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Wetland Delineation and Wetland Functional Assessment Report

PolyMet Mining Company

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1.0 Introduction

PolyMet Mining, Inc. (PolyMet) is submitting this wetland delineation and functional assessment report to provide updated, supporting information for the PolyMet Environmental Impact Statement (EIS) process. This report is also provided in support of the permit applications submitted to the U.S. Army Corps of Engineers and Minnesota Department of Natural Resources. The delineation report describes wetland delineation activities conducted at the PolyMet project site between August, 2004 and July, 2006 including the methods, findings, and a summary of wetland resources within the project site. The project areas (shown in Figure 1) have changed from the July, 2004 permit application; and the wetland resources within the project areas have been revised according to the detailed field delineations.

Potential mitigation sites have been identified and PolyMet has issued the *Preliminary Wetland Mitigation Plan – RS-20T* report describing the wetland mitigation planning efforts conducted to that date. A subsequent *Wetland Mitigation Plan* will be developed in which unavoidable wetland impacts will be presented and will be depicted in the Project Description (to be submitted later). The *Wetland Mitigation Plan* will include more detailed wetland mitigation plans that will be developed for suitable and available sites to compensate for the unavoidable wetland impacts as mitigation planning continues. Hydrologic monitoring of wetlands near the proposed pit began in the summer of 2005 and continued in 2006 to evaluate any indirect impacts due to pit dewatering and will continue into the future. Additional study will occur in the course of the joint State-Federal Environmental Impact Statement process that is now underway. This will include an analysis of alternatives and cumulative effects.

The wetland application and amendments included a conceptual description of the project, a discussion of the need for the project, and an analysis of alternatives to avoid and minimize wetland impacts. A phasing plan showing how mining activities will progress, and how the phasing of the work will impact the site, is in preparation and will be submitted at a later date. PolyMet's project plans will take into account the Minnesota Department of Natural Resources' (MN DNR) mandate to use previously disturbed lands wherever practicable, as required by the MN DNR's rules.

Wetland data forms have been completed for the wetlands that have been identified and delineated in the field. The wetland data forms are attached in Appendix A.

2.0 General Environmental Setting

The property area evaluated for the presence of wetlands encompasses approximately 3,300 acres at the mine site located 6 miles south of Babbitt (Figure 1). The United States Forest Service (USFS) owns the surface rights of the mine site and has managed the area for timber production. The mine site is south of the existing Peter Mitchell Pit operated by Northshore Mining Company. To the south of the mine site are the Dunka Road and the railroad tracks of the former LTV Steel Mining Company Railroad,

Ore from the mine site will be shipped via railroad to the plant site. A proposed modification to the existing rail system includes a corridor, approximately 1.2 miles in length and ranging from 50 ft to 150 ft in width (Figure 5). The railroad connects into an existing railroad on the south side, extending north through an area intertwined with former mine roads and forested land, and connecting into a former mining railroad grade at the north end.

Several areas of the former LTV Steel Mining Company site are being considered in the EIS as alternative locations for various aspects of the PolyMet project. Water resources within these areas are shown on Figure 6. The alternative project areas are generally composed of existing mine pits, some of which, have filled with water.

The remainder of this section is focused on the proposed mine site.

2.1 Hydrology and Hydrogeology

The mine site is situated in the headwaters of the St. Louis River Watershed #3. The mine site is partially encircled by the Partridge River, the headwaters of which, are formed by the One Hundred Mile Swamp and mine dewatering discharge from the Peter Mitchell Pit. The Partridge River wraps around much of the mine site starting on the north side and flowing northeast, south, and then southwest away from the site (Figure 4). The river ranges from about 100 feet to about 2,500 feet from the project boundaries.

Surface elevations of the mine site north of the Dunka Road range from 1630 MSL in the northern part to 1580 MSL along the Dunka Road according to the aerial-flown topography available for the site (Figure 7). Surface elevations in the One Hundred Mile Swamp range from 1610 MSL northwest of the mine site to about 1590 MSL northeast of the mine site. Ground elevations south of the Dunka Road range from 1580 MSL in the north to 1540 MSL along the Partridge River in the south. A

surface water divide oriented generally from the southwest to the northeast is situated near the northern boundary of the project site. North of the drainage divide, surface water drains north to the Partridge River. South of the divide, surface water generally drains south and southwest to culverts in five general locations under the Dunka Road. South of the Dunka Road, surface water generally flows south and southeast through large wetland complexes to the Partridge River.

2.2 Vegetation

Approximately 1,300 acres of the site have been characterized as wetland habitats and 2,000 acres as upland habitats (Figure 4). Approximately 80 percent of the upland areas are composed of mixed deciduous and coniferous trees with most in the 5- to 12-inch diameter at breast height (dbh) range. The next most dominant upland habitat type is shrub lands which comprise approximately 13 percent of the upland areas. The remaining upland areas include small amounts of grasslands, deciduous forests, coniferous forests, and disturbed lands.

The more mature upland forested areas at the mine site are dominated by jack pine, quaking aspen, and balsam fir with lesser amounts of paper birch, red pine, and white pine. Tree cover is about 70 to 80 percent. Trees within the mature forests range in age from 20 years to more than 80 years old. The more recently logged areas are dominated by aspen saplings and speckled alder with grasses and ferns in the ground layer. Logging operations are currently underway or have been completed in recent years within large areas of the site located both north and south of the Dunka Road.

Bogs and forested swamps make up about 80 percent of the wetland habitats within the mine site. Shrub swamps are the next most abundant wetland community, comprising 12 percent of the wetland areas. Shallow marsh and wet meadow wetlands make up approximately 3 percent and 4 percent of wetlands, respectively. The forested wetlands are typically dominated by black spruce and tamarack in the overstory, leatherleaf, Labrador tea, and speckled alder in the shrub layer, over a bed of sphagnum moss with a variety of grasses, sedges, and forbs present in lesser amounts. The shrub swamps are typically dominated by speckled alder and willow with Canada bluejoint grass, manna grass and sedges in the understory. The emergent wetland areas are dominated by cattails, sedges, and grasses, with submergent species present in the few areas of deep marsh wetlands.

2.3 Soils

The ongoing Natural Resources Conservation Service (NRCS) Soil Survey considers the project area to lie within the St. Louis County Geomorphic Area 28, the Allen and Wampus Moraines. These are minor glacial moraines of the Rainy lobe from the Automba phase of Wisconsinian glaciation. The

material deposited by this glacial lobe is generally coarse-textured and stony and bouldery. Textures of the fine soil fraction are loamy sand to sandy loam, but rock material including gravel, cobbles, stones, and boulders can range from 35 to 70 percent by volume. The surface relief of the area is gently rolling, with local relief ranging from 10 to 30 feet. Slopes are mostly short and irregular. The landscape includes many closed depressions, most of which contain peatlands.

The soils have formed in the coarse-textured till with a much denser till present at about 40 inches below the surface. The topographic sequence of mineral soils (starting with the highest topographic landscape position) include the well-drained Eveleth series, the moderately well-drained Eaglesnest and Whalsten series, and the somewhat poorly drained Babbitt series (the official description for the Babbitt series is yet to be developed but is reportedly similar to the Brimson series). The topographically lowest member of the sequence is the very poorly drained Bugcreek series. The organic soils in the peatlands are primarily the Rifle and the Greenwood series, with the Rifle having generally mixed vegetation compared to the black spruce-dominated Greenwood. Because of the dense underlying till and outcropping bedrock, some of the mineral soils in the landscape (with the possible exception of the Eveleth) experience perched water tables during the late spring and very early summer at a depth of 1 to 3 feet. The water table usually disappears relatively quickly following tree leaf-out, but may reappear for brief periods following heavy precipitation. The water table within the peat soils is usually at or near the surface persistently throughout the growing season.

3.0 Wetlands at the Project Site

The U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) maps, as shown on Figure 3, were generated from interpretations of black-and-white aerial photographs taken in 1977. The NWI maps generally do not accurately represent wetland resources in the forested areas of northeastern Minnesota. The NWI only maps 900 acres of wetlands within the PolyMet mine site. The following sections describe the methods used in field delineating the wetlands and discuss the wetland resources within the proposed project areas.

The mine areas that were evaluated for the current PolyMet project configuration cover approximately 4,300 acres, extending beyond the proposed project boundaries. The final project areas include:

1. Mining areas,
2. Lean ore, waste rock, and overburden stockpile areas,
3. Tailings basin,
4. Railroad access to the plant site, and
5. Plant site

Wetland and water resources within the project areas have been delineated and characterized in the field. The tailings basin is an actively permitted waste storage facility, and is therefore, not subject to state and federal wetland regulations. The plant site is the former LTV Steel Mining Company plant site, which is situated on the top of a hill. There are no wetland resources present within the plant area. The water resources within the alternative project areas are all existing mine pits that have filled with water after past mining activities ceased. They are all classified as deepwater habitats. The water-filled mine pits generally have steep side walls, generally with no lacustrine wetland habitats present. Wetlands present within the mine, stockpile, and railroad access areas are described below.

3.1 Wetland Delineation and Classification Methods

The wetlands at the mine site, which encompasses the proposed pit areas, stockpile areas, and mine-related facilities, are shown on Figure 4. These wetlands were identified, characterized, and mapped between 2004 and 2006. Possible wetland locations were first determined through off-site analysis of historic aerial photographs, U.S.G.S. quadrangle maps, 2-foot topography data, National Wetland

Inventory maps, and soils information. These maps were then used as a base for conducting field surveys to verify the presence of wetlands, characterize the wetlands, and map their extent within the proposed project areas. A preliminary field investigation of habitat types present on the mine site was conducted by ENSR in June, 2004. The final wetland field investigations were conducted by Barr Engineering in August 2004, June 2005, and July 2006. Staff of the Minnesota Department of Natural Resources, Corps of Engineers, and the North St. Louis Soil and Water Conservation District (SWCD) met at the project site on August 17, 2004 to view and discuss the wetland resources at the site. Representatives of the U.S. Army Corps of Engineers, North St. Louis SWCD, the Board of Water and Soil Resources, U.S. Environmental Protection Agency, the U.S. Forest Service, U.S. Fish and Wildlife Service, and the Minnesota Department of Natural Resources Ecological Resources met at the project site on June 28, 2005 to review wetland resources.

The wetland areas were initially mapped based on a general field survey in the project area located north of the Dunka Road by ENSR on June 22-26, 2004. Minnesota Department of Natural Resources color infrared aerial photographs taken in 1997 (scale 1 inch = 1,320 feet) were the primary data source used for this effort. The primary purpose of this initial effort was to characterize wildlife habitats including general wetland habitats. The site was surveyed by traveling the forest roads, straight-line transects, and circular paths through a variety of habitat types. The survey team documented vegetation cover types and plant species composition and documented observed cover types on the infrared color aerial photographs. Areas dominated by wetland vegetation were identified and approximately mapped using the U.S. Fish and Wildlife Service Cowardin Wetland Classification System as a general guide. The wetland areas were mapped based primarily on the presence of photographic signatures represented by observed wetland vegetation communities. The walking surveys were conducted so that the full range of various wetland communities was observed. During the field habitat mapping effort, portions of approximately one-half of the wetland habitats within the study area were observed in the field.

The wetland wildlife habitat classifications provided by ENSR were converted to the U.S. Fish and Wildlife Service Circular 39 Wetland Classification System (Shaw and Fredine, 1971) and the Cowardin Classification System (Cowardin, 1979) by Barr Engineering Company. The wetland habitat mapping was then overlaid with soils information, 2-foot topography, and 2003 true-color aerial photographs, 1999 black-and-white aerial photographs, 1997 color-infrared aerial photographs, and 1991 black-and-white aerial photographs. Field maps were produced at a scale of 1 inch = 500 feet to be used for subsequent wetland delineation efforts. The National Wetlands Inventory maps

and United States Geological Survey topography maps were reviewed to aid in wetland identification.

An initial field wetland delineation/mapping effort was conducted by Barr Engineering on August 16-18, 2004. The primary purpose of this field survey was to review the wetland habitat mappings and refine the wetland mappings based on feedback from the agencies at the August 17, 2004 field meeting. This effort included field survey of selected project areas located south and north of the Dunka Road and within the proposed railroad route leading from the existing Cliffs Erie plant site (which was recently purchased by PolyMet) to the mine site.

Portions of approximately one-quarter of the wetlands were observed and characterized in the field during the August, 2004 field wetland survey. Wetland boundaries were identified in general accord with the *1987 Corps of Engineers Wetland Delineation Manual* routine wetland delineation procedures. The mapping of wetland boundaries was based primarily on a predominance of hydrophytic vegetation, the presence of wetland hydrology, and where applicable, topography. Although soils were not characterized in detail, most wetland areas were characterized by peat soils or were saturated to the surface or inundated indicating the hydric soil criteria was satisfied. Specific wetland boundary locations were located using a Global Positioning System to verify aerial photographic wetland vegetation signatures. Based on those boundary locations, field observations, and topographic information, the wetland boundary mappings for the entire project site were refined from the earlier efforts for presentation in the Environmental Assessment Worksheet.

The wetland mapping produced by Barr Engineering based on the August, 2004 field survey were evaluated to determine areas in need of further field verification. Field maps were again produced at a scale of 1 inch = 500 feet using the 2004 wetland mapping, soils information, aerial photographs, and topography.

Additional wetland delineation/mapping efforts were conducted by Barr Engineering in June, 2005 and July, 2006. The primary purpose of these field surveys was to field verify and map wetland resources in areas of the project site that had not been previously evaluated. Portions of approximately an additional 70 percent of the wetlands were observed and characterized in the field during these field wetland surveys. Wetland boundaries were again identified in general accord with the *1987 Corps of Engineers Wetland Delineation Manual* routine wetland delineation procedures. Large sections of wetland boundary locations were located using a Global Positioning System to verify aerial photographic wetland vegetation signatures. Based on those boundary locations, field

observations, and topographic information, the wetland boundary mappings for the entire project site were again revised from the earlier efforts and are presented here.

Precipitation data from the Babbitt National Weather Service (NWS) station was analyzed in comparison to the statistical climatic WETS data developed by the NRCS specifically for evaluating climatic normalcy in conducting wetland delineations (Table 1). The WETS methods establish a normal range of monthly and annual precipitation based on the long-term precipitation record. The normal range is defined as the conditions present 60 percent of the time. The delineations were conducted during the 2004 - 2006 water years (defined as October 1 through September 30) following two water years with annual precipitation below the normal range (Table 1). The 2004 delineations were conducted during a year when the water year precipitation was below the normal range by 2.1 inches.

During the first 9 months of the 2005 water year leading up to the late June field wetland survey, precipitation was below the normal range during 2 months, above the normal range during 4 months (including May and June), and within the normal range the other 3 months. The precipitation data indicates slightly wetter than normal conditions were present during the field survey. The annual 2005 water year precipitation was above the normal range by 0.8 inches.

During the first 10 months of the 2006 water year leading up to the late July field wetland survey, precipitation was below the normal range during 3 months, above the normal range during 5 months (including May and June), and within the normal range the other 2 months. The precipitation data indicates normal conditions were present during the field survey, despite the dry and warm conditions that were present during June and July. It appears that the annual 2006 water year precipitation (ending September 30, 2006) will be within the normal range.

The delineated wetlands were classified using both the Circular 39 Classification System (Shaw and Fredine, 1956), the Cowardin System (Cowardin et al., 1979), and the Eggers and Reed (1998) wetland classification system (Figure 7). General descriptions of each Circular 39 wetland type are provided below:

3.1.1 Type 1: Seasonally Flooded Basin, Floodplain Forest

Soil is covered with water or is waterlogged during variable seasonal periods, but usually is well-drained during much of the growing season. This wetland type is found both in upland depressions and in overflow bottomlands. In uplands, basins or flats may be filled with water during periods of heavy rain or melting snow.

Vegetation varies greatly according to season and duration of flooding: from bottomland hardwoods to herbaceous plants. Where the water has receded early in the growing season, smartweeds, wild millet, fall panicum, chufa, various amaranths and other plants (i.e. marsh elder, ragweed, and cockleburs) are likely to occur. Shallow basins that are submerged only very temporarily usually develop little or no wetland vegetation.

3.1.2 Type 2: Wet Meadow, Fresh Wet Meadow, Wet to Wet-Mesic Prairie, Sedge Meadow, and Calcareous Fen

Soil is usually without standing water during most of the growing season, but is waterlogged within at least a few inches of the surface. Meadows may fill shallow basins, sloughs, or farmland sags, or these meadows may border shallow marshes on the landward side. Vegetation includes grasses, sedges, rushes and various broad-leaved plants. Common representative plants are *Carex* sp. (sedges), *Juncus* sp. (rushes), redtop, reed grasses, manna grasses, prairie cordgrass, and mints. Other wetland plant community types include low prairies, sedge meadows, and calcareous fens.

3.1.3 Type 3: Shallow Marsh

Soil is usually waterlogged early during the growing season and may often be covered with as much as 6 inches or more of water. These marshes may nearly fill shallow lake basins or sloughs, or may border deep marshes on the landward side. These are common as seep areas on irrigated lands. Vegetation includes grasses, bulrushes, spikerushes, and various other marsh plants such as cattails, arrowhead, pickerelweed, and smartweeds. Common representatives are reed, whitetop, rice cutgrass, *Carex*, and giant burreed.

3.1.4 Type 4: Deep Marsh

Soil is usually covered with 6 inches to 3 feet or more of water during the growing season. These deep marshes may completely fill shallow lake basins, potholes, limestone sinks and sloughs, or they may border open water in such depressions. Vegetation includes cattails, reeds, bulrushes, spikerushes and wild rice. In open areas, pondweeds, naiads, coontail, watermilfoils, waterweeds, duckweed, water lilies, or spatterdocks may occur.

3.1.5 Type 5: Shallow Open Water

Shallow ponds and reservoirs are included in this type. Water is usually less than 10 feet deep and is fringed by a border of emergent vegetation similar to open areas of Type 4. Vegetation (mainly at water depths less than 6 feet), includes pondweeds, naiads, wild celery, coontail, watermilfoils, muskgrass, waterlilies, and spatterdocks.

3.1.6 Type 6: Shrub Swamp; Shrub Carr, Alder Thicket

The soil is usually waterlogged during the growing season and is often covered with as much as 6 inches of water. Shrub swamps occur mostly along sluggish streams and occasionally on flood plains. Vegetation includes alders, willows, buttonbush, and dogwoods.

3.1.7 Type 7: Wooded Swamps; Hardwood Swamp, Coniferous Swamp

The soil is waterlogged at least to within a few inches of the surface during the growing season and is often covered with as much as 1 foot of water. Wooded swamps occur mostly along sluggish streams, on old riverine oxbows, on floodplains, on flat uplands,

and in very shallow lake basins. Forest vegetation includes tamarack, white cedar, black spruce, balsam fir, red maple, and black ash. Northern evergreen swamps usually have a thick ground covering of mosses. Deciduous swamps frequently support beds of duckweeds, smartweeds, and other herbs.

3.1.8 Type 8: Bogs; Coniferous Bogs, Open Bogs

The soil is usually waterlogged and supports a spongy covering of mosses. Bogs occur mostly in shallow lake basins, on flat uplands and along sluggish streams. Vegetation is woody or herbaceous or both. Typical plants are heath shrubs, sphagnum moss, and sedges. In the North, leatherleaf, Labrador-tea, cranberries, *Carex*, and cottongrass are often present. Scattered, often stunted, black spruce, and tamarack may occur in northern bogs.

A comparison of the Circular 39 and Cowardin wetland classification systems are provided in Table 2. The dominant plant species in each field-characterized wetland were identified and the corresponding wetland indicator status of each plant species was then determined and recorded on Wetland Data Forms (Appendix A).

Information on soils at the project site was obtained from the U.S. Forest Service prior to conducting the field delineations and is shown on Figure 2. In addition, soil borings were placed in most of the wetlands to a depth of 6 to 18 inches below the ground surface. Representative soil samples from each boring were examined for hydric soil indicators. Soil colors (e.g., 7.5YR 4/2, etc.) were determined with the aid of a Munsell® soil color chart and are noted on the Wetland Data Forms (Appendix A).

3.2 Wetland Functional Assessment Methods

During the field wetland surveys, data was collected related to the functions and values of each wetland within the proposed project areas. The vegetative diversity/integrity within each wetland was rated using the guidelines in the *Minnesota Routine Assessment Method for Evaluating Wetland Functions, Version 3.0* (MNRAM 3.0). While the vegetative diversity/integrity of the wetlands serves, to some degree, as an indicator of overall wetland functional quality, many other factors contribute to the overall functioning of the wetland in the larger landscape. To provide a clearer picture of overall wetland functional quality, other applicable wetland functions evaluated in MNRAM 3.0 were also considered in rating the overall wetland quality. The wetland functions that are most applicable to the PolyMet project site include: Maintenance of Characteristic Hydrologic Regime, Maintenance of Wetland Water Quality, Wildlife Habitat, and to some degree, Downstream Water Quality. Several landscape characteristics are important for evaluating many of these wetland functions. Some of the key landscape and wetland characteristics considered in rating wetland functional quality include:

- Outlet Characteristics
- Watershed and Adjacent Upland Land Uses and Condition
- Soil Condition
- Erosion and Sedimentation
- Wetland Vegetative Cover and Vegetation Types
- Wetland Community Diversity and Interspersion
- Human Disturbances (both past and present)

The broader landscape factors were typically evaluated on a larger scale. For instance, soil and vegetation conditions within the watershed contributing to the wetland were similar for large groups of wetlands. The human disturbance levels were also typically similar across broad areas. Two considerations are notable for the PolyMet site: 1) the majority of the site is relatively undisturbed by humans, and 2) logging disturbances have historically affected and continue to affect large areas of the project, which may not have been present at the time wetlands were evaluated. Other more local factors were considered for each wetland or small groups of wetlands. Table 4 provides detailed findings of the vegetative diversity/integrity and overall functional quality rating (low, medium, or high) for each delineated wetland and a summary of the functional quality ratings for all wetlands within the mine site is provided in Table 6.

3.3 Summary of Wetland Resources – Classification, Quality

Due to the large number of potentially impacted wetlands, not all of the individual wetlands are described here. However, data sheets describing each field-delineated wetland, including dominant vegetation, soil type, and hydrologic information, is provided in Appendix A. The identified wetland locations at the mine site are shown on Figure 4, wetlands within the proposed railroad connection area are shown on Figure 5, and the water resources in the plant, tailings basin, and alternative project areas are shown on Figure 6. A tabulation of the identified wetlands and deepwater habitats, including the type, classification, total size, and area within the project boundaries is provided in Table 3.

The wetlands within the major project areas are described below, including the general rationale for determining the regulatory wetland boundaries, an assessment of wetland functional quality, and a

general description of the wetland resources within each area. The wetland resources within the proposed project are shown on Figures 4-6.

3.3.1 Mine Site

The area around the mine site evaluated for the presence of wetlands, which is located about 1.5 miles southwest of Babbitt, encompasses approximately 4,300 acres. This area is bordered by the Partridge River and associated wetlands along the north, east, and south sides of the project area. The Dunka Road and an inactive railroad cross through the southern portion of the site and a transmission corridor runs along the south edge of the area evaluated for wetlands. There is a series of forest access trails within the project area located north of the Dunka Road. The other primary human disturbance of the site is logging, which has been conducted periodically throughout most of the site.

A total of 76 wetlands covering 2,429 acres have been identified within an area slightly larger than the proposed mine site project boundaries and 1,297 acres of wetlands lie within the project boundaries. A summary of the delineated wetlands by Circular 39 wetland type is provided in Table 5 and the wetlands are classified by Circular 39 type on Figure 7. The majority of the wetlands are present in complexes that either lie in the floodplain of the Partridge River or are tributary to the Partridge River. Approximately 30 percent of the wetlands appear to be isolated wetlands and isolated raised bogs within the mine site that represent only about 5 percent of the total wetland resources (Figure 4). A total of 8 wetlands, each over 50 acres in size within the project area, comprise approximately 871 acres of wetlands within the proposed project area. There are an additional 6 wetlands, each over 20 acres in size within the project area. Together, these 14 wetlands comprise 79 percent of the wetland area within the project boundaries.

A total of 42 percent of the wetlands identified are coniferous swamp/bog and open bog communities comprising over 72 percent of the wetland area (938 acres) within the project boundaries. Shrub wetland communities comprise 22 percent of the wetlands within the project areas making up about 12 percent of the wetland area (156 acres). Forested swamp communities make up 13 percent of the wetlands identified including approximately 9 percent of the wetland area (115 acres) within the project boundaries. Wet/sedge meadow communities make up 10 percent of the wetlands within the project areas covering nearly 4 percent of the wetland area (49 acres) within the site. Shallow marshes make up about 3 percent of the wetland area (39 acres) within the mine site (Table 5).

3.3.1.1 Coniferous Swamp/Bog and Open Bog Communities

Black spruce bogs/swamps and open bogs make up the majority of the wetlands at the mine site. The canopy in this wetland type is typically dominated by black spruce with some tamarack and balsam

fir and occasionally swamp birch and white cedar. The shrub layer is typically dominated by Labrador tea, leatherleaf, cranberry, and/or speckled alder with red raspberry present in some wetlands. The ground layer usually contains a contiguous bed of sphagnum moss with bunchberry, bluebead lily, sedges, and horsetail common. Bog goldenrod, Canada bluejoint grass and starflower are occasionally present.

Hydrologic monitoring of these wetlands during 2005-2006 has shown the hydrology to be characterized by a stable water table. Despite periods with precipitation well above and below the normal range (Figure 8), water levels in the bog communities fluctuated only 1 foot, on average, during the June 2005 to October 2006 monitoring period. During periods with normal precipitation, water levels in the bog wetlands monitored generally ranged from at the ground surface to about 5 inches below the surface. During extended periods with precipitation below the normal range, water levels generally dropped to 5-15 inches below the ground surface. The large wetland complex in the Partridge River headwaters have a slightly higher, more stable, and sustained water table than the black spruce swamps and bogs within the interior of the mine site.

The soils within these wetlands are typically characterized by fibric peat at the surface, ranging in thickness from a few inches where bedrock is shallow to over 15 feet in the Partridge River headwaters area.

All but one of the bog communities identified at the mine site are rated high quality overall. The quality of the wetlands can be primarily attributed to the lack of disturbance to the wetlands, the surrounding watersheds, and the hydrology, in general. One small bog wetland is rated moderate quality overall, primarily due to the presence of an adjacent forest road.

3.3.1.2 Shrub Swamp Communities

The shrub swamp wetlands are predominantly alder thicket communities. These wetlands do not have a significant tree canopy, but occasionally have balsam fir and paper birch along the perimeter. The shrub layer is typically dominated by speckled alder with some willow and red raspberry. The ground layer is typically dominated by Canada bluejoint grass, sedges, woolgrass, manna grass, rushes, and some ferns with typically only a minor coverage of sphagnum moss.

The hydrology in three of the shrub swamp wetlands has been monitored during 2005-2006. The hydrology appears to be characterized by prolonged periods (October-June) of shallow inundation (1-2 inches) with the water table dropping 6-12 inches below the ground surface during dry periods in late summer (July-September). The average total water level fluctuation in the three shrub swamp

wetlands during the 2005-2006 monitoring period has been 1.1 feet, despite periods of precipitation both above and below the normal range (Figure 8). The soils within these wetlands are typically fibric and hemic peat at the surface underlain by bedrock or mineral soils.

All of the shrub swamp wetlands at the mine site are rated high quality overall. The quality of the wetlands can be primarily attributed to the limited disturbance to the wetlands, the surrounding watersheds, and the hydrology, in general.

3.3.1.3 Forested Swamp Communities

The forested swamp wetlands include a mix of coniferous- and deciduous-dominated communities. The canopy in this wetland type is typically dominated by black spruce, tamarack, and balsam fir with white cedar, black ash, paper birch, and aspen present occasionally. The shrub layer is typically dominated by speckled alder, willow, and red raspberry. The ground layer may contain some sphagnum moss, but is more typically dominated by Canada bluejoint grass and sedges with bunchberry, starflower, and horsetail often present. None of the forested swamp wetlands have been hydrologically monitored. However, the hydrology appears to fluctuate more than that in the larger bog wetlands with saturation near the surface early in the growing season and a diminishing water table in late summer. The soils within these wetlands include organic and mineral hydric soils. All of the forested swamp wetlands identified within the project areas are rated high quality overall.

3.3.1.4 Wet Meadow and Sedge Meadow Communities

The wet meadow and sedge meadow wetlands are generally dominated by sedges (*Carex sp.*), Canada bluejoint grass (*Calamagrostis canadensis*), woolgrass, manna grass, and bulrushes (*Scirpus sp.*). The hydrology in the wet/sedge meadow wetlands has not been monitored at the project site. However, these wetlands are typically saturated close to the ground surface or have shallow inundation for prolonged periods during the growing season. Soils are typically organic at the surface underlain by mineral soils. Two of the wet/sedge meadow wetlands are rated moderate quality overall and the others are rated high quality. The moderate quality wet meadow wetlands are situated along the Dunka Road and railroad and have been affected by the hydrologic and physical alterations resulting from those features.

3.3.1.5 Shallow Marsh Communities

Approximately one-half of the shallow marsh (Type 3) wetlands at the mine site have become established as a result of artificial impoundment by beaver, roads, or railroads. Shallow marsh wetlands do not commonly occur naturally in the landscape present at the mine site. The Type 3 wetlands are generally dominated by cattails, sedges, bulrushes, Canada bluejoint grass

(*Calamagrostis canadensis*), woolgrass, and manna grass. These wetlands are typically inundated with 1-4 inches of water throughout the growing season, except during prolonged dry periods. Soils are typically organic at the surface underlain by mineral soils. A total of four of the ten shallow marsh wetlands are rated moderate quality overall and the other six are rated high quality. Hydrologic disturbances primarily account for the degradation to the wetlands.

3.3.2 Plant Facilities

The plant facilities area (Figure 1) is the site of the former LTV Steel Mining Company facilities. The plant site lies on the top of a hill straddling a three-way drainage divide with the northwest portion of the plant draining to the Embarrass River, the northeast portion draining to Spring Mile Creek, and the southern part draining to Second Creek. Nearly the entire plant facilities area is disturbed by past mining activities. The National Wetland Inventory mapping around the plant area is shown on Figure 9. No wetlands are present within the plant area, although there is one industrial pond located east of the concentrator.

A water pipeline is being planned to carry water from the mine site to the Area 2 shops, where a water treatment plant is planned. After treatment, the water would be routed to the tailings basin and used as make-up water. The preliminary water pipeline route is planned to follow along the Dunka Road for approximately the first half of the route and then is primarily routed through previously disturbed areas. While permanent wetland impacts will be avoided to the extent practicable during design, there is the potential that unavoidable wetland impacts may result. As a contingency, it is estimated that up to 10 acres of wetland impacts could result. Wetlands will be identified along the final route and unavoidable impacts will be determined and submitted for review by the permitting authorities prior to construction.

3.3.3 Tailings Basin

The proposed tailings basin is the site of the former LTV Steel Mining Company tailings basin, which is an existing permitted waste disposal facility (Figure 1). Wetlands located outside of the existing dike system were not thoroughly field evaluated; however, the wetland boundaries have been mapped based on limited field observations as shown on Figure 6. The National Wetland Inventory mapping around the tailings basin is shown on Figure 9. The only anticipated activity around the perimeter of the tailings basin is construction of a horizontal drain and collection system within the dikes. This drain system will be designed to avoid impacts to wetlands to the extent practicable, however details of the plans have not been determined at this time. Should constructability issues arise during plan development, there is the potential that wetland impacts may be necessary for

construction of pump stations. It is estimated that up to 5 acres of wetland impacts could result, should design issues arise, requiring construction outside of the existing tailings basin footprint. Unavoidable wetland impacts will be determined and submitted for review by the permitting authorities prior to construction.

3.3.4 Railroad Connection

An approximately 1 mile length of railroad is proposed to connect two rail corridors between the mine site and the processing facilities (Figure 5). A total of 8 wetlands, encompassing 57 acres, have been identified in the vicinity of the proposed railroad connection (Figure 5), but only a portion of 2 wetlands intersect the proposed construction area. The delineated wetlands are summarized in Tables 3 and 4. Approximately 0.1 acre of Wetland R-3 and 0.17 acre of Wetland R-4 lie within the proposed railroad connection. Wetland R-3 is a Type 7 hardwood swamp dominated by aspen, which is partially disturbed by the haul road along the west side of the wetland. Wetland R-4 is a Type 6 shrub carr wetland dominated by willow and speckled alder and is bordered by a road on the north side.

3.3.5 Alternative EIS Project Areas

Several alternative rock storage and tailings disposal areas are being evaluated in the EIS (Figure 6). The alternative areas are composed of existing mine pits and adjacent areas. Wetland resources and deepwater habitats within the alternative project areas have been mapped as shown on Figure 6. A total of 22 distinct deepwater basins covering 810 acres have been mapped within the alternative areas (Table 4). All of these deepwater habitats have resulted from the mine pits filling with water after the cessation of mining and dewatering activities. The water bodies are typically characterized by steep rock walls along the perimeter with unknown water depths. There are no known lacustrine wetland habitats contained within these pits.

3.4 Summary of Wetland Resources

A total of 84 wetlands covering 2,486 acres were delineated on or near the project site (Table 5). The mine site contains a total of 1,297 acres of wetlands. In addition, it is estimated that approximately 15 acres of wetlands may be involved in constructing the tailings dam drain system and water pipeline (Tables 5-8). These estimates will change as final design of the project progresses and will be presented in the Project Description. The majority of the project area wetland resources are Type 8, bog wetlands, including over 71 percent of the total wetland area. Type 6 and 7 wetlands constitute 12 percent and 9 percent of the project area wetland resources, respectively. The remaining project area wetland resources are Type 2 and Type 3 wetlands.

Table 1
Precipitation Summary Compared to WETS[1] Data
1999-2006
PolyMet Mining
Hoyt Lakes, Minnesota

	30% chance			Babbitt							
	Average	more than	less than	1999	2000	2001	2002	2003	2004	2005	2006
	Inches										
January	0.88	0.52	1.07	0.73	0.55	**1.21**	*0.12*	*0.19*	**1.23**	**2.15**	*0.42*
February	0.7	0.36	0.86	0.6	0.71	**1.77**	*0.26*	0.44	*0.23*	0.5	**0.88**
March	1.1	0.63	1.34	1.01	1.11	*0.22*	0.96	0.82	0.64	*0.95*	**1.69**
April	1.96	1.27	2.35	1.7	*0.9*	**5.07**	*0.47*	1.56	1.63	1.91	1.82
May	3.01	1.89	3.63	**5.13**	**3.65**	**6.69**	*1.72*	2.16	**4.53**	**9.01**	3.35
June	4.29	3.26	5	3.96	**5.89**	3.79	4.28	3.36	*1.45*	**5.78**	*1.71*
July	3.37	2.44	3.96	**13.51**	**4.08**	**4.91**	**5.13**	**5.51**	3.23	*1.42*	**4.92**
August	3.94	2.73	4.7	**4.91**	**5.14**	**9.59**	**4.9**	*1.9*	3.01	*1.77*	*2.10*
September	3.65	2.44	4.36	**5.33**	*2.23*	*1.41*	3.74	**5.42**	4.04	2.79	*2.13*
October	2.88	1.77	3.48	*1.48*	2.34	**4.07**	2.16	*1.5*	3.08	2.78	1.98
November	1.75	1	2.13	*0.09*	1.33	2.02	*0.29*	1.49	*0.34*	**3.44**	
December	1.07	0.74	1.27	*0.19*	0.81	*0.67*	*0.5*	0.88	**1.96**	0.90	
Annual	28.6	*25.96*	**30.86**	**38.64**	28.78	**41.42**	*24.53*	*25.23*	*25.37*	**33.40**	
Water Year					26.06	**39.14**	28.34	*24.31*	*23.86*	**31.66**	26.14

[1] The only normal period available for Babbitt is 1961-1985, which is the basis of the data above.
Bold = above the normal range
Italics = below the normal range

Table 2
Wetland Communities, Classification Systems, And Common Vegetation
PolyMet Mining

Wetland Plant Community Types (Eggers and Reed, 1997)	Classification of Wetlands and Deep Water Habitats of the United States (Cowardin et al. 1979)	Fish and Wildlife Service Circular 39 (Shaw and Fredine 1971)	Examples of Common Vegetation
Shallow, Open Water	Palustrine or lacustrine, littoral; aquatic bed; submergent, floating, and floating-leaved	Type 5: Inland open fresh water	White water lily, Yellow water lily, Northern milfoil, Largeleaf pondweed
Deep Marsh	Palustrine or lacustrine, littoral; aquatic bed; submergent, floating-leaved; and emergent; persistent and nonpersistent	Type 4: Inland deep fresh marsh	Bullrushes, Cattail, Duckweed, Water shield
Shallow Marsh	Palustrine; emergent; persistent and nonpersistent	Type 3: Inland shallow fresh marsh	Cattails, Reed canary grass, Common reed
Sedge Meadow	Palustrine; emergent; narrow leaved persistent	Type 2: Inland fresh meadow	Sedges, Canada bluejoint, Fowl bluegrass
Fresh (Wet) Meadow	Palustrine; emergent; broad and narrow-leaved persistent	Type 1: Seasonally flooded basin of flat; Type 2: Inland fresh meadow	Reed canary grass, Sawtooth sunflower, Joe-pye-weed, Giant goldenrod
Wet to Wet-Mesic Prairie	Palustrine; emergent; broad- and narrow leaved persistent	Type 1: Seasonally flooded basin of flat; Type 2: Inland fresh meadow	Cattail, gayfeather, Prairie cordgrass, Slender rush, Black bentgrass
Calcareous Fen	Palustrine; emergent; narrow-leaved persistent; and scrub	Type 2: Inland fresh meadow	Dioecious sedge, Beaked spikerush, Needle beakrush, Shrubby cinquefoil
Open Bog	Palustrine; moss/lichen; and scrub/shrub; broad-leaved evergreen	Type 8: Bog	Bog moss, Leatherleaf, Bog rosemary, Cranberry
Coniferous Bog	Palustrine; forested: needle-leaved evergreen and deciduous	Type 8: Bog	Tamarack, Black spruce, Cotton grass, Leatherleaf
Shrub-Carr	Palustrine; scrub/shrub; broad leaved deciduous	Type 6: Shrub swamp	Meadow willow, Pussy willow, Uptight Sedge, Canada blue-joint grass
Alder Thicket	Palustrine; scrub/shrub; broad-leaved deciduous	Type 6: Shrub swamp	Speckled Alder, American elder, Narrowleaf meadowsweet, Cinnamon fern
Hardwood Swamp	Palustrine; forested; broad-leaved deciduous	Type 7: Wooded swamp	Black ash, Lake sedge, Ostrich fern, Marsh marigold
Coniferous Swamp	Palustrine; forested; needle-leaved deciduous and evergreen	Type 7: Wooded swamp	Northern white cedar, Cinnamon fern, Yellow birch
Floodplain Forest	Palustrine; forested; broad-leaved deciduous	Type 1: Seasonally flooded basin or flat	Silver maple, Canada wood-nettle, Canada hornwort, Green ash
Seasonally Flooded Basin	Palustrine; flat; emergent; persistent and non-persistent	Type 1: Seasonally flooded basin or flat	Willow-weed, Pennsylvania smartweed, Barnyard grass, White goosefoot

Table 3: Delineated Wetland and Deepwater Habitat Types
PolyMet Mining

Project Area	Wetland ID	Total Wetland Area (acres)	Project Area Wetland Resources (acres)	Dominant Circular 39 Type	Secondary Circular 39 Type	Additional Circular 39 Type	Dominant Cowardin Type	Secondary Cowardin Type	Additional Cowardin Type	Field Delineated
Mine Site	1	0.42	0.42	3	2		PEMC	PEMB		Y
Mine Site	3	0.35	0.35	3	2		PEMC	PEMB		Y
Mine Site	5	0.61	0.61	2			PEMB			Y
Mine Site	6	0.62	0.62	3			PEMC			Y
Mine Site	7	0.07	0.07	2			PEMB			Y
Mine Site	8	6.16	6.16	2	3		PEMB	PEMC		Y
Mine Site	9	1.84	1.82	3	2		PEMC	PEMB		Y
Mine Site	10	1.17	1.17	2	3	6	PEMB	PEMC	PSSB	Y
Mine Site	11	8.88	8.88	8			PFO4B			Y
Mine Site	12	227.92	0.13	6	7		PSSB	PFOB		Y
Mine Site	13	5.03	5.03	2	3		PEMB	PEMC		Y
Mine Site	14	0.33	0.33	2			PEMB			Y
Mine Site	15	2.79	2.79	8			PFO4B			Y
Mine Site	16	0.31	0.31	3			PEMC			Y
Mine Site	18	18.89	18.89	3	2		PEMF	PEMB		Y
Mine Site	19	1.68	1.68	3			PEMF			Y
Mine Site	20	21.89	21.89	2	6		PEMB	PSSB		Y
Mine Site	22	8.71	2.51	3	7	8	PEMC	PFOB	PFO4B	Y
Mine Site	24	0.80	0.81	6	7		PSSB	PFOB		Y
Mine Site	25	1.95	1.95	8			PFOB			Y
Mine Site	27	1.07	1.07	8			PFOB			Y
Mine Site	29	12.01	12.01	3	2		PEMC	PEMB		Y
Mine Site	32	69.89	69.89	8			PFOB			Y
Mine Site	33	23.91	23.91	6	8		PSSB	PFO4B		Y
Mine Site	34	0.99	0.99	6			PSSB			Y
Mine Site	37	2.39	2.39	6			PSSB			N
Mine Site	43	8.33	8.33	6			PSSB			Y
Mine Site	44	3.27	3.27	6	8		PSSB	PFO4B		Y
Mine Site	45	30.58	30.58	6			PSSIC			Y
Mine Site	47	0.54	0.54	8			PFO4B			Y
Mine Site	48	98.45	98.45	8			PFO4B			Y
Mine Site	51	2.91	2.91	6			PSSB			Y
Mine Site	52	3.88	3.88	6	7		PSSB	PFOB		Y
Mine Site	53	132.33	24.23	6	8		PSSB	PFO4B		Y
Mine Site	54	10.24	4.85	6	8		PSSB	PFO4B		Y
Mine Site	55	3.91	3.91	6	8		PSSB	PFO4B		Y
Mine Site	56	2.79	2.79	8			PFO4B			Y
Mine Site	57	83.83	72.95	7	6		PFOB	PSSB		Y
Mine Site	58	33.29	33.29	6			PSSB			Y
Mine Site	60	5.95	5.95	6	8		PSSB	PFO4B		N
Mine Site	61	0.45	0.45	7	2		PFOB	PEMB		Y
Mine Site	62	12.13	12.13	8	7		PFO1B	PFO2B		Y

Table 3: Delineated Wetland and Deepwater Habitat Types
PolyMet Mining

Project Area	Wetland ID	Total Wetland Area (acres)	Project Area Wetland Resources (acres)	Dominant Circular 39 Type	Secondary Circular 39 Type	Additional Circular 39 Type	Dominant Cowardin Type	Secondary Cowardin Type	Additional Cowardin Type	Field Delineated
Mine Site	64	0.31	0.31	7	7		PFO1B	PFO2B		N
Mine Site	68	20.05	20.05	7	7		PFO1B	PFO2B		N
Mine Site	72	1.38	1.38	7	6		PFO1B	PSSB		Y
Mine Site	74	6.12	6.12	7			PFO2B			Y
Mine Site	76	3.38	3.38	8			PFOB			Y
Mine Site	77	13.00	13.00	8			PFOB			Y
Mine Site	78	0.81	0.81	8	8		PFO4B	PFO2B		Y
Mine Site	79	2.39	2.39	8			PFO4B			Y
Mine Site	80	0.29	0.29	8	8		PFO2B	PFO4B		Y
Mine Site	81	1.68	1.68	7			PFO4B			Y
Mine Site	82	61.52	61.52	8			PFO4B			Y
Mine Site	83	21.78	3.99	8			PSSB			Y
Mine Site	84	8.76	1.33	8			PFO4B			Y
Mine Site	85	1.41	1.41	8			PFO4B			Y
Mine Site	86	2.47	2.47	8			PFO4B			Y
Mine Site	88	5.57	5.57	8			PFO4B			N
Mine Site	90	189.35	184.69	8	8		PSSB	PFO4B		Y
Mine Site	95	2.54	2.54	8			PFO4B			N
Mine Site	96	17.29	17.29	8			PFO4B			Y
Mine Site	97	3.53	3.53	8			PFO4B			N
Mine Site	98	15.49	15.49	8			PFO4B			Y
Mine Site	99	1.40	1.40	8			PFO4B			Y
Mine Site	100	605.59	192.26	8			PFO4B			Y
Mine Site	101	15.09	15.09	8			PFO4B			Y
Mine Site	103	125.89	125.89	8	6		PFO4B	PSSB		Y
Mine Site	104	3.57	3.57	8			PFO4B			Y
Mine Site	105	19.80	15.47	8			PFOB			Y
Mine Site	107	65.80	65.80	8			PFO4B			Y
Mine Site	109	6.03	6.03	6	7	8	PSSB	PFOB	PFO4B	Y
Mine Site	114	89.76	0.74	8	3		PFOC	PEMC		Y
Mine Site	120	0.58	0.58	3			PEMC			Y
Mine Site	200	7.26	6.36	7	6		PFOB	PSSB		Y
Mine Site	201	13.48	13.48	2	6		PEMB	PSSB		Y
Mine Site	202	242.30	5.67	7	6		PFOC	PSSC		Y
Mine Site Subtotal	**76**	**2,429**	**1,296.7**							
Railroad	R-1	1.05	0.00	2			PEMB			Y
Railroad	R-2	1.65	0.00	3			PEMC			Y
Railroad	R-3	0.63	0.10	7			PFOB			Y
Railroad	R-4	3.50	0.17	6			PSSB			Y
Railroad	R-5	24.41	0.00	3	4		PEMF	PEMG		Y
Railroad	R-6	10.42	0.00	3			PEMC			Y
Railroad	R-7	12.14	0.00	6	3		PSSB	PEMC		Y

Table 3: Delineated Wetland and Deepwater Habitat Types
PolyMet Mining

Project Area	Wetland ID	Total Wetland Area (acres)	Project Area Wetland Resources (acres)	Dominant Circular 39 Type	Secondary Circular 39 Type	Additional Circular 39 Type	Dominant Cowardin Type	Secondary Cowardin Type	Additional Cowardin Type	Field Delineated
Railroad	R-8	3.00	0.00	6			PSSB			Y
Railroad Subtotal	**8**	**56.8**	**0.3**							
Tailings Basin Drain System	N/A	Unknown	~5							N
Tailings Basin Subtotal	**8**	**Unknown**	**5.0**							
Water Pipeline	R-8	Unknown	~10							N
Water Pipeline Subtotal	**8**	**Unknown**	**10.0**							
Project Subtotal	**84**	**2486**	**1312.0**							
Alternative EIS Areas										
Area 2E	1	6.4	Unknown	deepwater						N
Area 2E	2	75.2	Unknown	deepwater						N
Area 2E	3	78.0	Unknown	deepwater						N
Area 2W	1	1.1	Unknown	deepwater						N
Area 2W	2	3.5	Unknown	deepwater						N
Area 2W	3	157.2	Unknown	deepwater						N
Area 2WX	1	0.6	Unknown	deepwater						N
Area 2WX	2	0.8	Unknown	deepwater						N
Area 2WX	3	0.8	Unknown	deepwater						N
Area 2WX	4	1.9	Unknown	deepwater						N
Area 2WX	5	2.4	Unknown	deepwater						N
Area 2WX	6	28.8	Unknown	deepwater						N
Area 2WX	7	213.5	Unknown	deepwater						N
Area 5N	1	2.8	Unknown	deepwater						N
Area 5N	2	4.2	Unknown	deepwater						N
Area 5N	3	4.5	Unknown	deepwater						N
Area 5N	4	25.4	Unknown	deepwater						N
Area 5N	5	70.2	Unknown	deepwater						N
Area 5S	1	11.1	Unknown	deepwater						N
Area 5S	2	21.8	Unknown	deepwater						N
Area 5S	3	45.6	Unknown	deepwater						N
Area 5S	4	54.1	Unknown	deepwater						N
Alternative EIS Areas Subtotal	**22**	**810**	**Unknown**							
Total of All Potential Project Components	**106**	**3,296**	**1,312**							

Table 4: Delineated Wetland and Deepwater Habitat Quality
PolyMet Mining

Project Area	Wetland ID	Dominant Circular 39 Type	Total Wetland Area (acres)	Project Area Wetland Resources (acres)	Dominant Community Type	Vegetative Diversity/ Integrity	Overall Wetland Quality	Disturbance Level	Disturbance Type	Wetland Origin	Field Delineated
Mine Site	1	3	0.42	0.42	shallow marsh	Moderate	Moderate	High	Impounded	Natural	Y
Mine Site	3	3	0.35	0.35	shallow marsh	Moderate	Moderate	High	Impounded	Natural	N
Mine Site	5	2	0.61	0.61	wet meadow	High	High	Low		Natural	Y
Mine Site	6	3	0.62	0.62	shallow marsh	Moderate	Moderate	High	Impounded	Natural	Y
Mine Site	7	2	0.07	0.07	wet meadow	Moderate	Moderate	High	Impounded	Natural	N
Mine Site	8	2	6.16	6.16	sedge meadow	Moderate	Moderate	High	Impounded/Fill	Natural	Y
Mine Site	9	3	1.84	1.82	shallow marsh	High	High	Moderate	Impounded	Natural	Y
Mine Site	10	2	1.17	1.17	sedge meadow	High	High	Low		Natural	Y
Mine Site	11	8	8.88	8.88	coniferous bog	High	High	Low		Natural	Y
Mine Site	12	6	227.92	0.13	alder thicket	High	High	Low		Natural	Y
Mine Site	13	2	5.03	5.03	wet meadow	High	High	High	Impounded	Natural	Y
Mine Site	14	2	0.33	0.33	wet meadow	High	High	Low		Natural	Y
Mine Site	15	8	2.79	2.79	black spruce bog	High	High	Low		Natural	Y
Mine Site	16	3	0.31	0.31	shallow marsh	High	High	Low		Natural	Y
Mine Site	18	3	18.89	18.89	shallow marsh	High	High	Moderate	Impounded	Natural	Y
Mine Site	19	3	1.68	1.68	shallow marsh	High	High	Low		Natural	Y
Mine Site	20	2	21.89	21.89	sedge meadow	High	High	Low		Natural	N
Mine Site	22	3	8.71	2.51	shallow marsh	High	High	Low		Natural	Y
Mine Site	24	6	0.80	0.81	alder thicket	High	High	Low		Natural	Y
Mine Site	25	8	1.95	1.95	black spruce bog	High	High	Low		Natural	Y
Mine Site	27	8	1.07	1.07	black spruce bog	Moderate	Moderate	High	Road Fill	Natural	Y
Mine Site	29	3	12.01	12.01	shallow marsh	High	High	Low		Natural	Y
Mine Site	32	8	69.89	69.89	coniferous bog	High	High	Low		Natural	Y
Mine Site	33	6	23.91	23.91	alder thicket	High	High	Low		Natural	Y
Mine Site	34	6	0.99	0.99	alder thicket	High	High	Low		Natural	Y
Mine Site	37	6	2.39	2.39	shrub carr	High	High	Low		Natural	N
Mine Site	43	6	8.33	8.33	alder thicket	High	High	Low		Natural	Y
Mine Site	44	6	3.27	3.27	alder thicket	High	High	Low		Natural	Y
Mine Site	45	6	30.58	30.58	alder thicket	High	High	Low		Natural	Y
Mine Site	47	8	0.54	0.54	open bog	High	High	Low		Natural	Y
Mine Site	48	8	98.45	98.45	cedar bog	High	High	Low		Natural	Y
Mine Site	51	6	2.91	2.91	alder thicket	High	High	Low		Natural	Y
Mine Site	52	6	3.88	3.88	alder thicket	High	High	Low		Natural	Y
Mine Site	53	6	132.33	24.23	alder thicket	High	High	Low		Natural	Y
Mine Site	54	6	10.24	4.85	alder thicket	High	High	Low		Natural	Y
Mine Site	55	6	3.91	3.91	alder thicket	High	High	Low		Natural	Y
Mine Site	56	8	2.79	2.79	black spruce bog	High	High	Low		Natural	Y
Mine Site	57	7	83.83	72.95	coniferous swamp	High	High	Low		Natural	Y
Mine Site	58	6	33.28	33.29	alder thicket	High	High	Low		Natural	Y
Mine Site	60	6	5.95	5.95	alder thicket	High	High	Low		Natural	Y
Mine Site	61	7	0.45	0.45	coniferous swamp	High	High	Low		Natural	Y
Mine Site	62	8	12.13	12.13	coniferous bog	High	High	Low		Natural	Y
Mine Site	64	7	0.31	0.31	forested swamp	High	High	Low		Natural	N
Mine Site	68	7	20.05	20.05	forested swamp	High	High	Low		Natural	N
Mine Site	72	7	1.38	1.38	coniferous swamp	High	High	Low		Natural	Y
Mine Site	74	7	6.12	6.12	hardwood swamp	High	High	Low		Natural	Y

Table 4: Delineated Wetland and Deepwater Habitat Quality
PolyMet Mining

Project Area	Wetland ID	Dominant Circular 39 Type	Total Wetland Area (acres)	Project Area Wetland Resources (acres)	Dominant Community Type	Vegetative Diversity/ Integrity	Overall Wetland Quality	Disturbance Level	Disturbance Type	Wetland Origin	Field Delineated
Mine Site	76	8	3.38	3.38	coniferous bog	High	High	Low		Natural	Y
Mine Site	77	8	13.00	13.00	black spruce bog	High	High	Low		Natural	Y
Mine Site	78	8	0.81	0.81	coniferous bog	High	High	Low		Natural	Y
Mine Site	79	8	2.39	2.39	black spruce bog	High	High	Low		Natural	Y
Mine Site	80	8	0.29	0.29	black spruce bog	High	High	Low		Natural	Y
Mine Site	81	7	1.68	1.68	coniferous swamp	High	High	Low		Natural	Y
Mine Site	82	8	61.52	61.52	coniferous bog	High	High	Low		Natural	Y
Mine Site	83	8	21.78	3.99	open bog	High	High	Low		Natural	Y
Mine Site	84	8	8.76	1.33	black spruce bog	High	High	Low		Natural	Y
Mine Site	85	8	1.41	1.41	black spruce bog	High	High	Low		Natural	Y
Mine Site	86	8	2.47	2.47	coniferous bog	High	High	Low		Natural	Y
Mine Site	88	8	5.57	5.57	coniferous bog	High	High	Low		Natural	N
Mine Site	90	8	189.35	184.69	open bog	High	High	Low		Natural	Y
Mine Site	95	8	2.54	2.54	black spruce bog	High	High	Low		Natural	N
Mine Site	96	8	17.29	17.29	black spruce bog	High	High	Low		Natural	Y
Mine Site	97	8	3.53	3.53	black spruce bog	High	High	Low		Natural	N
Mine Site	98	8	15.49	15.49	black spruce bog	High	High	Low		Natural	Y
Mine Site	99	8	1.40	1.40	black spruce bog	High	High	Low		Natural	Y
Mine Site	100	8	605.59	192.26	coniferous bog	High	High	Low		Natural	Y
Mine Site	101	8	15.09	15.09	black spruce bog	High	High	Low		Natural	Y
Mine Site	103	8	125.89	125.89	tamarack bog	High	High	Low		Natural	Y
Mine Site	104	8	3.57	3.57	black spruce bog	High	High	Low		Natural	Y
Mine Site	105	8	19.80	15.47	black spruce bog	High	High	Moderate	Logged	Natural	Y
Mine Site	107	8	65.80	65.80	black spruce bog	High	High	Low		Natural	Y
Mine Site	109	6	6.03	6.03	alder thicket	High	High	Low	Partly cleared	Natural	Y
Mine Site	114	8	89.76	0.74	coniferous bog	High	High	Low		Natural	Y
Mine Site	120	3	0.58	0.58	shallow marsh	Moderate	Moderate	Moderate	Impounded	Natural	Y
Mine Site	200	7	7.26	6.36	hardwood swamp	High	High	Low		Natural	Y
Mine Site	201	2	13.48	13.48	wet meadow	High	High	Low		Natural	Y
Mine Site	202	7	242.30	5.67	coniferous swamp	High	High	Low		Natural	Y
Mine Site Subtotal	**76**		**2,429**	**1,296.7**		**69/76 High 7/76 Medium**	**69/76 High 7/76 Medium**				
Railroad	R-1	2	1.05	0.00	wet meadow	High	High	Moderate	Road fill	Natural	
Railroad	R-2	3	1.65	0.00	shallow marsh	High	High	Moderate	Road fill	Natural	
Railroad	R-3	7	0.63	0.10	hardwood swamp	High	High	Moderate	Road fill	Natural	
Railroad	R-4	6	3.50	0.17	shrub carr	High	High	Low		Natural	
Railroad	R-5	3	24.41	0.00	shallow marsh	High	High	Moderate	Impounded	Natural	
Railroad	R-6	3	10.42	0.00	shallow marsh	High	High	Low		Natural	
Railroad	R-7	6	12.14	0.00	shrub carr	High	High	Moderate	Impounded	Natural	
Railroad	R-8	6	3.00	0.00	shrub carr	High	High	Moderate	Impounded	Natural	
Railroad Subtotal	**8**		**56.8**	**0.27**		**6/8 High 2/8 Medium**	**6/8 High 2/8 Medium**				
Tailings Basin Drain S	Unknown	Unknown	Unknown	~5							N
Tailings Basin Subtotal				**5**							

Table 4: Delineated Wetland and Deepwater Habitat Quality
PolyMet Mining

Project Area	Wetland ID	Dominant Circular 39 Type	Total Wetland Area (acres)	Project Area Wetland Resources (acres)	Dominant Community Type	Vegetative Diversity/ Integrity	Overall Wetland Quality	Disturbance Level	Disturbance Type	Wetland Origin	Field Delineated
Water Pipeline	Unknown	Unknown	Unknown	~10							N
Water Pipeline Subtotal				**10**							
Alternative EIS Areas											
Area 2E	1	deepwater	6.4	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 2E	2	deepwater	75.2	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 2E	3	deepwater	78.0	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 2W	1	deepwater	1.1	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 2W	2	deepwater	3.5	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 2W	3	deepwater	157.2	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 2WX	1	deepwater	0.6	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 2WX	2	deepwater	0.8	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 2WX	3	deepwater	0.8	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 2WX	4	deepwater	1.9	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 2WX	5	deepwater	2.4	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 2WX	6	deepwater	28.8	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 2WX	7	deepwater	213.5	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 5N	1	deepwater	2.8	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 5N	2	deepwater	4.2	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 5N	3	deepwater	4.5	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 5N	4	deepwater	25.4	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 5N	5	deepwater	70.2	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 5S	1	deepwater	11.1	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 5S	2	deepwater	21.8	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 5S	3	deepwater	45.6	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Area 5S	4	deepwater	54.1	Unknown	deepwater	Low	Low	High	Mine Pit	Artificial	N
Alternative EIS Areas Subtotal	**22**		**810**	**Unknown**		**22/22 Low**	**22/22 Low**				
Total of All Potential Project Components	**106**		**3,296**	**1,312**		**75/106 High 9/106 Medium 22/106 Low**	**75/106 High 9/106 Medium 22/106 Low**				

Table 5: Summary of Project Area Wetland Resources by Circular 39 Type[1]
PolyMet Mining

Project Area		Circular 39 Type								Total
		1	**2**	**3**	**4**	**6**	**7**	**8**	**Deepwater**	
Mine Site	(acres)	0.00	48.73	39.20	0.00	155.44	114.96	938.36	0.00	1296.7
	% of mine impacts	0.0%	11.3%	11.7%	0.0%	93.6%	28.9%	254.5%	0.0%	
	# wetlands	0	8	10	0	16	9	33	0	76
Raillroad	(acres)	0.00	0.00	0.00	0.00	0.17	0.10	0.00	0.00	0.3
	% of railroad impacts	0.0%	0.0%	0.0%	0.0%	63.0%	37.0%	0.0%	0.0%	
	# wetlands	0	0	0	0	1	1	0	0	2
Tailings Basin Drain System	(acres)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	5.0
	% of tailings basin impacts									
	# wetlands									
Water Pipeline	(acres)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	10.0
	% of water pipeline impacts									
	# wetlands									
Total	(acres)	0.0	48.7	39.2	0.0	155.6	115.1	938.4	0.0	1312.0
	(%of impact area	0.0%	3.7%	3.0%	0.0%	11.9%	8.8%	71.5%	0.0%	
	# wetlands	0	8	10	0	17	10	33	0	78

[1] This wetland summary is based on the predominant wetland type within each wetland.

Table 6: Summary of Project Area Wetland Resources by Quality
PolyMet Mining

Project Area		Overall Wetland Quality			Total
		High	Medium	Low	
Mine Site	(acres)	1287.98	8.69	0.00	1296.7
	% of impact Area	99%	1%	0%	
	# wetlands	72	6	0	78
Railroad	(acres)	0.27	0.00	0.00	0.3
	% of impact Area	100%	0%	0%	
	# wetlands	0	0	0	0
Tailings Basin Drain System	(acres)	Unknown	Unknown	Unknown	5.0
	% of impact Area				
	# wetlands	Unknown	Unknown	Unknown	
Water Pipeline	(acres)	Unknown	Unknown	Unknown	10.0
	% of impact Area				
	# wetlands	Unknown	Unknown	Unknown	
Total of All Potential Project Areas	(acres)	1288.3	8.7	0.0	1312
	% of impact Area	98%	1%	0%	

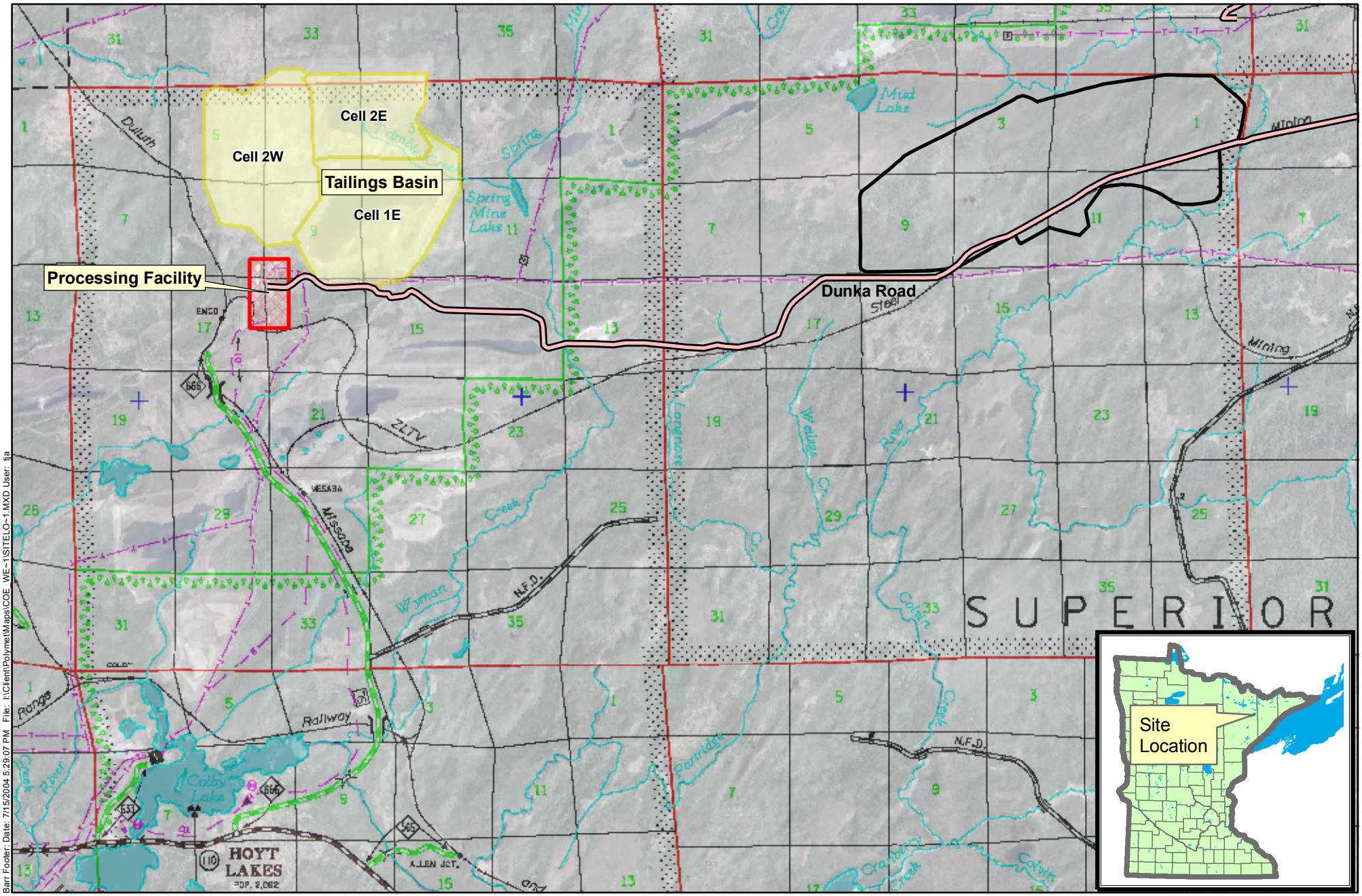
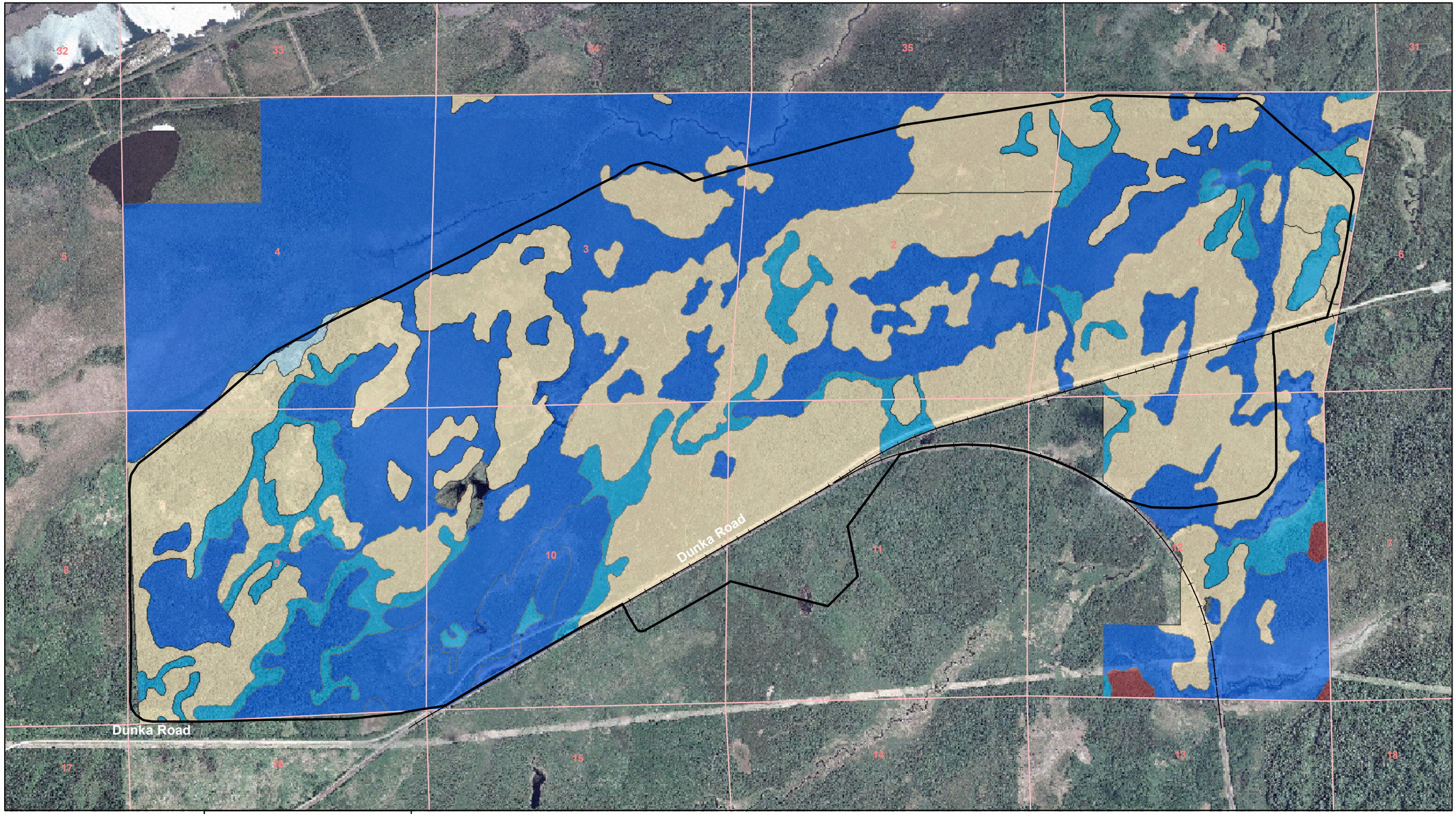


Figure 1

SITE LOCATION MAP
Polymet Mining
Hoyt Lakes, Minnesota



Barr Footer: Date: 7/13/2004 11:13:03 AM File: I:\Client\Polymet\Maps\COE_Wetland\PermitSoilsMap.mxd User: lja

2003 FSA Aerial Photo

Soils (Ecological Landtype)

- Lowland Loamy Moist – LLM
- Lowland Loamy Wet – LLW
- Lowland Organic Acid to Neutral– LPN
- Upland Deep Loamy Dry Course – UDLDC
- Upland Shallow Loamy Dry – USLD
- Mine/Stockpile Project Area

N

0 750 1,500 3,000 Feet

Figure 2

USFS ECOLOGICAL LANDTYPE
SOILS INFORMATION
Polymet Mining
Hoyt Lakes, Minnesota

Dunka Road

Dunka Road

2003 FSA Aerial Photo

LEGEND

Project Area

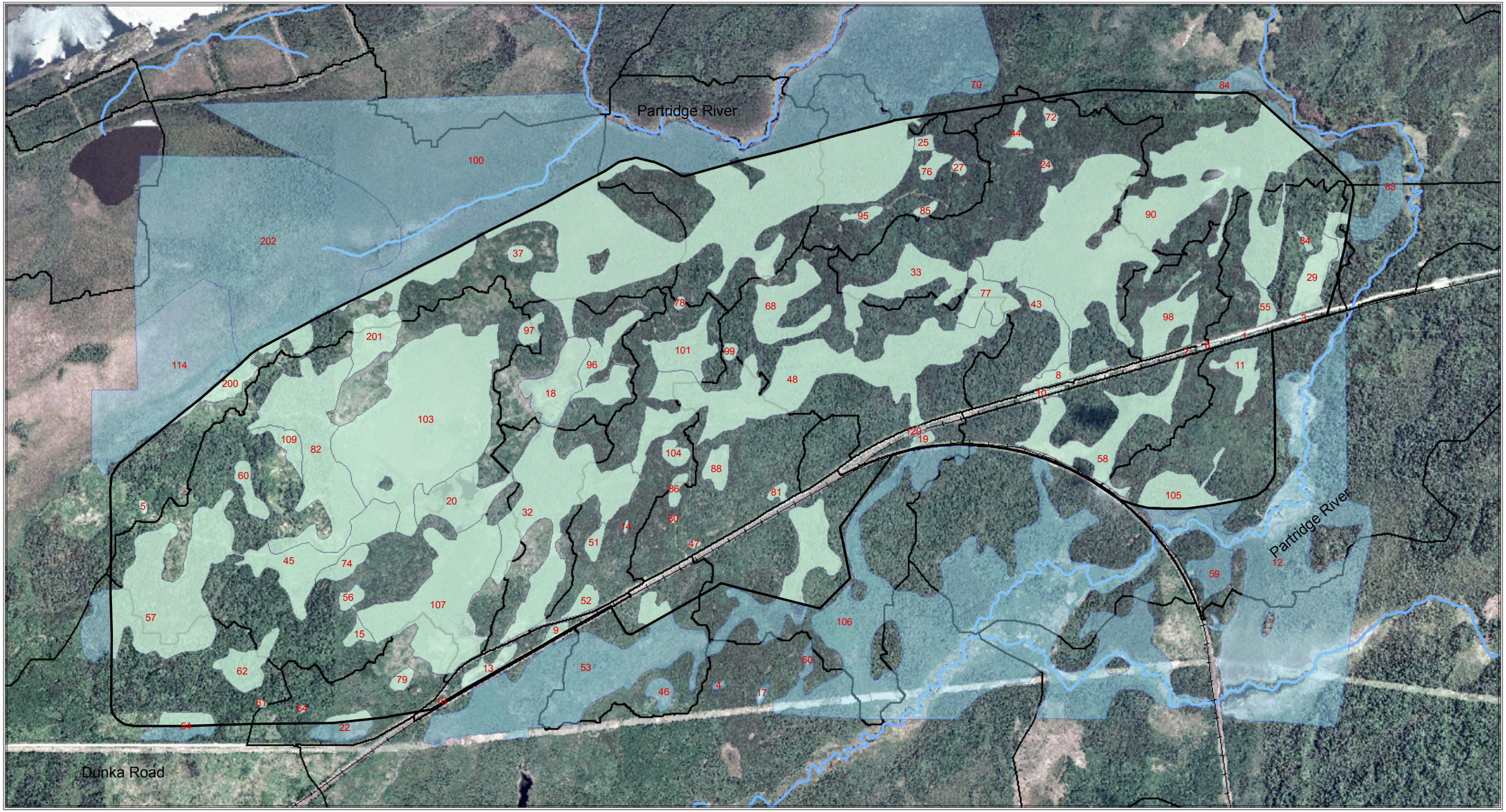
NWI (Circular 39 Type)

- 2
- 3
- 4
- 6
- 7
- 8

0 750 1,500 3,000 Feet

Figure 3

NATIONAL WETLAND INVENTORY
Mine Site
PolyMet Mining
Hoyt Lakes, Minnesota



Aerial Photo: FSA=USDA, 2003

Legend

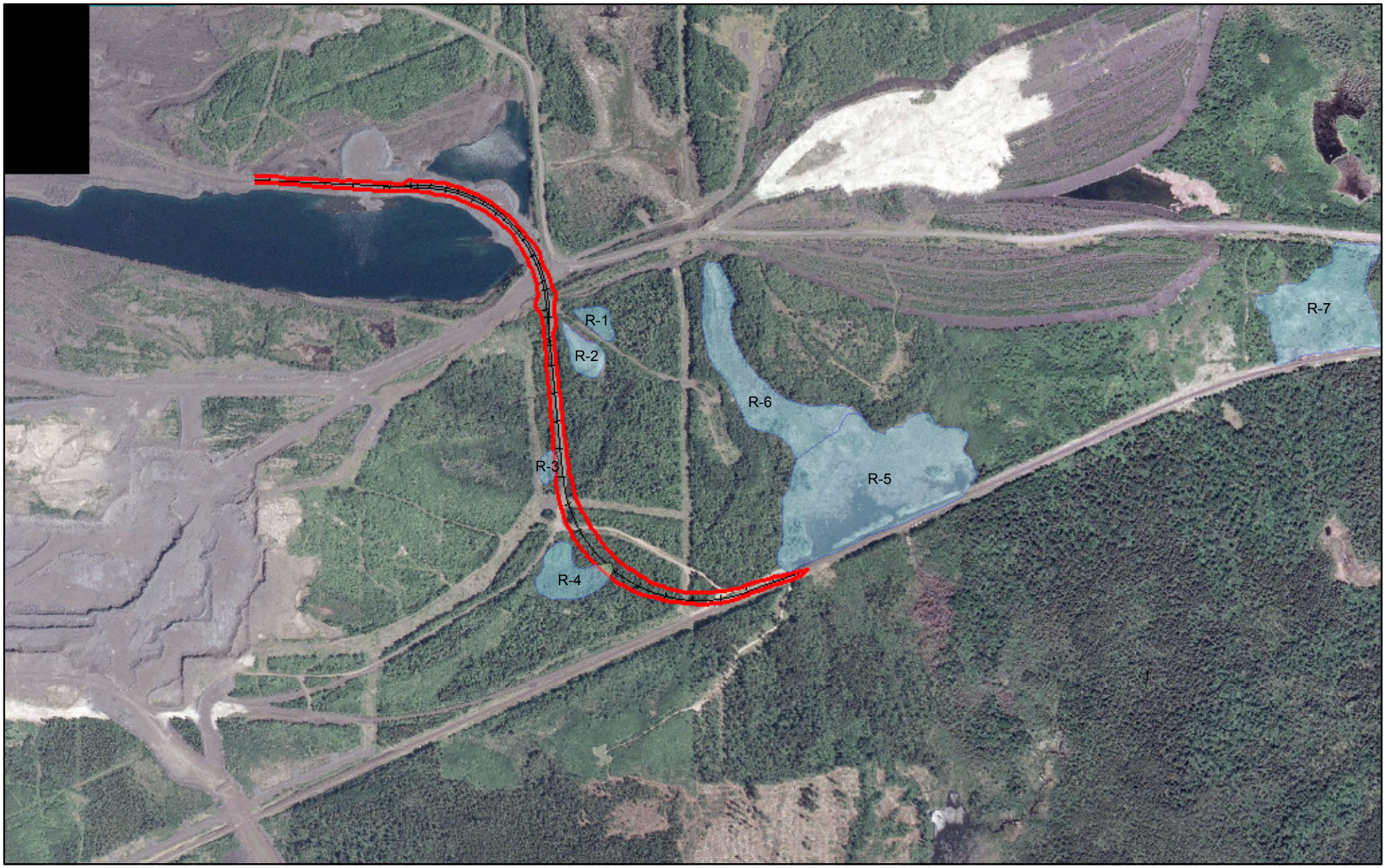
- Wetland Delineations
- Watersheds
- Mine/Stockpile Project Area
- Existing Railroad
- Streams
- Project Area Wetland Delineations

0 750 1,500 Feet

Figure 4

WETLAND DELINEATION MAP
Mine Site
PolyMet Mining
Hoyt Lakes, Minnesota

Barr Footer: Date: 11/19/2006 7:17:22 PM File: I:\Client\Polymet\Maps\Wetlands\MineWetlandDelineationMap090706.mxd User: maj



Legend

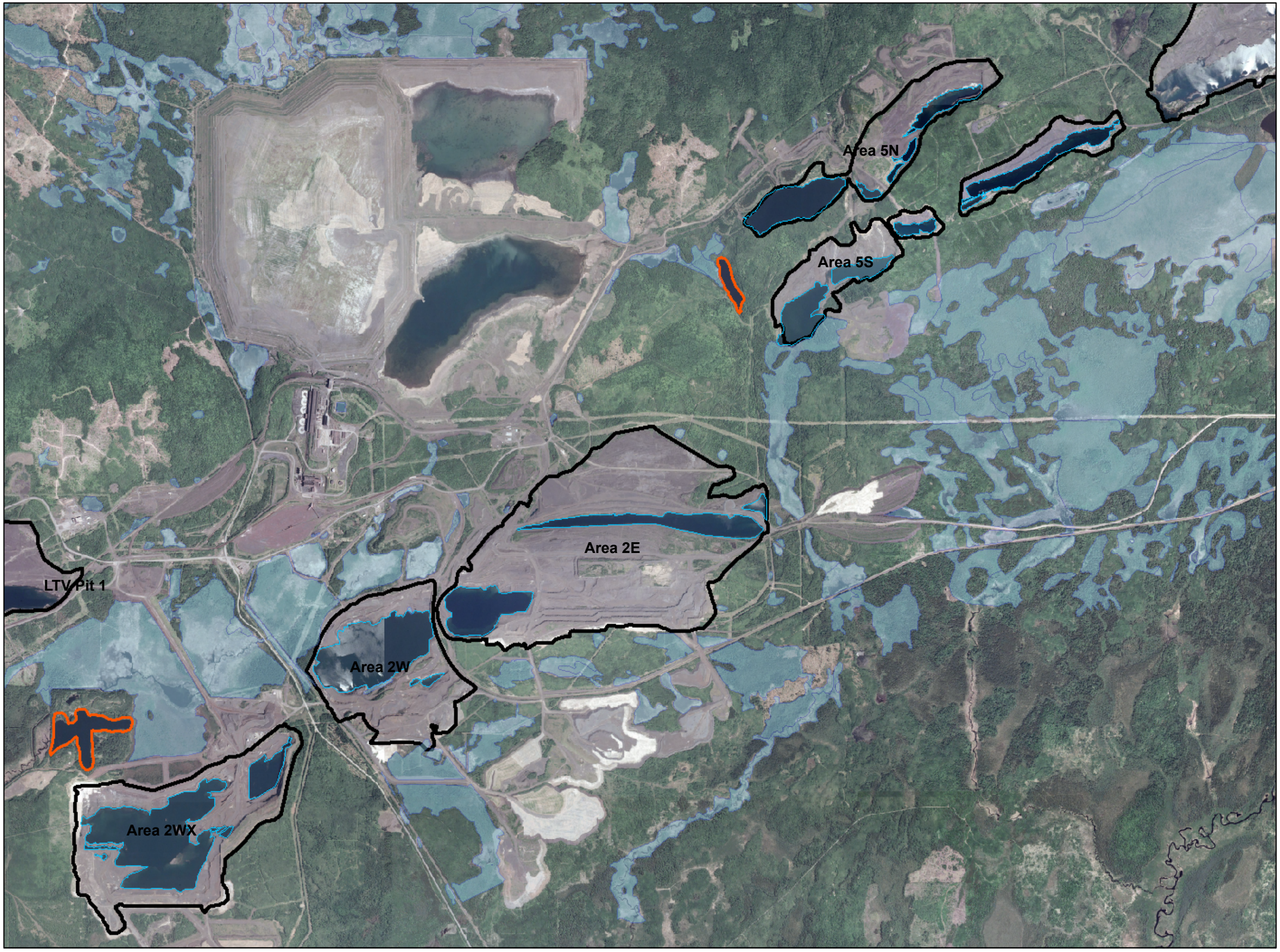
- Railroad Centerline
- Railroad Footprint
- Non-Impacted Wetland
- Impacted Wetland

0 500 1,000 2,000 Feet

Figure 5

WETLAND DELINEATION MAP
Proposed Railroad Connection
PolyMet Mining
Hoyt Lakes, Minnesota

Barr Footer: Date: 9/14/2006 2:29:55 PM File: I:\Client\Polymet\Maps\Wetlands\RailroadWetlands.mxd User: maj



Legend

- Taconite Pit Water
- Alternative Project Areas
- Natural Ore Pits
- Wetland Resources

3,000 1,500
Feet

Figure 6

WATER RESOURCES
PLANT SITE AND
TAILINGS BASIN AREAS
Polymet Mining
Hoyt Lakes, Minnesota

Barr Footer: Date: 11/16/2006 5:14:57 PM File: I:\Client\Polymet\Maps\Wetlands\Taconite_pit_water.mxd User: maj

Aerial Photo: FSA-USDA, 2003

Legend

- Mine/Stockpile Project Area
- Watersheds
- Contour10ft
- Contour 2ft
- Erie Rail
- Water

Wetland Delineations

Circular 39

- Type 1
- Type 2
- Type 3
- Type 4
- Type 6
- Type 7
- Type 8

1,500 750 0 1,500 Feet

Figure 7

WETLAND CLASSIFICATION AND TOPOGRAPHY MAP
Mine Site
PolyMet Mining
Hoyt Lakes, Minnesota

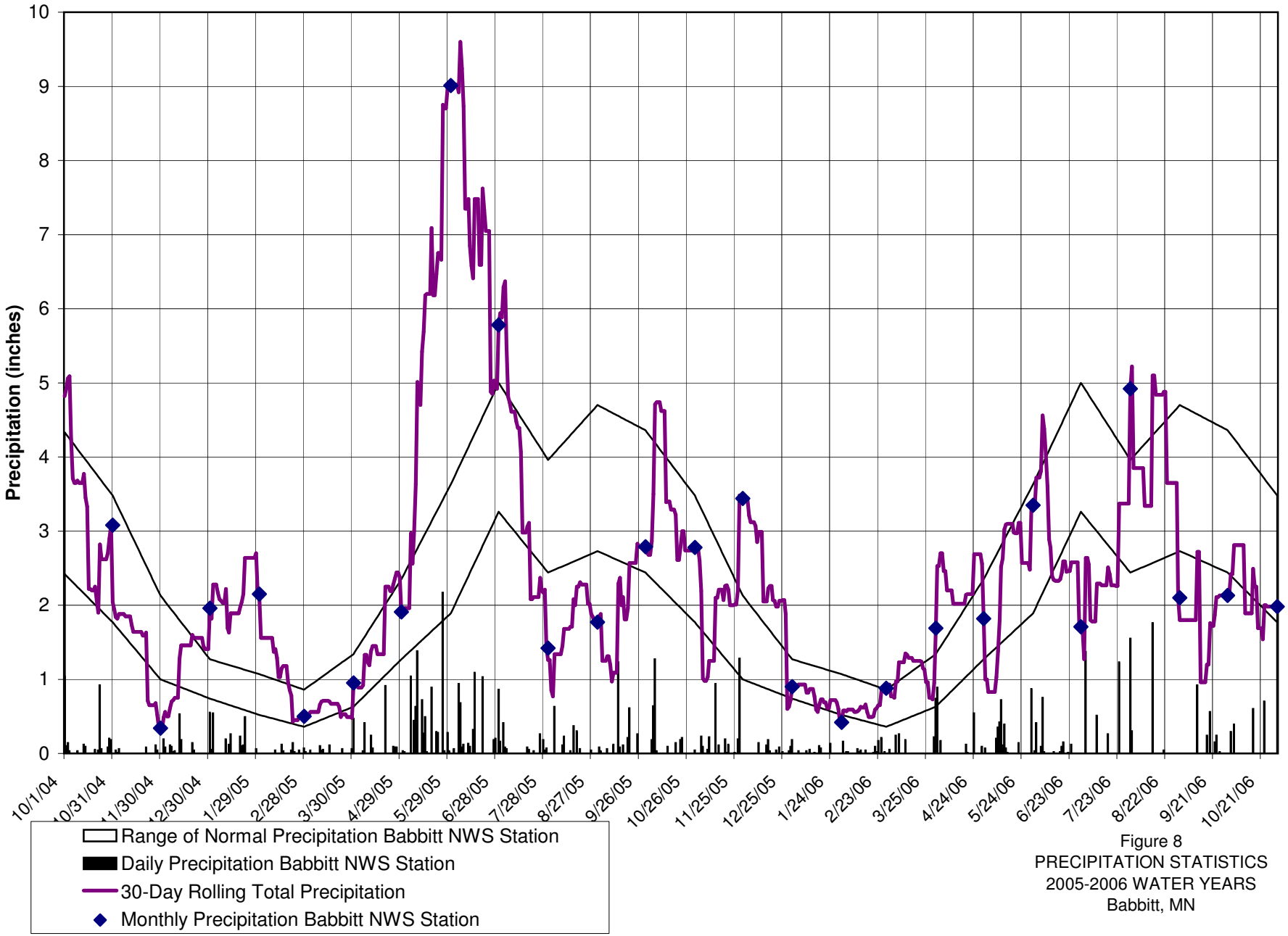
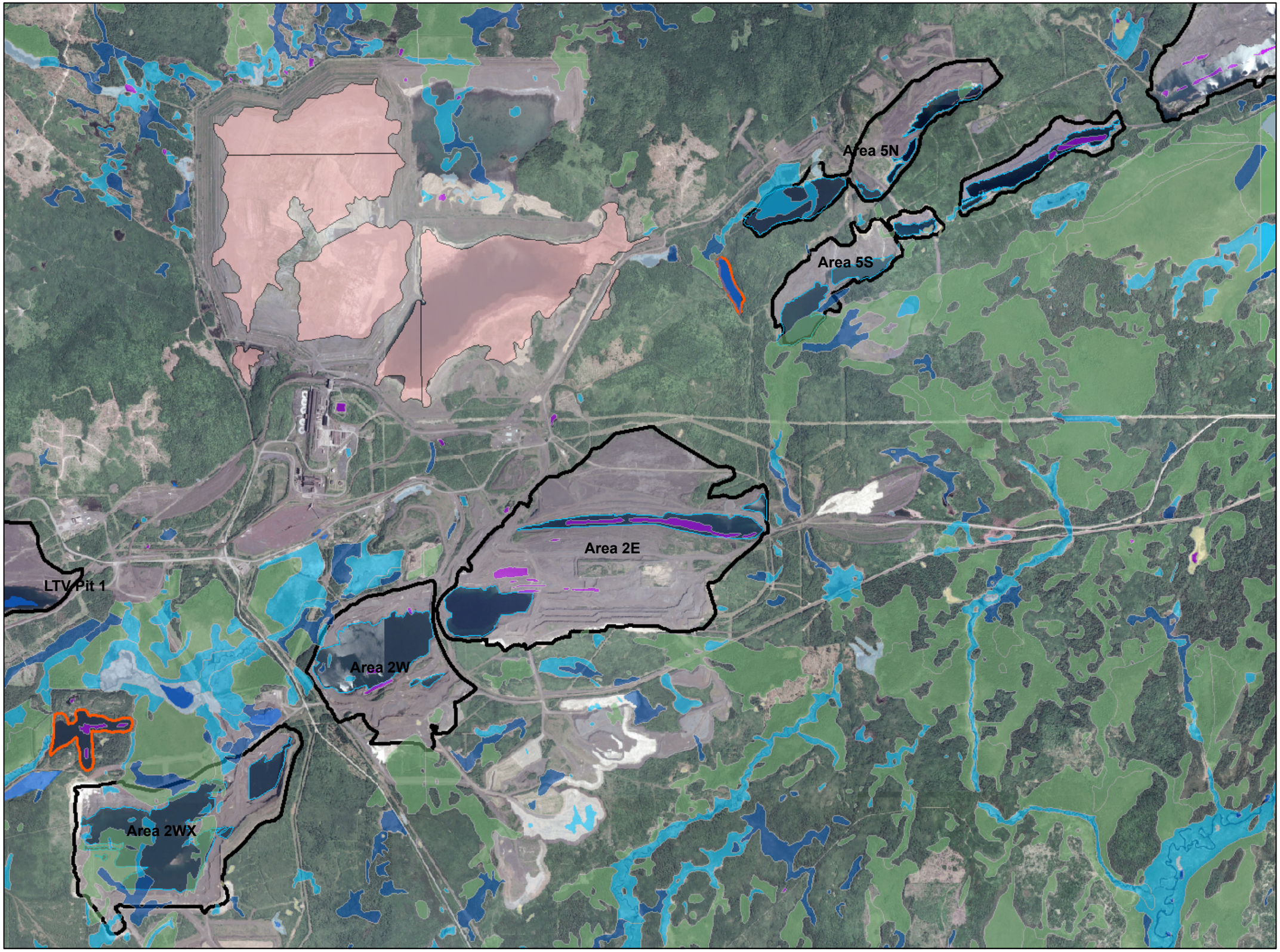


Figure 8
PRECIPITATION STATISTICS
2005-2006 WATER YEARS
Babbitt, MN



Legend

National Wetland Inventory

Circular 39

- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 80
- Taconite Pit Water
- Alternative Project Areas
- Natural Ore Pits

3,000 1,500

Feet

Figure 9

NATIONAL WETLAND INVENTORY - PLANT SITE AND TAILINGS BASIN AREAS
Polymet Mining
Hoyt Lakes, Minnesota

Barr Footer: Date: 11/16/2006 5:14:57 PM File: I:\Client\Polymet\Maps\Wetlands\Taconite_pit_water.mxd User: maj

Appendix A

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/17/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W1
Transect ID:
Plot ID: W1
Circular 39 Type: 3/2
Cowardin: PEMC/EMB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Typha species*		H	OBL
2.	*Calamagrostis canadensis*		H	OBL
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:
Vegetation was not thoroughly investigated but clearly appeared to be hydric.

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 4 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Soils are inundated for long duration.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/17/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W5
Transect ID:
Plot ID: W5
Circular 39 Type: 2
Cowardin: PEMB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Calamagrostis canadensis*	60	H	OBL
2.	*Carex species*	30	H	NI
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Rubus strigosus*	5	H	FACW-
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☑ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
There was no water present, but water marks on large boulders within the wetland indicated prolonged inundation.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Evidence of long-duration and assumed frequent inundation.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/17/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☑	☐
Is there a potential problem area?	☐	☑
(If needed, explain on reverse)		

Community ID: W6
Transect ID:
Plot ID: W6
Circular 39 Type: 3
Cowardin: PEMC

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Typha angustifolia*		H	OBL
2.	*Calamagrostis canadensis*		H	OBL
3.				
4.				
5.				
6				
7.				
8.				
9.				
10.				

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:
Vegetation was not thoroughly investigated but clearly appeared to be hydric.

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 4 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

		Yes	No
Taxonomy (subgroup): _____	Field observations confirm map type?	☐	☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Soils are inundated for long duration.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/16/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse)		

Community ID: W8
Transect ID:
Plot ID: W8
Circular 39 Type: 2/3
Cowardin: PEMB/C

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Carex species*		H	NI
2.	*Scirpus cyperinus*		H	OBL
3.	*Calamagrostis canadensis*		H	OBL
4.	*Sparganium sp*		H	OBL
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Caltha natans*		H	OBL
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 4 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Inundated for long duration. Soils appear to be muck.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
sedge meadow

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/17/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W9
Transect ID:
Plot ID: W9
Circular 39 Type: 3/2
Cowardin: PEMC/B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Calamagrostis canadensis*		H	OBL
2.	*Typha species*		H	OBL
3.	*Carex species*		H	NI
4.				
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Scirpus cyperinus*		H	OBL
2	*Picea mariana*		T	FACW
3.				
4.				
5				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 12 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
Impounded by RR with large culverts.

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Soils were not investigated in detail, but were indundated and appeared to be frequently to permanently inundated.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
Shallow marsh, sedge meadow.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/30/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse)		

Community ID: W10
Transect ID:
Plot ID: W10
Circular 39 Type: 2/3/6
Cowardin: PEMB/C/SSB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Calamagrostis canadensis*	20	H	OBL
2.	*Salix species*	5	S/S	FACW
3.	*Scirpus cyperinus*	30	H	OBL
4.	*Larix laricina*	15	S/S	FACW
5.	*Carex species*	15	H	NI
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Sphagnum magellanicum*	5	H	OBL
2.	*Juncus species*	5	H	OBL
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 80-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 8 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
100% of the wetland is saturated to the surface. 50% is inundated with as much as 8" of water.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	7/14/2006
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W11
Transect ID:
Plot ID: W11
Circular 39 Type: 8
Cowardin: PFOB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*	30	T	FACW
2.	*Larix laricina*	30	T	FACW
3.	*Ledum groenlandicum*	50	S/S	OBL
4.	*Sphagnum magellanicum*	90	H	OBL
5.	*Alnus rugosa*	30	S/S	OBL
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Trientalis borealis*	10	H	FAC+
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		10YR 2/1 to 3/2			Fibric to hemic peat
16-18+		10YR 2/1			Silt loam

Hydric Soil Indicators:

- ☑ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
Coniferous bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	7/14/2006
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W12
Transect ID:
Plot ID: W12
Circular 39 Type: 6/7
Cowardin: PSSC/FOB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Alnus rugosa*	70	S/S	OBL
2.	*Calamagrostis canadensis*	40	H	OBL
3.	*Rubus strigosus*	20	S/S	FACW-
4.	*Sphagnum magellanicum*	40	H	OBL
5.	*Ledum groenlandicum*	20	S/S	OBL
6.	*Larix laricina*	20	T	FACW
7.	*Picea mariana*	20	T	FACW
8.	*Abies balsamea*	10	T	FACW
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Salix species*	10	S/S	FACW
2.	*Trientalis borealis*	10	H	FAC+
3.	*Ribes sp*	5	S/S	NI
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8		10YR 2/1			Mucky peat
8-28		10YR 3/2			Fibric peat

Hydric Soil Indicators:

- ☑ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
Alder swamp and coniferous swamp

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W13
Transect ID:
Plot ID: W13
Circular 39 Type: 2/3
Cowardin: PEMB/F

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Calamagrostis canadensis*	80	H	OBL
2.	*Picea mariana*	10	T	FACW
3.	*Picea mariana*	10	S/S	FACW
4	*Sphagnum magellanicum*	20	H	OBL
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Carex species*	10	H	NI
2.				
3.				
4				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 4 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
60% of the wetland is inundated with as much as 4" of water.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/28/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑

(If needed, explain on reverse).

Community ID	W14
Transect ID:	
Plot ID:	W14
Circular 39 Type:	2
Cowardin:	PEMB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Calamagrostis canadensis*	80	H	OBL
2.	*Rubus strigosus*	20	S/S	FACW-
3.	*Salix species*	10	T	FACW
4.				
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Iris versicolor*	15	H	OBL
2.	*Pinus resinosa*	5	T	FACU
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-) 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):

- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:

Depth of surface water: _____ (in.)

Depth to free water in pit: _____ (in.)

Depth to saturated soil: _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☑ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):

- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
water stains on rocks

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4		10YR2/1			mucky peat

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☑ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Appears to be inundated forlong duration.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
wet meadow

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/17/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W15
Transect ID:
Plot ID: W15
Circular 39 Type: 8
Cowardin: PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator	
1.	*Picea mariana*		T	FACW	1.
2.	*Alnus rugosa*		S/S	OBL	2.
3.	*Chamaedaphne calyculata*		S/S	OBL	3.
4.	*Ledum groenlandicum*		S/S	OBL	4.
5.	*Sphagnum species*		H	NI	5.
6.	*Calamagrostis canadensis*		H	OBL	6.
7.	*Solidago uliginosa*		H	OBL	7.
8.	*Larix laricina*		T	FACW	8.
9.	*Thuja occidentalis*		T	FACW	9.
10.					10.

Percent of dominant species that are OBL., FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):

- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:

Depth of surface water: _____ (in.)

Depth to free water in pit: _____ (in.)

Depth to saturated soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:

- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):

- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8					mucky peat

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
black spruce bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/17/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W16
Transect ID:
Plot ID: W16
Circular 39 Type: 3
Cowardin: PEMC

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Typha species*	80	H	OBL
2.	*Populus tremuloides*	10	T	FAC
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Scirpus cyperinus*	10	H	OBL
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 2 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Soils appear to be inundated for a long duration.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
shallow marsh

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/17/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☑	☐
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W18
Transect ID:
Plot ID: W18
Circular 39 Type: 3/2
Cowardin: PEMB/Fb

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Calamagrostis canadensis*		H	OBL
2.	*Glyceria sp.*		H	OBL
3.	*Carex species*		H	NI
4.	*Scirpus sp.*		H	NI
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:
Snags also present due to beaver impoundment.

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 6 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Soils not investigated, but are saturated for long duration.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
sedge meadow

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/30/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W19
Transect ID:
Plot ID: W19
Circular 39 Type: 3
Cowardin: PEMF

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*	5	T	FACW
2.	*Scirpus cyperinus*	30	H	OBL
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Carex species*	5	H	NI
2.	*Calamagrostis canadensis*	10	H	OBL
3.	*Typha latifolia*	5	H	OBL
4.	*Sphagnum magellanicum*	10	H	OBL
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 12 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
75% of the wetland is inundated with as much as 12" of water.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
between tracks

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	7/14/2006
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☑	☐
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W20
Transect ID:
Plot ID: W20
Circular 39 Type: 2/6
Cowardin: PEM/SSB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator	
1.	*Carex species*		H	NI	1.
2.	*Alnus rugosa*		S/S	OBL	2.
3.	*Calamagrostis canadensis*		H	OBL	3.
4.	*Glyceria sp.*		H	OBL	4.
5.	*Alisma subcordatum*		H	OBL	5.
6.	*Typha species*		H	OBL	6.
7.	*Scirpus atrovirens*		H	OBL	7.
8.					8.
9.					9.
10.					10.

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:
Vegetation list is not completely definitive, but generally accurate.

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: Up to 2 (in.)
- Depth to free water in pit: Surface (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
Water level was actually lower than normal in the areas impounded by beaver due to droughty conditions, the remaining areas appeared to have normal hydrologic conditions.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
Surface					Peat to mucky peat

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Inundated for long duration.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
Sedge meadow, alder thicket. Portions of the wetland have been affected by beaver impoundments.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/17/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑

(If needed, explain on reverse).

Community ID: W22
Transect ID:
Plot ID: W22
Circular 39 Type: 3/7/8
Cowardin: PEMC/FOB/FO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Fraxinus nigra*		T	FACW+
2.	*Thuja occidentalis*		T	FACW
3.	*Salix species*		T	FACW
4.	*Thelypteris thelypteroides*		H	FACW+
5.	*Caltha palustris*		H	OBL
6.	*Typha species*		H	OBL
7.	*Alnus rugosa*		S/S	OBL
8.	*Calamagrostis canadensis*		H	OBL
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Acer spicatum*		T	FACU*
2.	*Betula spp.*		T	NI
3.	*Sphagnum species*		H	NI
4.	*Carex species*		H	NI
5.	*Ledum groenlandicum*		S/S	OBL
6.	*Vaccinium macrocarpon*		H	OBL
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:
floating bog mats - 30% water within Type 3 portion.
All species listed above are dominant.

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
water in hollows

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Inundated for long duration

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
shallow marsh, black ash swamp, and cedar swamp

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/30/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse)		

Community ID: W24
Transect ID:
Plot ID: W24
Circular 39 Type: 6/7
Cowardin: PSS/FOB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1	*Alnus rugosa*	60	S/S	OBL
2	*Calamagrostis canadensis*	40	H	OBL
3	*Sphagnum magellanicum*	40	H	OBL
4	*Betula papyrifera*	10	T	FACU+
5	*Salix species*	10	T	FACW
6				
7				
8				
9				
10				

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 80

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 3 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
90% of the wetland is inundated with as much as 3" of water.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/30/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W25
Transect ID:
Plot ID: W25
Circular 39 Type: 8
Cowardin: PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Abies balsamea*	20	T	FACW
2.	*Picea mariana*	50	T	FACW
3.	*Sphagnum magellanicum*	80	H	OBL
4.	*Cornus canadensis*	40	H	FAC
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Larix laricina*	10	T	FACW
2.	*Betula papyrifera*	5	T	FACU+
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: None (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
100% of the wetland is saturated to the surface.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/30/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W27
Transect ID:
Plot ID: W27
Circular 39 Type: 8
Cowardin: PFOB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Larix laricina*	10	S/S	FACW
2.	*Picea mariana*	20	T	FACW
3.	*Sphagnum magellanicum*	20	H	OBL
4.	*Calamagrostis canadensis*	30	H	OBL
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 24 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					sand/gravel/rock

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Inundated for long duration.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W29
Transect ID:
Plot ID: W29
Circular 39 Type: 3/2
Cowardin:

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Typha species*	40	H	OBL
2.	*Carex cristatella*	30	H	FACW+
3.	*Glyceria borealis*	30	H	OBL
4.	*Alnus rugosa*	5	S/S	OBL
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Scirpus acutus*	1	H	OBL
2.	*Calamagrostis canadensis*	5	H	OBL
3.	*Sphagnum species*	5	H	NI
4.	*Calla palustris*	5	H	OBL
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 1-3 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4		10YR2/1			peaty muck
4+					rock

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☑ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☑ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:

Mucky peat at surface, assumed to be of adequate thickness for histic epipedon and mapped as aquept soils. Inundated for long duration.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:

shallow marsh/sedge meadow

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/28/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W32
Transect ID:
Plot ID: W32
Circular 39 Type: 8
Cowardin: PFO3B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Larix laricina*	50	T	FACW
2.	*Betula pumila*	30	T	OBL
3.	*Sphagnum species*	80	H	NI
4.	*Ledum groenlandicum*	50	S/S	OBL
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Linnaea borealis*	20	H	FAC
2.	*Calamagrostis canadensis*	20	H	OBL
3.	*Alnus rugosa*	5	S/S	OBL
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 75-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
Water table to the surface in hollows.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat
below surface					peaty muck

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Peat at surface, assumed histic epipedon due to dominance of sphagnum.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
tamarack bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/16/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W33
Transect ID:
Plot ID: W33
Circular 39 Type: 6/8
Cowardin: PSS/FOB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Alnus rugosa*		S/S	OBL
2.	*Salix species*		T	FACW
3.	*Calamagrostis canadensis*		H	OBL
4.	*Scirpus cyperinus*		H	OBL
5.	*Picea mariana*		T	FACW
6.	*Sphagnum magellanicum*		H	OBL
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☑ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
Evidence of recent and apparently prolonged inundation.

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
No soils data obtained, but there was recent evidence of inundation and appeared to have organic soils.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W34
Transect ID:
Plot ID: W34
Circular 39 Type: 6
Cowardin: PSSB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Alnus rugosa*	90	S/S	OBL
2.	*Carex species*	15	H	NI
3.	*Fragaria vesca*	20	H	NI
4.				
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Rubus strigosus*	10	S/S	FACW-
2.	*Thelypteris thelypteroides*	10	H	FACW+
3.	*Ribes sp.*	5	S/S	NI
4.	*Sphagnum species*	10	H	NI
5.	*Equisetum fluviatile*	1	H	OBL
6.	*Calamagrostis canadensis*	1	H	OBL
7				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 66-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: 4 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2		10YR3/1			peat
2-10		10YR4/2	7.5YR4/6	many	gravelly sand
10+					rock

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☑ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
alder thicket

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse)		

Community ID: W43
Transect ID:
Plot ID: W43
Circular 39 Type: 6
Cowardin: PSSB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Alnus rugosa*	70	S/S	OBL
2.	*Picea mariana*	5	T	FACW
3.	*Larix laricina*	5	T	FACW
4.	*Calamagrostis canadensis*	50	H	OBL
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Equisetum fluviatile*	10	H	OBL
2.	*Osmunda regalis*	5	H	OBL
3.	*Carex species*	10	H	NI
4.	*Scirpus sp*	10	H	NI
5.	*Rubus strigosus*	20	S/S	FACW-
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					muck

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Muck present at the surface, assumed to be histic epipedon.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/30/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W44
Transect ID:
Plot ID: W44
Circular 39 Type: 6/8
Cowardin: PSSB/FO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Alnus rugosa*	70	S/S	OBL
2.	*Sphagnum magellanicum*	40	H	OBL
3.	*Calamagrostis canadensis*	30	H	OBL
4.	*Picea mariana*	20	T	FACW
5.	*Salix species*	10	T	FACW
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Ledum groenlandicum*	10	S/S	OBL
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 4 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
95% of the wetland is inundated with as much as 4" of water.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/17/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W45
Transect ID:
Plot ID: W45
Circular 39 Type: 6
Cowardin: PSS1C

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Alnus rugosa*		S/S	OBL
2.	*Scirpus cyperinus*		H	OBL
3.	*Calamagrostis canadensis*		H	OBL
4.	*Larix laricina*		T	FACW
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 1-2 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Appears to be inundated for long duration.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
alder thicket

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/28/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W47
Transect ID:
Plot ID: W47
Circular 39 Type: 8
Cowardin: PSSB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Salix species*	60	T	FACW
2.	*Ledum groenlandicum*	40	S/S	OBL
3.	*Vaccinium macrocarpon*	20	S/S	OBL
4.	*Sphagnum species*	50	H	NI
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Pinus resinosa*	5	T	FACU
2.	*Solidago uliginosa*	5	H	OBL
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 75-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 1-3 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
water standing in deep hollows

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Appears to be inundated for long duration

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/28/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse)		

Community ID: W48
Transect ID:
Plot ID: W48
Circular 39 Type: 8
Cowardin: PSSB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Alnus rugosa*	30	S/S	OBL
2.	*Salix species*	10	T	FACW
3.	*Sphagnum species*	80	H	NI
4.	*Clintonia borealis*	50	H	FAC+
5.	*Thuja occidentalis*	50	T	FACW
6.	*Rubus strigosus*	10	S/S	FACW-
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Typha species*	25	H	OBL
2.	*Larix laricina*	10	T	FACW
3.	*Calamagrostis canadensis*	30	H	OBL
4.	*Solidago uliginosa*	1	H	OBL
5				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 83-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 0-1 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
Installed Well 1
TOC to ground 9.5" after 10 min. below TOC

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4					peat
4-16					mucky peat

Hydric Soil Indicators:

- ☑ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
cedar swamp

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/28/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W51
Transect ID:
Plot ID: W51
Circular 39 Type: 6
Cowardin: PSSB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*	10	T	FACW
2.	*Sphagnum species*	40	H	NI
3.	*Carex species*	20	H	NI
4.	*Alnus rugosa*	100	S/S	OBL
5.	*Abies balsamea*	5	T	FACW
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Ledum groenlandicum*	10	S/S	OBL
2.	*Thelypteris thelypteroides*	5	H	FACW+
3.	*Equisetum fluviatile*	15	H	OBL
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 60-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 1-2 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
1-2" water standing in hollows.

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
					mucky peat

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
alder thicket

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/28/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse)		

Community ID: W52
Transect ID:
Plot ID: W52
Circular 39 Type: 6/7
Cowardin: PSS/FOB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Alnus rugosa*	80	S/S	OBL
2.	*Picea mariana*	20	T	FACW
3.	*Salix species*	10	T	FACW
4.	*Abies balsamea*	10	T	FACW
5.	*Linnaea borealis*	30	H	FAC
6.	*Larix laricina*	10	T	FACW
7.	*Sphagnum species*	30	H	NI
8.	*Rubus strigosus*	25	S/S	FACW-
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Equisetum fluviatile*	10	H	OBL
2.	*Cornus canadensis*	10	H	FAC
3.	*Lycopodium sp.*	15	H	NI
4.				
5.				
6				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 88-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
Wet to the surface in hollows.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2		10YR2/1			peaty muck
2+					rock

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☑ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
alder/conifer swamp

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW/MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑

(If needed, explain on reverse).

Community ID: W53
Transect ID:
Plot ID: W53
Circular 39 Type: 6/8
Cowardin: PSS/FO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Betula papyrifera*	5	T	FACU+
2.	*Picea mariana*	10	T	FACW
3.	*Calamagrostis canadensis*	20	H	OBL
4.	*Sphagnum magellanicum*	60	H	OBL
5.	*Alnus rugosa*	80	S/S	OBL
6.	*Larix laricina*	10	T	FACW
7.	*Thuja occidentalis*	10	T	FACW
8.	*Fraxinus nigra*		T	FACW+
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*	10	S/S	FACW
2.	*Calla palustris*	10	H	OBL
3.	*Lycopodium sp*	10	H	NI
4.	*Carex species*	10	H	NI
5.	*Salix species*	5	S/S	FACW
6.	*Onoclea sensibilis*		H	FACW
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 88

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 4-6 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
100% of the wetland is saturated to the surface with areas of inundation as much as 4-6" of water.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6					peat
6-28					muck

Hydric Soil Indicators:

- ☑ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:

alder/conifer swamp, black ash swamp
Additional site visit on 8/17/2004.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W54
Transect ID:
Plot ID: W54
Circular 39 Type: 6/8
Cowardin: PSS/FOB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1	*Alnus rugosa*	60	S/S	OBL
2	*Sphagnum magellanicum*	60	H	OBL
3	*Picea mariana*	15	T	FACW
4	*Abies balsamea*	20	T	FACW
5	*Calamagrostis canadensis*	30	H	OBL
6				
7				
8				
9				
10				

	Other Plant Species	% Cover	Stratum	Indicator
1	*Calla palustris*	5	H	OBL
2	*Betula papyrifera*	5	S/S	FACU+
3	*Picea mariana*	10	S/S	FACW
4	*Salix species*	5	S/S	FACW
5	*Abies balsamea*	10	S/S	FACW
6	*Carex species*	5	H	NI
7				
8				
9				
10				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 4 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: upper 12 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
100% of the wetland is saturated in the upper 12", with small isolated areas of inundation as much as 4" of water.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3					peat
3-28					fine sand

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
Alder thicket and coniferous bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W55
Transect ID:
Plot ID: W55
Circular 39 Type: 6/8
Cowardin: PSS1/FO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Alnus rugosa*	80	S/S	OBL
2.	*Calamagrostis canadensis*	60	H	OBL
3.	*Larix laricina*	10	T	FACW
4.	*Pinus resinosa*	5	T	FACU
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Salix species*	10	S/S	FACW
2.	*Sphagnum species*	20	H	NI
3.	*Thelypteris thelypteroides*	1	H	FACW+
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 75

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6		10YR2/1			peaty muck
6+					rock

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☑ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Soils mapped as lowland organic and peaty muck observed at the surface.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
alder thicket

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/17/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W56
Transect ID:
Plot ID: W56
Circular 39 Type: 8
Cowardin: PFOB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Alnus rugosa*		S/S	OBL
2.	*Calamagrostis canadensis*		H	OBL
3.	*Glyceria sp*		H	OBL
4.	*Picea mariana*		T	FACW
5.	*Scirpus cyperinus*		H	OBL
6.	*Ledum groenlandicum*		S/S	OBL
7.	*Ribes sp.*		S/S	NI
8.	*Sphagnum species*		H	NI
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: Surface (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

		Yes	No
Taxonomy (subgroup): _____	Field observations confirm map type?	☐	☐

Profile Description:

Hydric Soil Indicators:

- ☑ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Soils are peat at the surface with sphagnum, so assumed histosol.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
black spruce bog
wetland on top of a hill- raised bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/17/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W57
Transect ID:
Plot ID: W57
Circular 39 Type: 7/6
Cowardin: PFO4/PSSB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Larix laricina*		T	FACW
2.	*Picea mariana*		T	FACW
3.	*Thuja occidentalis*		T	FACW
4.	*Alnus rugosa*		S/S	OBL
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Assumed hydric soil due to apparent prolonged saturation.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
conifer swamp/alder thicket

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	10/18/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W58
Transect ID:
Plot ID: W58
Circular 39 Type: 6
Cowardin: PSSC

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Alnus rugosa*	80	S/S	OBL
2.	*Carex lacustris*	15	H	OBL
3.	*Calamagrostis canadensis*	40	H	OBL
4.				
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Rubus strigosus*	5	H	FACW-
2.	*Abies balsamea*	10	T	FACW
3.	*Picea mariana*	10	T	FACW
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: 1 (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-14					Peat
14-18					Muck
18-28					Sand

Hydric Soil Indicators:

- ☑ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W60
Transect ID:
Plot ID: W60
Circular 39 Type: 6/8
Cowardin: PSS/FO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*		T	FACW
2.	*Alnus rugosa*		S/S	OBL
3.	*Sphagnum magellanicum*		H	OBL
4.	*Calamagrostis canadensis*		H	OBL
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: upper 12 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
Surface					Peat

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W61
Transect ID:
Plot ID: W61
Circular 39 Type: 7/2
Cowardin: PFO/EMB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Alnus rugosa*	20	S/S	OBL
2.	*Carex lacustris*	30	H	OBL
3.	*Carex species*	30	H	NI
4.	*Picea mariana*	20	T	FACW
5.	*Populus balsamifera*	20	T	FACW
6.	*Populus balsamifera*	20	S/S	FACW
7.	*Sphagnum magellanicum*	30	H	OBL
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Calamagrostis canadensis*	10	H	OBL
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 86-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 8 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: upper 12 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
40% of the wetland is saturated in the upper 12".

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Inundated for long duration.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W62
Transect ID:
Plot ID: W62
Circular 39 Type: 8
Cowardin: PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*	30	T	FACW
2.	*Abies balsamea*	30	T	FACW
3.	*Cornus canadensis*	20	H	FAC
4.	*Sphagnum magellanicum*	60	H	OBL
5.	*Alnus rugosa*	15	S/S	OBL
6.	*Picea mariana*	10	S/S	FACW
7.	*Abies balsamea*	10	S/S	FACW
8.	*Acer spicatum*	10	S/S	FACU*
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Calamagrostis canadensis*	10	H	OBL
2.	*Acer spicatum*	10	T	FACU*
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 86

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☑ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Soils mapped primarily as lowland loamy wet, aquepts.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
Coniferous bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/30/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W72
Transect ID:
Plot ID: W72
Circular 39 Type: 7/6
Cowardin: PFO/SSB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Calamagrostis canadensis*	70	H	OBL
2.	*Picea mariana*	20	S/S	FACW
3.	*Alnus rugosa*	10	S/S	OBL
4.	*Sphagnum magellanicum*	20	H	OBL
5.	*Salix species*	10	T	FACW
6.	*Larix laricina*	20	S/S	FACW
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 6 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/17/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W74
Transect ID:
Plot ID: W74
Circular 39 Type: 7
Cowardin: PFOB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Populus tremuloides*		T	FAC
2.	*Abies balsamea*		T	FACW
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

1.
2
3.
4.
5.
6.
7.
8.
9.
10.

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: 6 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Mapped as lowland loamy wet soils which correspond to the Aquepts classification, which is hydric.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/30/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑

(If needed, explain on reverse).

Community ID: W76
Transect ID:
Plot ID: W76
Circular 39 Type: 8
Cowardin: PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*	40	T	FACW
2.	*Picea mariana*	30	S/S	FACW
3.	*Larix laricina*	20	T	FACW
4.	*Ledum groenlandicum*	50	S/S	OBL
5.	*Sphagnum magellanicum*	80	H	OBL
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Abies balsamea*	10	T	FACW
2.	*Betula papyrifera*	5	T	FACU+
3.	*Larix laricina*	10	S/S	FACW
4.	*Calamagrostis canadensis*	10	H	OBL
5.	*Equisetum species*	10	H	NI
6.	*Cornus canadensis*	10	H	FAC
7.	*Abies balsamea*	5	S/S	FACW
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 1-2 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
100% of the wetland is saturated to the surface, with pockets of inundation at 1-2" depth.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/16/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W77
Transect ID:
Plot ID: W77
Circular 39 Type: 8
Cowardin: PFOB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Sphagnum species*		H	NI
2.	*Chamaedaphne calyculata*		H	OBL
3.	*Alnus rugosa*		S/S	OBL
4.	*Typha species*		H	OBL
5.	*Picea mariana*		T	FACW
6.	*Eriophorum sp.*		H	OBL
7.	*Carex species*		H	NI
8.	*Solidago uliginosa*		H	OBL
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 1 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
Water in hollows

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☑ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Soils were not investigated, but with sphagnum present, peat soils are assumed.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
open and black spruce bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/18/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse)		

Community ID: W78
Transect ID:
Plot ID: W78
Circular 39 Type: 8
Cowardin: PFO4/2B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Larix laricina*		T	FACW
2.	*Sphagnum magellanicum*		H	OBL
3.	*Abies balsamea*		T	FACW
4.	*Ledum groenlandicum*		S/S	OBL
5.	*Picea mariana*		T	FACW
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-)

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

		Yes	No
Taxonomy (subgroup): _____	Field observations confirm map type?	☐	☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Peat soils at surface, assumed to adequate depth for histic epipedon due to dominance of sphagnum.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
black spruce/tamarack bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/17/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W79
Transect ID:
Plot ID: W79
Circular 39 Type: 8
Cowardin: PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Sphagnum magellanicum*		H	OBL
2.	*Calamagrostis canadensis*		H	OBL
3.	*Picea mariana*		T	FACW
4.	*Equisetum species*		H	NI
5.	*Chamaedaphne calyculata*		H	OBL
6.	*Lycopodium sp.*		H	NI
7.				
8.				
9.				
10.				

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

		Yes	No
Taxonomy (subgroup): _____	Field observations confirm map type?	☐	☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Soils are mucky peat at surface.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
black spruce bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/18/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W80
Transect ID:
Plot ID: W80
Circular 39 Type: 8
Cowardin: PFO2/4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator	
1.	*Picea mariana*		T	FACW	1.
2.	*Larix laricina*		T	FACW	2.
3.	*Abies balsamea*		T	FACW	3.
4.	*Sphagnum species*		H	NI	4.
5.	*Ledum groenlandicum*		S/S	OBL	5.
6.	*Salix species*		T	FACW	6.
7.	*Acer spicatum*		T	FACU*	7.
8.	*Pteridium aquilinum*		H	FACU	8.
9.	*Equisetum species*		H	NI	9.
10.					10.

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 56-78

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in upper 12 inches
- ☑ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Very rocky surface, water marks appeared to indicate long duration inundation.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
black spruce/tamarack bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/16/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W81
Transect ID:
Plot ID: W81
Circular 39 Type: 7
Cowardin: PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Ledum groenlandicum*		S/S	OBL
2.	*Alnus rugosa*		S/S	OBL
3.	*Abies balsamea*		T	FACW
4.	*Picea mariana*		T	FACW
5.	*Trientalis borealis*		H	FAC+
6.	*Betula spp.*		T	NI
7.	*Calamagrostis canadensis*		H	OBL
8.	*Eleocharis sp.*		H	NI
9.	*Acer saccharinum*		T	FACW
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 82-100

Remarks:
mosses

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 1 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
water standing in hollows

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Inundated for long duration.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
black spruce swamp

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W82
Transect ID:
Plot ID: W82
Circular 39 Type: 8
Cowardin: PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*	30	T	FACW
2.	*Abies balsamea*	30	T	FACW
3.	*Sphagnum magellanicum*	50	H	OBL
4.	*Calamagrostis canadensis*	20	H	OBL
5.	*Equisetum species*	20	H	NI
6.	*Cornus canadensis*	30	H	FAC
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Acer rubrum*	10	T	FAC
2				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 83-100

Remarks:
20% ferns

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: None (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: upper 12 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☑ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Peat at surface assumed to be of adequate thickness for histic epipedon. Soils mapped as lowland loamy wet and lowland organic.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
Coniferous bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W83
Transect ID:
Plot ID: W83
Circular 39 Type: 8
Cowardin: PSSB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Alnus rugosa*	70	S/S	OBL
2.	*Picea mariana*	30	T	FACW
3.	*Ledum groenlandicum*	30	S/S	OBL
4.	*Sphagnum species*	90	H	NI
5.	*Vaccinium macrocarpon*	30	S/S	OBL
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Calamagrostis canadensis*	10	H	OBL
2.	*Cornus canadensis*	5	H	FAC
3.	*Solidago uliginosa*	5	H	OBL
4.	*Clintonia borealis*	5	H	FAC+
5.	*Equisetum fluviatile*	5	H	OBL
6	*Vaccinium uliginosum*	5	H	FAC*
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 80-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-21					mucky peat with some sand
21-23+					sand

Hydric Soil Indicators:

- ☑ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
open bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse)		

Community ID: W84
Transect ID:
Plot ID: W84
Circular 39 Type: 8
Cowardin: PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*	50	T	FACW
2.	*Abies balsamea*	40		FACW
3.	*Sphagnum species*	90	H	NI
4.	*Vaccinium macrocarpon*	10	S/S	OBL
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Clintonia borealis*	10	H	FAC+
2.	*Rubus strigosus*	1	S/S	FACW-
3.	*Cypripedium acaule*	1	H	FACW
4.	*Cornus canadensis*	10	H	FAC
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 67-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3		10YR2/1			mucky peat
3-12					? Peat
12-18+		10YR2/1			peaty muck

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☑ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
black spruce bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/16/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W85
Transect ID:
Plot ID: W85
Circular 39 Type: 8
Cowardin: PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Sphagnum species*		H	NI
2.	*Ledum groenlandicum*		S/S	OBL
3.	*Salix species*		T	FACW
4.	*Picea mariana*		T	FACW
5.	*Scirpus cyperinus*		H	OBL
6.	*Alnus rugosa*		S/S	OBL
7.	*Equisetum species*		H	NI
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 71-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☑ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Soils not investigated in detail but with continuous sphagnum mat, appear to be peat soils.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
black spruce bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/18/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W86
Transect ID:
Plot ID: W86
Circular 39 Type: 8
Cowardin: PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Sphagnum species*		H	NI
2.	*Ledum groenlandicum*		S/S	OBL
3.	*Picea mariana*		T	FACW
4.	*Abies balsamea*		T	FACW
5.	*Larix laricina*		T	FACW
6.	*Pinus banksiana*		T	FACU
7.	*Vaccinium macrocarpon*		H	OBL
8.				
9				
10.				

1.
2.
3.
4
5.
6
7.
8.
9.
10.

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 86-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: ~4 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

		Yes	No
Taxonomy (subgroup): _____	Field observations confirm map type?	☐	☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Peat at surface, with predominance of sphagnum - histic epipedon assumed.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
raised bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W90
Transect ID:
Plot ID: W90
Circular 39 Type: 8/8
Cowardin: PSS/FO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Alnus rugosa*	70	S/S	OBL
2.	*Picea mariana*	15	T	FACW
3.	*Larix laricina*	15	T	FACW
4.	*Sphagnum species*	80	H	NI
5.	*Ledum groenlandicum*	30	S/S	OBL
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Cornus canadensis*	5	H	FAC
2.	*Rubus strigosus*	5	S/S	FACW-
3	*Equisetum fluviatile*	10	H	OBL
4.	*Thelypteris thelypteroides*	1	H	FACW+
5	*Lycopodium sp.*	1	H	NI
6.	*Vaccinium uliginosum*	5	H	FAC*
7.	*Osmunda cinnamomea*	1	H	FACW
8				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 80-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-10					peat
10-16		10YR3/1			sandy muck
16-18		10YR3/1			sand

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☑ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
alder thicket/black spruce bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/18/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No		
Do normal circumstances exist on the site?	☑	☐	Community ID	W96
Is the site significantly disturbed (atypical situation)?	☐	☑	Transect ID:	
Is there a potential problem area?	☐	☑	Plot ID:	W96
(If needed, explain on reverse).			Circular 39 Type:	8
			Cowardin:	PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*		T	FACW
2.	*Sphagnum species*		H	NI
3.	*Ledum groenlandicum*		S/S	OBL
4.	*Pinus banksiana*		T	FACU
5.	*Equisetum species*		H	NI
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 80

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):

- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:

Depth of surface water: _____ (in.)

Depth to free water in pit: _____ (in.)

Depth to saturated soil: ~6 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):

- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Peat at surface, with dominance of sphagnum - assumed histic epipedon.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
black spruce bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W98
Transect ID:
Plot ID: W98
Circular 39 Type: 8
Cowardin: PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*	50	T	FACW
2.	*Alnus rugosa*	50	S/S	OBL
3.	*Vaccinium macrocarpon*	40	S/S	OBL
4.	*Ledum groenlandicum*	50	S/S	OBL
5.	*Sphagnum species*	70	H	NI
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Larix laricina*	10	T	FACW
2.	*Populus tremuloides*	5	T	FAC
3.	*Abies balsamea*	5	T	FACW
4.	*Calamagrostis canadensis*	10	H	OBL
5.	*Equisetum fluviatile*	10	H	OBL
6.	*Cornus canadensis*	5	H	FAC
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 80-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
Water standing in hollows.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4					peat
4-12+					muck

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
black spruce bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/18/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No		
Do normal circumstances exist on the site?	☑	☐	Community ID	W99
Is the site significantly disturbed (atypical situation)?	☐	☑	Transect ID:	
Is there a potential problem area?	☐	☑	Plot ID:	W99
(If needed, explain on reverse).			Circular 39 Type:	8
			Cowardin:	PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator	
1.	*Ledum groenlandicum*		S/S	OBL	1.
2.	*Sphagnum species*		H	Ni	2.
3.	*Picea mariana*		T	FACW	3.
4.					4.
5.					5.
6.					6.
7.					7.
8.					8.
9.					9.
10.					10.

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-) 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):

- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:

Depth of surface water: _____ (in.)

Depth to free water in pit: _____ (in.)

Depth to saturated soil: 4-6 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):

- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

		Yes	No
Taxonomy (subgroup): _____	Field observations confirm map type?	☐	☐

Profile Description:

Hydric Soil Indicators:

- ☑ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Soils were not investigated in detail, but with the presence of sphagnum mat, soils were assumed to be peat.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
black spruce bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/30/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W100
Transect ID:
Plot ID: W100
Circular 39 Type: 8
Cowardin: PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*	80	T	FACW
2.	*Ledum groenlandicum*	30	H	OBL
3.	*Sphagnum species*	90	H	NI
4.				
5.				
6.				
7.				
8.				
9.				
10.				

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: 3-8 (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-14					Peat
14-18					Muck
18-28					Sand

Hydric Soil Indicators:

- ☑ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
Black spruce bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/18/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W101
Transect ID:
Plot ID: W101
Circular 39 Type: 8
Cowardin: PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*		T	FACW
2.	*Ledum groenlandicum*		H	OBL
3.	*Sphagnum species*		H	NI
4.	*Larix laricina*		T	FACW
5.	*Abies balsamea*		T	FACW
6.	*Betula spp.*		T	NI
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 83-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
Soils appeared to be saturated to near the surface.

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Soils were not investigated in detail, but with the presence of sphagnum mat, soils were assumed to be peat.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
black spruce bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/17/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No		
Do normal circumstances exist on the site?	☑	☐	Community ID	W103
Is the site significantly disturbed (atypical situation)?	☐	☑	Transect ID:	
Is there a potential problem area?	☐	☑	Plot ID:	W103
(If needed, explain on reverse).			Circular 39 Type:	8/6
			Cowardin:	PFO4B/PSSB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Larix laricina*		S/S	FACW
2.	*Sphagnum magellanicum*		H	OBL
3.	*Calamagrostis canadensis*		H	OBL
4.	*Picea mariana*		T	FACW
5.				
6.				
7.				
8.				
9.				
10.				

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-) 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):

- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:

Depth of surface water: _____ (in.)

Depth to free water in pit: 0-4 (in.)

Depth to saturated soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:

- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):

- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
Wells 3 + 17

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☑ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Peat at surface assumed to be histic epipedon due to dominance of sphagnum and lowland, organic soil mapping.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
Coniferous bog and shrub carr

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/18/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W104
Transect ID:
Plot ID: W104
Circular 39 Type: 8
Cowardin: PFO4B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*		T	FACW
2.	*Sphagnum species*		H	NI
3.	*Ledum groenlandicum*		S/S	OBL
4.	*Vaccinium macrocarpon*		H	OBL
5.				
6.				
7.				
8.				
9.				
10.				

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

		Yes	No
Taxonomy (subgroup): _____	Field observations confirm map type?	☐	☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:
Peat at surface, assumed histic epipedon with dominance of sphagnum.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
black spruce bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	7/14/2006
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse)		

Community ID: W105
Transect ID:
Plot ID: W105
Circular 39 Type: 8
Cowardin: PFOB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*	80	T	FACW
2.	*Sphagnum magellanicum*	80	H	OBL
3.	*Ledum groenlandicum*	20	S/S	OBL
4.	*Vaccinium oxycoccos*	15	S/S	OBL
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Trientalis borealis*	5	H	FAC+
2.	*Clintonia borealis*	5	H	FAC+
3.	*Abies balsamea*	10	T	FACW
4.	*Calamagrostis canadensis*	5	H	OBL
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: ~4 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6		N2.5/0			Mucky peat
6+					Rock

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☑ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
Black spruce bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	8/16/2004
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MAJ	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W107
Transect ID:
Plot ID: W107
Circular 39 Type: 8
Cowardin: PFO4B/2B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator	
1.	*Picea mariana*		T	FACW	1.
2.	*Alnus rugosa*		S/S	OBL	2.
3.	*Chamaedaphne calyculata*		S/S	OBL	3.
4.	*Ledum groenlandicum*		S/S	OBL	4.
5	*Sphagnum species*		H	NI	5.
6.	*Calamagrostis canadensis*		H	OBL	6.
7.	*Solidago uliginosa*		H	OBL	7.
8.	*Larix laricina*		T	FACW	8.
9.	*Thuja occidentalis*		T	FACW	9.
10.					10.

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8					mucky peat

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
black spruce bog

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W109
Transect ID:
Plot ID: W109
Circular 39 Type: 6/7
Cowardin: PSSB/PFOB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*	50	T	FACW
2.	*Alnus rugosa*	50	S/S	OBL
3.	*Sphagnum magellanicum*	30	H	OBL
4.	*Calamagrostis canadensis*	20	H	OBL
5.	*Ledum groenlandicum*	20	S/S	OBL
6.	*Cornus canadensis*	40	H	FAC
7.				
8.				
9.				
10.				

1.
2.
3.
4.
5
6.
7.
8.
9.
10.

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:
numerous other species

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 2-4 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: upper 12 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
areas of inundation

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat

Hydric Soil Indicators:

- ☐ Histosol
- ☑ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Peat at the soil surface, assumed histic epipedon and long duration inundation.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

	Yes	No
Is this sampling point within a wetland?	☑	☐

Remarks:
alder thicket/black spruce swamp

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑

(If needed, explain on reverse).

Community ID: W109b
Transect ID:
Plot ID: W109b
Circular 39 Type: 8/7
Cowardin: PFO4B/FO2B

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Populus tremuloides*	30	T	FAC
2.	*Picea mariana*	20	T	FACW
3.	*Abies balsamea*	20	T	FACW
4.	*Calamagrostis canadensis*	50	H	OBL
5.	*Sphagnum magellanicum*	70	H	OBL
6.	*Alnus rugosa*	50	S/S	OBL
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Acer rubrum*	10	T	FAC
2	*Acer rubrum*	10	S/S	FAC
3.	*Populus tremuloides*	10	S/S	FAC
4	*Picea mariana*	10	S/S	FACW
5.				
6.				
7				
8.				
9				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:
10% ferns

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 2-4 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: upper 12 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
75% of the wetland is saturated in the upper 12", with a few isolated areas of inundation 2-4" in depth.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/28/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑

(If needed, explain on reverse).

Community ID: W114
Transect ID:
Plot ID: W114
Circular 39 Type: 8/3
Cowardin: PFOC/EMC

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Larix laricina*	20	S/S	FACW
2.	*Larix laricina*	20	T	FACW
3.	*Picea mariana*	20	S/S	FACW
4.	*Picea mariana*	20	T	FACW
5.	*Typha latifolia*	40	H	OBL
6.	*Equisetum species*	20	H	NI
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Carex species*	5	H	NI
2.	*Alnus rugosa*	5	S/S	OBL
3.	*Ledum groenlandicum*	5	S/S	OBL
4.	*Calamagrostis canadensis*	5	H	OBL
5.	*Salix species*	5	T	FACW
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 83-100

Remarks:
5% fern species
Over 30 species present in any given 10' diameter.

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 6 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
Pockets with as much as 6" of water.

SOILS

Map unit name
(series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Inundated for long duration.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
Coniferous bog and shallow marsh

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/28/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W200
Transect ID:
Plot ID: W200
Circular 39 Type: 7/6
Cowardin: PFO1A/EMA/SSA

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Populus tremuloides*	30	T	FAC
2.	*Populus tremuloides*	30	S/S	FAC
3.	*Alnus rugosa*	20	S/S	OBL
4.	*Calamagrostis canadensis*	30	H	OBL
5.	*Aster macrophyllus*	15	H	NI
6.	*Larix laricina*	15	S/S	FACW
7.	*Picea mariana*	10	T	FACW
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Picea mariana*	10	S/S	FACW
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 86-100

Remarks:

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: Near surf. (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:
Well monitoring data from 2005-2006 indicates long duration inundation in adjacent wetland and likely saturation near the surface in this wetland.

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☑ Other (explain in remarks)

Remarks:
Saturation for long duration.

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W201
Transect ID:
Plot ID: W201
Circular 39 Type: 2/6
Cowardin: PEM/SSB

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Populus tremuloides*	20	S/S	FAC
2.	*Salix species*	40	T	FACW
3.	*Calamagrostis canadensis*	60	H	OBL
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:
numerous other species

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: _____ (in.)
- Depth to free water in pit: _____ (in.)
- Depth to saturated soil: upper 12 (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☐ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks:
W201 has inclusions of upland areas dominated by beaked hazelnut and bracken fern.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Polymet	Date:	6/29/2005
Applicant/Owner:	Polymet	County:	St. Louis
Investigator:	MEW	State:	MN

	Yes	No
Do normal circumstances exist on the site?	☑	☐
Is the site significantly disturbed (atypical situation)?	☐	☑
Is there a potential problem area?	☐	☑
(If needed, explain on reverse).		

Community ID: W202
Transect ID:
Plot ID: W202
Circular 39 Type: 7/6
Cowardin: PFOC/SSC

VEGETATION

	Dominant Plant Species	% Cover	Stratum	Indicator
1.	*Alnus rugosa*	40	S/S	OBL
2.	*Larix laricina*	30	T	FACW
3.	*Picea mariana*	30	T	FACW
4.	*Calamagrostis canadensis*	50	H	OBL
5.				
6.				
7.				
8.				
9.				
10.				

	Other Plant Species	% Cover	Stratum	Indicator
1.	*Carex species*	5	H	NI
2.	*Equisetum species*	5	H	NI
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Percent of dominant species that are OBL, FACW or FAC (excluding FAC-): 100

Remarks:
5% ferns

HYDROLOGY

☑ Recorded data (describe in remarks):
- ☐ Stream, lake, or tide gauge
- ☑ Aerial photographs
- ☐ Other

☐ No recorded data available

Field Observations:
- Depth of surface water: 6 (in.)
- Depth to free water in pit: (in.)
- Depth to saturated soil: Surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ☑ Inundated
- ☑ Saturated in upper 12 inches
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Indicators (2 or more required):
- ☐ Oxidized root channels in upper 12 inches
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other (explain in remarks)

Remarks:

SOILS

Map unit name (series and phase): _____ Drainage class: _____

Taxonomy (subgroup): _____ Field observations confirm map type? Yes ☐ No ☐

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
surface					peat

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low-chroma colors
- ☐ Concretions
- ☐ High organic content in surface layer in sandy soil
- ☐ Organic streaking in sandy soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (explain in remarks)

Remarks:

WETLAND DETERMINATION

	Yes	No
Hydrophytic vegetation present?	☑	☐
Wetland hydrology present?	☑	☐
Hydric soils present?	☑	☐

Is this sampling point within a wetland? Yes ☑ No ☐

Remarks: