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VIA HAND DELIVERY (HARD COPY AND ELECTRONIC VERSION)

May 16, 2017

Jason Boyle  
State Dam Safety Engineer  
Minnesota Department of Natural Resources  
500 Lafayette Road  
St. Paul, MN 55155-3864

RE: Poly Met Mining, Inc.'s Updated Dam Safety Permit Application for the NorthMet Project

Dear Mr. Boyle:

Please find enclosed Poly Met Mining, Inc.'s (PolyMet) updated application to the Minnesota Department of Natural Resources (MDNR) for a Dam Safety Permit Application (Application) for its NorthMet Project's Hydrometallurgical Residue Facility (HRF). The updated Application is being submitted because it includes revisions associated with agency review and third party review.

By copy of this letter, and pursuant to Minnesota Statutes Section 103G.301, subd. 6, PolyMet is also providing copies of this updated Application to the local governmental units (the City of Hoyt Lakes and the North St. Louis Soil and Water Conservation District) in with the FTB will be located.

This Application contains the five primary permit application content sections required by Minnesota Rules, part 6115.0410:

- General Permit Application
- Preliminary Design Report
- Final Design Report
- Plans and Specifications
- Permit Standards

Attached to this letter is a table that summarizes the DNR's third party review of the Application. The table provides the third party reviewers' comments and recommendations, as well as the location in the permit application documents where the comments have been addressed.

Based on PolyMet's review of the applicable laws and content of this Application, PolyMet believes that this Application is complete and satisfies all federal and state requirements relating to the content of a dam safety permit application. PolyMet recognizes that MDNR may request additional information during the course of its review.

Letter to Jason Boyle, MDNR

May 16, 2017

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Thank you in advance for your efforts to review PolyMet's Application. If any questions or concerns arise during MDNR's review of the Application, please do not hesitate to contact me at 651-389-4108 or [jsaran@polymetmining.com](mailto:jsaran@polymetmining.com).

Sincerely,



Jennifer Saran

Director of Environmental Permitting and Compliance

**Review of PolyMet's Tailings Basin Permit Application: HydroMet Facility**

Reviewers: Dirk Van Zyl, Steve Gale/Nate Lichty - Gale Tec Engineering, Inc. and Stu Grubb/Cecilio Olivier - Emmons Olivier Resources, Inc.

Comment #	Page	Section or Table Number	Comment/Concern	PolyMet Response	Final Comment	Recommendation				Location in Permit Application Documents where the Comment has been Addressed
						Address Pre-Permit	Address Post-Permit & make Condition of Permit	Address Pre-constr.	Condition of Permit Recommendation	
1	Mgmt. Plan - page 10	Section 2.2.2.2	The 80 foot high residue storage facility will be constructed over potentially soft ground. The management plan addresses shear strength gain and settlement of the soft soils but does not commit to a construction plan stating that the Observational Method will be used to assess what type of construction needs to take place in the future. Since the soft foundation soils already exist in place, these soils should be further tested and further evaluated such that a design can be promulgated. The pre-load method should be evaluated and a determination made if the pre-load will induce shear strength gain of the soft deposit and whether external drainage, such as wick drains, would be required. It is our opinion that the Observational Method requires a design be presented at the time of permit application.	The need for wick drains is dictated by schedule; the time available for pre-load construction relative to required in-service date for the HRF. The wick drains are not necessary for dam stability.	<p>The subsurface exploration indicates that the soft ground beneath the proposed residue facility consists of up to 30 ft. of slimes, peat and tailings concentrate. The geotechnical report states that this material was placed hydraulically and therefore is likely in a loose unconsolidated state. A preload to consolidate the soft ground has been proposed to reduce settlement and subsequent strains that may occur in the proposed HRF Geomembrane liner. Wick drains are listed as optional based on the amount of time that a preload can be placed.</p> <p>The preload is proposed to be about 50 ft. in height, constructed in 5 lifts each 10 ft. thick. The top of preload elevation is given as 1,620 ft. in the project Plans, approximately 50 ft. above the existing grade of the emergency overflow basin. The top of dam elevation and residue elevation is proposed to be 1,650 ft.</p> <p>Due to the preload, the over consolidation ratio is estimated = 1.37 of the unconsolidated material. The preload is proposed to remain in place until instrumentation has indicated that pore pressure dissipation has been completed and that minimal additional settlement will occur. A 2 year preload time has been estimated.</p> <p>The geotechnical report indicates that the soft material will reenter the normally consolidated state during the last few years of residue filling. The settlement modeling that was performed assumes that the soft soil is isotropic, consisting of a uniform material. The model also varies the depth of the soft soil, but the soft soil depths are only known at a few discreet points where borings were performed, so there is likely some variability that is not expressed in the model.</p>	X	X		Design of the preload shall be required to reduce the potential for differential settlement and excess strain in the liner due to the underlying soft soils considering variable soil properties and variable deposit depths. It is recommended that this design be evaluated and approved prior to Preload/HRF construction.	Design of the preload is presented in Geotechnical Data Package - Vol. 2 and in the Hydrometallurgical Residue Facility Permit Support Drawings.

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Comment #1 (continued)					<p>Due to the likely variation of material type and depth of the soft material, it is likely that differential settlement will occur over the length of the liner system, especially after the material becomes normally consolidated again during HRF construction. This variability may cause an excessive amount of strain in the liner system.</p> <p>The liner system has been designed based on an analysis which considers uniform subsurface conditions. If deformation from the preload construction varies notably from the predictions from this analysis, then the preload height, wick drain type and extent and the liner and leachate collection system design, in part, will have to be modified, as required. In accordance with the Observational Method approach, variability of parameters should be predicted at this time and alternate designs included in the Permit application. This would be necessary in order to establish appropriate financial assurance.</p>					

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2	Mgmt. Plan - page 8	Section 2.2.2.1 - Liner and Leakage Collection System Design	The HydroMet residue basin will consist of a double liner with an internal leakage collection system. Since this system is susceptible to rupture as a result of strains in the geomembrane or geosynthetic liner as a result of settlement or other localized conditions, we recommend that the pre-load/wick drain system be further evaluated and a design promulgated for review during permit.	Deformation and impacts on liner were presented in GDP Vol 2, Sections 5.4 and 6.1	See Comment No. 1.	X	X		See Comment 1.	See Comment 1.
3	Mgmt. Plan - page 33 and 34	Section 7.2.2	The management plan identifies that the HydroMet closure will include a 40 mil LLDPE membrane or a MPCA approved geomembrane and a geosynthetic clay liner (GCL) constructed over a working platform. As far as we know, the MPCA does not have an approved geomembrane list. They do have a guidance on their website. We recommend that the liner type be further investigated and the proposed liner be identified and detailed at permit.	The proposed 40 mil LLDPE liner is detailed in the RMP, Section 2.2 and Attachments A and G.	This issue can be closed.					

