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## Memorandum

**To:** Mr. Jon Ahlness, USCOE  
Ms. Kate Gunderson, MnDNR  
Mr. Mike Crotteau, MnDNR

**From:** Mark Jacobson, Cheryl Feigum

**Subject:** Addendum to Wetland Hydrology Monitoring Plan

**Date:** April 12, 2010

**Project:** PolyMet Mining Company

**c:** Jim Scott, John Borovsky

This 2010 monitoring plan update is being prepared in response to issues raised during the environmental review process regarding the determination of potential indirect wetland impacts during the proposed project. The original work plan was submitted and approved in 2005. Monitoring was started in late 2005 and continued during the 2006 and 2007 growing seasons. At the end of 2007, two wells (Wells 3 and 17) were removed from the study because they were determined to be within the proposed project footprint. In 2008, one well (Well 1) was relocated within the same wetland complex, two wells (Wells 21 and 22) were installed in new wetland locations at the NorthMet Site, and two wells (Wells Ref1 and Ref2) were installed in reference wetlands located west of the NorthMet Site that will not be affected by the proposed project. During 2008-2009, there were a total of 21 sites monitored using manual and electronic wells. Well installations were conducted following the protocols established in the *2005 Wetland Hydrology Study Plan*.

For the Mine Site in 2010, we are proposing to remove two monitoring wells (Wells 18 and 19) that were monitored using electronic recording wells in 2008 and 2009, with manual monitoring well information for 2005-2007 (Figure 1). Wells 18 and 19 are currently located in coniferous bogs, within the footprint of the proposed haul road and West Pit, respectively, so they are not likely to provide useful data for determining indirect wetland impacts. The two years of electronic recording well data collected-to-date has clearly established the presence of wetland hydrology, so it appears that continued monitoring will not provide additional value to determining effects of the project on those wetlands. To ensure adequate baseline data within the wetlands south of the proposed mine pits, and to provide data with which to compare to future conditions, two additional monitoring locations are proposed (Wells 23 and 24, Figure

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1). At these monitoring locations, electronic recording wells would be installed in shrub swamps. During the 2010 monitoring season, there will be a total of 21 monitoring locations at the Mine Site.

Concern has been expressed regarding the potential for impacts to the hydrology of wetlands located north of the Tailings Basin. To ensure adequate baseline data within those wetlands, with which to compare to future conditions, 8 monitoring locations are proposed north and west of the Tailings Basin, downstream from where the existing wetland alteration is evident (Table 1, Figure 2). The wells will be located on land owned by PolyMet or State of Minnesota Tax Forfeit Land. There will be three monitoring well transects, with 2 or 3 wells per transect, as discussed with the Corps on February 10, 2010. Transect 1 includes monitoring wells TB1 and TB2; Transect 2 includes monitoring wells TB3, TB4, and TB7; and Transect 3 includes monitoring wells TB5, TB6, and TB7. Well TB8 will be installed at a reference wetland location.

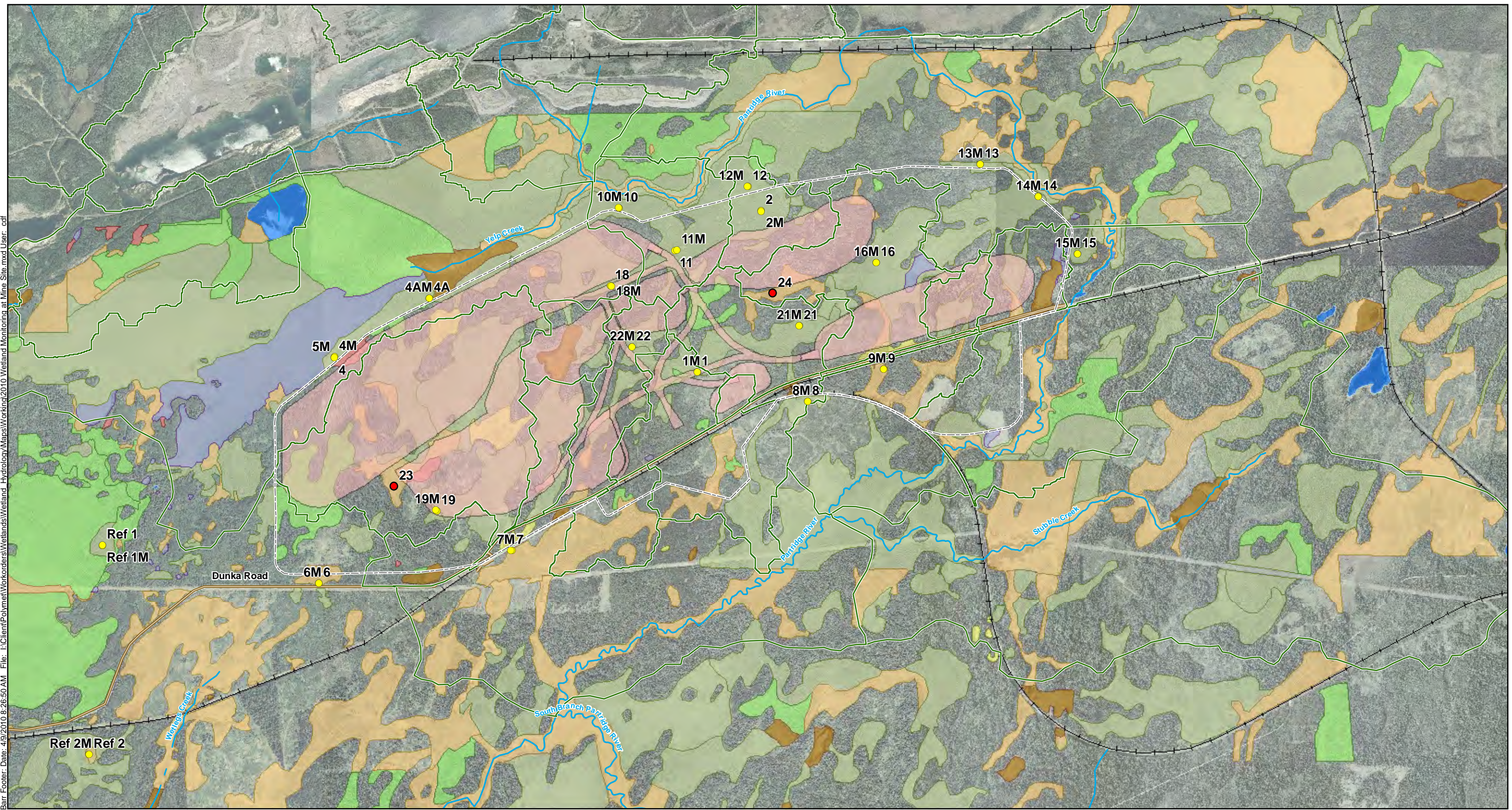
**Table 1. Location of Monitoring Wells North of the Tailings Basin**

<b>Well Name</b>	<b>Wetland ID</b>	<b>Circular 39 Type</b>	<b>Eggers and Reed Wetland Community Type</b>
Well TB1	667	3	Shallow Marsh
Well TB2	662	7	Coniferous Swamp
Well TB3	399	8	Coniferous Bog
Well TB4	654	6	Shrub Swamp
Well TB5	762	7	Hardwood Swamp
Well TB6	679	8	Coniferous Bog
Well TB7	646	8	Coniferous Bog
Reference Well TB8	492	8	Coniferous Bog

There will be seven monitoring wells locations and one reference well location, with a paired recording and manual wells at each location, for a total of 16 wells at 8 locations. We propose to install recording wells in all monitoring locations and record water levels every 2 to 4 hours. Well installations will be conducted following the protocols established in the 2005 *Wetland Hydrology Study Plan*. The elevation of each well will be surveyed during the 2010 growing season. Data from the recording wells will be downloaded approximately once per month during the monitoring period. During download events, water levels will also be recorded within manual wells to provide a quality check on the operation of the recording wells.

Please review and comment on this addendum to the PolyMet Mine Site Wetland Hydrology Monitoring Study. We are planning to begin the 2010 monitoring season at the end of April 2010. If you have any questions, please contact Mark Jacobson at 952-832-2764 or Cheryl Feigum at 952-832-2680.

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- Mine Site
- Detailed Watersheds
- Streams
- Dunka Road
- Revised Mine Footprint
- Proposed 2010 Monitoring Wells**
  - Proposed New Locations for 2010 Monitoring Wells
  - Wetland Hydrology Monitoring Well
- Eggers & Reed Wetland Types**
  - Shrub Swamps (Alder thickets & Shrub-carrs)
  - Coniferous bog
  - Coniferous swamp
  - Deep marsh; Shallow marsh
  - Hardwood swamp
  - Open water (Shallow, open water & lakes)
  - Open bog
  - Sedge meadow; Wet meadow

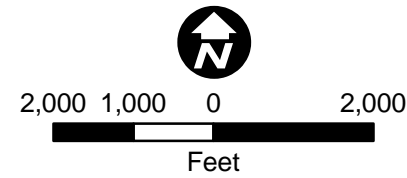
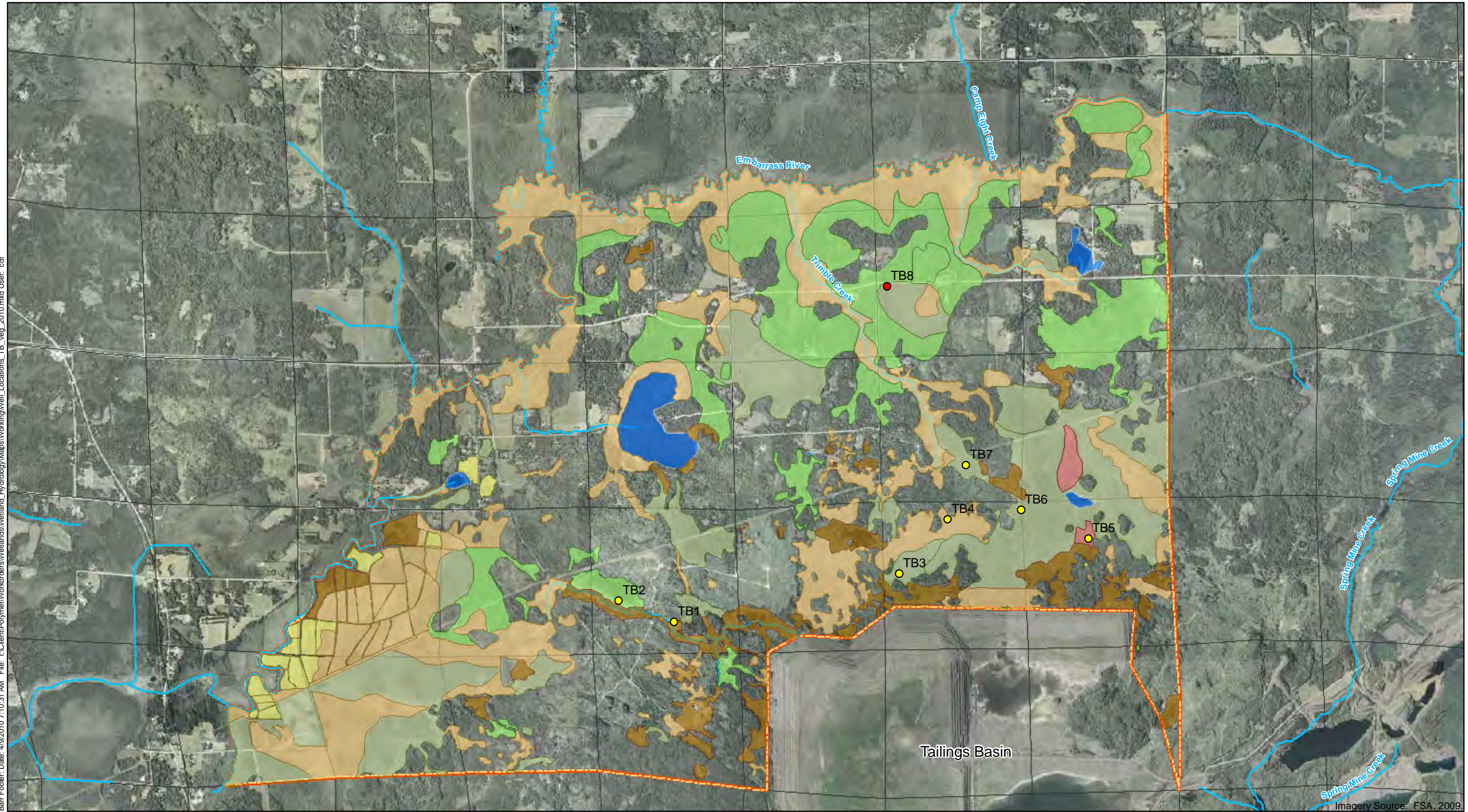


Figure 1  
2010 WETLAND MONITORING WELL LOCATIONS  
MINE SITE  
PolyMet Mining  
Hoyt Lakes, Minnesota



Tailings Basin Area	<b>Eggers &amp; Reed Wetland Types</b>	Hardwood swamp
Section Lines	Shrub Swamps (Alder thickets & Shrub-carrs)	Open water (Shallow, open water & lakes)
Streams	Coniferous bog	Open bog
<b>2010 Wetland Monitoring Wells</b>	Coniferous swamp	Sedge meadow; Wet meadow
Monitoring Wells	Deep marsh; Shallow marsh	
Reference Well		

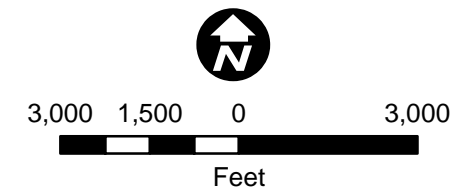


Figure 2  
 2010 PROPOSED WETLAND MONITORING WELLS  
 NORTH OF TAILINGS BASIN  
 NorthMet Project  
 PolyMet Mining Inc.  
 Hoyt Lakes, Minnesota