



US Army Corps
of Engineers
St Paul District

APPLICANT: U.S. Steel Corporation
Minntac

Public Notice

ISSUED: 16 May 2014

EXPIRES: 16 June 2014

REFER TO: MVP-2014-01247-TJH

SECTION:404 - Clean Water Act

1. APPLICATION FOR PERMIT to discharge fill material into approximately 25.3 acres of wetlands that are part of the tributary system of the Dark River for the construction of a seepage collection project at the west tailings basin of United States Steel Corporation's Minntac iron ore mining and processing facility in the City of Mountain Iron, MN.

2. SPECIFIC INFORMATION.

APPLICANT'S ADDRESS: Mr. Tom Moe
U.S. Steel Corporation
Minnesota Ore Operations
8819 Old Highway 169
Mt. Iron, Minnesota 55768

PROJECT LOCATION: The project site is located in Sections 6, 7, 18, 19, and 30, Township 59N, Range 18W; and in Section 24, Township 59N, Range 19W, St. Louis County, Minnesota.

DESCRIPTION OF PROJECT: Minntac is a ferrous ore mining facility that began taconite mining and processing operations in 1967. During the processing of the taconite ore, fine tailings (the non-magnetic fraction of the ore) are sent to the tailings basin in slurry form. Decant water from the fine tailings slurry is reclaimed and recirculated as process water in a nearly closed loop system. While most of the reclaimed water returns to the plant, some seepage occurs from the tailings basin perimeter dams. The purpose of the project is to collect surface seepage water from the west tailings basin perimeter dike and return it back to the tailings basin to reduce the impact of surface seepage on downstream water quality. The proposed seepage collection project would utilize existing ponds, natural and constructed drainage swales, a french drain, interconnecting piping, wetland separation sheet pile walls, and natural drainage to convey surface seepage into four catch basins and pump stations to be pumped back to the tailings basin. Details of these project features and associated proposed wetland impacts are described below.

The project location, wetland impact areas, and project features of the Minntac Western Seepage Collection Project are shown on the attached drawings labeled 2014-01247-TJH, figures 1 of 16 to 16 of 16.

QUANTITY, TYPE, AND AREA OF FILL: There are approximately 97.8 acres of wetlands identified within the 225 acre Western Seepage Collection Project area. A total of 14.78 acres of wetlands would be permanently filled and an additional 10.50 acres of wetlands would be drained as a result of this project. The wetland impact locations are shown on the attached drawings. Wetland impacts by impact type are listed in Table 1.

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TABLE 1- SUMMARY OF WETLAND IMPACTS

Wetland ID	Wetland Type	Wetland Impact Type Summary	Proposed Acreage Impact
W5	6	Direct Road	1.38
W6	7	Direct Road	0.62
W6	7	Direct Drainage Swale	0.03
W7B	6	Direct Pump Station	0.08
W7B	6	Direct Road	1.53
W7B	6	Direct Drainage Swale	0.42
W8	7	Direct Road	1.92
W10A	7	Direct Pump Station	0.05
W10A	7	Direct Road	3.12
W10A	7	Hydrologic French Drain	1.19
W11B	3	Direct Road	0.14
W11C	4	Direct Road	0.13
W11D	7	Direct Road	1.79
W13A	7	Direct Road	0.47
W13B	5	Direct Road	0.79
W13B	5	Hydrologic French Drain	5.73
W13G	4	Direct Road	0.20
W13G	4	Hydrologic French Drain	0.13
W13H	4	Direct Road	0.11
W13H	4	Hydrologic French Drain	0.32
W26B	5	Temporary Forcemain	0.02
W33A	6	Direct Pump Station	0.02
W33A	6	Direct Road	0.75
W33C	7	Direct Road	0.64
W34	4	Direct Road	0.31
W34	4	Hydrologic Culvert Outlet	0.63
W35B	3	Direct Road	0.27
W35B	3	Hydrologic Culvert Outlet	1.20
W35A	5	Hydrologic Culvert Outlet	1.29
TOTAL			25.28

The wetland boundaries shown on the attached drawings were delineated in 2011 and 2012 within a linear corridor that extended approximately 300 feet west and north from the outer tailings basin dike. Some project features extend beyond the delineation corridor in some areas. The wetland impact calculations are based on both delineated and estimated wetland boundaries. Estimated wetland boundaries will be delineated and field reviewed in the spring/summer of 2014.

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Direct wetland impacts involve placement of fill, placement of structures, and excavation within wetlands. The project elements in this category include: Access Roads and Wetland Separation Measures, Pump Stations and Catch Basins, and constructed Drainage Swales.

Access Roads and Wetland Separation Measures: An access road would be constructed to access construction areas, serve as platforms to install wetland separation measures (sheet-pile) and provide maintenance access during operation. The existing access road would be utilized to the extent possible to minimize construction of new roads and impacts to wetlands. At other locations, access roads will need to be constructed to a width of 30 feet in order to accommodate construction traffic. Waste rock and coarse tailings would be used in access road construction and would include four foot high safety berms along either side. Approximately 8,500 linear feet of access road would be constructed.

Wetland separation measures would be installed at specific locations to prevent dewatering of wetlands adjacent to the seepage collection system and promote additional seepage capture/collection. They are designed to limit the lateral effect of seepage collection systems on adjacent wetlands as well as limit surface water flows into the seepage collection system from adjoining areas. Separation measures would consist of a sheet piling barrier placed along the edge of the access road to minimize seepage from the adjacent wetland to the seepage collection system while not obstructing the natural occurring groundwater flow. The sheet piling would be installed prior to construction of the drainage swales and french drains so that the construction area can be dewatered during construction.

For purposes of calculating wetland impacts, wetland separation barriers and earthen berms are considered part of the access road foot print. The portion of pump stations and force mains that overlap with access roads is also included as part of the access road footprint.

Pump Stations and Catch Basins: Seepage water collected in the french drains and collection swales would be routed to catch basins situated at low points within the localized catchment area. Seepage water entering the catch basins would then be conveyed to pump stations and pumped into the tailings basin. A total of four catch basins and four pump stations would be constructed, and water would be pumped from the pump stations back into the tailings basin via a high-density polyethylene (HDPE) force main ranging from 4 to 18 inches in diameter. All force mains would be installed by open cut construction methods. The rim elevation of catch basins would be at the elevation of the adjacent ground or approximate normal water level elevation of adjacent wetland areas. It is anticipated that water would pool within the catch basins and the isolated catchment areas under design storm conditions (100 year-24 hour event). The pumps would be sized to recover the impounded storm water runoff volume over a one week period. Portions of three pump stations and catch basin footprints would be located within wetlands where they extend outside the footprint of existing or constructed access roads. A fifteen foot perimeter around pump stations and catch basins was used to define the area of wetland impacts for these facilities.

Drainage Swales: The natural topography of the area combined with grading of the existing ground surface would be used to form collection swales to transport surface seepage into catch basins. Construction of collection swales would include removal of top soil and organics to expose the subgrade. Coarse tailings or blast furnace trim would then be placed over the subgrade and compacted in place to the finished grade. The project includes several collection swales.

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One drainage swale would be constructed to collect water from Seep No.7 and Seep No.8. It is not expected to dewater adjacent wetland areas. It would direct surface seepage to allow point where it will discharge into a catch basin. This assumption is consistent with similar drainage swales constructed on the east side of the tailings basin. Wetland impacts for this drainage swale are based on the footprint of the drainage swale. Additional drainage swales may be constructed at the SW corner of the project (Seep C) and the NW corner of the project (Seep No.13) depending upon conditions encountered during construction. Proposed wetland impacts from the potential implementation of these additional drainage swales have been included in the impact totals.

Hydrologic wetland impacts include complete or partial loss of wetland hydrology. Hydrologic impacts are anticipated from two project elements; the French drain seepage collection system and culvert placement at wetland/pond outlets.

French Drain: The french drain would consist of an excavation to grade and placement of filter material, 12-inch perforated pipe, and backfill of rock over the pipe and trench. It would slope towards a central catch basin, which would outlet to a pump. The french drain would be installed within wetlands near Seep No.4. This facility includes 2,270 linear feet of drainage swale with a 480 foot french drain located near the central low point of the swale. The french drain would extend from wetland W13B/W13H, north to wetland W10A. The north and south portions of this facility, which includes non-perforated pipe, are included as hydrologic impacts associated with the french drain. The south portion of the french drain would impact Wetland W13B/W13H, therefore, Wetland W13B/W13H is assumed to be fully drained.

For portions of the french drain north of Wetland W13B/W13H, the water table within adjacent wetlands will be drawn down. The french drain is designed so that it is 24 in below ground surface in the middle at the catch basin, with arms that slope upward toward the ground surface away from the catch basin. The lateral effect is greatest near the catch basin, and tapers to zero at the ends of the french drain. The calculated lateral effect in the two mapped soils (Bowstring and the Keewatin-Nashwauk complex) is 75 feet and 17 feet, respectively. The extent of the calculated lateral effect is shown on the attached drawing labeled 2014-01247-TJH, figure 3 of 16.

Culverts: A culvert would be placed between the two southern-most wetland basins (W35A/W35B and W34). These two basins would then outlet to wetland W26G via a second culvert. Water levels in the two southerly wetland basins would be drawn down to divert Seep C to the north. Wetland W35A will also be excavated near the culvert outlet to facilitate drainage to the north. Both of these basins are assumed to be substantially drained after the culverts are installed. The entire acreage of these two basins is assumed to be impacted.

Temporary impacts are assumed to occur where forcemains and HDPE pipes are installed across wetlands. All pipes would be placed by excavating a trench, placing the pipe, backfilling and restoring the surface to preconstruction grade. All disturbed areas would be stabilized and seeded with an appropriate wetland seed mix. Temporary impact calculations assume pipes will be buried to a depth of five feet and require 3:1 slopes during construction, resulting in a 30 foot wide area of disturbance. Within forested wetlands, trees would be avoided where possible. There is one area located at the NE edge of wetland W26B where HDPE pipe installation would potentially impact a wetland. The force

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main alignment will be shifted north at that location to avoid this impact. All other HDPE force main pipes will be located within existing or new access roads to avoid additional wetland impacts.

VEGETATION IN AFFECTED AREA: The project area is located within the Laurentian Mixed Forest Province (MnDNR’s Ecological Classification System). The site is located within the Northern Superior Uplands Section Nashwauk Uplands subsection, and the Northern Minnesota Drift and Lake Plains Section, and the St. Louis Moraine and Tamarack Lowlands subsections.

Wooded habitat in uplands and wetlands cover approximately 35% of the land area, most of which is second growth forest composed of aspen and birch. Wetland communities found within the corridor include shallow marsh, shrub-carr, and hardwood swamp/ coniferous swamp. Shallow marsh (Type 3) wetlands typically support cattails, bulrushes, water plantains, arrowheads and lake sedges. Shrub-Carr (Type 6) wetlands typically support shrub communities consisting of alders and willows. Hardwood/coniferous swamp (Type 7) wetlands typically support tamarack, northern white cedar, black spruce, balsam fir, balsam poplar, and black ash.

Much of the area near the project is fragmented by existing haul roads and mine features, including the Minntac tailings basin. The wetland types, dominant vegetation, and acres of impact for the Project are summarized in the following table.

**Wetland Plant Community Type
(Acres By Type of Impact)**

Eggers and Reed	Predominant Vegetation in Impacted Area	Direct	Hydrologic	Total
Shallow Marsh	<i>Typhia x glauca, Carex l. Calamogrostis c.</i>	0.41	1.20	1.61
Deep Marsh	<i>Typha x glauca, Carex l.</i>	0.76	1.08	1.84
Shallow OpenWater	Submerged macrophytes	0.79	7.03	7.82
Alder Thicket	<i>Alnus i., Calamogrostis c., Carex spp.</i>	4.19		4.19
Coniferous Swamp	<i>Picea m., Larix l., Alnus i. Calamogrostis c.</i>	8.63	1.19	9.82
TOTALS		14.78	10.50	25.28

SOURCE OF FILL MATERIAL: Blast Furnace Trim (BFT), waste rock, and coarse tailings from the Minntac facility would be used in access road construction. Gravel and rockfill from the Minntac facility or from alternative commercial sources would be used in french drain construction. Local soils would be used if necessary for grading the collection swales. Concrete from a commercial source would be used in the construction of the catch basins and their adjacent pump stations.

SURROUNDING LAND USE: The project area is located within the Little Fork River Watershed along the toe of an existing tailings basin at an active taconite mine. Typical mining activities include operation of excavators, mining trucks, and weekly blasting of material. The City of Mountain Iron has zoned the project area as a mineral mining district. Mining, processing, storage and transportation of taconite and other metallic ores are permitted uses. Land use in the project area is dominated by the existing Minntac mine operations. Much of the area remains undeveloped, with expanses of wooded habitat with open agricultural areas, wetlands and both natural water bodies and abandoned mine pits.

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THE FOLLOWING POTENTIALLY TOXIC MATERIALS COULD BE USED AT THE PROJECT SITE: No use of toxic materials has been identified by the applicant.

THE FOLLOWING PRECAUTIONS TO PROTECT WATER QUALITY HAVE BEEN DESCRIBED BY THE APPLICANT: Best Management Practices to protect water quality in the form of temporary and permanent erosion and sediment control measures would be used as required throughout the project area.

PROPOSED MITIGATION: The applicant has proposed compensatory mitigation for the permanent loss of 25.27 acres of wetlands at the project site by purchasing 37.91 new Sedge Meadow wetland credits from U.S. Steel's Palisade III Wetland Bank located in Aitkin County, Minnesota.

The Palisade III wetland bank is located in an adjacent bank service area (the Minntac Western Seepage Collection Project is in Bank Service Area 2, whereas the Palisade III bank site is located in Bank Service Area 5). The project and compensatory mitigation sites are both located on landscapes with greater than 80% of pre-settlement wetlands remaining. The impacted wetlands are Shallow Marsh (1.61 acres), Deep Marsh (1.83 acres), Shallow Open Water (7.82 acres), Alder Thicket (4.18 acres), and Coniferous Swamp (9.83 acres) wetland plant communities. Compensation for the impacted wetlands would be provided with Sedge Meadow (37.91 acres) wetland credits. The proposed compensation is in-advance, but not in-kind or in-place. The proposed compensation ratio is 1.5:1.

ALTERNATIVES: Although no specific design alternative was presented as part of this permit application, other designs to collect seepage water from the west tailings basin were explored and rejected due to technical issues, construction risks and a much larger area of wetland impact than the proposed design.

The no-build alternative considers not installing the surface seep collection and return system. However, Minntac must complete the proposed seep collection project, as per a June 9, 2011, Schedule of Compliance entered into between USS and the Minnesota Pollution Control Agency.

AVOIDANCE MEASURES: The construction activities and the installation of the seepage collection system are expected to result in a combination of direct and indirect hydrologic impacts to adjacent wetlands. The seepage collection system has been designed to avoid and minimize impacts to wetlands where possible. Complete avoidance is not possible because groundwater seeps occur within low lying areas of the landscape and then flow overland or via subsurface interflow through natural drainage systems, both being settings where wetlands generally occur. The following discusses key project elements with respect to wetland avoidance

Access Road Construction: Due to dam safety and integrity requirements, construction of the access roads cannot cut into the existing perimeter dike slope; therefore, the access road must be located away from the perimeter dike, limiting opportunities to utilize the perimeter dike to construct and operate the seepage collection return system. The width of the access road must be wide enough for large grading equipment to maintain the road and to allow for the appropriate berm size that meets Mine Safety and Health Administration (MSHA) requirements, limiting options to reduce the overall footprint of the

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access road. Where possible, the access road and seepage collection system facilities are being constructed over existing roads to reduce wetland impacts.

Drainage Swales and French Drains: The drainage swale design for the west tailings basin is similar to the east tailings basin, where impacts to adjacent wetlands have been limited. The purpose of drainage swales is not to drain wetlands, but to collect surface seepage water and direct it into catch basins where it can be pumped back to the tailings basin. The drainage swale depth, extent and outlet elevation differences relative to adjacent grades will be limited as much as possible, while at the same time meeting channel slope and stability design requirements. The use of french drains is limited to approximately 480 linear feet of the total project area and will result in unavoidable wetland impacts to wetlands W13B, W13G, W13H and W10A. The location and elevation of french drains at this location is necessary to effectively capture tailings basin surface seeps. The use of drainage swales and french drains will be further limited by using existing, natural drainage systems to collect seepage water. Catch basin rim elevations will be set at or just below the normal water level of wetlands to maintain existing wetland hydrology.

Wetland Separation Measures: Separation walls will be constructed without directly impacting the adjacent wetlands. Separation wall installation will involve the use of specialized equipment to install the sheet-pile from the constructed access road. The design of the separation walls will minimize dewatering of the adjacent downstream wetlands. The installation depth of separation walls will be limited to 15 feet below grade, so as not to intercept the groundwater flow that recharges downstream wetlands.

3. REPLIES/COMMENTS.

Interested parties are invited to submit to this office written facts, arguments, or objections within 30 days of the date of this notice. These statements should bear upon the suitability of the location and the adequacy of the project and should, if appropriate, suggest any changes believed to be desirable. Comments received may be forwarded to the applicant.

Replies may be addressed to Regulatory Branch, St. Paul District, Corps of Engineers, 180 Fifth Street East, Suite 700, Saint Paul, MN 55101-1678.

Or, IF YOU HAVE QUESTIONS ABOUT THE PROJECT, call Tom Hingsberger at the St. Paul District office of the Corps, telephone number (651) 290 - 5367.

To receive Public Notices by e-mail, go to:

http://mvp-extstp.mvp.usace.army.mil/list_server/ and add your information in the New Registration Box.

4. FEDERALLY-LISTED THREATENED OR ENDANGERED WILDLIFE OR PLANTS OR THEIR CRITICAL HABITAT.

None were identified by the applicant or are known to exist in the permit area. However, St. Louis County is within the known or historic range of the following Federally-listed threatened and endangered species:

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<u>Species</u>	<u>Status</u>	<u>Habitat</u>
Canada lynx (<i>Lynx canadensis</i>)	Threatened; Critical Habitat	Northern Forest
Piping Plover(<i>Charadrius melodus</i>)	Endangered	Great Lakes Shorelines
Rufa Red knot (<i>Calidris canutus rufa</i>)	Proposed Threatened	Coastal areas around Lake Superior
Northern long-eared bat (<i>Myotis septentrionalis</i>)	Proposed as endangered	Caves, mines, upland forests

This application is being coordinated with the U.S. Fish and Wildlife Service. Any comments it may have concerning Federally-listed threatened or endangered wildlife or plants or their critical habitat will be considered in our final assessment of the described work.

5. JURISDICTION.

This application is being reviewed in accordance with the practices for documenting Corps jurisdiction under Sections 9 & 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act identified in Regulatory Guidance Letter 08-02. We have made an initial determination that the aquatic resources that would be impacted by the proposed project are regulated by the Corps of Engineers under Section 404 of the Clean Water Act and/or Section(s) 9 & 10 of the Rivers and Harbors Act. The Corps will prepare an approved or preliminary jurisdictional determination prior to making a permit decision. Approved jurisdictional determinations are posted on the St. Paul District web page at <http://www.mvp.usace.army.mil/Missions/Regulatory.aspx>.

THE APPLICANT HAS STATED THAT THE FOLLOWING STATE, COUNTY, AND/OR LOCAL PERMITS HAVE BEEN APPLIED FOR/ISSUED: State NPDES Permitting has been completed for this project.

6. STATE SECTION 401 WATER QUALITY CERTIFICATION.

Valid Section 404 permits cannot be issued for any activity unless state water quality certification for the activity is granted or waived pursuant to Section 401 of the Clean Water Act. The state Section 401 authority in Minnesota is the Minnesota Pollution Control Agency (MPCA). The St. Paul District has provided this public notice and a copy of the applicant's Section 404 permit application form to the MPCA. If MPCA needs any additional information in order for the Section 401 application to be considered complete by MPCA, the MPCA has indicated that it will request such information from the applicant. It is the permit applicant's responsibility to ensure that the MPCA has received a valid, complete application for state Section 401 certification and to obtain a final Section 401 action from the MPCA.

The MPCA has indicated that this public notice serves as its public notice of the application for Section 401 water quality certification under Minnesota Rules Part 7001. The MPCA has also indicated that the Section 401 process shall begin to commence upon the issuance date of this public notice unless the MPCA notifies both the St. Paul District and the permit applicant to the contrary, in writing, before the expiration date of this public notice.

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Any comments relative to MPCA's Section 401 Certification for the activity proposed in this public notice may be sent to:

Minnesota Pollution Control Agency, Resource Management and Assistance Division,
Attention: 401 Certification, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194.

7. HISTORICAL/ARCHAEOLOGICAL.

This public notice is being sent to the National Park Service and the State Archaeologist for their comments. The Corps will review information on known cultural resources and/or historic properties within and adjacent to the project area. The Corps will also consider the potential effects of the project on any properties that have yet to be identified. The results of this review and the Corps' determination of effect will be coordinated with the State Historic Preservation Officer independent of this public notice. Any adverse effects on historic properties will be resolved prior to the Corps authorization, or approval, of the work in connection with this project.

The Mountain Iron Mine Pit Reservoir is a listed historic property on the National Register of Historic Places. It is located in the town of Mt. Iron at the end of Missabe Avenue, approximately two miles to the SE of the Western Seepage Collection Project area. According to the National Register's nomination form, mining of this pit began in 1892 and marked the opening of the Mesabi Range, setting in motion events which made Minnesota the largest producer of iron ore in the nation. During the 64 years the mine was in operation, it yielded more than 48 million tons of ore. The pit is now used as a reservoir by U.S. Steel. It can be viewed from an observation point in the city of Mountain Iron. The Western Seepage Collection Project would have no effect on the Historic Mine Pit Reservoir.

8. PUBLIC HEARING REQUESTS.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state, in detail, the reasons for holding a public hearing. A request may be denied if substantive reasons for holding a hearing are not provided or if there is otherwise no valid interest to be served.

9. PUBLIC INTEREST REVIEW.

The decision whether to issue a permit will be based on an evaluation of the probable impact, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered, including the cumulative effects. Among those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production and, in general, the needs

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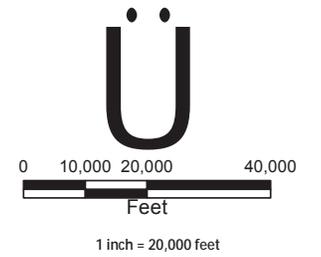
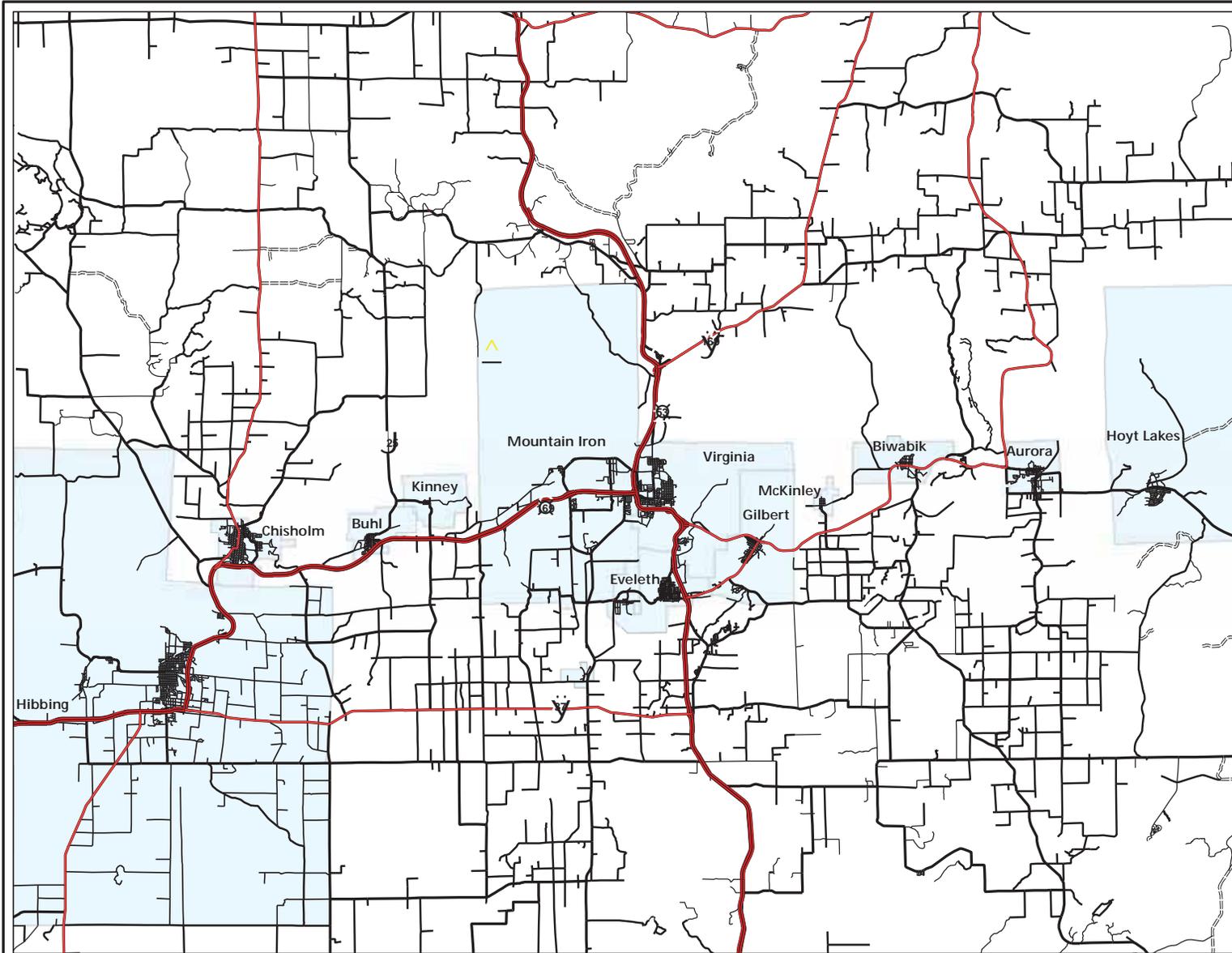
and welfare of the people. Environmental and other documents will be available for review in the St. Paul District Office.

The Corps of Engineers is soliciting comments from the public; Federal, State, and local agencies and officials; Indian tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition, or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

Desiree Morningstar
Acting Chief, Northwest Section

Enclosures

NOTICE TO EDITORS: This public notice is provided as background information and is not a request or contract for publication.

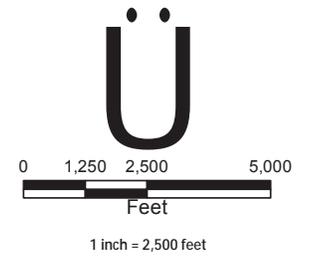
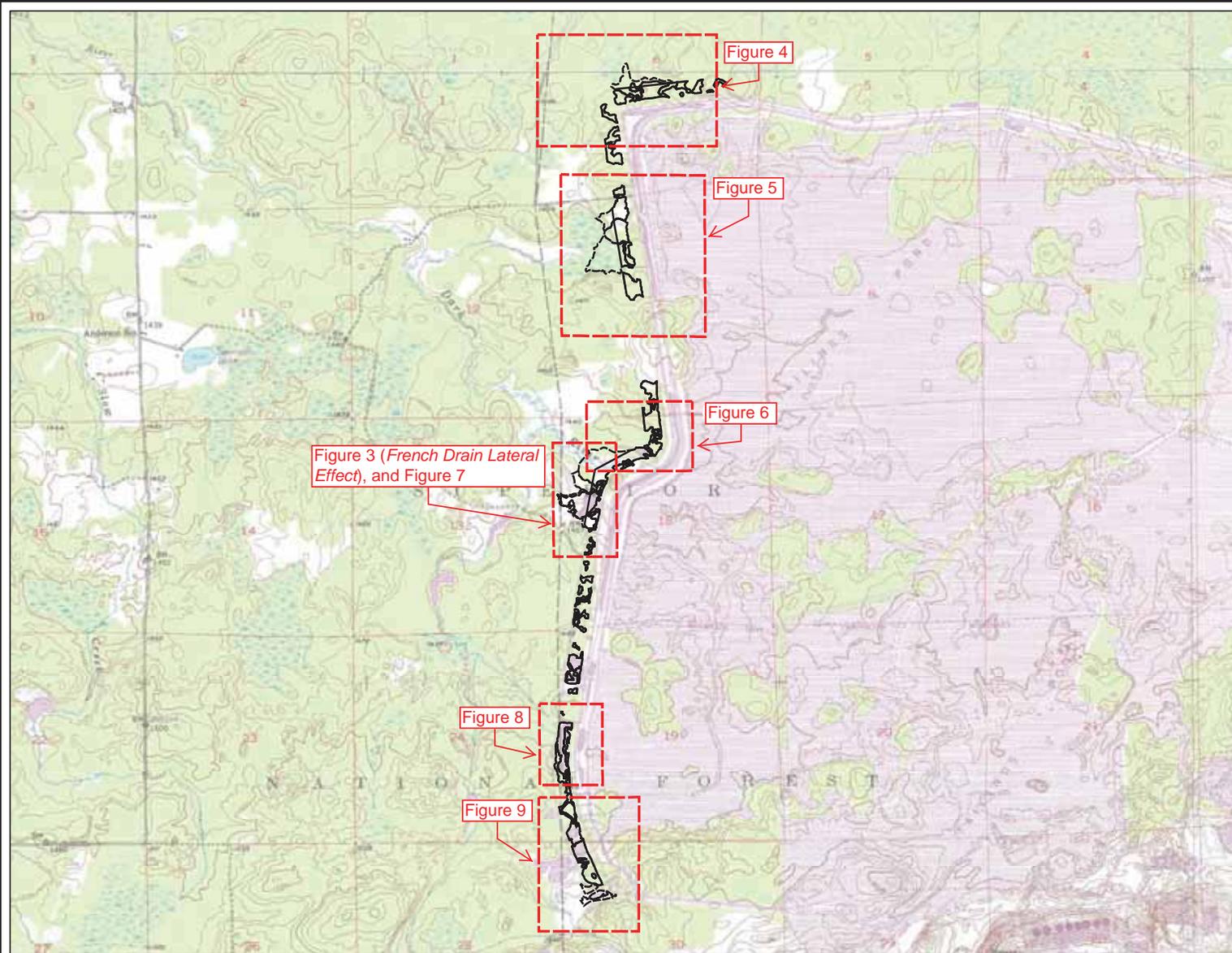


Legend

 Project Location

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Version	Description	Drawn	Date	Checked	Date
1	Original Issue	SRP	27 Mar 2014	ARD	27 Mar 2014



Legend

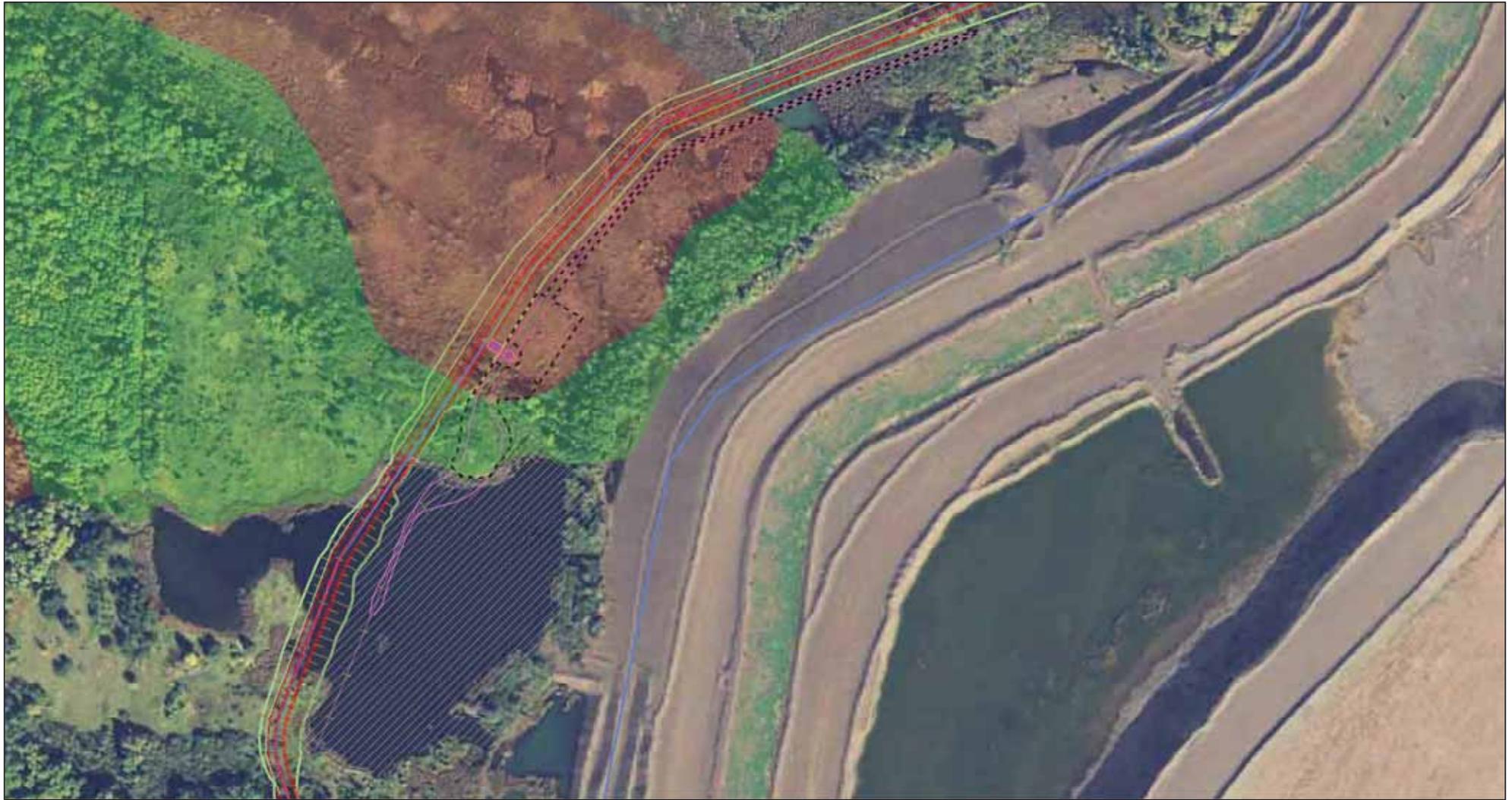
 Sheet Boundaries

 Wetland Impact Locations

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Reference: USGS Topographic Maps

Version	Description	Drawn	Date	Checked	Date
1	Original Issue	SRP	27 Mar 2014	ARD	27 Mar 2014



**U.S. Steel Corporation - Minnesota Ore Operations
Minntac Western Seepage Collection Project**

**Figure 3
French Drain Lateral Effect**

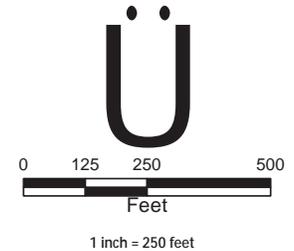
- Soils**
- Bowstring
 - Nashwauk
- Drained Wetland Area**
-
- Lateral Effect of French Drain**
-

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Source: Esri, DigitalGlobe, GeoEye, Earthstar, USDA, USGS, AeroGRID, IGN, IGP, swisstopo, and the GIS User Community



Legend

- Road Centerline
 - Force Main Alignment
 - Wetland Boundary 2012
 - Estimated Wetland Boundary 2014
- Direct Impacts**
- Road
 - Pump Station

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Reference: ESRI World Imagery

NTS
Environmental Science
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Virginia, MN 55702-1142
218.741.4290
www.netechnical.com

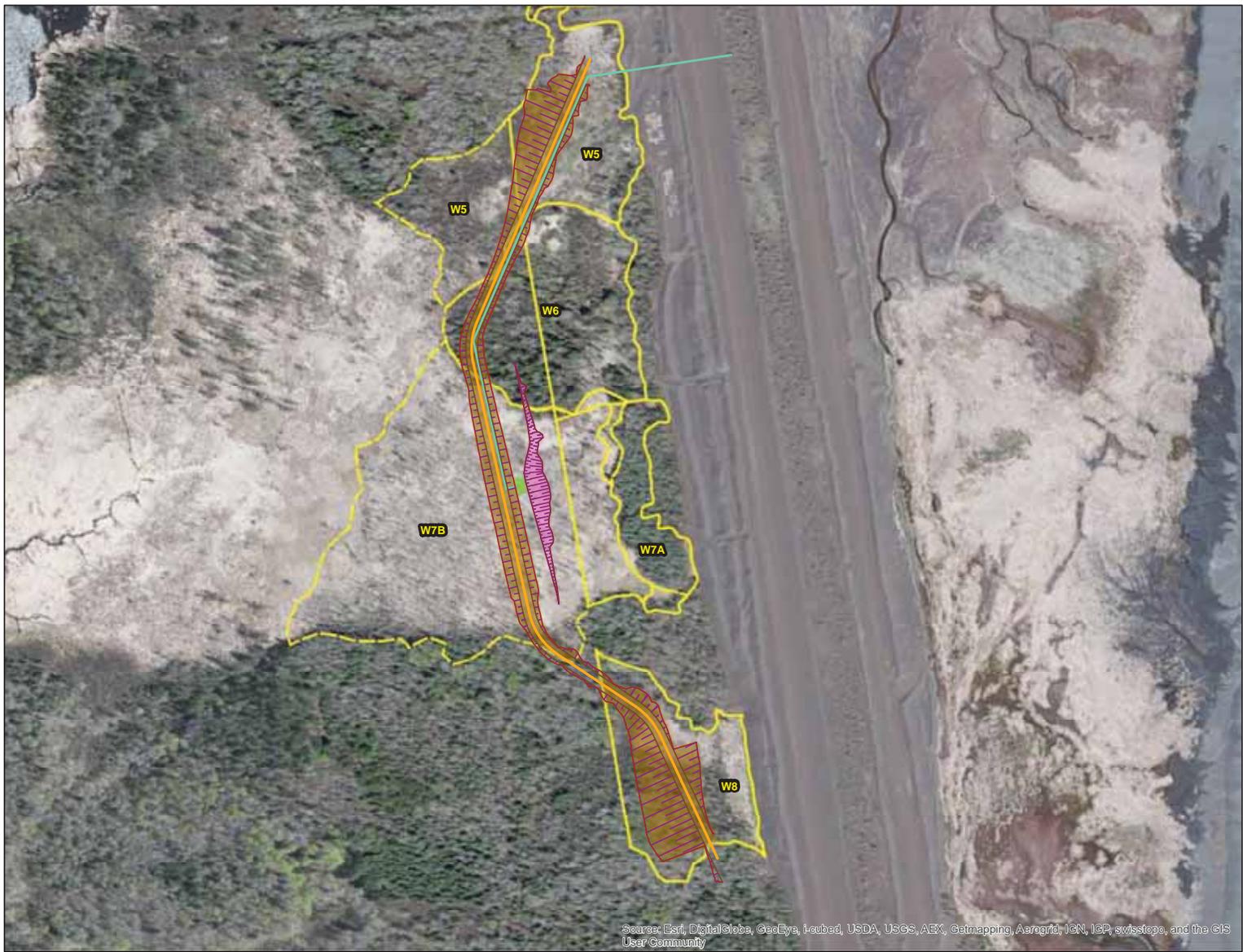
Version	Description	Drawn	Date	Checked	Date
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Minntac Western Seepage Collection Project
U.S. Steel Corporation – Minnesota Ore Operations
Mt. Iron, Minnesota (St. Louis)

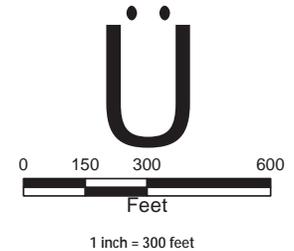
Figure 4
Wetland Impacts
Sheet 1

NTS Project #:
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Date:
27 Mar 2014



Source: Esri, DigitalGlobe, GeoEye, Earthstar, USDA, USGS, AeroGRID, IGN, IGP, swisstopo, and the GIS User Community



Legend

- Road Centerline
- Force Main Alignment
- Wetland Boundary 2012
- Estimated Wetland Boundary 2014

Direct Impacts

- Road
- Drainage Swale
- Pump Station

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Reference: ESRI World Imagery

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1	Original Issue	SRP	27 Mar 2014	ARD	27 Mar 2014

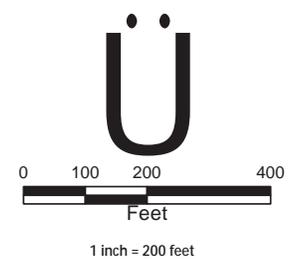
Minntac Western Seepage Collection Project
U.S. Steel Corporation – Minnesota Ore Operations
Mt. Iron, Minnesota (St. Louis)

Figure 5
Wetland Impacts
Sheet 2

NTS Project #:
7892P
Date:
27 Mar 2014



Source: Esri, DigitalGlobe, GeoEye, Earthstar, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



- Legend**
- Road Centerline
 - Force Main Alignment
 - Wetland Boundary 2012
 - Estimated Wetland Boundary 2014
- Direct Impacts**
- Road
- Hydrologic Impacts**
- French Drain

2014-01247-TJH
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Reference: ESRI World Imagery

NTS
Environmental Science
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218.741.4290
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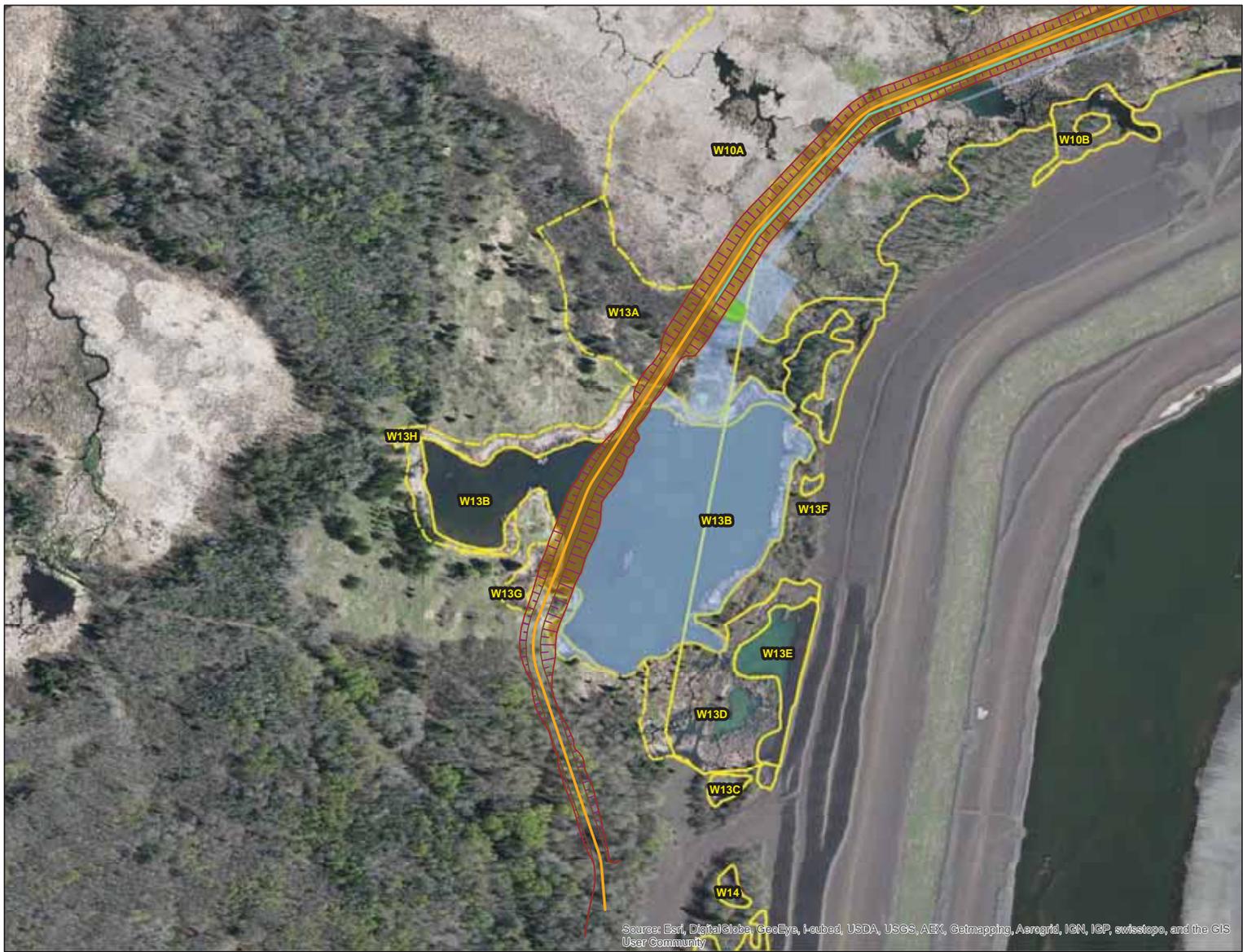
Version	Description	Drawn	Date	Checked	Date
1	Original Issue	SRP	27 Mar 2014	ARD	27 Mar 2014

Minntac Western Seepage Collection Project
U.S. Steel Corporation – Minnesota Ore Operations
Mt. Iron, Minnesota (St. Louis)

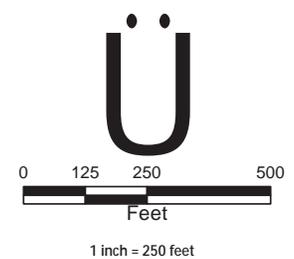
Figure 6
Wetland Impacts
Sheet 3

NTS Project #:
7892P

Date:
27 Mar 2014



Source: Esri, DigitalGlobe, GeoEye, iSat, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Legend

- Road Centerline
- Force Main Alignment
- Wetland Boundary 2012
- Estimated Wetland Boundary 2014
- Direct Impacts**
- Road
- Pump Station
- Hydrologic Impacts**
- French Drain

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Reference: ESRI World Imagery

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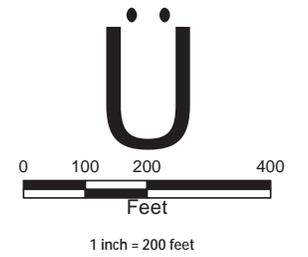
Version	Description	Drawn	Date	Checked	Date
1	Original Issue	SRP	27 Mar 2014	ARD	27 Mar 2014

Minntac Western Seepage Collection Project
U.S. Steel Corporation – Minnesota Ore Operations
Mt. Iron, Minnesota (St. Louis)

Figure 7
Wetland Impacts
Sheet 4

NTS Project #:
7892P
Date:
27 Mar 2014

7



Legend

- Force Main Alignment
- Pump Station
- Wetland Boundary 2012
- Estimated Wetland Boundary 2014
- Indirect Impacts**
- Force main

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Reference: ESRI World Imagery



Version	Description	Drawn	Date	Checked	Date
1	Original Issue	SRP	27 Mar 2014	ARD	27 Mar 2014

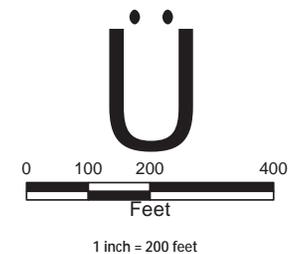
Minntac Western Seepage Collection Project
U.S. Steel Corporation – Minnesota Ore Operations
Mt. Iron, Minnesota (St. Louis)

Figure 8
Wetland Impacts
Sheet 5

NTS Project #:
7892P
Date:
27 Mar 2014



Source: Esri, DigitalGlobe, GeoEye, Earthstar, USDA, USGS, AeroGRID, IGN, IGP, swisstopo, and the GIS User Community



Legend

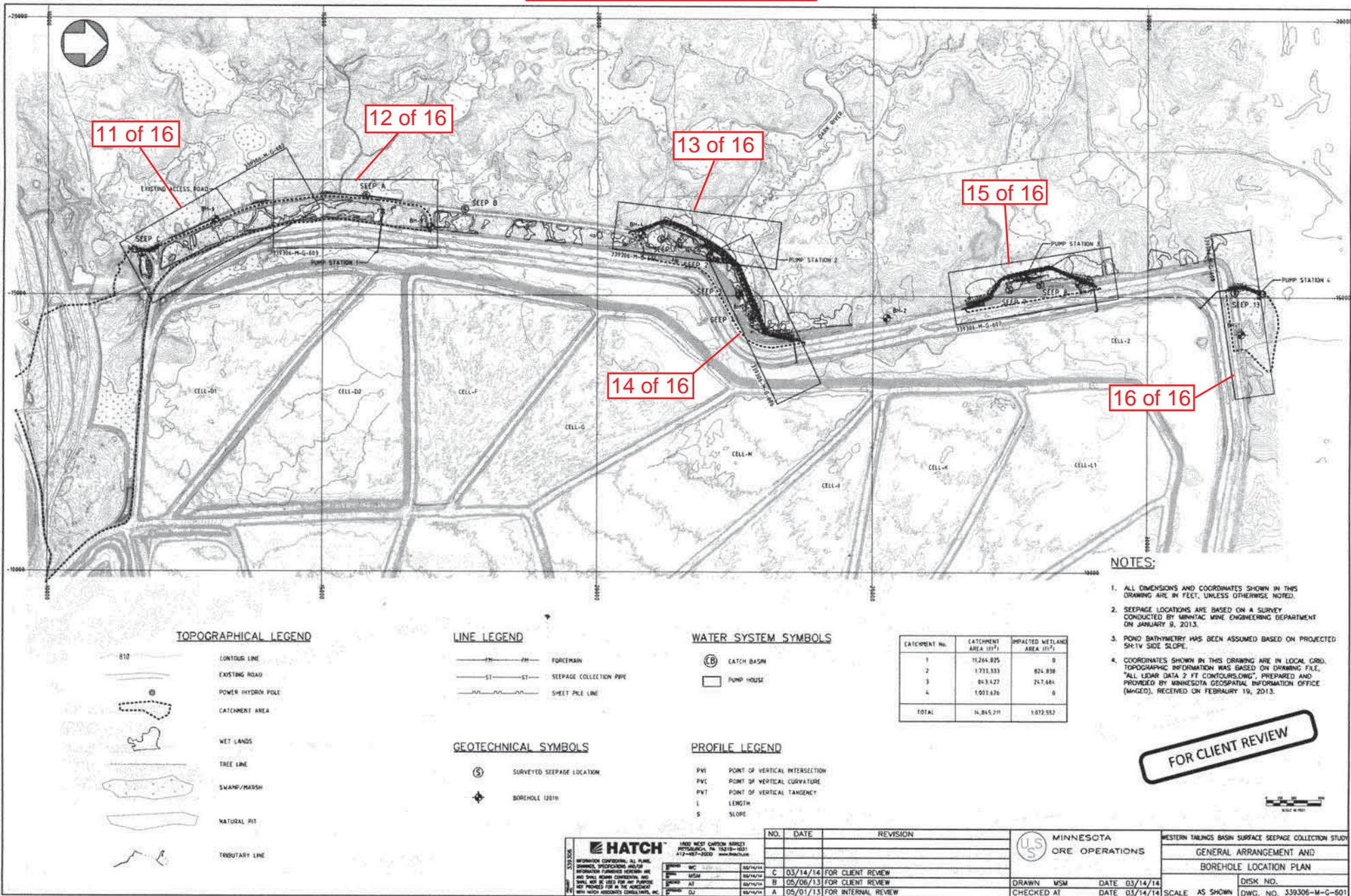
-  Road Centerline
-  Culvert
- Direct Impacts**
-  Road
- Hydrologic Impacts**
-  Culvert Outlet
-  Wetland Boundary 2012
-  Estimated Wetland Boundary 2014

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Reference: ESRI World Imagery

Version	Description	Drawn	Date	Checked	Date
1	Original Issue	SRP	27 Mar 2014	ARD	27 Mar 2014

Plan and Profile Sheet Index



- NOTES:**
1. ALL DIMENSIONS AND COORDINATES SHOWN IN THIS DRAWING ARE IN FEET, UNLESS OTHERWISE NOTED.
 2. SEEPAGE LOCATIONS ARE BASED ON A SURVEY CONDUCTED BY MINNATAC MINE ENGINEERING DEPARTMENT ON JANUARY 9, 2013.
 3. POND BATHYMETRY HAS BEEN ASSUMED BASED ON PROJECTED SH-1V SIDE SLOPE.
 4. COORDINATES SHOWN IN THIS DRAWING ARE IN LOCAL GRID. TOPOGRAPHIC INFORMATION WAS BASED ON DRAWING FILE: "ALL LIDAR DATA 2 FT CONTOURS.DWG", PREPARED AND PROVIDED BY MINNESOTA GEOSPATIAL INFORMATION OFFICE (MIGEO), RECEIVED ON FEBRUARY 19, 2013.

TOPOGRAPHICAL LEGEND

- 810 CONTOUR LINE
- EXISTING ROAD
- POWER HYDROF POLE
- CATCHMENT AREA
- WET LANDS
- TREE LINE
- SWAMP/MARSH
- NATURAL PIT
- TRIBUTARY LINE

LINE LEGEND

- FH — FH — FORCEMAIN
- ST — ST — SEEPAGE COLLECTION PIPE
- S — S — SHEET PILE LINE

WATER SYSTEM SYMBOLS

- ⊕ CATCH BASIN
- PUMP HOUSE

GEOTECHNICAL SYMBOLS

- ⊙ SURVEYED SEEPAGE LOCATION
- ⊕ BOREHOLE (2011)

PROFILE LEGEND

- PVI POINT OF VERTICAL INTERSECTION
- PVC POINT OF VERTICAL CURVATURE
- PVT POINT OF VERTICAL TANGENCY
- L LENGTH
- S SLOPE

CATCHMENT No.	CATCHMENT AREA (11') ²	IMPACTED WETLAND AREA (11') ²
1	11,264.825	0
2	1,731.333	824.838
3	843.427	247.461
4	1,003.626	0
TOTAL	14,843.211	1,072.302

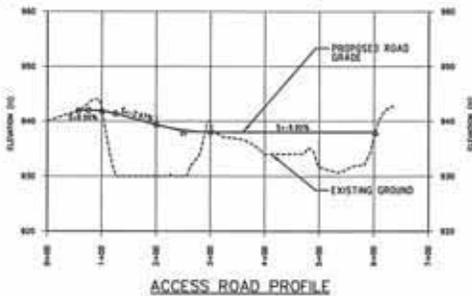
FOR CLIENT REVIEW

<p>HATCH 1400 WEST GARDEN AVENUE PITTSBURGH, PA 15219-1031 412-487-2000 www.hatch.com</p>	NO.	DATE	REVISION	<p>MINNESOTA ORE OPERATIONS</p>	<p>WESTERN TALKING BASIN SURFACE SEEPAGE COLLECTION STUDY GENERAL ARRANGEMENT AND BOREHOLE LOCATION PLAN</p>
	<p>DATE PLOTTED: 03/14/14</p>	<p>DATE: 03/14/14</p>	<p>REVISION: FOR CLIENT REVIEW</p>		
<p>DESIGNED BY: MC</p>	<p>DATE: 03/14/14</p>	<p>REVISION: C</p>	<p>DATE: 03/14/14</p>	<p>DRAWN BY: MSM</p>	<p>DATE: 03/14/14</p>
<p>CHECKED BY: AT</p>	<p>DATE: 05/06/13</p>	<p>REVISION: B</p>	<p>DATE: 05/06/13</p>	<p>CHECKED BY: AT</p>	<p>DATE: 03/14/14</p>
<p>DESIGNED BY: DJ</p>	<p>DATE: 05/01/13</p>	<p>REVISION: A</p>	<p>DATE: 05/01/13</p>	<p>SCALE: AS SHOWN</p>	<p>DWG. NO. 339305-M-G-601</p>



NOTES:

1. ALL DIMENSIONS AND COORDINATES SHOWN IN THIS DRAWING ARE IN FEET UNLESS OTHERWISE NOTED.
2. SEEKIE LOCATIONS ARE BASED ON A SURVEY CONDUCTED BY SHAWTEC AND ENGINEERING DEPARTMENT ON JANUARY 8, 2014.
3. POND WATER LEVEL ELEVATIONS ARE BASED ON A SURVEY CONDUCTED IN DECEMBER 2011.
4. COORDINATES SHOWN IN THIS DRAWING ARE IN LOCAL GRID TOPOGRAPHIC INFORMATION WAS BASED ON DRAWING FILE, "ALL LEAD DATA 2 FT COMPENSATING", PREPARED AND PROVIDED BY MINNESOTA GEOGRAPHIC INFORMATION OFFICE (MNGIO), RECEIVED ON FEBRUARY 19, 2014.
5. POND BATHYMETRY ARE BASED ON A PROJECTED 24-HR SOLE FLOW.



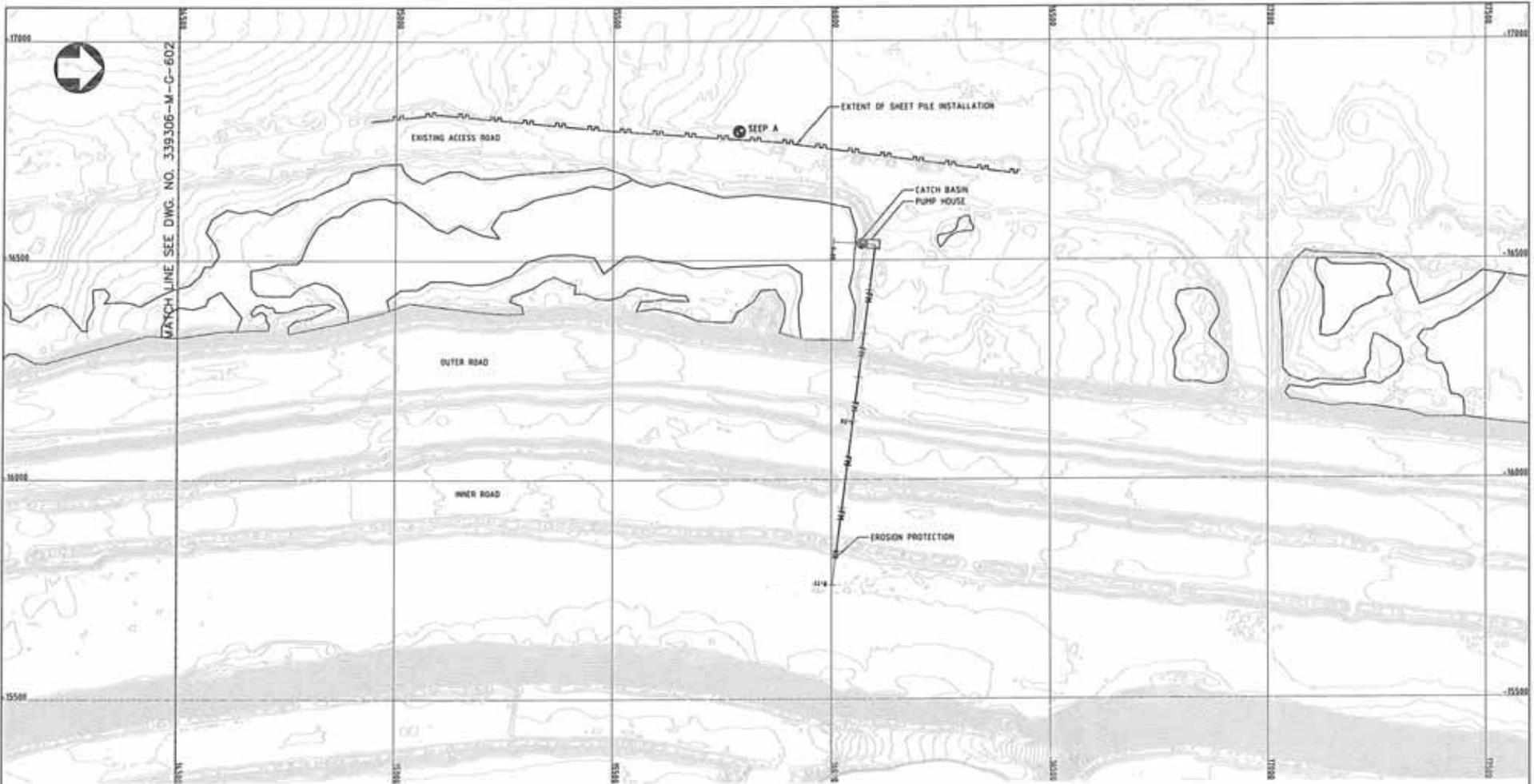
PLAN

FOR CLIENT REVIEW

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 <small>1500 WEST GARDEN STREET Plymouth, MN 55441-1001 612-537-2500 hatching.com</small>	<table border="1"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>REVISION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		NO.	DATE	REVISION							 <small>MINNESOTA ORE OPERATIONS</small>	<small>WESTERN TRUNKS BASH SURFACE SEEKIE COLLECTION STUDY CATCHMENT 1 PLAN AND PROFILE (1 OF 2)</small>
	NO.	DATE	REVISION										
<small>DESIGNED BY: [Signature] DATE: 03/14/14 FOR CLIENT REVIEW DRAWN BY: [Signature] DATE: 05/08/13 FOR CLIENT REVIEW CHECKED BY: [Signature] DATE: 05/07/13 FOR INTERNAL REVIEW</small>	<small>DRAWN: MSM DATE: 03/14/14 CHECKED BY: DATE: 03/14/14</small>	<small>SCALE: AS SHOWN DWG. NO. 339,306-M-G-602</small>											



PLAN

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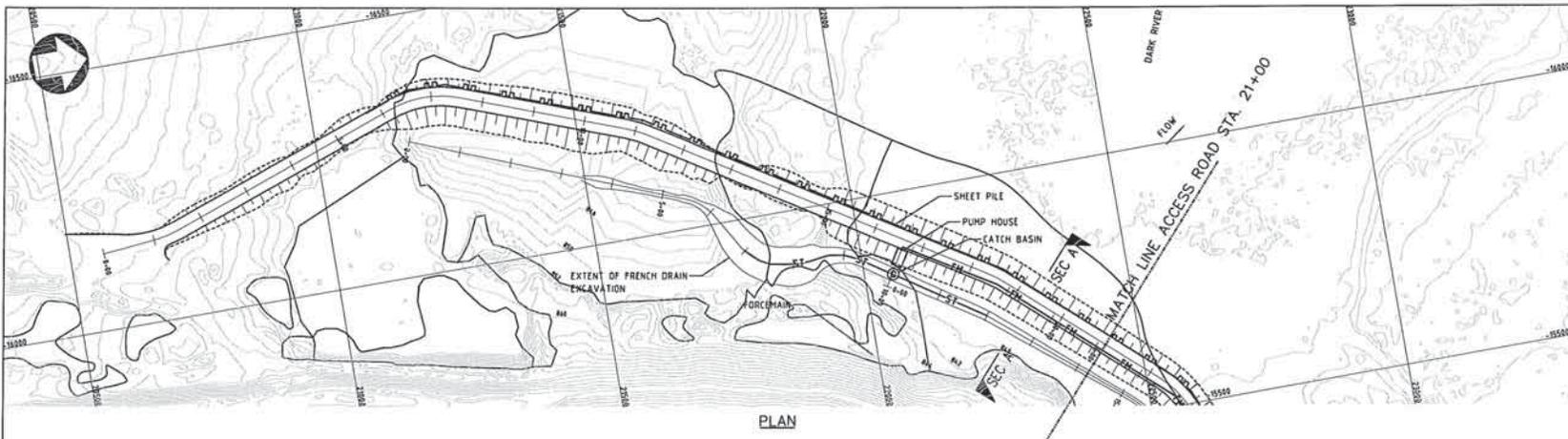
1. ALL DIMENSIONS AND COORDINATES SHOWN IN THIS DRAWING ARE IN FEET, UNLESS OTHERWISE NOTED.
2. SEEPAGE LOCATIONS ARE BASED ON A SURVEY CONDUCTED BY MINNAPAC MINE ENGINEERING DEPARTMENT ON JANUARY 8, 2013.
3. ROAD WATER LEVEL ELEVATIONS ARE BASED ON A SURVEY CONDUCTED IN DECEMBER 2011.
4. COORDINATES SHOWN IN THIS DRAWING ARE IN LOCAL GRID. TOPOGRAPHIC INFORMATION WAS BASED ON DRAWING FILE "141111.DWG" (2 FT. CONTOUR INTERVAL), PROVIDED AND PROVIDED BY MINNESOTA GEOGRAPHIC INFORMATION OFFICE (MGI/O), RECEIVED ON FEBRUARY 19, 2013.
5. ROAD SURVEYING ARE BASED ON A PROJECTED 3% SLOPE.

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FOR CLIENT REVIEW

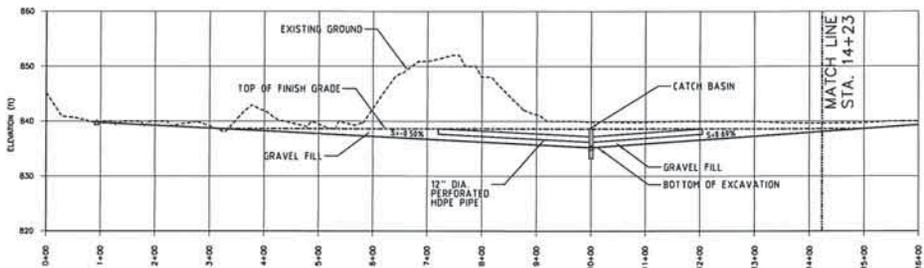


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<small>NO.</small> <small>DATE</small> <small>REVISION</small>	<small>NO.</small> <small>DATE</small> <small>REVISION</small>	<small>NO.</small> <small>DATE</small> <small>REVISION</small>	<small>NO.</small> <small>DATE</small> <small>REVISION</small>	<small>DATE</small> <small>DATE</small>	<small>SCALE</small> <small>SCALE</small>

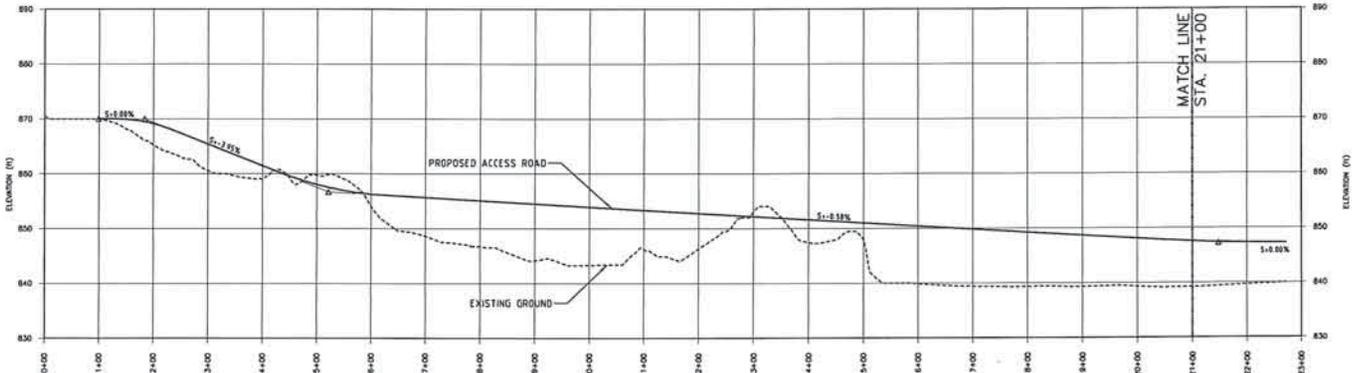


- NOTES:**
1. ALL DIMENSIONS AND COORDINATES SHOWN IN THIS DRAWING ARE IN FEET, UNLESS OTHERWISE NOTED.
 2. SEEPAGE LOCATIONS ARE BASED ON A SURVEY CONDUCTED BY MINNAPAC MINE ENGINEERING DEPARTMENT ON JANUARY 9, 2013.
 3. POND WATER LEVEL ELEVATIONS ARE BASED ON A SURVEY CONDUCTED IN DECEMBER 2011.
 4. COORDINATES SHOWN IN THIS DRAWING ARE IN LOCAL GRID. TOPOGRAPHIC INFORMATION WAS BASED ON DRAWING FILE: "ALL LEARN DATA 2 FT CONTOUR.DWG", PREPARED AND PROVIDED BY MINNESOTA GEOGRAPHIC INFORMATION OFFICE (MAGISO), RECEIVED ON FEBRUARY 19, 2013.
 5. POND BATHYMETRY ARE BASED ON A PROJECTED SHINY SIDE SLOPE.

PLAN



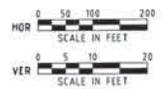
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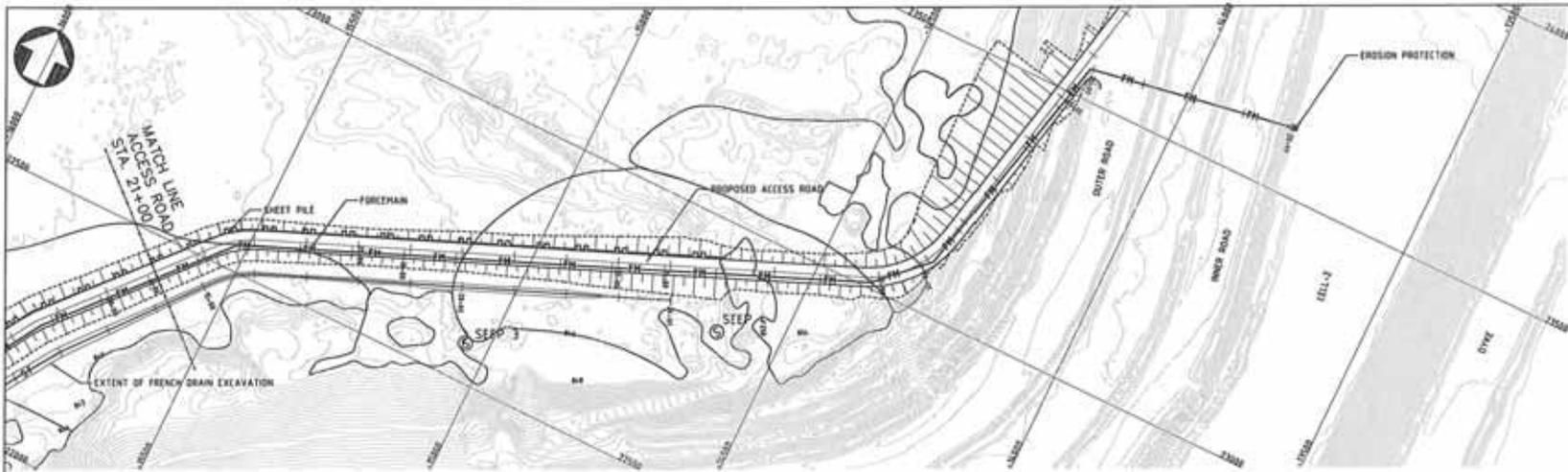
ACCESS ROAD PROFILE

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FOR CLIENT REVIEW

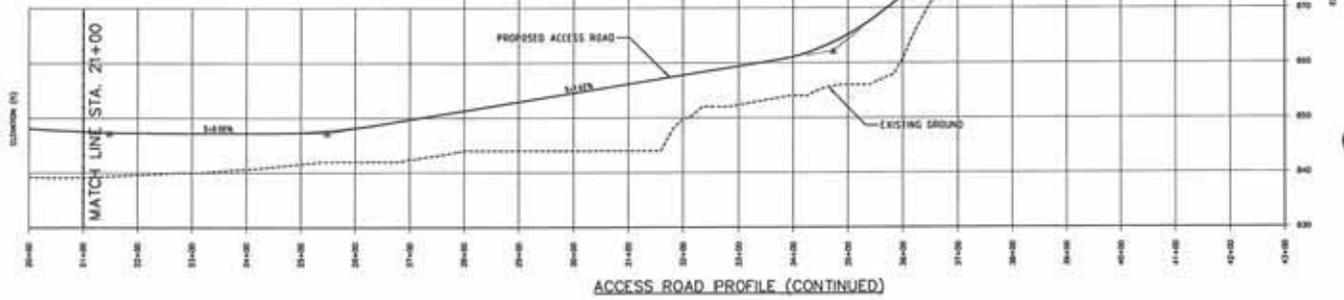
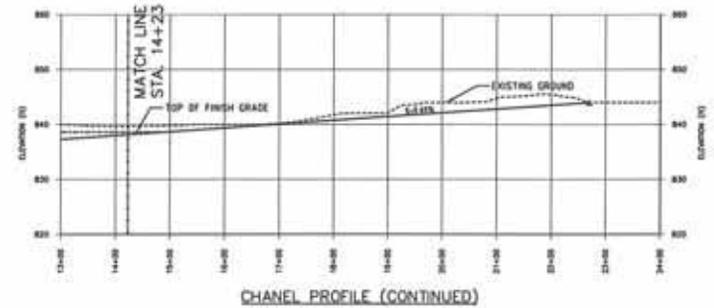


 <small>1800 WEST GARDEN STREET PITTSBURGH, PA 15229-1531 412-497-2000 www.hatch.us</small>	<small>DESIGNED BY</small> WC <small>CHECKED BY</small> MSJ <small>DATE</small> 03/14/14	<small>NO.</small> C <small>DATE</small> 03/14/14 <small>REVISION</small> FOR CLIENT REVIEW		<small>WESTERN TALINGS BASIN SURFACE SEEPAGE COLLECTION STUDY</small>
	<small>DATE</small> 05/05/13 <small>REVISION</small> FOR CLIENT REVIEW	<small>NO.</small> B <small>DATE</small> 05/05/13 <small>REVISION</small> FOR CLIENT REVIEW		<small>PLAN AND PROFILE (1 OF 2)</small>
<small>DATE</small> 05/01/13 <small>REVISION</small> FOR INTERNAL REVIEW	<small>NO.</small> A <small>DATE</small> 05/01/13 <small>REVISION</small> FOR INTERNAL REVIEW	<small>NO.</small> B <small>DATE</small> 03/14/14 <small>REVISION</small> FOR CLIENT REVIEW	<small>MINNESOTA ORE OPERATIONS</small>	<small>DISK NO.</small>
<small>DATE</small> 03/14/14 <small>REVISION</small> FOR CLIENT REVIEW	<small>NO.</small> C <small>DATE</small> 03/14/14 <small>REVISION</small> FOR CLIENT REVIEW	<small>NO.</small> B <small>DATE</small> 03/14/14 <small>REVISION</small> FOR CLIENT REVIEW	<small>MINNESOTA ORE OPERATIONS</small>	<small>SCALE AS SHOWN</small>



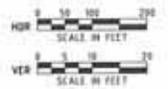
- NOTES:**
1. ALL DIMENSIONS AND COORDINATES SHOWN IN THIS DRAWING ARE IN FEET, UNLESS OTHERWISE NOTED.
 2. SEEPAGE LOCATIONS ARE BASED ON A SURVEY CONDUCTED BY MINNESOTA MINE ENGINEERING DEPARTMENT ON JANUARY 6, 2013.
 3. FINE WATER LEVEL ELEVATIONS ARE BASED ON A SURVEY CONDUCTED IN DECEMBER 2011.
 4. COORDINATES SHOWN IN THIS DRAWING ARE IN LOCAL UTM TOPOGRAPHIC INFORMATION WAS OBTAINED BY DRAWING FILE "MLI_LOCAL_DATA_2_FT_COORDINATES.DWG", PROVIDED AND PROVIDED BY MINNESOTA GEOGRAPHICAL INFORMATION OFFICE (MGIO), RECEIVED ON FEBRUARY 18, 2013.
 5. FLOOD BATHYMETRY ARE BASED ON A PROJECTED 50-YR SOLE.

PLAN

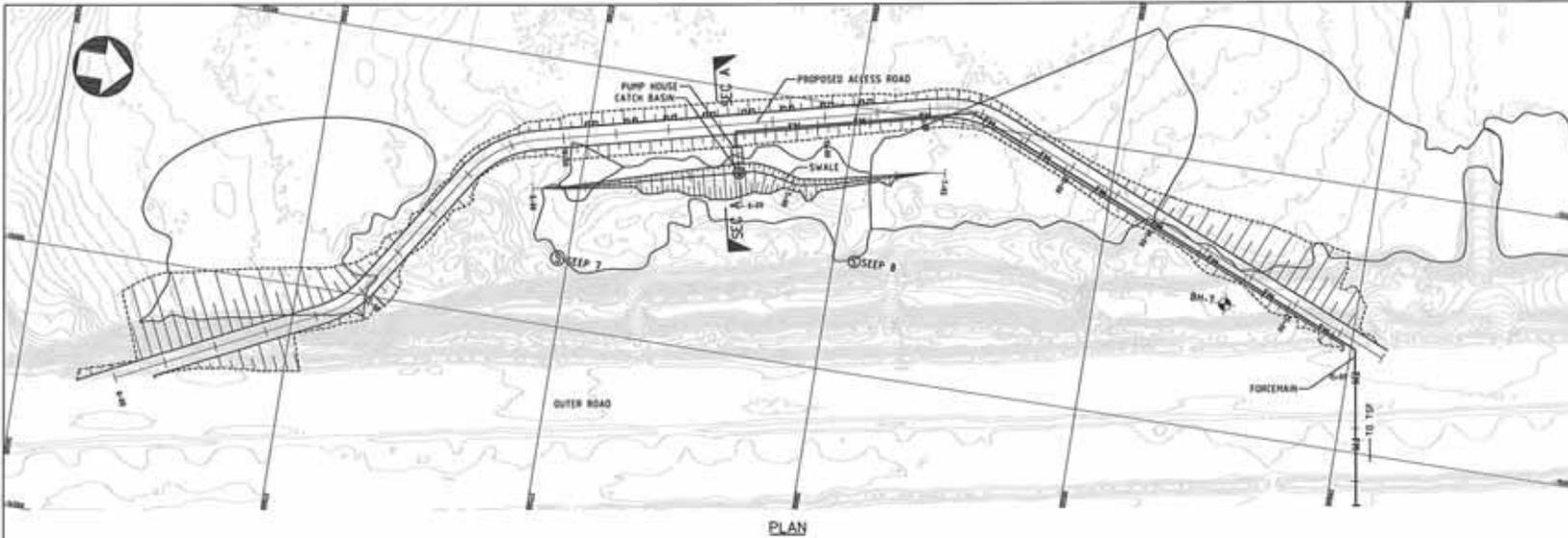


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FOR CLIENT REVIEW



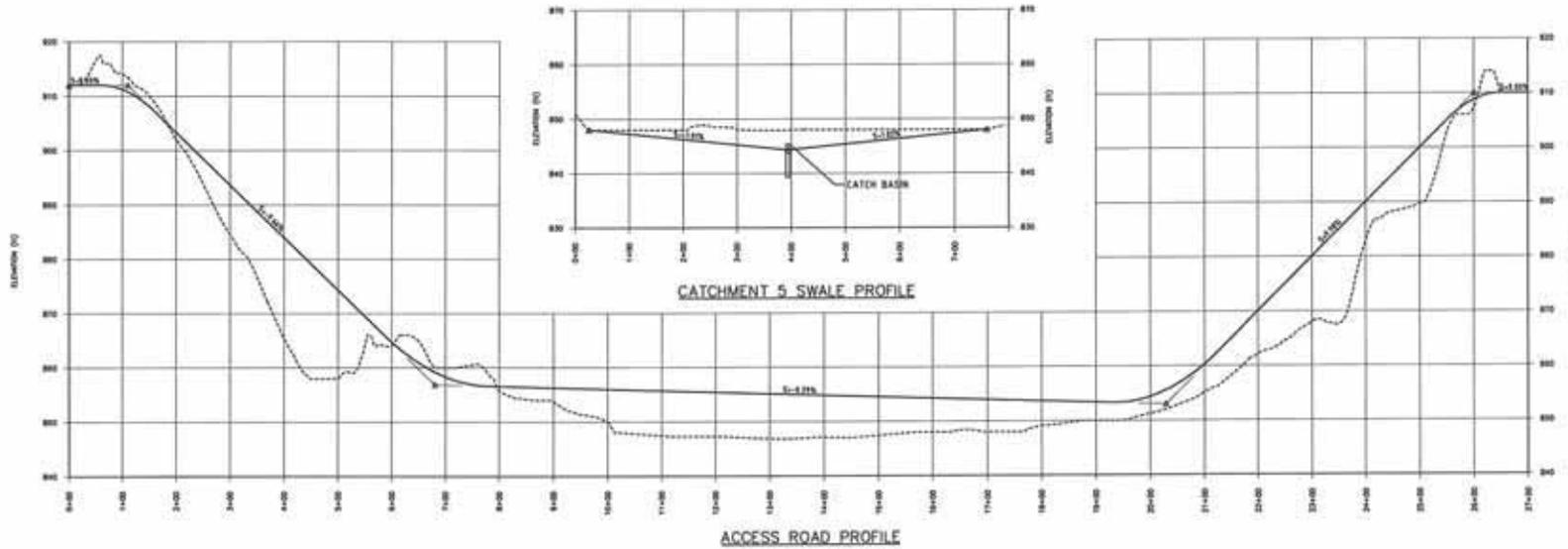
	1500 WEST CANTON STREET MINNEAPOLIS, MN 55408-1000 612-557-3300		NO. DATE REVISION			WESTERN TALINGS BIOM SURFACE SEEPAGE COLLECTION STUDY CATCHMENT 2 PLAN AND PROFILE (2 OF 2)
	DRAWN: USM CHECKED AT:	DATE: 03/14/14 DATE: 03/14/14	C 03/14/14 FOR CLIENT REVIEW B 05/04/13 FOR CLIENT REVIEW A 05/01/14 FOR INTERNAL REVIEW	DISK NO. SCALE: AS SHOWN DWG. NO. 338305-M-C-608		



NOTES:

1. ALL DIMENSIONS AND COORDINATES SHOWN IN THIS DRAWING ARE IN FEET, UNLESS OTHERWISE NOTED.
2. SEWAGE LOCATIONS ARE BASED ON A SURVEY CONDUCTED BY MINNIE AHE ENGINEERING DEPARTMENT ON JANUARY 6, 2013.
3. FLOOD WATER LEVEL ELEVATIONS ARE BASED ON A SURVEY CONDUCTED IN DECEMBER 2011.
4. COORDINATES SHOWN IN THIS DRAWING ARE IN LOCAL ONE. SPOTHEIGHT INFORMATION WAS BASED ON DRAWING FILE "ALL LOUISIANA 2 FT CONTOUR.DWG", PROVIDED AND PROVIDED BY MINNESOTA GEOGRAPHICAL INFORMATION OFFICE (MGI/O), RECEIVED ON FEBRUARY 18, 2013.
5. FLOOD HYDRAULICS ARE BASED ON A PROJECTED 5:1 V SIDE SLOPE.

PLAN



CATCHMENT 5 SWALE PROFILE

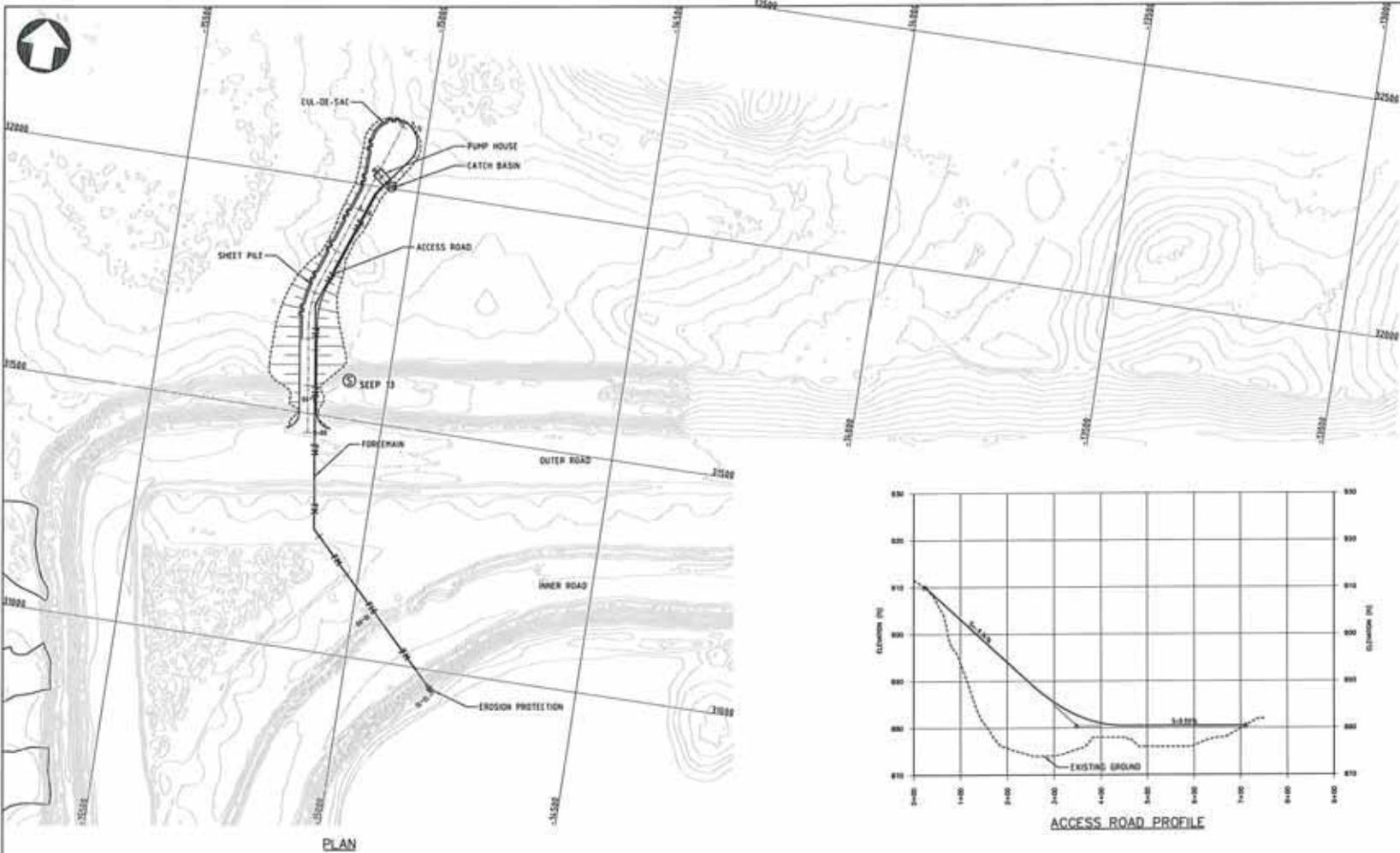
ACCESS ROAD PROFILE

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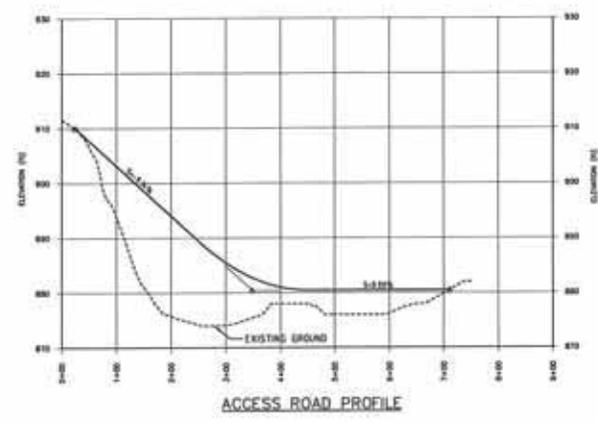
FOR CLIENT REVIEW



	NO.	DATE	REVISION		WESTERN INLANDS BARR SURFACE SEWAGE COLLECTION STUDY CATCHMENT 3 PLAN AND PROFILE
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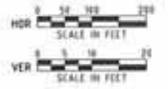


- NOTES:**
1. ALL DIMENSIONS AND COORDINATES SHOWN IN THIS DRAWING ARE IN FEET, UNLESS OTHERWISE NOTED.
 2. SEEPADE LOCATIONS ARE BASED ON A SURVEY CONDUCTED BY MWHAVE AND ENGINEERING DEPARTMENT ON JANUARY 9, 2013.
 3. POND WATER LEVEL ELEVATIONS ARE BASED ON A SURVEY CONDUCTED IN DECEMBER 2011.
 4. COORDINATES SHOWN IN THIS DRAWING ARE IN LOCAL GRID. TOPOGRAPHIC INFORMATION WAS BASED ON DRAWING FILE: "ALL LIGN DATA 3 FT CONTOURS.DWG", PREPARED AND PROVIDED BY MINNESOTA GEOGRAPHICAL INFORMATION OFFICE (MGI), RECEIVED ON FEBRUARY 18, 2013.
 5. POND BATHYMETRY ARE BASED ON A PROJECTED 3% SIDE SLOPE.



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FOR CLIENT REVIEW



 <small>1800 WEST CAMDEN STREET ANN ARBOR, MI 48104-1501 412-997-2000</small>	<small>DESIGNED BY: MCM</small> <small>CHECKED BY: MCM</small> <small>DATE: 03/14/14</small>		NO. DATE REVISION	
			<small>PROJECT: WESTERN TALKINS BATH SURFACE SEEPADE COLLECTION STUDY</small>	<small>CATCHMENT 4</small>
<small>DISK NO.</small>			<small>SCALE: AS SHOWN</small>	
<small>DRAWN: MSM</small>			<small>DATE: 03/14/14</small>	
<small>CHECKED BY: MCM</small>			<small>DATE: 03/14/14</small>	
<small>DATE: 05/01/13 FOR INTERNAL REVIEW</small>			<small>SCALE: AS SHOWN</small>	
<small>DATE: 05/14/14 FOR CLIENT REVIEW</small>			<small>SCALE: AS SHOWN</small>	
<small>DATE: 05/06/13 FOR CLIENT REVIEW</small>			<small>SCALE: AS SHOWN</small>	
<small>DATE: 03/14/14 FOR CLIENT REVIEW</small>			<small>SCALE: AS SHOWN</small>	