installation for appropriating or using water with a flow meter, unless another method of measuring the quantity of water appropriated to within ten (10) percent of actual amount withdrawn is approved by the Department. (b) REPORTS Monthly records of the amount of water appropriated or used shall be recorded for each installation. Such readings and the total amount of water appropriated or used shall be reported annually to the Director of DNR Ecological and Water Resources, on or before February 15 of the following year, via the MNDNR Permitting and Reporting System (MPARS) at www.mndnr.gov/mpars/signin. Any processing fee required by law or rule shall be submitted with the records whether or not any water was appropriated during the year. Failure to report shall be sufficient cause for terminating the permit 30 days following written notice. (c) TRANSFER OR ASSIGNMENT Any transfer or assignment of rights, or sale of property involved hereunder shall be reported within 90 days thereafter to the Director of DNR Ecological and Water Resources. Such notice shall be made by the transferee (i.e., new owner) and shall state the intention to continue the appropriation as stated in the permit. This permit shall not be transferred or assigned except with the written consent of the Commissioner. (d) MODIFICATION The Permittee must notify the Commissioner in writing of any proposed changes to the existing permit. This permit shall not be modified without first obtaining the written permission from the Commissioner.

COMMISSIONER'S AUTHORITY: (a) The Commissioner may inspect any installation utilized for the appropriation or use of water. The Permittee shall grant access to the site at all reasonable times and shall supply such information concerning such installation as the Commissioner may require. (b) The Commissioner may, as he/she deems necessary, require the Permittee to install gages and/or observation wells to monitor the impact of the Permittee's appropriation on the water resource and require the Permittee to pay necessary costs of installation and maintenance. (c) The Commissioner may restrict, suspend, amend, or cancel this permit in accordance with applicable laws and rules for any cause for the protection of public interests, or for violation of the provisions of this permit.

PUBLIC RECORD: All data, facts, plans, maps, applications, annual water use reports, and any additional information submitted as part of this permit, and this permit itself are part of the public record and are available for public inspection at the offices of DNR Ecological and Water Resources. The information contained therein may be used by the Division as it deems necessary. The submission of false data, statements, reports, or any such additional information, at any time shall be deemed as just grounds for revocation of this permit.

MONITORING REQUIREMENTS: Minnesota Statutes 103G.282 authorizes the Department of Natural Resources to require permittees to install and maintain monitoring equipment to evaluate water resource impacts from permitted appropriations. You may be required to modify or install automated measuring devices and keep records for each installation. The frequency of measurements and other requirements will be based on quantity of water appropriated, source of water, potential connections to other water resources, nature of concern, and other relevant factors.

DROUGHT PLANNING: In accordance with M.S. 103G.293, all permits must be consistent with the drought response plan detailed in the Statewide Drought Plan at http://files.dnr.state.mn.us/natural_resources/climate/drought/drought_plan_matrix.pdf.

PUBLIC COMMENT DRAFT

WATER USE CONFLICT: If notified by the DNR that a water use conflict is suspected and probable from your appropriation, based on confirmation of a formal well interference complaint or a preliminary hydrologic assessment, all appropriation authorized by this permit must cease immediately until the interference is resolved. The permittee may be required to obtain additional data to support the technical analysis, such as domestic well information within a radius of one and one-half miles of the production well. The permittee and impacted party may engage in a negotiated settlement process and there may be modifications made to this permit in support of conflict resolution.

SUSPENSION: The Department may require the suspension of appropriation during periods of low water in order to maintain minimum water levels within the basin/watercourse/watershed.

CONTINGENCY: If directed by DNR Ecological and Water Resources to cease pumping, the permittee agrees to withstand the results of no appropriation as stated in the contingency statement submitted with the application.

INTAKE: All pump intakes must be screened to prevent fish from being drawn into the system.

INVASIVE SPECIES - EQUIPMENT DECONTAMINATION: All equipment intended for use at a project site must be free of prohibited invasive species and aquatic plants prior to being transported into or within the state and placed into state waters. All equipment used in designated infested waters, shall be inspected by the Permittee or their authorized agent and adequately decontaminated prior to being transported from the worksite. The DNR is available to train inspectors and/or assist in these inspections. For more information refer to the "Best Practices for Preventing the Spread of Aquatic Invasive Species" at http://files.dnr.state.mn.us/publications/ewr/invasives/ais/best_practices_for_prevention_ais.pdf. Contact your regional Invasive Species Specialist for assistance at www.mndnr.gov/invasives/contacts.html. A list of designated infested waters is available at www.mndnr.gov/invasives/ais/infested.html. A list of prohibited invasive species is available at www.mndnr.gov/eco/invasives/laws.html#prohibited.

INFESTED WATERS - WATER TREATMENT REQUIREMENTS: Surface water appropriation from waters listed as containing invasive species (see www.mndnr.gov/invasives/ais/infested.html) are required to contact 651-259-5100 or 1-888-MINN-DNR to obtain information from the DNR Division of Ecological and Water Resources on specific invasive species water treatment requirements.

WATER CONSERVATION: All practical and feasible water conservation methods and practices must be employed to promote sound water management and use the least amount of water necessary, such as reuse and recycling water, water-saving devices, and water storage.

DISCHARGE AUTHORIZATION: This permit is valid only in conjunction with all required discharge authorizations from local, state, or federal government units.

MONITORING PLAN: Monitoring shall be done in accordance with the attached Monitoring Plan dated [date]. All data shall be reviewed annually in cooperation with the DNR and adjustments made to the monitoring requirements as appropriate. Changes to the Monitoring Plan shall be made through an amendment to this permit.

QUALITY ASSURANCE PROJECT PLAN: Monitoring procedures and reporting requirements shall be conducted in accordance with the attached Quality Assurance Project Plan (QAPP) dated [date].

WATER MOVEMENT REPORTING: Flow rates and total monthly volumes shall be reported for all water movement on-site or discharged off-site as listed in the attached Monitoring Plan. Instantaneous rates, when relevant, shall be recorded when the total monthly volumes (totalizer readings) are collected. This information will allow for the development of a comprehensive water balance, provide further data about past and current water uses and inform future water management decisions.

PROCESS FLOW DIAGRAM - TEMPORARY IDLE: Prior to initiation of a temporary idle that may last longer than six (6) months, Permittee shall submit an updated process flow diagram showing water movement on-site and off-site during the temporary idle. Permittee shall work with the DNR to evaluate the process flow diagram and determine additional data needs. Additional data collected shall be reported to the DNR. This Condition applies once a temporary idle lasts six months even if a shorter time frame was originally anticipated. All Conditions of this permit apply in the event of a temporary idle.

PUBLIC COMMENT DRAFT

WATER BALANCE MODEL - PLANNED COMPLETION OF MINING: Two (2) years prior to planned completion of mining, Permittee shall update existing or, with DNR approval, develop new Mine Site and Plant Site water balance models to predict hydrologic equilibrium conditions after closure for submittal to the DNR. Permittee shall work with the DNR to evaluate the water balance models and determine if additional data is needed. If after this evaluation the DNR identifies additional data needs related to water balance modeling, Permittee must provide the additional data prior to closure.

REQUIRED REPORTING: The monitoring and reporting required by conditions of this permit are necessary to protect public health, safety and welfare pursuant to Minnesota Statutes 103G.297 and shall continue during periods of temporary idle, shutdown and/or bankruptcy unless otherwise specified by the DNR

WELL SEALING: The permittee shall notify the Minnesota Department of Health prior to sealing, removing, covering, plugging or filling the well(s). The well(s) must be sealed by a licensed well driller and in accordance with the procedures required under Minnesota Statutes 103I and Minnesota Rules 4725 as administered by the Minnesota Department of Health. Prior to sealing any wells used solely for NPDES/SDS monitoring, Permittee and DNR shall determine if any of the wells shall be left unsealed and used for groundwater level monitoring.

NEW WELL INSTALLATION: Permittee shall provide the MN Unique Well Numbers, well logs, and any additional data collected during the installation process, for each new well that is installed for monitoring required by this permit.

ADAPTIVE MANAGEMENT: Should monitoring data and/or modeling results show unacceptable impacts to public health, to public safety, or to the public interests in lands and waters are being, or could potentially be, caused by the appropriation or use of water authorized under this permit, Permittee shall work with the DNR to develop and implement appropriate adaptive management or mitigation strategies. If the DNR concludes that adaptive management or other mitigation strategies are insufficient to remedy the unacceptable impacts, the DNR may cancel or suspend the permit in accordance with Minnesota Statutes 103G.297.

MODEL UPDATES AND ASSESSMENT: Permittee shall conduct ongoing modeling in accordance with the modeling work plan to be approved by the DNR. Permittee shall submit its model reports according to the schedules established in said work plan. This modeling will incorporate ongoing surface water and groundwater monitoring results obtained under this permit.

RIGHT TO APPROPRIATE: This permit is valid only as long as the Permittee has ownership, control of, or a license to use the land overlying the groundwater source or abutting the surface water source from which the water will be appropriated.

TERM OF PERMIT: The term of this permit shall end in the event that the Permittee fails to appropriate and use water under this permit for a continuous period of ten (10) years. In such event, the Permittee shall be deemed to have abandoned any right to use and appropriate water under this permit and the permit shall be terminated, unless the DNR extends the term of the permit in writing upon good cause shown by the Permittee.

PUBLIC COMMENT DRAFT

Attachment A
Maximum Rates and Volumes by Individual Installation
DNR Water Appropriation Permit 2016-1367

Installation	Maximum Daily Rate (gpm)	Total Volume (MG)
Ore Surge Pile foundation, sumps, and overflow construction ponds	200	30
Construction of new buildings	50	5
Mine water pond construction	200	40
Stormwater pond construction	750	35
Category 4 Waste Rock Stockpile foundation, sumps and overflow ponds construction	850	50
Category 2/3 Waste Rock Stockpile foundation, sumps and overflow ponds construction	1,525	135
Category 1 Waste Rock stockpile foundation construction	3,375	45
Category 1 Stockpile Groundwater Containment System construction	275	80
Category 1 Stockpile Groundwater Containment System operation	14,400	3,115
Category 2/3 Waste Rock Stockpile lined mine water drainage	430	1,115
Category 2/3 Waste Rock Stockpile underdrain operation, if needed	50	185
Category 4 Waste Rock Stockpile lined mine water drainage	130	230
Category 4 Waste Rock Stockpile underdrain operation, if needed	25	40
Ore Surge Pile liner mine water drainage	80	255
Ore Surge Pile underdrain operation, if needed	25	85
Haul Roads, OSLA and RTH mine water runoff	470	795
Lined ponds, collected precipitation, (EQ Basins and Construction Mine Water Basin)	75	280
Miscellaneous construction dewatering	100	20
Maximum Total Volume (MG)*		6,550

*Maximum Total Volume is Total Volume rounded up to nearest 25 MG. This is not an annual volume but a total maximum volume for the life of the project.

PUBLIC COMMENT DRAFT

Attachment B
Initial Discharge Location for Individual Installations
DNR Water Appropriation Permit 2016-1367

Installation	Initial Discharge Location
Ore Surge Pile foundation, sumps, and overflow construction ponds	Construction Mine Water Basin or similar temporary basin at the Mine Site, or, if construction stormwater, off-site through the stormwater system (Partridge River Tributaries)
Construction of new buildings	FTB or, if construction stormwater, off-site through the stormwater system (Partridge River Tributaries)
Mine water pond construction	FTB or, if construction stormwater, off-site through the stormwater system (Partridge River Tributaries)
Stormwater pond construction	Construction Mine Water Basin or similar temporary basin at the Mine Site, or, if construction stormwater, off-site through the stormwater system (Partridge River Tributaries))
Category 4 Waste Rock Stockpile foundation, sumps and overflow ponds construction	Construction Mine Water Basin or similar temporary basin at the Mine Site, or, if construction stormwater, off-site through the stormwater system (Partridge River Tributaries)
Category 2/3 Waste Rock Stockpile foundation, sumps and overflow ponds construction	Construction Mine Water Basin or, if construction stormwater, off-site through the stormwater system (Partridge River Tributaries)
Category 1 Waste Rock stockpile foundation construction	Construction Mine Water Basin or similar temporary basin at the Mine Site, or, if construction stormwater, off-site through the stormwater system (Partridge River Tributaries)
Category 1 Stockpile Groundwater Containment System construction	Construction Mine Water Basin or similar temporary basin at the Mine Site, or, if construction stormwater, off-site through the stormwater system (Partridge River Tributaries)
Category 1 Stockpile Groundwater Containment System operation	Equalization Basin
Category 2/3 Waste Rock Stockpile lined mine water drainage	Equalization Basin
Category 2/3 Waste Rock Stockpile underdrain operation, if needed	Equalization Basin
Category 4 Waste Rock Stockpile lined mine water drainage	Equalization Basin
Category 4 Waste Rock Stockpile underdrain operation, if needed	Equalization Basin
Ore Surge Pile liner mine water drainage	Equalization Basin
Ore Surge Pile underdrain operation, if needed	Equalization Basin

PUBLIC COMMENT DRAFT

Attachment B
Initial Discharge Location for Individual Installations
DNR Water Appropriation Permit 2016-1367

Installation	Initial Discharge Location
Haul Roads, OSLA and RTH mine water runoff	Equalization Basins, Construction Mine Water Basin, or the East Pit during pit filling
Lined ponds, collected precipitation, (EQ Basins and Construction Mine Water Basin)	FTB or WWTS
Miscellaneous construction dewatering	FTB or if construction stormwater, off-site through the stormwater system (Partridge River Tributaries)
Treated water may be discharged off-site to the following sites for augmentation:	◦Second Creek UTMs X=565896 Y=5271955 ◦Trimble Creek #1 UTMs X=563983 Y=5275733 ◦Trimble Creek #2 UTMs X=564471 Y=5275791 ◦Trimble Creek #3 UTMs X=564857 Y=5276079 ◦Trimble Creek #4 UTMs X=565381 Y=5276076 ◦Trimble Creek #5 UTMs X=565918 Y=5276075 ◦Trimble Creek #6 UTMs X=566331 Y=5276044 ◦Trimble Creek #7 UTMs X=566818 Y=5276024 ◦Unnamed Creek #1 UTMs X=563404 Y=5274175 ◦Unnamed Creek #2 UTMs X=563388 Y=5275138

PUBLIC COMMENT DRAFT

Poly Met Mining, Inc.
Monitoring Plan for Compliance with DNR Water Appropriation Permit 2016-1367
[Date]

Appropriations under Water Appropriation Permit 2016-1367 are conditioned upon Poly Met Mining, Inc. (PolyMet) fulfilling the following monitoring requirements in accordance with this Monitoring Plan.

Changes to the Monitoring Plan shall be made through an amendment to Water Appropriation Permit 2016-1367.

All monitoring requirements under this Monitoring Plan go into effect following issuance of Water Appropriation Permit 2016-1367, or as otherwise specified below.

Monitoring locations are shown in Figure 1 and process flow shown in Figure 3.

Mine Site Weather Station – PolyMet shall begin/continue recording hourly, on-site precipitation and air temperature, at a location approved by the DNR.

Rates and Monthly Water Volumes – PolyMet shall equip the following locations with flow meters and totalizers to accurately record instantaneous rates and total monthly volumes, within 10% of actual. Rates and monthly volumes shall be reported after dewatering is initiated, according to the following schedule:

- WS411, Category 1 Stockpile Groundwater Containment System (continuous, year-round)
- WS412, Category 1 Stockpile Groundwater Containment System (continuous, year-round)
- WS413, Overburden Laydown and Storage Area (OLSA) Pond (continuous, year-round)
- WS414, Construction Mine Water (continuous, year-round)
- WS415, Low Concentration Mine Water (continuous, year-round)
- WS416, High Concentration Mine Water (continuous, year-round)
- WS421, Category 2/3 Waste Rock Stockpile Mine Water Drainage (continuous, year-round)
- WS422, Category 2/3 Waste Rock Stockpile Mine Water Drainage (continuous, year-round)
- WS423, Category 2/3 Waste Rock Stockpile Mine Water Drainage (continuous, year-round)
- WS424, Category 4 Waste Rock Stockpile Mine Water Drainage (continuous, year-round)
- WS425, Ore Surge Pile Mine Water Drainage (continuous, year-round)
- WS441, Construction Mine Water and OLSA Runoff (continuous, year-round)
- WS442, Low Concentration Mine Water (continuous, year-round)
- WS443, Low Concentration Mine Water (continuous, year-round)
- WS444, High Concentration Mine Water (continuous, year-round)
- GW491, Category 2/3 Waste Rock Stockpile Underdrain (continuous, year-round)
- GW492, Category 2/3 Waste Rock Stockpile Underdrain (continuous, year-round)
- GW493, Category 2/3 Waste Rock Stockpile Underdrain (continuous, year-round)
- GW494, Category 4 Waste Rock Stockpile Underdrain (continuous, year-round)
- GW495, Ore Surge Pile Underdrain (continuous, year-round)

Alternative methods may be used to record instantaneous rates and total monthly volumes. The alternative method must be approved by the DNR prior to commencement of monitoring. Monitoring shall commence after water movement is initiated at the following locations:

- Truck fill stations (continuous, year-round)

Temporary construction dewatering shall be discussed with the DNR prior to the commencement of construction. Monitoring shall commence after dewatering is initiated. A description of temporary dewatering methods and locations shall be included in the Annual Report with instantaneous rates and total monthly volumes.

Lake Water Levels – Should nearby groundwater and surface water levels show impacts from PolyMet's mining operation, PolyMet shall commence water level monitoring at the following location. The monitoring schedule shall be approved by the DNR prior to commencement of monitoring.

PUBLIC COMMENT DRAFT

- Mud Lake (DNR Lake ID# 69-0148)

Installation of a continuous recording data logger is recommended.

Groundwater Well Monitoring – PolyMet shall monitor groundwater levels at the following locations according to the schedule below. These wells shall be installed as soon as reasonably practicable after PolyMet obtains all necessary rights to access the land at the Mine Site. Well installation must be completed no later than six months from the date PolyMet obtains all necessary approvals for site access and well installation.

- GW412, MDH Unique Well No. 786732 (monthly, year-round)
- GW414, MDH Unique Well No. 786730 (monthly, year-round)
- GW415, MDH Unique Well No. 786731 (monthly, year-round)
- GW468 (monthly, year-round)
- GW508 (monthly, year-round)
- GW512 (monthly, year-round)
- GW514 (monthly, year-round)
- GW515 (monthly, year-round)

Installation of a continuous recording data logger is recommended.

Streamflow Monitoring – PolyMet shall validate stage-discharge relationships with a manual discharge and stage measurement every 4 to 6 weeks year-round. In addition, streamflow monitoring shall occur during season(s) of interest or as needed during high and low flows. Stage measurements shall be recorded at 15 minute intervals. PolyMet shall measure streamflows at the following locations:

- Partridge River (H03155002)
- SW430, Partridge River near Babbitt, 0.5mi DS PM Pit Rd (H03155005)
- SW431, Partridge River
- SW432, South Branch of Partridge River near Skibo, 1.4mi US of FR113 (H03145003)
- SW433, Unnamed Creek (West Pit Outfall) – 2 years of monitoring required with location to be determined with DNR. Based upon the monitoring results the DNR will determine if monitoring may cease or whether monitoring needs to be continued.

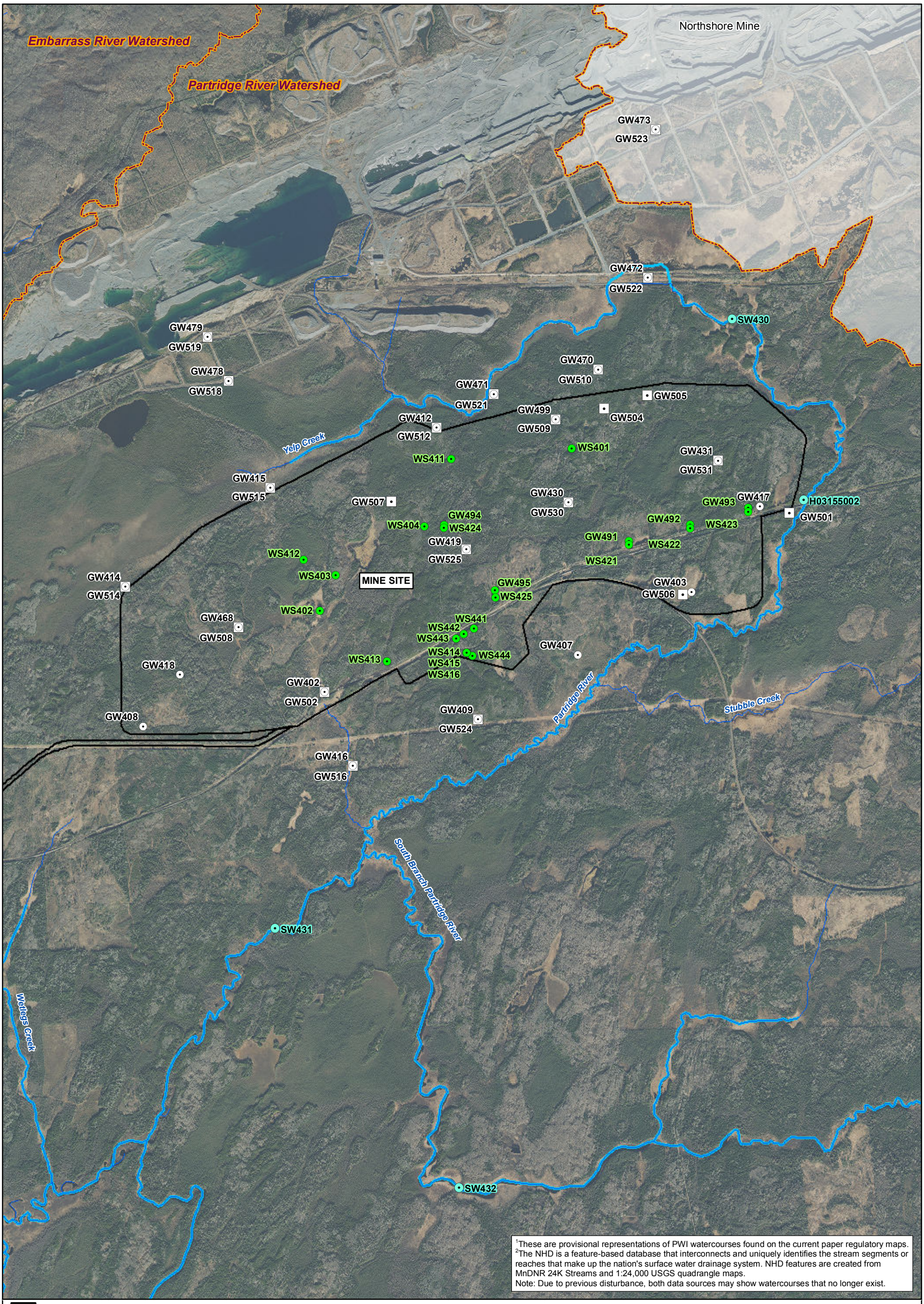
Stream Blockage Monitoring – PolyMet shall monitor for stream channel blockages due to beaver dams and debris at all streamflow monitoring locations required under this Monitoring Plan. PolyMet shall notify the DNR if a blockage is observed to be impacting the streamflow monitoring locations prior to removal. If a blockage occurs, PolyMet shall be prepared to remove the blockage in a timely manner, assuming it is within the public right-of-way or on property PolyMet controls.

Annual Report, Re-evaluation of Monitoring Plan, Closure and Temporary Idle

- Data shall be collected and reported in accordance with requirements outlined in the Quality Assurance Project Plan (QAPP) dated [date].
- If the DNR determines that monitoring data and/or modeling results show unacceptable impacts to public health, to public safety, or to the public interests in land and waters that could potentially be caused by the appropriation or use of water authorized under Water Appropriation Permit 2016-1367, then the DNR may revise the requirements of this Monitoring Plan.
- PolyMet shall discuss with the DNR plans for temporary idle beyond six (6) months or cessation of pumping. This Monitoring Plan shall remain in effect during a temporary idle or after cessation of pumping unless otherwise approved by the DNR.

_____	_____
[DNR Representative]	**[Company Representative]**
[Title]	**[Title]**
Minnesota Department of Natural Resources	**Poly Met Mining, Inc.**

PUBLIC COMMENT DRAFT



[1]These are provisional representations of PWI watercourses found on the current paper regulatory maps.
[2]The NHD is a feature-based database that interconnects and uniquely identifies the stream segments or reaches that make up the nation's surface water drainage system. NHD features are created from MnDNR 24K Streams and 1:24,000 USGS quadrangle maps.
Note: Due to previous disturbance, both data sources may show watercourses that no longer exist.

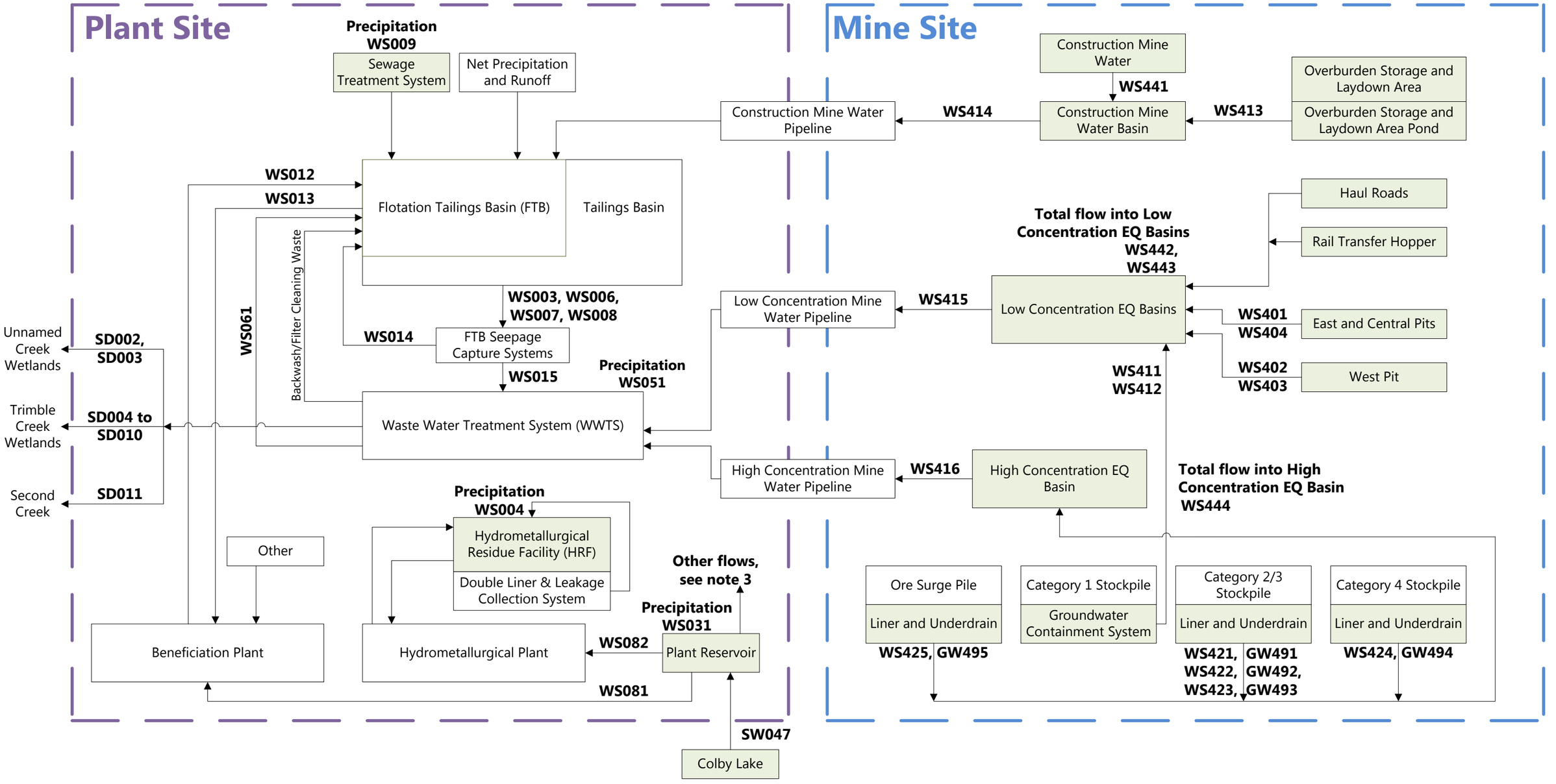
- EIS Project Areas
- Watershed Divide
- Public Waters Inventory (PWI) Watercourses[1]
- National Hydrography Dataset (NHD) Rivers & Streams[2]
- Rates and Monthly Water Volumes Monitoring
- Streamflow Monitoring
- Surficial Aquifer Groundwater Well Monitoring
- Bedrock Aquifer Groundwater Well Monitoring

Note: Water appropriation monitoring stations not shown on this figure include the following:
- WS900, East Pit outfall
- SD401, West Pit outfall
- SW433, Unnamed (West Pit Outfall) Creek stream monitoring

N

0 0.25 0.5
Miles

Figure 1. Mine Site Monitoring Locations



Legend	
	= Water Appropriation Source
WSXXX **GWXXX** **SDXXX**	= Monitoring station in water appropriation permits monitoring plan

Notes:

1. This figure only includes water appropriation monitoring stations associated with developing a water balance during operations.
2. Water appropriation monitoring stations associated with the water balance, but not shown on this figure, include the following:
   - GW496, the HRF wick drain
   - WS062, from WWTS to East Pit during East Pit flushing
   - WS063, from WWTS to West Pit during West Pit flooding
   - WS010, water level in FTB Cell 1E
   - WS011, water level in FTB Cell 2E
   - WS016, water level in HRF
   - SD401, discharge to Unnamed (West Pit Overflow) Creek during closure
3. Other flows from the Plant Reservoir:
   - WS083, to FTB
   - WS084, to Potable Water Treatment Plant
   - WS085, to Fire Water System
   - WS086, to air emission scrubber system
   - WS087, to miscellaneous water needs
   - WS088, to truck fill stations

Figure 3. Process Flow

Poly Met Mining, Inc.
Quality Assurance Project Plan (QAPP) for Water Appropriation Permit Monitoring Procedures
2016-1963, 2016-1964, 2016-1965, 2016-1967, 2016-1969, 2017-0260
[Date]

Background

This QAPP applies to the monitoring and reporting requirements imposed under Water Appropriation Permits 2016-1963, 2016-1964, 2016-1965, 2016-1967, 2016-1969, and 2017-0260 issued to Poly Met Mining, Inc. (PolyMet) and details the methods for data collection. The permits require data collection and reporting under the Department of Natural Resources (DNR) approved Monitoring Plans in order to monitor for potential impacts from water appropriations under these permits. Any changes to the Monitoring Plan(s) shall occur through an amendment to the Water Appropriation Permit(s).

Reporting Requirements

An annual report displaying and analyzing all monitoring data shall be prepared by PolyMet and submitted electronically (and in hard copy, if requested), along with associated data in a Microsoft Excel compatible format, no later than February 15th of the following year to [email]. Data shall be submitted in template(s), should they be provided by the DNR. The annual report shall include a narrative analyzing monitoring data for short-term and long-term trends, comparison of data trends to short-term and long-term predictions, effects of dewatering or pumping activities, effectiveness of the Monitoring Plan, and provide recommendations for any monitoring changes. The DNR shall provide guidance on development of this report and submittal of data as needed.

PolyMet shall also provide with the annual report: 1) an updated process flow diagram depicting all water movement on-site and off-site and 2) documentation showing the current configuration of all points of taking, points of discharge, pipe alignments, truck-fill stations, flow meters, and monitoring locations. Locational data shall be reported as points, lines, or polygon features in an ArcGIS compatible file or as otherwise approved by the DNR.

Data may be requested at any time by the DNR between reporting periods.

Survey Requirements

The survey method used to collect elevation data for Monitoring Plan(s) shall be capable of reporting elevations within 0.05 foot accuracy and calibrated to an approved Minnesota Department of Transportation (MnDOT) GSID benchmark (NGVD 1929) or a temporary benchmark approved by the DNR. If an approved temporary benchmark is used, PolyMet shall provide information on the MnDOT GSID benchmark used to establish that temporary benchmark. PolyMet is responsible for choosing the appropriate survey methodology based on the monitoring requirements and DNR recommendations. However, any method that is chosen must meet the 0.05 foot accuracy requirement. Survey grade GPS should be considered when choosing an appropriate survey method because of its ability to meet the 0.05 foot accuracy requirement.

All survey data shall be reported with the date and time of survey, surveyed elevation (NGVD 1929), site name and number of the MnDOT GSID benchmark or temporary benchmark, survey method used, and survey accuracy.

Monitoring Data Collection

Data shall be presented in the annual report and submitted in electronic format according to the Reporting Requirements. All surveyed water level elevations shall be reported according to the Survey Requirements for survey method and survey accuracy. Should PolyMet be unable to collect scheduled data in accordance with the Monitoring Plan(s), PolyMet shall notify the DNR of the issue and develop a plan to correct the issue.

PUBLIC COMMENT DRAFT

1. On-site Weather Station

PolyMet shall collect hourly, on-site precipitation and air temperature data at a site approved by the DNR in accordance with the Monitoring Plan(s). Air temperature data shall be collected year-round. Precipitation data shall be collected during non-freezing months unless a heated gage is used. Should PolyMet's data collection system fail, PolyMet shall inform the DNR of the failure and develop a plan to correct the issue. In this event, the DNR may allow the use of precipitation data from the nearest approved weather station until PolyMet's data collection system is operational.

Precipitation totals (inches) and air temperature (degrees Fahrenheit) shall be reported in hourly time increments with the date and time of measurement.

2. Rates and Monthly Water Volumes

Unless otherwise noted in the Monitoring Plan(s), all installations shall be equipped with flow meters and totalizers to record instantaneous rates and total monthly volumes of water appropriated and/or discharged. Flow meters shall be accurate to within 10% of the total volume. This information shall be used to complete the annual Water Use Report in the MN DNR Permitting and Reporting System (MPARS). An alternative method may be approved by the DNR if PolyMet is unable to use flow meters and totalizers to record instantaneous rates and total monthly volumes. PolyMet shall follow standards set forth in the USGS Water Supply Paper #2175, or the latest updated USGS standards, for rate and volume monitoring associated with a weir structure.

Flow rates and total monthly volumes shall be reported for all water movement on site or discharged off site as listed in the Monitoring Plan. Instantaneous rates, when relevant, shall be recorded when the total monthly volumes (totalizer readings) are collected. This information will allow for the development of a comprehensive water balance, provide further data about past and current water uses and inform future water management decisions.

Data shall be submitted in a template, should one be provided by the DNR.

3. Pit Elevations and Volumes

All Digital Elevation Model(s) (DEM) and/or pit contour data must meet American Society for Photogrammetry and Remote Sensing (ASPRS) standards unless otherwise approved by the DNR.

4. Pit and Lake Water Levels

Pit and lake water levels shall be monitored in accordance with requirements set forth in the Monitoring Plan(s). Water level elevations may be surveyed or measured using a data logger, staff gage, or other DNR approved method(s).

Data Logger

Following installation of a continuous recording data logger, PolyMet shall submit monthly logger and calibration data for six (6) months or unless otherwise approved by the DNR. Data will be assessed for data logger and calibration accuracy. Once the DNR concludes after this initial reporting period that the data loggers are accurate and appropriately calibrated, PolyMet may begin collection and calibration of data at the frequency set forth in the Monitoring Plan(s).

If a data logger is used to monitor water level elevation, the frequency at which the logger is calibrated and data are recorded must be done in accordance with requirements set forth in the Monitoring Plan(s). If no calibration requirements are included in the Monitoring Plan(s) then the data logger shall be calibrated, at minimum, quarterly unless otherwise approved by the DNR. The data logger shall be calibrated with a surveyed manual water level elevation measurement taken immediately before and after data are downloaded or calibrated with a staff gage measurement unless otherwise approved by the DNR. Data logger calibration shall be conducted by resetting the water level elevation to the surveyed manual water level

PUBLIC COMMENT DRAFT

elevation or staff gage measurement. At a minimum, data should be downloaded during each calibration and data logger corrected, if needed, in a timely manner. Any problems with the data logger shall be reported to the DNR as soon as possible.

All calibration corrections and data logger data shall be submitted with the date and time of correction and measurement. Any difference in the manual and data logger water level measurements at the time of calibration shall be reported to the nearest hundredth of a foot (0.01'). If drift corrections are retroactively applied to the logger data, PolyMet shall include a narrative explaining the correction applied and submit both the raw and corrected data files.

Staff Gage

Staff gages shall be surveyed upon installation and measured during ice-free periods in accordance with requirements set forth in the Monitoring Plan(s). Should the staff gage need to be reset, PolyMet shall report the new staff gage location and survey information. Staff gage water level elevations shall be reported with the date and time of measurement, gage zero elevation, and gage plate reading.

Other Method

The DNR may approve an alternative method for pit or lake water level elevation collection. In order to request DNR approval of alternative methods, PolyMet shall submit a report detailing the proposed method for data collection, proposed equipment accuracy, and a feasibility review of using data loggers and staff gages.

5. Groundwater Levels

Well water levels shall be monitored in accordance with requirements set forth in Monitoring Plan(s). The ground level elevation and measuring point elevation on the well casing shall be surveyed and reported. Groundwater levels may be measured using an electronic tape, steel tape, or data logger.

Manual Water Level

Manual groundwater level measurements using an electronic tape or steel tape shall be taken by measuring the depth to water (feet) from a designated measuring point on the well casing. Data shall be reported with the date, time, depth to water measurement, and calculated water level elevation.

Data Logger

Following installation of a continuous recording data logger, PolyMet shall submit monthly logger and calibration data for six (6) months or unless otherwise approved by the DNR. Data will be assessed for data logger and calibration accuracy. Once the DNR concludes after this initial reporting period that the data loggers are accurate and appropriately calibrated, PolyMet may begin collection and calibration of data at the frequency set forth in the Monitoring Plan(s).

If a data logger is used to monitor water level elevation, the frequency at which the logger is calibrated and data are recorded must be done in accordance with requirements set forth in the Monitoring Plan(s). If no calibration requirements are included in the Monitoring Plan(s) then the data logger shall be calibrated, at minimum, quarterly unless otherwise approved by the DNR. The logger shall be calibrated with a manual water level elevation measurement taken immediately before and after data are downloaded unless otherwise approved by the DNR. Calibration of the data logger shall be conducted by resetting the water level elevation to the measured manual water level elevation. At a minimum, data should be downloaded during each calibration and data logger corrected, if needed, in a timely manner. Any problems with the data logger shall be reported to the DNR as soon as possible.

PUBLIC COMMENT DRAFT

All calibration corrections and data logger data, including barometric pressure corrected data for non-vented pressure transducers, shall be submitted with the date and time, manual water level measurement, data logger water level reading, and applied calibration. Any difference in the manual and data logger water level measurements at the time of calibration shall be reported to the nearest hundredth of a foot (0.01'). If data are retroactively corrected for instrument drift or barometric pressure, PolyMet shall include a narrative explaining the correction applied and shall submit both the raw and corrected data files.

6. Streamflow Monitoring

All equipment and procedures used to collect streamflow and stage measurements and compute stream discharges shall conform to procedures set forth in the USGS Water Supply Paper #2175 or the latest updated USGS procedures. The DNR shall approve proposed gage sites prior to establishment.

Discharge Measurements

Wading discharge measurements made using hand-held velocity meters must have a minimum of 25 – 30 velocity, depth, and cross-sectional distance measurements within a transect. Other methods for measuring stream discharge, such as acoustic doppler current profilers (ADCP), shall be approved by the DNR prior to measurement and methodologies shall be described in detail in the annual report.

Stage Measurements

Continuous stage recording equipment shall be accurate to +/- 0.005 feet over the expected stage range for each gage site.

Rating Curve / Stage-Discharge Relation

Flow and stage measurements, required to develop an initial stage-discharge relationship, shall be collected according to standard USGS procedures.

Computation of Continuous Stage Measurements

Discharge computed using continuous stage measurements shall follow standard USGS procedures including the use of datum corrections and shift adjustments throughout the year. During winter ice conditions, flow measurements, weather data, and gage height record shall be used to estimate discharge for periods when the stage-discharge relation is affected by ice backwater; and flow adjusted accordingly.

Reference Points

All continuous gaging stations shall be surveyed annually and a reference staff gage installed and maintained at gage datum.

All continuous and manual stage and discharge measurements and daily average discharges shall be included in the annual report. Estimated discharge values shall be noted in the dataset. A detailed summary of collected data and data processing shall also be included in the annual report.

7. Macroinvertebrate Monitoring

Macroinvertebrate surveys shall be conducted in accordance with the Minnesota Pollution Control Agency (MPCA) standards at the locations and frequencies specified in the Monitoring Plan(s).

8. Fish Community Monitoring

Fish community surveys shall be conducted in accordance with the Minnesota Pollution Control Agency (MPCA) standards at the locations and frequencies specified in the Monitoring Plan(s).

PUBLIC COMMENT DRAFT