



**CITY OF DULUTH  
REQUEST FOR PROPOSALS FOR**

**DULUTH-WINNIPEG-PACIFIC (DWP) REDEVELOPMENT SITE**

**RFP NUMBER 26-AA14**

**ISSUED Tuesday, April 14, 2026**

**PROPOSALS DUE Friday, May 29, 2026, By 3:00 PM**

**SUBMIT TO**

**CITY OF DULUTH ATTN:  
PURCHASING DIVISION  
CITY HALL, ROOM 120 411 WEST  
1ST STREET DULUTH, MN 55802**

## **PART I – GENERAL INFORMATION**

### **I-1. Introduction & Project Summary.**

The Duluth Economic Development Authority (DEDA) invites qualified development teams to submit proposals for the redevelopment of the 5.6-acre DWP site located adjacent to Main Street and N 67th Avenue West Alley, in Duluth’s Fairmount neighborhood. The City seeks proposals that address the highest and best use of the property, contribute to the vibrancy of the Fairmount residential neighborhood, and align with the City’s comprehensive plan, Imagine Duluth 2035. Additional details are provided in **Part IV** of this RFP.

### **I-2. Calendar of Events.**

The City will make every effort to adhere to the following schedule:

<b>Activity</b>	<b>Date</b>
Pre-proposal Conference	April 23 <sup>rd</sup>
Deadline to submit Questions via email to <a href="mailto:purchasing@duluthmn.gov">purchasing@duluthmn.gov</a>	May 13 <sup>th</sup>
Answers to questions will be posted to the City website no later than this date.	May 18 <sup>th</sup>
Proposals due in the Purchasing Office by 3:00 PM on this date.	May 29 <sup>th</sup>
Interviews tentatively scheduled the week of:	June 8 <sup>th</sup>
Anticipated Selection	June 15 <sup>th</sup>

### **I-3. Rejection of Proposals.**

The City reserves the right, in its sole and complete discretion, to reject any and all proposals or cancel the request for proposals, at any time prior to the time a contract is fully executed, when it is in its best interests. The City is not liable for any costs the Bidder incurs in preparation and submission of its proposal, in participating in the RFP process or in anticipation of award of the contract.

### **I-4. Pre-proposal Conference.**

The City will hold an optional virtual pre-proposal conference as specified in the Calendar of Events. Interested Bidders can attend via Microsoft Teams, a link will be posted on the City’s Purchasing site <https://duluthmn.gov/purchasing/bids-request-for-proposals/>. A site visit will follow the conference, attendance at the site visit is not mandatory.

#### **I-5. Questions & Answers.**

Any questions regarding this RFP must be submitted by e-mail to the Purchasing Office at [purchasing@duluthmn.gov](mailto:purchasing@duluthmn.gov) no later than the date indicated on the Calendar of Events. Answers to the questions will be posted as an Addendum to the RFP.

#### **I-6. Addenda to the RFP.**

If the City deems it necessary to revise any part of this RFP before the proposal response date, the City will post an addendum to its website <http://www.duluthmn.gov/purchasing/bids-request-for-proposals/>. Although an e-mail notification will be sent, it is the Bidder's responsibility to periodically check the website for any new information. Any addenda issued must be acknowledged on the Proposal Cover Sheet attached as Appendix A.

#### **I-7. Proposals.**

To be considered, hard copies of proposals must arrive at the City on or before the time and date specified in the RFP Calendar of Events. The City will not accept proposals via email or facsimile transmission. The City reserves the right to reject or to deduct evaluation points for late proposals.

Proposals must be signed by an authorized official. If the official signs the Proposal Cover Sheet attached as Appendix A, this requirement will be met. Proposals must remain valid for 60 days or until a contract is fully executed.

Please submit one (1) unbound paper copy of the Technical Submittal.

All materials submitted in response to this RFP will become property of the City and will become public record after the evaluation process is completed and an award decision made.

#### **I-8.Small Diverse Business Information.**

The City encourages participation by minority, women, and veteran-owned businesses as prime contractors, and encourages all prime contractors to make a significant commitment to use minority, women, veteran-owned and other disadvantaged business entities as subcontractors and suppliers. A list of certified Disadvantaged Business Enterprises is maintained by the Minnesota Unified Certification Program at <http://mnucp.metc.state.mn.us/>.

#### **I-9. Agreement.**

The awarded proposer will be required to enter into a purchase agreement upon DEDA's terms and conditions for sale of the property. The awarded proposer will be required to sign a development agreement, to be negotiated between the parties. Questions about this agreement

should be submitted to [purchasing@duluthmn.gov](mailto:purchasing@duluthmn.gov) by the question deadline in the schedule above.

**I-10. Award.**

The award will be based upon the evaluation criteria, subject to execution of a written development agreement.

**I-11. Term of Contract.**

The term of the contract will begin once the contract is fully executed and is anticipated to end once operating covenant requirements have been met. The selected Bidder shall not start the performance of any work nor shall the City be liable to pay the selected Bidder for any service or work performed or expenses incurred before the contract is executed.

**I-12. Mandatory Disclosures.**

By submitting a proposal, each Bidder understands, represents, and acknowledges that:

- A. Their proposal has been developed by the Bidder independently and has been submitted without collusion with and without agreement, understanding, or planned common course of action with any other vendor or suppliers of materials, supplies, equipment, or services described in the Request for Proposals, designed to limit independent bidding or competition, and that the contents of the proposal have not been communicated by the Bidder or its employees or agents to any person not an employee or agent of the Bidder.
- B. There is no conflict of interest. A conflict of interest exists if a Bidder has any interest that would actually conflict, or has the appearance of conflicting, in any manner or degree with the performance of work on the project. If there are potential conflicts, identify the municipalities, developers, and other public or private entities with whom your company is currently, or have been, employed and which may be affected.
- C. It is not currently under suspension or debarment by the State of Minnesota, any other state or the federal government.
- D. The company is either organized under Minnesota law or has a Certificate of Authority from the Minnesota Secretary of State to do business in Minnesota, in accordance with the requirements in M.S. 303.03.

**I-13. Notification of Selection.**

Bidders whose proposals are not selected will be notified in writing.

## **I-14. Interviews.**

Interviews will be scheduled with the top three proposers.

## **PART II – PROPOSAL REQUIREMENTS**

Proposals must include the following:

- A. Cover Letter & Signed Proposal Sheet (Appendix A).
- B. Proposal Narrative & Concept Plan
  - a. Conceptual site plan explaining how the development will be integrated, showing development massing, street configuration, unit type and count, trail connection, and open space
  - b. Specific description of proposed housing development including housing types, unit breakdown, and anticipated price points
    - i. Single family homes, duplexes, townhomes, cottage home parks, accessory dwelling units are the only types of housing permitted for this development with a maximum of 77 units
  - c. Narrative describing integration into the Fairmount neighborhood and alignment with City goals
- C. Development Team Qualifications
  - a. Background of firm(s), roles of key personnel, and examples of similar projects completed in the past 5 years
  - b. References with contact information
- D. Budget & Pro Forma
  - a. Sources and uses, financing strategy to ensure project success and preliminary cost estimates
  - b. Proposed purchase price
  - c. Local sourcing is encouraged
- E. Project Schedule
  - a. Preliminary timeline for site plan development, regulatory approvals, financing and construction plans
    - i. DEDA does not expect detailed designs or financials at this time
- F. Written and signed acknowledgement (Appendix B) that upon site acquisition, a Regulating Plan must be created in conformance with the DWP R-P District prior to development of the site

## **PART III – CRITERIA FOR SELECTION**

The proposals will be reviewed by City and DEDA Staff. The intent of the selection process is to review proposals and make an award based upon qualifications as described therein. A 100-point scale will be used to create the final evaluation recommendations. The factors and weighing on which proposals will be judged are:

Qualifications of the Bidder and Personnel	40%
Project Readiness	20%
Prior experience with similar work	15%
Incorporates highest and best uses	15%
Proposed purchase price	10%

**PART IV – PROJECT DETAIL**

**IV-1. Site Overview.**

Location: Seven parcels adjacent to the Former Duluth-Winnipeg-Pacific (DWP) rail line, directly north of the intersection of Main Street and 67th Avenue West

- Parcel IDs: 010-0580-00170, -00190, -00210, -00340, -00440, -00500, -00700 (St. Louis County Land Explorer: <https://gis.stlouiscountymn.gov/landexplorer/>)

Site Size: Approximately 5.6 acres

Zoning: Residential Planned (R-P)

- DWP R-P Zone District summary (full zoning map/description attached as Appendix C):
  - Maximum building height of 40’
  - 50’ vegetative buffer required along the existing DWP trail
  - A public connector trail must be constructed to connect the DWP tail with the existing Fairmount neighborhood
  - Permitted uses:

Use Description	Status
Dwelling, one-family	Permitted
Dwelling, two-family	Permitted
Dwelling, townhouse	Permitted
Cottage home park	Permitted
Accessory dwelling unit	Permitted
Accessory home occupation	Permitted
Accessory solar or geothermal power equipment	Permitted
Accessory daycare	Permitted
Accessory uses and structures not listed elsewhere	Permitted

- Upon acquisition of the site, the developer must create a Regulating Plan in conformance with the DWP R-P District requirements. Technical assistance for this process will be provided by the City’s Planning and Economic Development department.

- Further information about R-P zoning: <https://duluthmn.gov/media/phahyhll/rp-district.pdf>

Neighborhood Assets: DWP trail, Spirit Valley commercial district, Keene Creek Park, Keene Creek dog park, connection to the Willard Munger Trail, Lake Superior Zoo

#### **IV-2. Environmental Conditions.**

##### Former Uses:

- Duluth-Winnipeg-Pacific (DWP) rail line, roundhouse, and railyard (1912-1984)
- Duluth Brass Works and Aluminum (1967-1998)

##### Site Remediation:

- Between 1986 and 2011 Mn/DOT completed multiple investigations and remedial actions including the removal and offsite disposal of contaminated soils and materials found on the site
  - The site received a No Further Action Determination from the MPCA based on meeting industrial soil standards
- Further testing and remediation were required with the proposal of recreational redevelopment in 2014 (previous industrial soil standards were not adequate for future recreational use on the site)
  - A Voluntary Response Action Plan (VRAP) was created to facilitate remediation (Appendix F)
- With the help of a National Forest Service Great Lakes Restoration Initiative Grant, additional remediation on the site was completed in 2017 in response to the VRAP
  - Remedial actions included elimination of invasive species, planting of flood-resistant and native trees and plants, and clean-up of soil contamination (Appendices G & H)
- Note: all remediation efforts were carried out on the entire historic DWP railyard site, the entire DWP railyard site includes but is not limited to the DEDA-owned properties discussed in this RFP

#### **IV-3. Highest & Best Uses.**

- High-quality design and integration with the Fairmount neighborhood
- Maximum unit density allowed in the district
- Denser projects like duplexes and townhomes (open to variety of all permitted uses)
- Quality housing for a range of incomes
- Advance goals of Imagine Duluth 2035, specifically sustainability, density, walkability (Appendix J)
- Inclusion of childcare amenities

#### **IV-4. Ownership & Disposition.**

- The property is owned by the Duluth Economic Development Authority (DEDA)

- DEDA intends to convey property at no less than fair market value (fair market value is equal to 125% of Estimated Market Value)
- Conveyance of the property will be subject to the submittal and approval of a final site plan

#### **IV-5. Additional Considerations.**

- Proposals that clearly align with and incorporate City priorities, studies, and reports (ex. Imagine Duluth 2035, 2025 Duluth Comprehensive Needs Analysis, etc.) will be viewed more favorably in the evaluation process
- Additional consideration will be given to a developer that provides public engagement prior to site development within their work plan
  - DEDA staff will support by attending with the developer regarding any desired public engagement
- For any proposed construction, a geotechnical report may need to be conducted for the proposed future building
  - Potential developers/buyers may need to consult with a design team on their proposed ideas and guidance will be provided by the design team of City Staff from Construction Services and Inspections ([permittingservices@duluthmn.gov](mailto:permittingservices@duluthmn.gov))

## **APPENDICES**

Appendix A – Proposal Cover Sheet

Appendix B – Acknowledgement of Regulating Plan

Appendix C – DWP R-P Zone District Description and Site Map

Appendix D – Engineering Department Memo

Appendix E – Fire Department Memo

Appendix F – DWP Voluntary Response Action Plan (VRAP)

Appendix G – DWP Restoration Work Documents

Appendix H – DWP Remediation Grant Final Report

Appendix I – 2025 Duluth Comprehensive Housing Needs Analysis Executive Summary (full report link: <https://duluthmn.gov/media/ge0imvox/2025-duluth-comprehensive-housing-needs-analysis-maxfield-study.pdf>)

Appendix J – Imagine Duluth 2035 Comprehensive Land Use Plan Executive Summary (full plan link: [https://duluthmn.gov/media/rtgk5tin/imagine-duluth-2035-combined\\_website\\_temp.pdf](https://duluthmn.gov/media/rtgk5tin/imagine-duluth-2035-combined_website_temp.pdf))

Appendix K – Sample Form of Purchase and Development Agreement

**APPENDIX A – PROPOSAL COVER SHEET  
CITY OF DULUTH**

**RFP# 26-AA14 DWP REDEVELOPMENT SITE**

**BIDDER INFORMATION**

Bidder Name	
Mailing Address	
Contact Person	
Contact Person's Phone Number	
Contact Person's E-Mail Address	
Federal ID Number	
Authorized Signature	
Name & Title of Authorized Signer	
Email of Authorized Signer	

**ACKNOWLEDGMENT OF ADDENDA**

ADDENDUM #	INITIAL/DATE
ADDENDUM #	INITIAL/DATE
ADDENDUM #	INITIAL/DATE
ADDENDUM #	INITIAL/DATE

**APPENDIX B – ACKNOWLEDGEMENT OF REGULATING PLAN  
CITY OF DULUTH**

**RFP# 26-AA14 DWP REDEVELOPMENT SITE**

**Acknowledgement**

I hereby acknowledge that upon site acquisition, a Regulating Plan must be created in conformance with the DWP R-P District prior to the development of the site. As site owner, I am responsible for the completion of said Regulating Plan.

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Name

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Signature

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Date

**APPENDIX C – DWP R-P ZONE DISTRICT DESCRIPTION AND SITE MAP  
CITY OF DULUTH**

**RFP# 26-AA14 DWP REDEVELOPMENT SITE**

**DWP R-P District**

The proposed R-P district encompasses land previously owned by the former Duluth-Winnipeg-Pacific (DWP) Railway; the rail line was decommissioned and is now the location of a paved trail connecting the Cross-City Trail to Spirit Mountain and the Magney-Snively Natural Area.

Land adjacent to the former rail line was previously used as a roundhouse and railyard. As DWP has divested the property, community plans have helped envision the future of the area. Recent plans including the *Irving Fairmount Brownfields Revitalization Plan* and *Imagine Duluth 2035* have identified the area as a mixture of open space and residential. The current zoning of the area shown in the R-P Concept Plan is a mixture of R-1 and R-2.

More recently, site investigation has shown that the southern triangular area of land included significant contamination that hinders future residential development. Because of this, this R-P District proposes to rezone the area to R-P to accommodate development options that still incorporate residential and open space uses in close proximity, while being flexible in the approach, conserving and enhancing natural features, and increasing pedestrian connectivity.

**PRESERVATION OF OPEN SPACE**

The proposed R-P district includes a total of 26.2 acres. Of this area, 15.2 acres would remain as designated open space, while the remaining 11 acres would allow for development.

Total acres	Open space/green space	Net developable acres
26.2	15.2	11

**DENSITY AND HEIGHT**

Area A, adjacent to existing single-family uses, would maintain a maximum density of 7 units per acre. This density conforms with the average lot size of parcels throughout the neighborhood. Area B would remain as open space, preserving the urban wilderness space for the neighborhood.

Area	Base Zone District	Size	Maximum Density	Maximum Height
A	R-1, R-2	11 acres	7 units/acre	40'
B	R-1, R-2	15.2 acres	0	N/A

As can be seen in the below table, this density is in line with both the zoning for the R-P area as well as the future land uses for the area:

	Area A	Area B	Total
Current Zone District	R-1, R-2	R-1, R-2	
# Units Under Current Zoning	16 units	79 Units	135 units
# Units Under Future Land Use	39 units	45 units	84 units
Proposed Maximum Units	77 units	0 units	77 units

\*Table uses land use recommendations for 4 units/acre for R-1 and 8 units/acre for R-2

**PERMITTED USES**

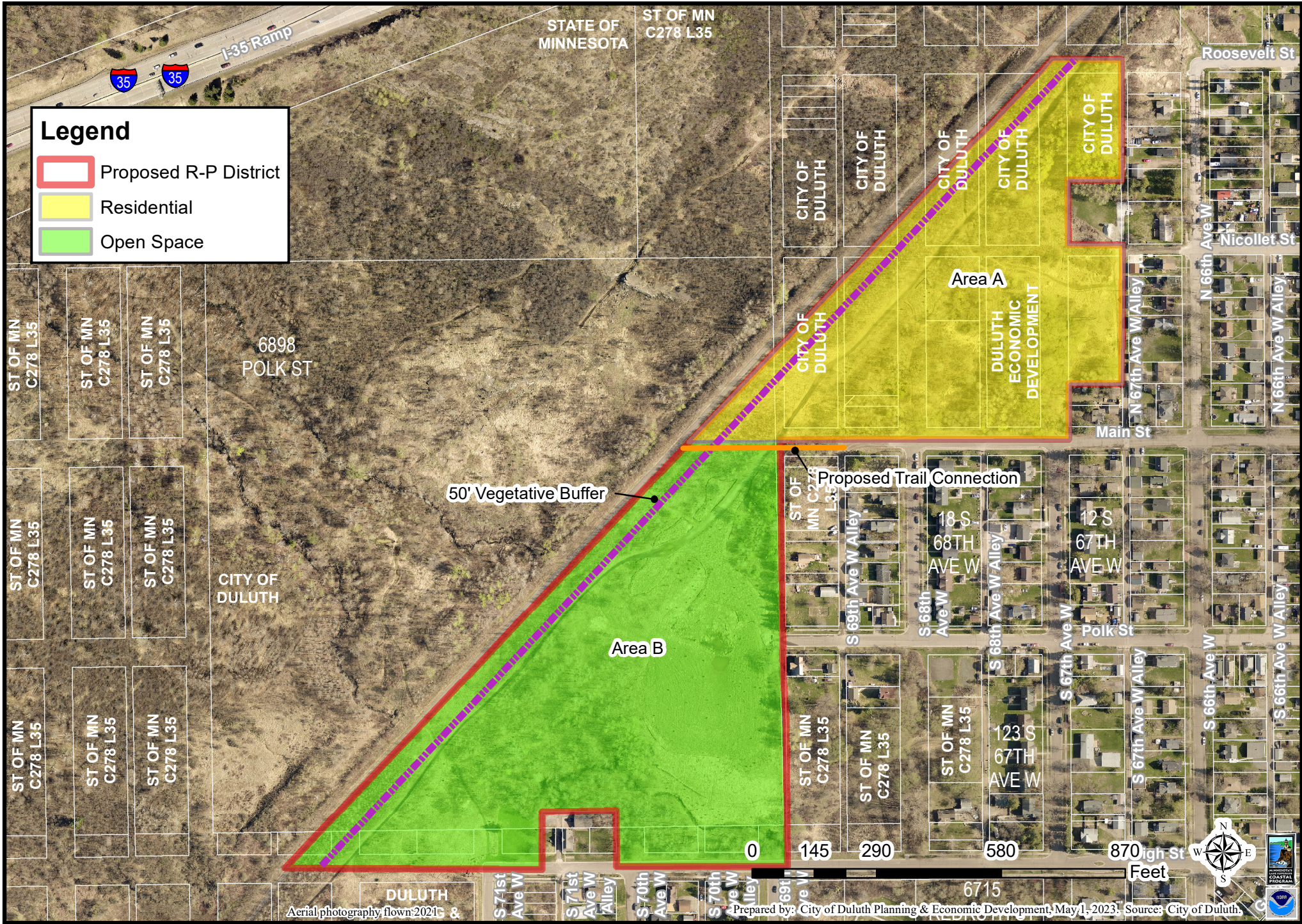
Area	Uses
A	Dwelling, one-family Dwelling, two-family Dwelling, Townhouse Cottage Home Park Agriculture, community garden Accessory dwelling unit Accessory home occupation Accessory solar or geothermal power equipment Accessory daycare Accessory uses and structures not listed elsewhere
C	Park, playground, or forest reserve

**PUBLIC BENEFITS**

R-P districts require demonstration of a greater level of public benefit than what would be required in the underlying zone district. The proposed R-P district would incorporate the following:

- Cleanup work in the southern portion to remain as open-space, including a 3-acre cap on contamination from the former rail use.
- Significant habitat restoration including the planting of hundreds of trees.
- Protection of habitat along two branches of 62<sup>nd</sup> Ave W creek, to the equivalent of more than double the structure and impervious surface setbacks in existing shoreland areas.
- A 50' vegetative buffer would protect the views and rural character along the DWP Trail.
- Along with the proposed development, a connector trail will be constructed, connecting the existing neighborhood to the DWP Trail.

# DWP R-P District



**APPENDIX D – ENGINEERING DEPARTMENT MEMO  
CITY OF DULUTH**

**RFP# 26-AA14 DWP REDEVELOPMENT SITE**

The City of Duluth has tried to ensure that the information contained in this map or electronic document is accurate. The City of Duluth makes no warranty or guarantee concerning the accuracy or reliability. This drawing/data is neither a legally recorded map nor a survey and is not intended to be used as one. The drawing/data is a compilation of records, information and data located in various City, County and State offices and other sources affecting the area shown and is to be used for reference purposes only. The City of Duluth shall not be liable for errors contained within this data provided or for any damages in connection with the use of this information contained within. The City of Duluth requires that this map/data not be redistributed to any party in whole or in part, including any derivative works of products generated by combining the data with other data, unless authorized by the City of Duluth GIS office.

Any Development will need to follow the Engineering Guidelines for Professional Services and Developments, these can be found on the City's web page under Engineering. Additionally a meeting can be scheduled with engineering staff to discuss proposed infrastructure needs, that includes public roads, watermain and sanitary sewer main extensions, and stormwater management facilities.

Former DWP Railroad Corridor, Soil Conditions Unknown.

Sanitary Sewer Main

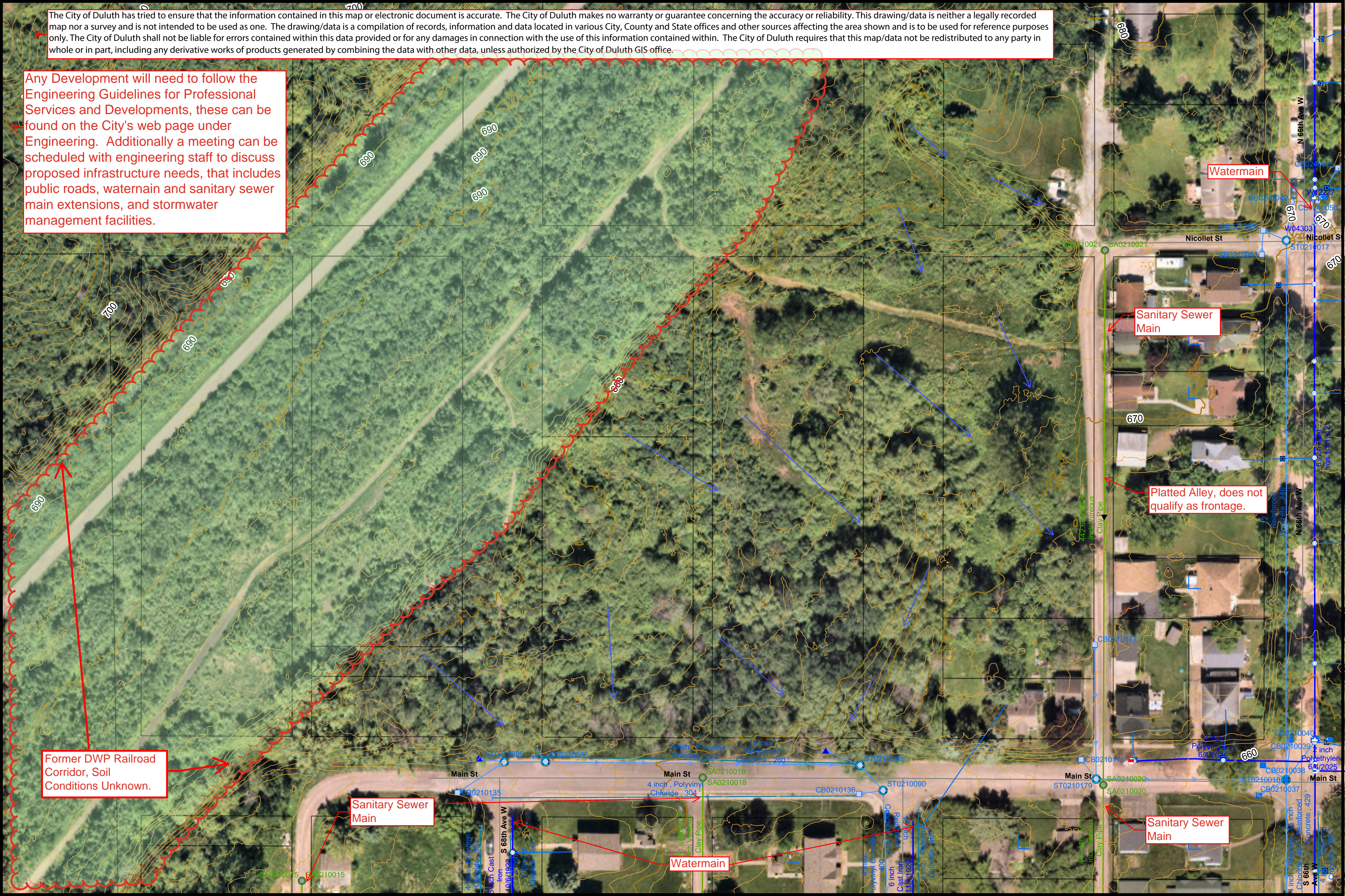
Watermain

Sanitary Sewer Main

Platted Alley, does not qualify as frontage.

Sanitary Sewer Main

Watermain



**APPENDIX E – FIRE DEPARTMENT MEMO  
CITY OF DULUTH**

**RFP# 26-AA14 DWP REDEVELOPMENT SITE**



## General Fire Code for New Development

Generally speaking, when it comes to new developments, the fire department needs fire apparatus access and water supply. The fire code is specific in what it requires for these items, but the requirements depend on what building type and occupancy type is being built specifically.

2020 MN State Fire Code (MSFC) chapter 5 covers general fire service features that are required. MSFC Appendix B, C, and D cover water and hydrant requirements for firefighting and fire apparatus access roads in more detail than the general sections of the code. These appendices were adopted by city ordinance. Please refer to these sections for complete information. Provided below are a few specific details:

Fire apparatus access roads are required for every building constructed within the jurisdiction. It shall extend to within 150ft of all portions of the building. The surface shall be built to hold the weight of fire apparatus and provide all-weather driving capabilities (concrete, asphalt, etc.). The road shall not exceed 10% grade. The width shall be a minimum of 20ft (if building heights are above 30ft, the width must be 26ft to accommodate aerial apparatus as well), if the access road has hydrants. Dead-end roads in excess of 150ft in length shall be provided with an approved area for turning around fire apparatus. The width and dead-end length can be increased for group R occupancies if the buildings are provided with an approved sprinkler system.

Depending on the development type, a second fire apparatus access road might be required. These include buildings over 30ft in height or 3 stories, buildings exceeding 62,000ft<sup>2</sup>, multi-family developments with more than 100 dwelling units, or one-and-two family developments with more than 30 dwelling units. Adding an approved sprinkler system to these buildings can increase sizes and/or decrease the need for a second apparatus access road. Where a second access road is required, the roads shall be placed a distance apart equal to not less than half of the length of the maximum overall diagonal dimension of the area/property to be served.

Hydrants are required for new developments. The number and spacing between each hydrant required is based on fire flow requirements calculated from MSFC Appendix C. The flow required decreases and distance between hydrants increases if buildings are provided with approved sprinkler systems. If hydrants are not feasible within the development site, then other means of water supply must be provided such as water reservoirs, tanks, etc.

**APPENDIX F – DWP Voluntary Response Action Plan (VRAP)  
CITY OF DULUTH**

**RFP# 26-AA14 DWP REDEVELOPMENT SITE**

# ***Voluntary Response Action Plan***

***Prepared for  
DWP Railroad Site Redevelopment Project  
Duluth, Minnesota***

***July 2014***



325 Lake Ave South Suite 700  
Duluth, MN 55802  
Phone: (218) 529-8200  
Fax: (218) 529-8202

# Voluntary Response Action Plan

## DWP Railroad Site Redevelopment Project

### Duluth, Minnesota

July 2014

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- Appendix B 2014 Sampling and Analysis Summary

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# 1.0 Introduction

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This Voluntary Response Action Plan (VRAP) presents the methods, actions, and controls proposed to be implemented at the DWP Railroad Site Redevelopment Project (the Property) for protection of human health and the environment, consistent with the future use of the Property. This plan is prepared for the City of Duluth (City) and the Duluth Economic Development Authority (DEDA). The Property is located at 6900 Polk Street, West Duluth, Saint Louis County, Minnesota as shown on [Figure 1](#).

## 1.1 Background

The approximately 60 acres that comprise the Property is currently owned by the Minnesota Department of Transportation (Mn/DOT), and was formerly occupied by the Duluth Winnipeg and Pacific (DWP) rail yard and railroad roundhouse, and a brass foundry. [Figure 2](#) shows the Property layout and proposed development areas.

## 1.2 Development Project

The current proposed development plans at the Property include the following:

- DWP Central Parking Lot and Access Road
- DWP Recreational Fields
- 62<sup>nd</sup> Avenue West Creek Ravine and Proposed Road Crossing
- Proposed DWP Trail Center

## 1.3 Voluntary Response Action Plan Scope and Objectives

The scope of the VRAP is to implement corrective measures for contaminated soil on the Property that are protective of human health and the environment for the proposed redevelopment ([Figure 2](#)). Based on previous groundwater testing conducted at the Property, groundwater corrective measures are not anticipated.

The VRAP is intended to primarily address two areas of concern in the overlying surficial fill that are anticipated to be encountered during future Property development:

- Known copper and/or lead-impacted soil at elevated levels in, and/or adjacent to, proposed Property development areas including:

- DWP Central Parking Lot and Access Road
  - DWP Recreational Fields
  - 62<sup>nd</sup> Avenue West Creek Ravine and Proposed Road Crossing
  - Proposed DWP Trail Center.
- Potential or known pockets of soil containing copper, lead, arsenic, PAHs, and/or petroleum impacts at elevated levels outside of the proposed Property development areas.

These areas are discussed in further detail in Section 3.0. The corrective measures for the Property will consist of potential additional soil characterization using a previously-established grid sampling protocol, removal of affected fill soil from planned construction areas above the native clay, and reuse and/or offsite management of soil as dictated by the concentrations of contaminants present. In general, the fill soil thickness ranges from 2 to 4 feet across the Property (Barr, 2014).

The City of Duluth/DEDA are seeking the following environmental assurances for the Property:

- No Association Determination with respect to the identified releases,
- Technical concurrence with this VRAP, and
- Upon completion of the development and remediation work a No Further Action determination.

The VRAP tasks proposed for the Property will be implemented as part of the construction phase of the development project. Construction activities associated with the development project will be executed in accordance with the VRAP soil management actions and contingency plan described in this report. The timing of the construction activities at the Property may not be concurrent, and may occur in stages.

## 2.0 Summary of Previous Investigations

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### 2.1 Property History and Investigation Activities

The Property has a development history that dates back to 1912 and includes the former Duluth Winnipeg and Pacific (DWP) rail yard and railroad roundhouse and the Duluth Brass and Aluminum nonferrous foundry operation (Figure 3). The DWP Duluth Yard operated between 1912 and 1984 and site activities included engine fueling, repair and maintenance activities. Between 1967 and 1998, Duluth Brass Works and Aluminum leased several DWP Duluth Yard buildings; including the former blacksmith shop, which housed the foundry operation. Waste material from the foundry operations was disposed of onsite until 1981. Material generated after 1981 was managed at an off-site disposal facility. Mn/DOT acquired the approximately 60-acre Property in 1984 via eminent domain and Duluth Brass Works operations were relocated in 1998. The Property is currently vacant and all historical DWP buildings have been demolished.

Two intermittent streams flow beneath the former railroad tracks and central portion of the Property via large diameter concrete culverts at approximately 20 feet below ground surface. The presence of the culverts may limit investigation and future development in these areas of the Property. The two intermittent streams exit the culverts and merge at the 62<sup>nd</sup> Avenue West Creek Ravine. Areas of the Property, primarily ravines including the 62<sup>nd</sup> Avenue West Creek Ravine, were historically filled with soil/cinder material and spent foundry sand.

Mn/DOT enrolled the Property in the Minnesota Pollution Control Agencies (MPCA) Voluntary Investigation and Cleanup (VIC) program in 1995 (site identification number VP4140) to obtain approval for environmental Work Plans and Response Action Plans. Between 1986 and 2011, Mn/DOT completed multiple investigations and remedial actions including the removal and offsite disposal of approximately 9,100 cubic yards of soil contaminated with lead, copper, polyaromatic hydrocarbons (PAHs), asbestos containing materials (ACM) and petroleum hydrocarbons; removal and disposal/recycling of approximately 5,200 cubic yards of concrete from former building foundations; and disposal of over 2.5 tons of solid waste including tires, appliances and treated wood. Site restoration work in 2009 included the placement, grading and seeding of a six inch layer of clean topsoil across the excavated areas. In January 2011, Mn/DOT requested and received a No Further Action (NFA) Determination from the MPCA VIC program based on the site meeting MPCA Tier 2 Industrial Soil standards.

The DWP Railroad Site Redevelopment Project is the next proposed development activity for the Property and would be carried out by the City, with support from the DEDA. The City's proposed redevelopment is recreational in nature; therefore the previous MPCA NFA determination, based on industrial soil reference values (SRVs), is not adequate and Tier 2 Recreational SRV risk-screening levels must be met. As part of this process, the Property has been re-enrolled in the MPCA's VIC program and additional sediment sampling was performed in June 2014 in order to prepare this VRAP (Appendix A).

## **2.2 Investigation Results**

Site geology and background are discussed in detail in previous Property documents as listed in Section 7.0 and are briefly summarized below.

### **2.2.1 Geology**

The geology of the flat-laying portion of the Property, including the former rail yard, maintenance areas, fueling areas and foundry operations, generally consists of approximately 2 to 4 feet of fill material that was placed for the construction of the rail yard. The fill material overlies native clay-rich soil and bedrock. The fill material, which is thicker in historical stream channels, is more permeable than the underlying clay. Geologic maps of the area indicate the subsurface bedrock is likely either Duluth Complex Gabbro or North Shore Volcanic Group Basalt (Schwartz, 1949).

### **2.2.2 Soil Quality**

Soil quality at the Property has been investigated previously with the most recent sampling occurring during June 2014 (Appendix B). Based on previous investigations of the Property, known surface soil constituents of concern (COCs) at the Property are copper and lead within shallow fill; and potential arsenic, polycyclic aromatic hydrocarbons (PAHs), petroleum constituents and asbestos in scattered and isolated locations. These constituents appear to be limited vertically to the fill overlying the native clay material. Remedial excavation activities were conducted by Mn/DOT in 2007 (GES, 2008) and 2010 (GES, 2010) to remove contaminated soil exceeding MPCA Tier 2 Industrial SRV's as indicated in Section 2.1. Contaminated soil exceeding MPCA Tier 2 Recreational SRV's does however remain in some areas of the Property ([Figure 4](#)).

### **2.2.3 Groundwater Quality**

The groundwater table at the Property ranges in depth from 14 to 24 feet below ground surface (bgs) within native clay and is assumed to flow southeast toward the St. Louis River. Perched groundwater is present at the contact between fill materials and the native clay. This shallow groundwater generally flows south toward the 62<sup>nd</sup> Avenue West Creek, and is controlled by topography and lithology.

Groundwater testing conducted at the Property showed no elevated detections of volatile organic compounds (VOCs), PAHs, metals, pesticides, or polychlorinated biphenyls (PCBs). The planned development is not anticipated to encounter or require the management of groundwater during the development work. Based on these prior findings, groundwater quality management is not addressed in the soil remediation section of this VRAP. The environmental construction contingency section of this document discusses contingencies for characterizing water quality and if necessary, construction water management, should excavation work or other construction work encounter water which requires handling or management.

## 3.0 Voluntary Response Action Plan

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This section of the VRAP describes the tasks that will be implemented and the parties' responsibilities for the execution and documentation of the VRAP activities.

The VRAP is intended to primarily address shallow soil contamination encountered in two general areas of concern during proposed Property development, including:

- Known copper and/or lead-impacted soil at elevated levels in and/or adjacent to proposed Property development areas including:
  - DWP Central Parking Lot and Access Road
  - DWP Recreational Fields
  - 62<sup>nd</sup> Avenue West Creek Ravine and Proposed Road Crossing
  - Proposed DWP Trail Center.
- Potential or known pockets of soil containing copper, lead, arsenic, PAHs, and/or petroleum impacts at elevated levels outside of the proposed Property development areas.

Section 3.4.1 describes the targeted remediation areas in detail. In general, the contamination encountered at the Property is in the surficial fill. This fill is relatively shallow and ranges from approximately 2 to 4 feet thick across the Property. In the proposed development areas of the Property, the fill will be characterized and managed, as described below.

The objectives of proposed response actions are to manage contaminated soils encountered at the Property and to restrict future contact with the contaminated soils that may remain at the Property after response actions are completed. This will include:

- Removal of contaminated soils, with stabilization of lead and/or copper-impacted soils, if necessary.
- Creation of clean utility corridors, if needed.
- Potential management of contaminated soils on-site in accordance with this VRAP.

- Disposal of some contaminated soil off-site at an approved landfill facility.

Response actions were developed based on historical investigations (previous sample locations are shown on [Figures 4, 5, 6 and 7](#)).

The planned development layout has not been finalized, however the plan currently includes:

- A paved central parking lot
- Two soccer/recreational fields
- A paved access to the Property via a proposed crossing of the 62<sup>nd</sup> Avenue West creek ravine
- A proposed future trail center

Construction work is planned to commence in 2015. A general redevelopment plan is shown on [Figure 2](#). The proposed response actions are intended to be flexible and can be coordinated to occur prior to or during Property development construction.

Corrective action for groundwater is not anticipated. Additionally, proposed soil remediation, the addition of covers such as pavement, new structures, or soil caps will prevent direct contact with impacted soil, prevent erosion or mobilization of impacted soil, and reduce infiltration of precipitation and potential for leaching through remaining historical fill materials.

### **3.1 General Operations**

Contractors will be contracted by the City of Duluth. The contractors will either perform excavation and soil management activities, or subcontract excavation and soil management activities, but will maintain control and direction of the excavation subcontractor. The contractors' site personnel and/or excavation subcontractor(s) will be trained under the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations (HAZWOPER) regulations (29 CFR 1910.12c), and have the proper training to correctly identify asbestos-containing material (ACM).

#### **3.1.1 Onsite Representative**

The City of Duluth and/or the DEDA will appoint an onsite Representative to observe response action activities, including contaminated soil excavation and management. The onsite Representative

will also be responsible for documenting excavation limits, collecting soil samples, and implementation or enactment of contingency actions in accordance with the Contingency Plan as described in Section 6.0.

### **3.1.2 Site Safety Plan**

The contractor selected to implement the response action construction activities will be required to submit a Site Safety Plan to address requirements of 29 CFR 1910.120 and VIC Guidance Document #10 *Site Safety and Contingency Plan*. Contractor personnel completing the response action excavations and related activities that involve potential contact with contaminated materials will be required to provide documentation of appropriate training as described in Section 3.1 above. Copies of project health and safety documents will be made available to the MPCA.

## **3.2 Constituents of Concern and Cleanup Goals**

The COCs at the Property are copper and lead within shallow fill; and potential arsenic, PAHs, petroleum constituents and asbestos in scattered and isolated locations. Based on the historic use of the Property, additional COCs are not anticipated.

The cleanup criteria for the Property are based on the plan to develop the Property for recreational uses. The MPCA Tier 2 Recreational SRVs were utilized to compare the analytical results of the samples collected and analyzed for the Property's COCs. Soil risk-management measures will be required for soils exceeding Tier 2 Recreational SRV human direct contact exposure risk-criteria for the Property COCs including:

- Copper concentrations greater than 100 milligrams per kilogram (mg/kg).
- Lead concentrations greater than 300 mg/kg.
- Arsenic concentrations greater than 11 mg/kg.
- PAHs expressed as benzo-a-pyrene equivalence (BaP eqv) concentrations greater than 2 mg/kg.
- Petroleum volatile organic compound (VOC) concentrations greater than respective Tier 2 Recreational SRVs.

Based on the investigation results and observations, those areas known to exceed MPCA Tier 2 Recreational SRVs are limited to approximately the fill soil which resides above the native clay. Additional guidance-based soil screening criteria which will be evaluated for directing soil management decisions include:

- Diesel-range organics (DRO) concentrations greater than 100 mg/kg (risk-screening criterion for fine grained soils).
- Soil organic vapor field screening headspace greater than 10 parts per million-vapor (ppmv), using a hand-held photoionization detector (PID).

### **3.3 VRAP Cleanup and Soil Management Criteria**

#### **3.3.1 Criteria for Landfill Disposal of Soil**

Soil with COC concentrations above the MPCA Tier 2 Recreational SRV will either be transported off-site to an approved landfill for disposal or if site conditions and development design allow, they will be managed onsite as discussed in the next Section. Soils with high concentrations of total lead and/or copper may require stabilization onsite prior to disposal at the landfill based on analytical sampling results and follow-up Toxicity Characteristic Leaching Procedure analyses. General debris and debris containing asbestos will be removed from the Property and transported off-site to an appropriately approved landfill.

#### **3.3.2 Criteria for Onsite Management of Contaminated Soil**

Soil with COC concentrations above the MPCA Tier 2 Recreational SRVs may be managed onsite in one of three types of on-site soil management areas. On-site soil management areas may include:

- under pavement - soils exceeding the Tier 2 Recreational SRV may be placed two feet below finished grade,
- under a structure- soils exceeding the Tier 2 Recreational SRV may be placed one foot below the base of finished building slab, or
- in green space areas or engineered berms with a 4-foot clean soil cover.

Soils with high concentrations of total lead and/or copper may require stabilization onsite prior to placement in one of the three types of soil management areas. Achievement of successful soil stabilization will be based on Toxicity Characteristic Leaching Procedure analyses.

### **3.4 Contaminated Soil Management**

#### **3.4.1 Target Soil Remediation Areas**

There are two targeted areas for soil remediation during construction. The remediation areas have been identified through past investigations at the Property. These areas are described as follows:

- Known copper and/or lead-impacted soil at elevated levels in and/or adjacent to proposed Property development areas including:
  - DWP Central Parking Lot
  - DWP Recreational Fields
  - 62<sup>nd</sup> Avenue West Creek Ravine and Proposed Road Crossing
  - Proposed DWP Trail Center.
- Potential or known pockets of soil containing copper, lead, arsenic, PAHs, and/or petroleum impacts at elevated levels outside of the proposed Property development areas.

#### **3.4.2 Contaminated Soil Removal**

Contaminated soil not meeting the cleanup goals in green space areas (less than four feet below finished grade), utility trenches, pavement areas (less than two feet), or structures (less than one foot) will be excavated during development construction work by appropriately trained excavation operators (Hazardous Waste Site Operator (HAZWOPER)-trained individuals) under the observation of the City's environmental VRAP implementation Representative. Refer to Section 3.3.2 for on-site soil management criteria. Contaminated soil will be removed during:

- site preparation and development, and
- road/parking lot construction activities.

The excavation areas will be staked in the field by the contractor or onsite Representative. The estimated depths of contaminated soil excavation will be marked on the boundary stakes and field verified by field screening and/or laboratory sample analysis. The contractor will excavate the soil materials to the proposed excavation limits. The onsite Representative will collect samples from the base and sidewalls to confirm that contaminated soils were removed to the extent needed to meet the cleanup objectives and separation distances outlined in Section 3.3.2 for the Property. Excavation areas greater than 4 feet deep will be fenced with construction fence or surrounded with “Caution” tape after excavation is complete and prior to backfilling as a health and safety measure.

It is anticipated that the contractor or its subcontractor will use a backhoe or track hoe to excavate contaminated soil from the Property. The excavated material will be loaded into trucks for direct transport to an approved disposal facility or to an on-site Property location for temporary stockpiling.

#### **3.4.2.1 Temporary Soil Stockpiles**

Excavated soil will be placed in a temporary soil stock pile area located on the Property. Stockpile locations will be determined in the field based on proximity to the work area, accessibility, and protection from surface water drainage. Polyethylene sheeting (poly), of a thickness that can withstand stockpiling of soil without tearing, will line the bottom with a berm of soil ringing the perimeter. Soil will be placed on the poly, covered with poly and weighted down. The stockpiled soil will be maintained in the covered stockpile until it is characterized as acceptable for on-site reuse or for disposal. Soils identified as contaminated and accepted for off-site disposal will then be loaded, transported, and disposed at the identified landfill.

It is anticipated that multiple stockpiles may be created based on field observations and screening results. Separate stockpiles may be used for fill for suspect copper and/or lead contamination, soil that exhibits petroleum odors and/or has PID headspace readings that exceed 10 ppmv, and un-impacted soil. The separate stockpiles will be sampled and analyzed to characterize the particular COC to determine appropriate offsite or onsite management.

Trucks transporting contaminated soil off-site will be covered during transportation. Waste characterization and disposal-facility profiling will be completed prior to removal of the soil.

Once each individual excavation area is deemed complete and the Property cleanup objectives have been achieved for that specific area, fill material meeting the cleanup goals will be placed and compacted in the excavation area. Diversionary procedures such as soil berms or straw bales may be

placed adjacent to the excavation limits to prevent run on/runoff from/to the excavation prior to backfilling.

#### **3.4.2.2 Planned Soil Management Options**

Following additional characterization of the stockpiles, use of the stockpiled soil will be evaluated based on the development needs and the risk-management criteria described in Section 3.3.2. Depending on the soil COC concentrations, the soil management may involve placing soil in locations, such as beneath pavement, under a structure, under a recreational field, and/or in green space areas or engineered berms. A cap with acceptable clean soil cover material, that has been pre-screened and tested, may be placed over small shallow pockets of impacted soil.

#### **3.4.2.3 Management of Excavation Water/ Construction Stormwater**

If water collects in the base of an excavation, either from rain, runoff or groundwater seepage, it may be removed prior to soil sampling and backfilling. Before the water is removed from the excavation it will be evaluated for the presence of oil sheen. If no oil sheen exists, the water will be pumped out of the excavation and discharged on the Property, provided proper erosion control measures are in place. If oil sheen is present on the water, the water will be pumped out of the excavation, containerized and sampled for proper disposal.

#### **3.4.2.4 Related Construction-Activity Measures**

The construction activities associated with the VRAP do not differ significantly from normal construction activities associated with construction of roadways, utilities and a building complex. Dust creation will be controlled and minimized by wetting of the excavation areas if necessary. Access to the Property for transportation of contaminated soils offsite and import of clean fill material will be from Raleigh Street.

### **3.4.3 Soil Documentation Sampling Program**

The number of documentation samples collected from each excavation area will be determined by the onsite Representative in accordance with MPCA guidelines or as approved by MPCA project staff. The exact number of samples will depend on the size and depth of the excavation and the potential presence of COCs. The documentation samples will be analyzed for specific COCs, as appropriate, depending on the specific impacts for that area.

### **3.5 Utility Installation**

Storm sewers and catch basins may be constructed at the Property for stormwater control. Underground sanitary sewers, water and gas supply, and electric utilities may also be installed. Clean soil used to backfill utility trenches will have soil vapor headspace readings less than 10 ppmv and have soil concentrations of COCs less than the risk criteria noted in Section 3.3.2. In utility trenches, the sidewalls and bottoms of the excavations will be excavated such that headspace values are less than 10 ppmv, as measured with a PID to a lateral separation distance of two feet surrounding the planned utility. Contaminated soil encountered during excavation activities will be managed with the other contaminated soils identified on the Site.

### **3.6 Institutional Controls**

Institutional controls may be part of the response actions for the Property and will be developed in conjunction with the final development plan for the Property. It is anticipated that Institutional Controls would include an affidavit pursuant to Minn. Stat. § 115B.16, subd. 2 (2008) in accordance with the draft template found on the MPCA's website entitled Affidavit Concerning Real Property Contaminated With Hazardous Substances. The affidavit would document the soil, groundwater and, if any, soil vapor conditions identified during previous activities.

### **3.7 Monitoring and Mitigation of Potential Short-Term Impacts**

#### **3.7.1 Site Access Control**

During construction activities, the Property will be restricted to authorized, trained, and protected personnel. Fencing or caution tape will be constructed around Property excavations deeper than 4 feet when not in use.

#### **3.7.2 Dust Control Procedures during Earthwork**

Standard odor and dust control practices will be implemented as necessary during excavating, stockpiling, hauling, and backfilling activities. Dust control may consist of watering earthwork areas to maintain a soil moisture content favorable to dust suppression. If ACM (asbestos-containing material) is encountered, the Site Contingency Plan (Section 6.0) will be implemented. Odor control efforts will be utilized as necessary to protect onsite workers and prevent offsite nuisance odors. Open excavation and stockpile surface areas will be minimized to control odors. If necessary,

commercially available odor suppressants may be used to reduce odors or emissions from dump materials or contaminated soils (mulch, foam, plastic sheeting, etc.).

Appropriate health and safety air monitoring will also be conducted at the Property. The air monitoring will be performed according to the Contractor's Site Safety Plan to be developed by the Contractor. At minimum, the air monitoring plan will include monitoring for VOCs (with a PID) and particulates in the work zone.

### **3.7.3 Erosion Control**

Erosion control measures shall consist of silt fences, straw bales and/or other control measures implemented to prevent erosion and transport of contaminated materials off site and to protect surface water quality. Care will be taken to divert any storm water run-off from open excavation areas. Berms, ditches, or other control measures will be constructed to direct run-off away from the excavation area and contaminated materials, and to minimize the accumulation of rain in the excavation if a significant storm event is anticipated.

### **3.7.4 Construction Stormwater Controls**

Surface water contact with fill soil exhibiting soil contamination, will be minimized by the measures noted in the preceding section in addition to the measures described in Sections 3.4.2.2. It is anticipated that a construction stormwater pollution prevention plan (SWPPP) will be developed as part of the final construction planning and permitting.

## **4.0 Documentation of Implemented Response Action**

The implementation of the proposed VRAP will be documented in the Response Action Implementation (RAI) report after the conclusion of response action activities and completion of the earthwork activities associated with the construction of the proposed central parking lot, recreational fields, 62<sup>nd</sup> Avenue West creek ravine road crossing and trail center. The RAI report will include drawings or figures that show the excavation area limits, depths of the excavations, and the soil sampling locations. Laboratory data results for documentation samples will be included in the RAI report. Excavation quantities and disposal facilities used will also be included in the RAI report.

## **5.0 Response Action Implementation Schedule**

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The City/DEDA plan to initiate response action activities during 2015. The sequence of response action activities are as follows:

- Obtain MPCA approval of the VRAP
- Excavate and remove known contaminated soils that exceed the Tier 2 Recreational SRVs as necessary during property development
- Sample and analyze the documentation samples
- Backfill excavation areas with imported or onsite fill material, which meets Property requirements
- Monitor for potential environmental contingencies during development preparations, earthwork, foundation construction, utility work, grading, and paving
- Prepare and submit Response Action Implementation (RAI) report to MPCA for review and approval
- Implement necessary institutional controls
- Issuance of final environmental legal liability assurance letters to development partners

The tasks listed above are the major elements of the response actions proposed for the Property. If grant funding is received during the fall grant award round, it is anticipated that the response actions will be initiated during the spring and summer of 2015.

DEDA respectfully requests approval of this VRAP by September 1, 2014 such that complete applications for clean-up grants can be submitted by the November 1, 2014 cleanup grant application deadline. The clean-up grant applications require inclusion of the VRAP approval. This will allow the implementation of response actions and the future development activities to be executed in a timely fashion following the procurement of grant funding and in accordance with the schedule discussed above.

## 6.0 Contingency Plan

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### 6.1 Contingency Plan

The VRAP described in this report was developed for contaminated soils that are known to be present on the Property. Additional contaminated soils may be encountered during earthwork activities associated with future redevelopment work.

#### 6.1.1 Contaminated Soil

If suspect contaminated soil is encountered during excavation activities at the Property based upon organic vapor screening, visual evidence of contamination, and/or odor; excavation and earthwork activities of the potentially impacted area will temporarily cease until the onsite Representative familiar with the Contingency Plan is notified. A PID headspace reading of 10 ppm or more shall be considered as indicative of suspect contamination.

Following appropriate notification, an onsite Representative will be present during the excavation to screen soils, classify materials, and collect analytical samples. A contaminated soil staging area (CSSA) will be constructed by placing a plastic sheet on the ground and constructing a 6-inch-high soil berm around the perimeter. The plastic will extend beyond the perimeter berm to prevent runoff from and runon to the CSSA. A plastic cover will be placed over contaminated soil that is stockpiled in the CSSA. The cover will extend beyond the perimeter soil berm and it will be secured and maintained.

The excavation will proceed after appropriate notification has been made. During excavation, contaminated soil will be segregated based on appearance, odor, headspace testing and other field screening methods. Contaminated soil will be transported directly to the CSSA.

#### 6.1.2 Underground Storage Tanks

If unexpected underground storage tanks (USTs) are encountered during excavation activities at the Property, earthwork activities will be temporarily ceased until the development partner responsible for the particular work area is notified. Following appropriate notification, an onsite representative will be present to oversee the removal of the UST. If fluids are present in the UST, they will be removed and characterized for proper disposal. The UST will then be removed in accordance with

MPCA guidelines by a licensed contractor. After the UST is emptied and removed it will be transported to an approved facility for proper recycling or disposal.

### **6.1.3 Drums or Other Wastes**

If drums or other waste items are encountered, they will be individually removed and their condition will be assessed. If the excavated drums/waste are not in good condition (e.g., severe rusting, structural defects, leaking, etc.), or if uncontainerized wastes are encountered, the materials will be transferred to a new drum or other appropriate container that is in satisfactory condition. These containers will meet the appropriate requirements of United States Department of Transportation (DOT), OSHA, and U.S. Environmental Protection Agency (EPA) regulations for the associated wastes.

Intact drums and repacked wastes will be transported to a storage area and placed in roll-off boxes. If appropriate, liquid wastes may be bulk-stored in tanks. The roll-off box will be lined to contain leaks, spills, or accumulated precipitation. The roll-off box will be of sufficient capacity to contain 10 percent of the volume of the drums or the volume of the largest container, whichever is greater. The roll-off box will be covered to prevent collection of precipitation.

Drum contents will be evaluated, tested and characterized for proper handling and disposal. It is assumed that drums and contents will be disposed at an approved off-site landfill.

### **6.1.4 Suspect Asbestos-Containing Materials**

If piping or debris containing potential ACM is encountered during excavation, excavation activities in the affected location shall temporarily cease. Visual inspection by a MDH certified and licensed asbestos inspector will be conducted to determine if the materials encountered are ACM and to assess the proper separation, handling and disposal of the material. Samples will be collected by the certified asbestos inspector. If the material contains ACM, a certified asbestos abatement company will remove the material and provide the proper handling and disposal of ACM in accordance with state and federal regulations. Proper notifications will be made to the MPCA.

All asbestos-related work will be conducted in accordance with Minnesota and Federal National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements. Monitoring of airborne asbestos concentrations will be conducted in accordance with OSHA asbestos requirements for the construction industry, found in 29 CFR 1926.1101 (adopted by reference by Minnesota OSHA).

If significant quantities of ACM or ACM and soil mixtures are encountered during the excavation activities, an Asbestos-Containing Material Emission Control Plan will be implemented for the work. The contractor will implement standard operating procedures during excavation and abatement work to ensure maximum protection and safeguard from asbestos exposure of the workers, visitors, tenants, employees and the environment. All soil containing potential ACM will be immediately wetted to minimize asbestos fiber release during excavation and loading activities. Soils will be segregated, reburied on site, and/or disposed at an offsite landfill based on visual observations and analytical testing results.

#### **6.1.5 Other Buried Debris**

Concrete foundations or structures, asphalt or bricks buried in fill and other buried debris (greater than 50 percent by volume in soil) if encountered will be stockpiled separately from the excavated soil materials, and transported offsite for disposal in a demolition landfill or RCRA Subtitle D landfill, as appropriate.

#### **6.1.6 Groundwater Dewatering**

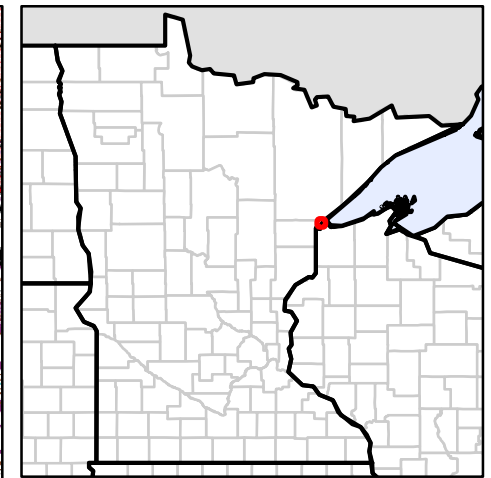
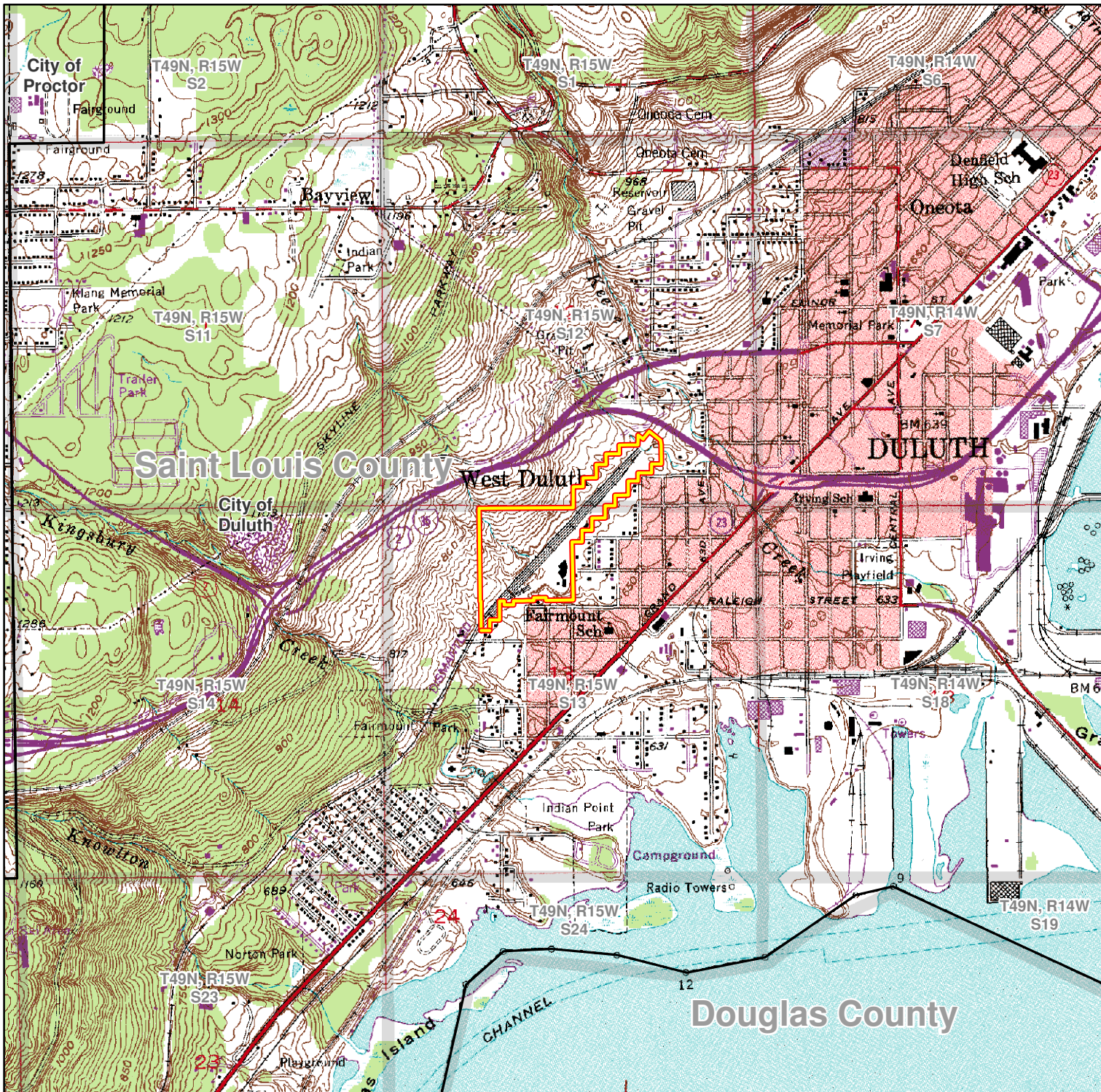
If construction or excavation activities result in the need to dewater an excavation either due to precipitation or groundwater infiltration into the excavation, appropriate permitting shall be secured and permit requirements shall be followed.

Testing and possible treatment of petroleum or PAH compounds in the water may be necessary. The construction contractor will obtain a sanitary sewer discharge permit from the City of Duluth for discharge to the sanitary sewer system and perform all necessary testing, treatment and flow measuring in accordance with the permit requirements. If a direct discharge to the sanitary sewer system is not possible, the discharge water will be containerized and treated/disposed of as batches in accordance with applicable permits and disposal requirements.

## 7.0 References

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— DWP Property Boundary



0 2,000 4,000

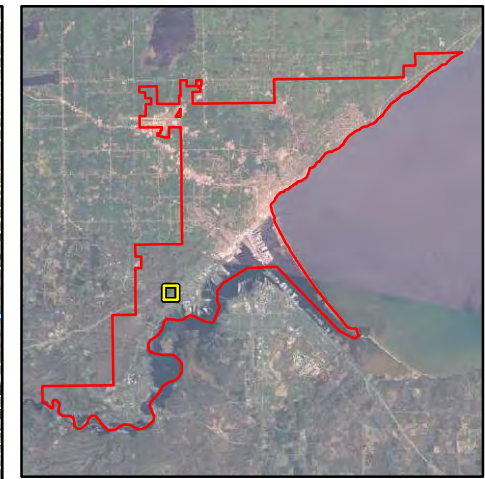
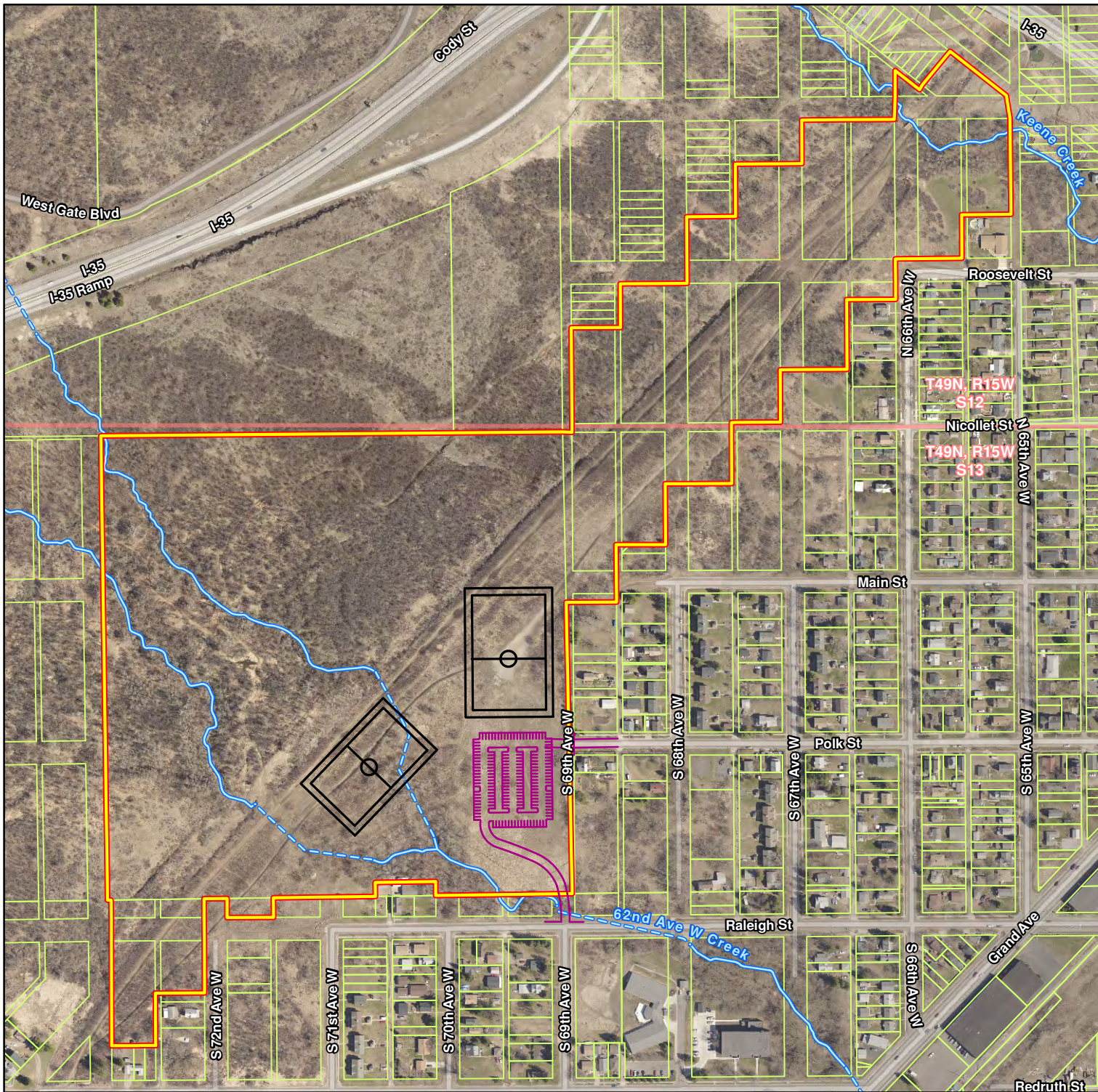
Feet

1 Inch = 2,000 Feet

Figure 1

**SITE LOCATION**  
 DWP Redevelopment Site  
 Duluth, Minnesota





- DWP Property Boundary
  - Proposed Fields
  - Proposed Roads/Parking
  - Parcel Lines
  - Section Lines
  - City of Duluth Boundary
- Rivers and Streams**
- Surface Waters
  - Underground (Culvert)

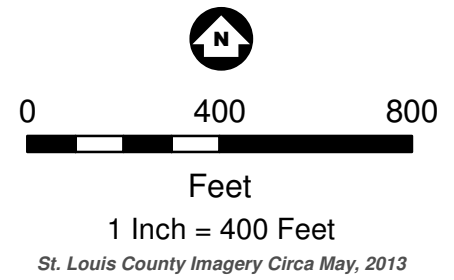
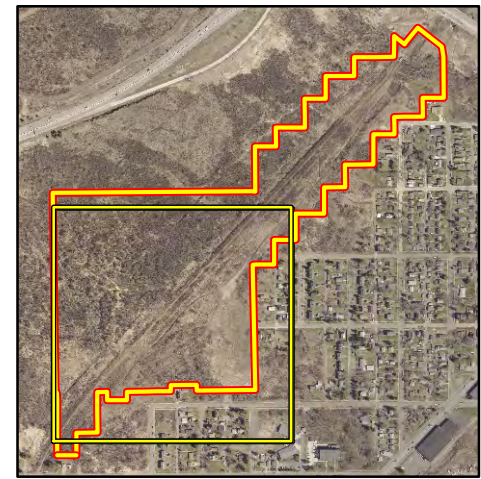
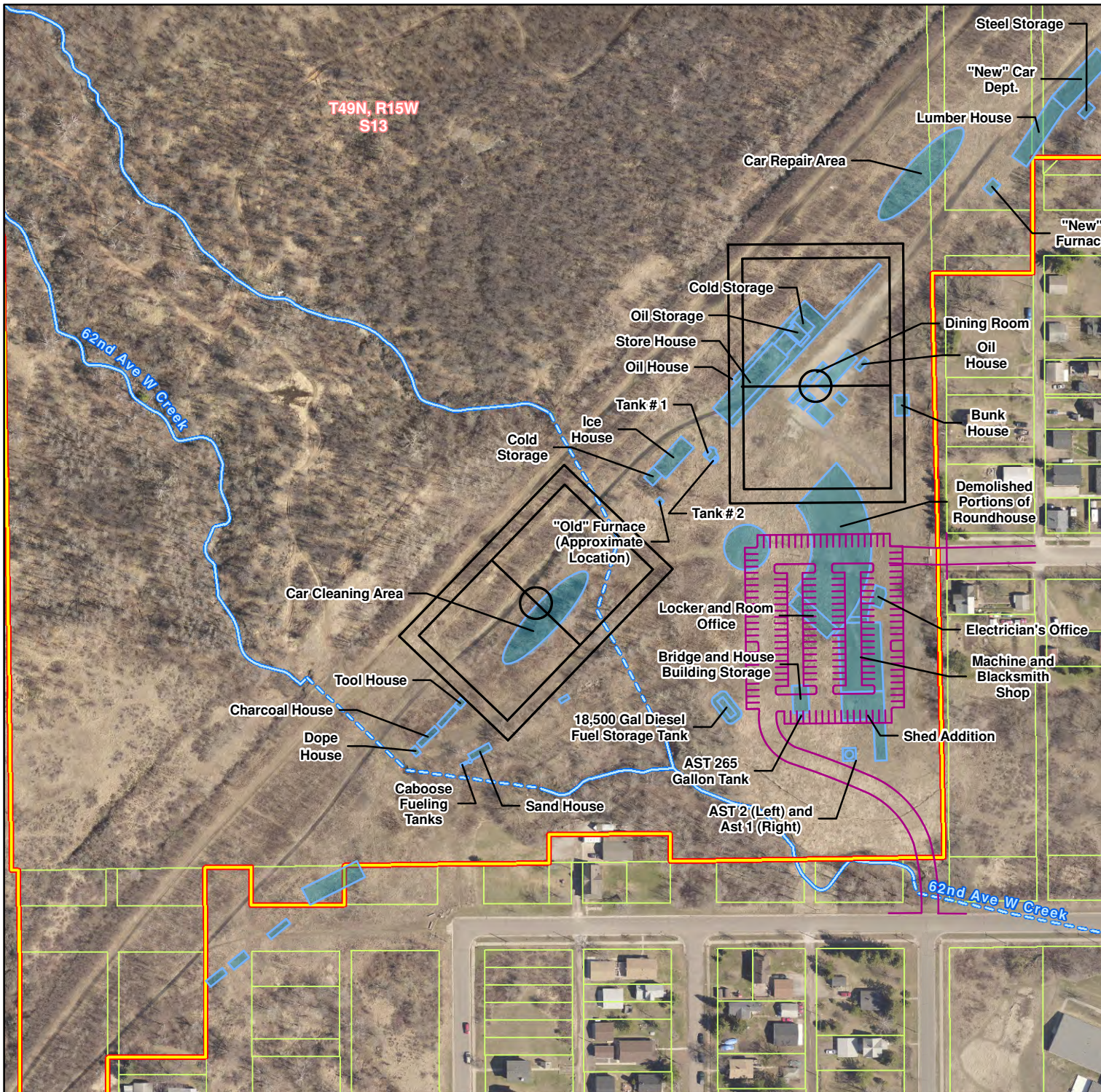


Figure 2

**PROPERTY LAYOUT**  
DWP Redevelopment Site  
Duluth, Minnesota





- DWP Property Boundary
- Proposed Fields
- Proposed Roads/Parking
- Historical Structures
- Parcel Lines
- Rivers and Streams**
- Surface Waters
- - - Underground (Culvert)

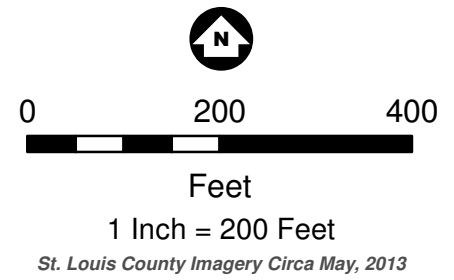
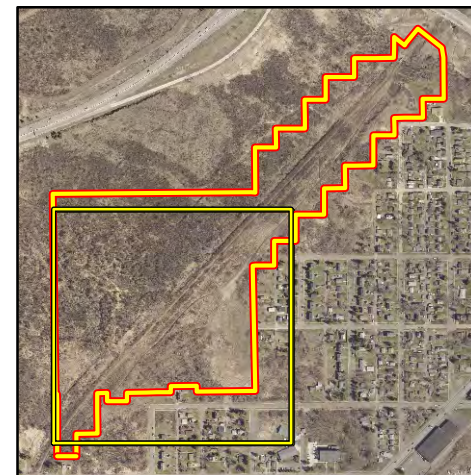
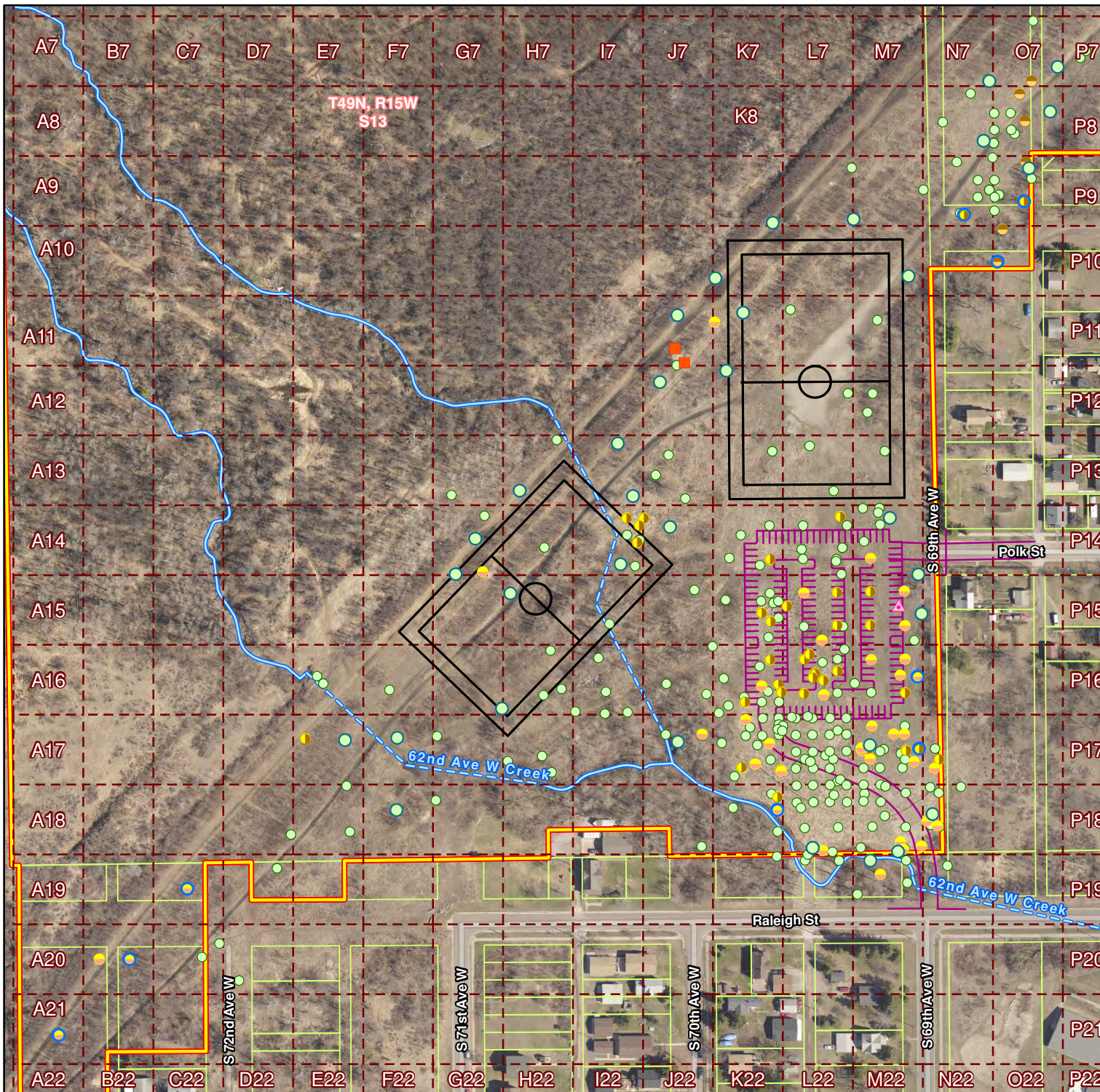


Figure 3

**HISTORICAL SITE USE**  
DWP Redevelopment Site  
Duluth, Minnesota





- Historical Sample Locations**
- ▲ Exceedance Sample Location - Arsenic
  - Exceedance Sample Location - PAH
  - Exceedance Sample Location - Copper
  - Exceedance Sample Location - Lead
  - Exceedance Sample Location - Copper and Lead
  - Sample Locations - No Exceedance
- 2014 Sample Locations**
- Exceedance Sample Location - Copper
  - Exceedance Sample Location - Lead
  - Exceedance Sample Location - Copper and Lead
  - Sample Locations - No Exceedance
- Other Symbols:**
- DWP Property Boundary
  - Proposed Fields
  - Proposed Roads/Parking
  - 100-Foot Reference Grid
  - Parcel Lines
  - Rivers and Streams**
  - Surface Waters
  - Underground (Culvert)

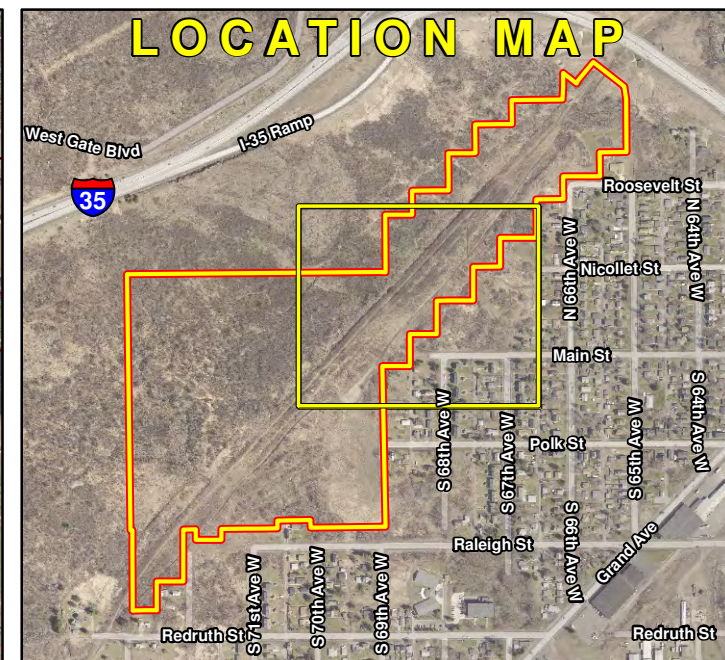
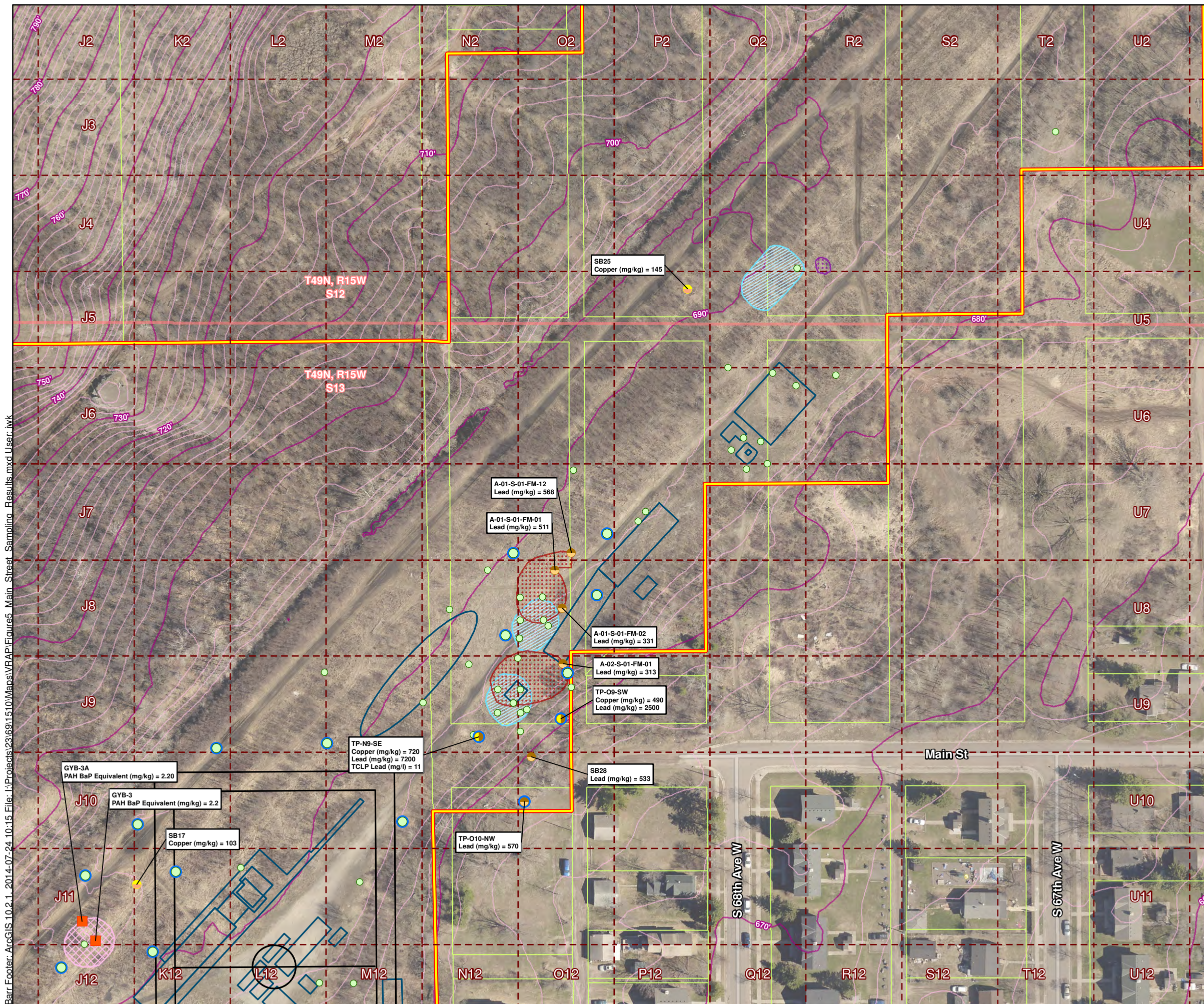
\*Note: Exceedance determinations are based on MPCA Tier 2 Recreational Soil Reference Values (SRVs).



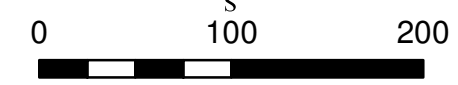
Feet  
1 Inch = 200 Feet  
St. Louis County Imagery Circa May, 2013  
Figure 4

**SITE SAMPLING LOCATIONS**  
DWP Redevelopment Site  
Duluth, Minnesota





- Historical Sample Locations**
- Exceedance Sample Location - Arsenic
  - Exceedance Sample Location - PAH
  - Exceedance Sample Location - Copper
  - Exceedance Sample Location - Lead
  - Exceedance Sample Location - Copper and Lead
  - Sample Locations - No Exceedance
- 2014 Sample Locations**
- Exceedance Sample Location - Copper
  - Exceedance Sample Location - Lead
  - Exceedance Sample Location - Copper and Lead
  - Sample Locations - No Exceedance
- Legend**
- DWP Property Line
  - Proposed Fields
  - Proposed Roads/Parking
  - 100-Foot Reference Grid
  - Sample Areas**
    - Soil Sampling Area Surface
    - Barr Phase II
  - Excavation Limits**
    - 2007
    - 2010
  - 2012 (Post Flood) Lidar Contours**
    - Index
    - Intermediate
  - Rivers and Streams**
    - Surface Waters
    - Underground (Culvert)
  - Other Features**
    - Approximate Historical Structure Locations
    - Parcel Lines
    - Section Lines

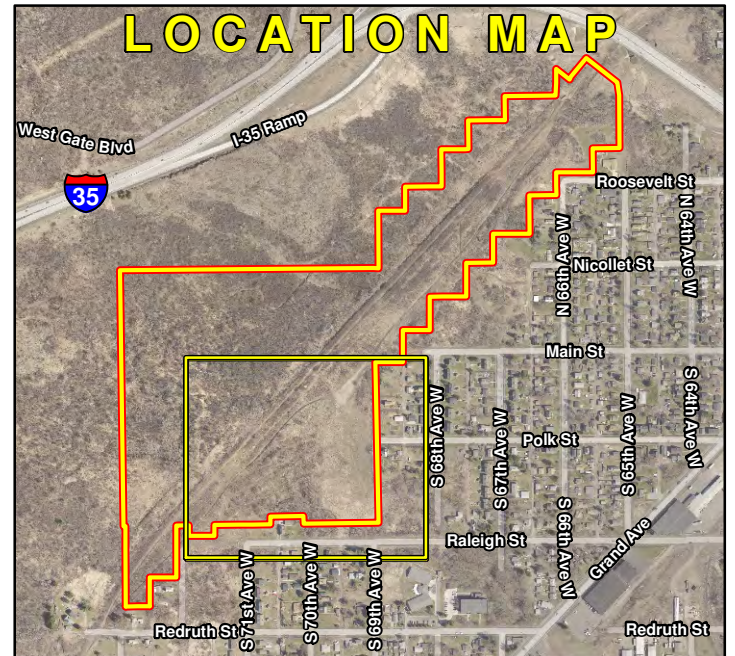
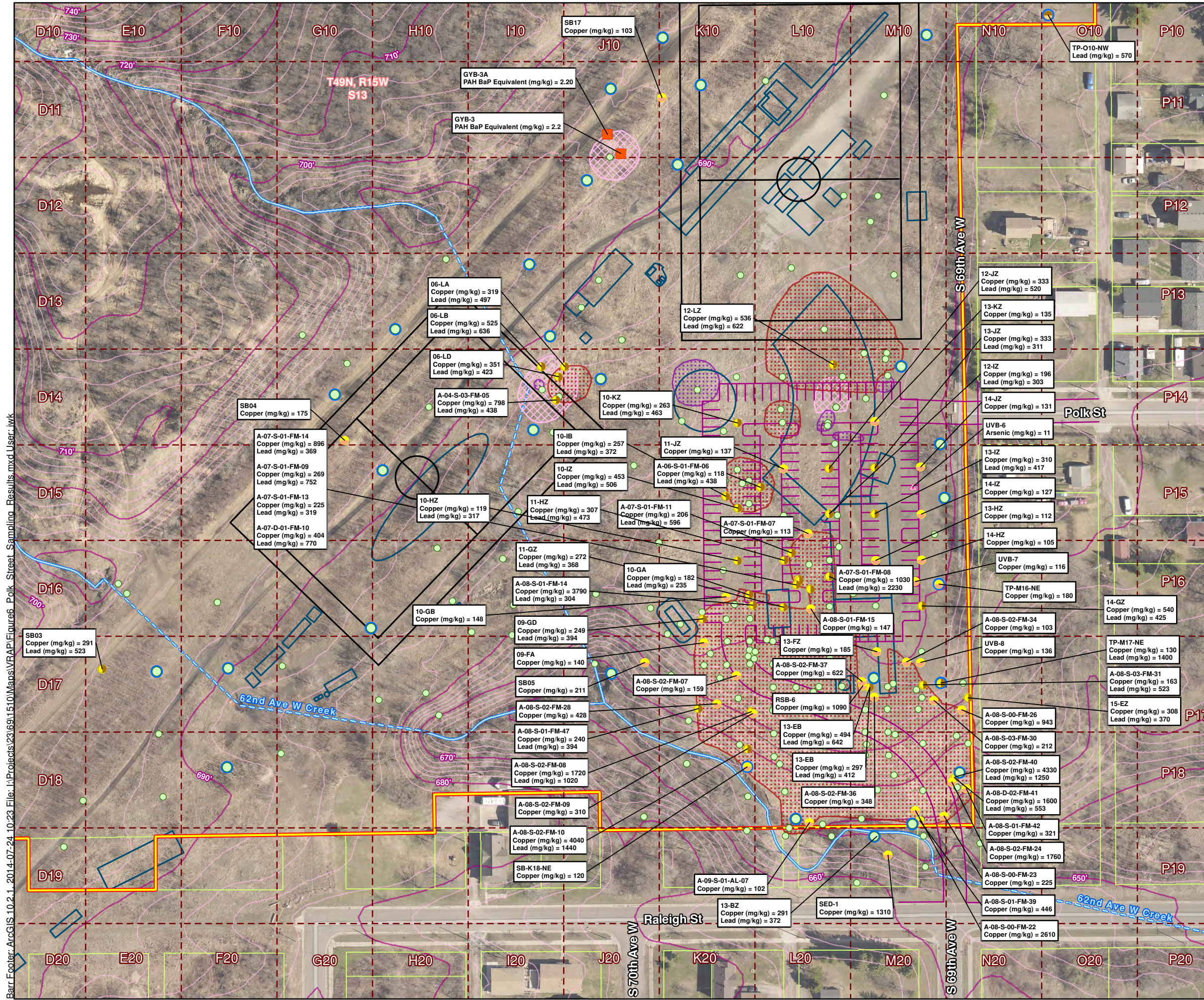


Feet  
1 Inch = 100 Feet  
St. Louis County Imagery Circa May, 2013

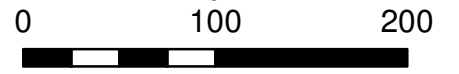
Figure 5

**MAIN STREET SAMPLING RESULTS**  
DWP Redevelopment Site  
Duluth, Minnesota





- Historical Sample Locations**
- ▲ Exceedance Sample Location - Arsenic
  - Exceedance Sample Location - PAH
  - Exceedance Sample Location - Copper
  - Exceedance Sample Location - Lead
  - Exceedance Sample Location - Copper and Lead
  - Sample Locations - No Exceedance
- 2014 Sample Locations**
- Exceedance Sample Location - Copper
  - Exceedance Sample Location - Lead
  - Exceedance Sample Location - Copper and Lead
  - Sample Locations - No Exceedance
- Legend**
- DWP Property Line
  - Proposed Fields
  - Proposed Roads/Parking
  - 100-Foot Reference Grid
  - Sample Areas**
  - Soil Sampling Area Surface
  - Barr Phase II
  - Excavation Limits**
  - 2007
  - 2010
  - Approximate Historical Structure Locations
  - Parcel Lines
  - Section Lines
  - Rivers and Streams**
  - Surface Waters
  - Underground (Culvert)
  - 2012 (Post Flood) Lidar Contours**
  - Index
  - Intermediate



Feet  
1 Inch = 100 Feet  
St. Louis County Imagery Circa May, 2013

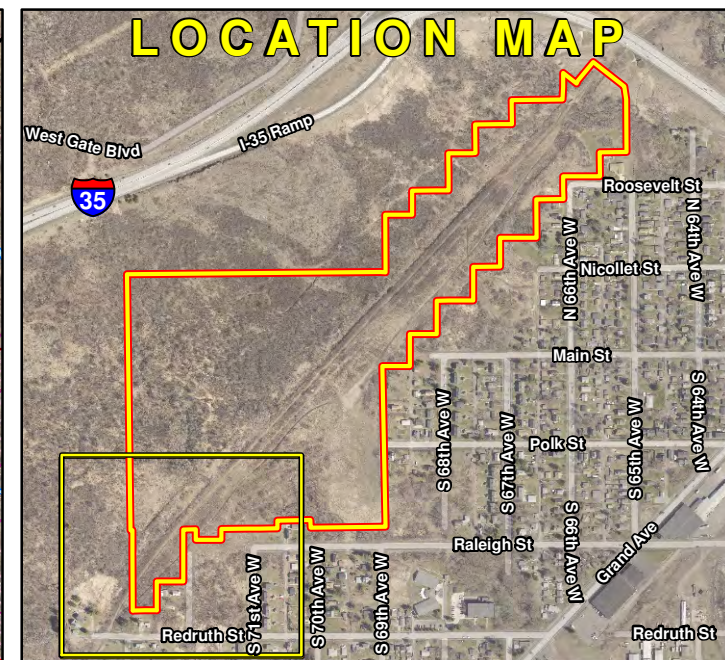
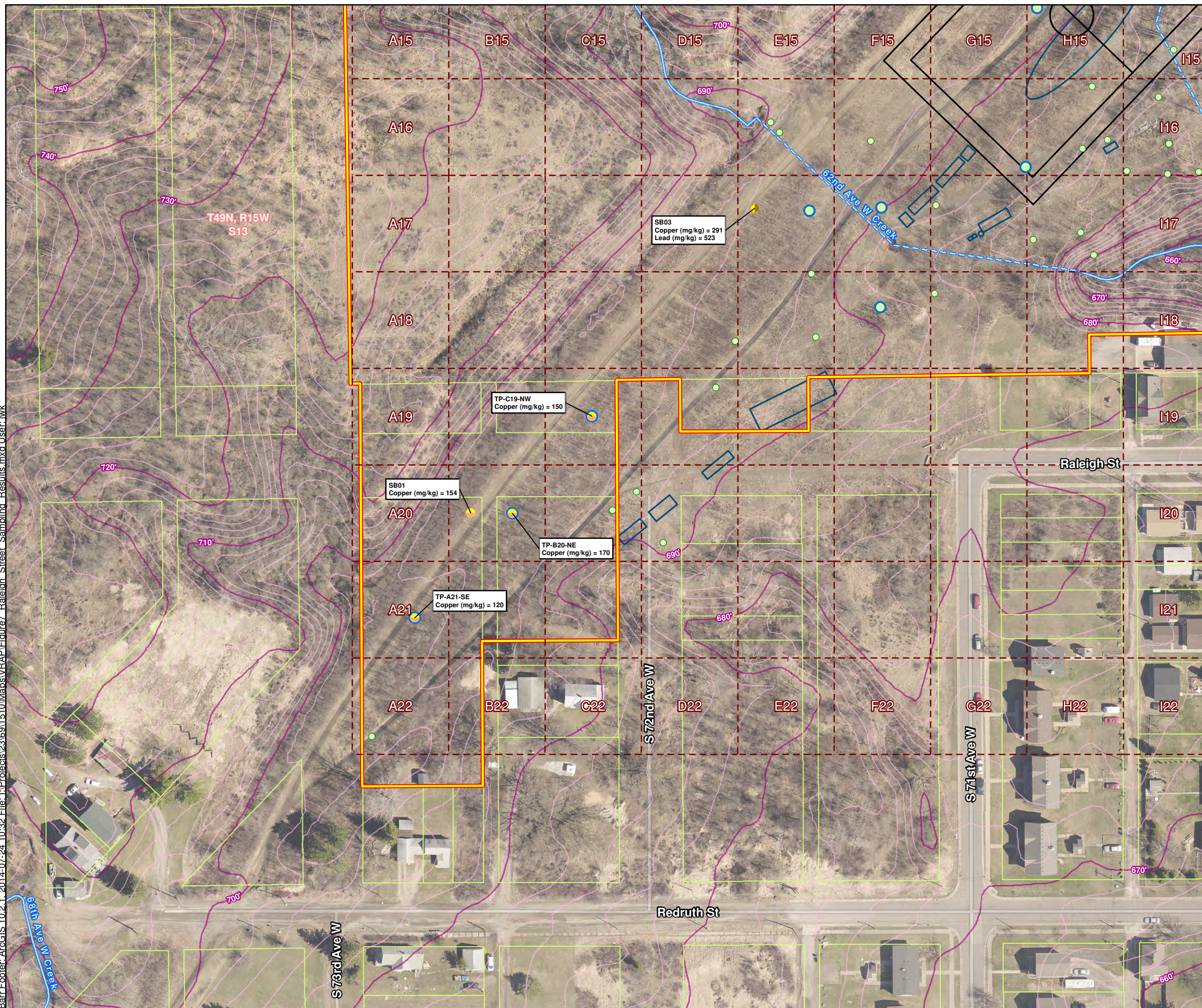
Figure 6

**POLK STREET SAMPLING RESULTS**  
DWP Redevelopment Site  
Duluth, Minnesota

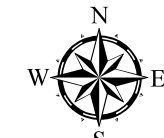


Barr Footer: ArcGIS 10.2.1, 2014-07-24 10:23 File: \\Projects\23.6911510\Maps\VRAP\Figure6\_Polk\_Street\_Sampling\_Results.mxd User: iwk

Barr Footer: ArcGIS 10.2.1\_2014-07-24\_10:32 File: I:\Projects\2316911510\Maps\VRAP\Figure7\_Raleigh\_Street\_Sampling\_Results.mxd User: iwk



- Historical Sample Locations**
- ▲ Exceedance Sample Location - Arsenic
- Exceedance Sample Location - PAH
- Exceedance Sample Location - Copper
- Exceedance Sample Location - Lead
- Exceedance Sample Location - Copper and Lead
- Sample Locations - No Exceedance
- 2014 Sample Locations**
- Exceedance Sample Location - Copper
- Exceedance Sample Location - Lead
- Exceedance Sample Location - Copper and Lead
- Sample Locations - No Exceedance
- DWP Property Line
- ▭ Proposed Fields
- ▭ Proposed Roads/Parking
- ▭ 100-Foot Reference Grid
- Sample Areas**
- ▭ Soil Sampling Area Surface
- ▭ Barr Phase II
- Excavation Limits**
- ▭ 2007
- ▭ 2010
- ▭ Approximate Historical Structure Locations
- ▭ Parcel Lines
- ▭ Section Lines
- Rivers and Streams**
- Surface Waters
- Underground (Culvert)
- 2012 (Post Flood) Lidar Contours**
- Index
- Intermediate



0 100 200  
Feet

1 Inch = 100 Feet

St. Louis County Imagery Circa May, 2013

Figure 7

**RALEIGH STREET SAMPLING RESULTS**  
DWP Redevelopment Site  
Duluth, Minnesota



## **Appendix A – Previous Investigations**

**DWP Historical Site Investigation Analytical Samples  
with Residual Tier 2 Recreational Soil Reference Value (SRV) Exceedances**

**Analytical Soil Sample Concentrations**

SAMPLE ID	DATE	DEPTH (ft)	ARSENIC	COPPER	LEAD	PAH - BaP Equivalent	Source Reference
			<i>Tier 2 Recreational SRVs:</i>				
			11	100	300	2	
GYB-3	12/08/1994	0 to 2.3		< 100	< 300	<b>2.2</b>	MnDOT AFF.
GYB-3A	12/16/1999	0 to 2				<b>2.20</b>	MnDOT AFF.
RSB-6	12/16/1999	0 to 1		<b>200</b>			MnDOT AFF.
RSB-6	12/16/1999	4 to 6		<b>1090</b>	< 300		MnDOT AFF.
SED-1	1999	1		<b>1310</b>			AECOM
UVB-6	12/20/1999	2	<b>11</b>	< 100	< 300	< 2.0	AECOM
UVB-7	12/20/1999	0 to 0.5		<b>116</b>	< 300		MnDOT AFF.
UVB-8	12/20/1999	0 to 0.5		<b>136</b>	< 300		MnDOT AFF.
06-LA	05/17/2004	1	< 11	<b>319</b>	<b>497</b>	< 2.0	MnDOT AFF.
06-LB	05/17/2004	1		<b>306</b>	<b>367</b>		MnDOT AFF.
06-LB	05/17/2004	5	< 11	<b>525</b>	<b>636</b>	< 2.0	MnDOT AFF.
06-LD	05/17/2004	8		<b>351</b>	<b>423</b>		MnDOT AFF.
09-FA	05/19/2004	1		<b>140</b>	< 300		MnDOT AFF.
09-GD	06/26/1905			<b>249</b>	<b>394</b>		AECOM
10-GA	05/17/2004	1		<b>182</b>	<b>235</b>		MnDOT AFF.
10-GA	05/17/2004	1		<b>110</b>			MnDOT AFF.
10-GB	05/17/2004	1		<b>148</b>	<300		MnDOT AFF.
10-HZ	05/17/2004	1		<b>119</b>	<b>317</b>		MnDOT AFF.
10-IB	05/17/2004	1		<b>133</b>	<b>372</b>		MnDOT AFF.
10-IB	05/17/2004	1		<b>257</b>			MnDOT AFF.
10-IZ	05/17/2004	1		<b>453</b>	<b>506</b>		MnDOT AFF.
10-KZ	05/17/2004	1	< 11	<b>263</b>	<b>463</b>	< 2.0	MnDOT AFF.
11-GZ	05/19/2004	1		<b>272</b>	<b>368</b>		MnDOT AFF.
11-HZ	05/18/2004	1		<b>307</b>	<b>473</b>		MnDOT AFF.
11-JZ	05/18/2004	2	< 11	<b>137</b>	< 300	< 2.0	MnDOT AFF.
12-IZ	05/18/2004	1	< 11	<b>196</b>	<b>303</b>	< 2.0	MnDOT AFF.
12-JZ	05/18/2004	1	< 11	<b>333</b>	<b>520</b>	< 2.0	MnDOT AFF.
12-LZ	05/17/2004	1		<b>536</b>	<b>622</b>		MnDOT AFF.
13-BZ	05/19/2004	2.25		<b>291</b>	<b>372</b>		AECOM
13-EB	05/19/2004	1		<b>494</b>	<b>642</b>		MnDOT AFF.
13-EB	05/19/2004	2		<b>207</b>	<b>412</b>		MnDOT AFF.
13-FZ	05/17/2004	1		<b>185</b>	< 300		MnDOT AFF.
13-HZ	05/19/2004	2		<b>112</b>	< 300		MnDOT AFF.
13-IZ	05/19/2004	2	< 11	<b>310</b>	<b>417</b>	< 2.0	MnDOT AFF.
13-JZ	05/19/2004	2	< 11	<b>333</b>	<b>311</b>	< 2.0	MnDOT AFF.
13-KZ	05/19/2004	1	< 11	<b>135</b>	< 300	< 2.0	MnDOT AFF.
14-GZ	05/17/2004	1		<b>540</b>	<b>425</b>		MnDOT AFF.
14-HZ	05/17/2004	1		<b>105</b>	< 300		MnDOT AFF.
14-IZ	05/17/2004	1	< 11	<b>127</b>	< 300	< 2.0	MnDOT AFF.
14-JZ	05/17/2004	1		<b>116</b>			MnDOT AFF.
14-JZ	05/17/2004	3	< 11	<b>131</b>	< 300	< 2.0	MnDOT AFF.
15-EZ	05/17/2004	1		<b>308</b>	<b>370</b>		AECOM
SB01	05/16/2007	1		<b>154</b>			MnDOT AFF.
SB03	05/16/2007	2		<b>291</b>	<b>523</b>		MnDOT AFF.
SB04	05/16/2007	2	< 11	<b>175</b>	< 300	< 2.0	MnDOT AFF.
SB05	05/17/2007	1		<b>211</b>	< 300		MnDOT AFF.
SB17	05/15/2007	2		<b>103</b>	< 300	< 2.0	MnDOT AFF.

**BOLD** = Tier 2 Recreational SRV Exceedance

Data compiled from historical site investigation reports.

MnDOT AFF. = Referenced in MPCA Affidavit

AECOM = in data review but not in MnDOT Affidavit

**DWP Historical Site Investigation Analytical Samples  
with Residual Tier 2 Recreational Soil Reference Value (SRV) Exceedances**

**Analytical Soil Sample Concentrations**

SAMPLE ID	DATE	DEPTH (ft)	ARSENIC	COPPER	LEAD	PAH - BaP Equivalent	Source Reference
			<i>Tier 2 Recreational SRVs:</i>				
			11	100	300	2	
SB25	05/15/2007	2		<b>145</b>			MnDOT AFF.
SB28	05/15/2007	2		< 100	<b>533</b>	< 2.0	AECOM
A-01-S-01-FM-01	11/09/2007	1		< 100	<b>511</b>	< 2.0	MnDOT AFF.
A-01-S-01-FM-02	11/09/2007	1		< 100	<b>331</b>	< 2.0	MnDOT AFF.
A-01-S-01-FM-12	12/18/2007	1		< 100	<b>568</b>	< 2.0	MnDOT AFF.
A-02-S-01-FM-01	11/09/2007	1		< 100	<b>313</b>	< 2.0	MnDOT AFF.
A-04-S-03-FM-05	11/13/2007	3		<b>798</b>	<b>438</b>	< 2.0	MnDOT AFF.
A-06-S-01-FM-06	2007	1	< 11	<b>118</b>	<b>438</b>	< 2.0	AECOM
A-07-S-01-FM-07	11/13/2007	1		<b>113</b>	< 300		MnDOT AFF.
A-07-S-01-FM-08	2007	1		<b>1030</b>	<b>2230</b>		AECOM
A-07-S-01-FM-09	2007	1		<b>269</b>	<b>752</b>		AECOM
A-07-S-01-FM-11	11/13/2007	1		<b>206</b>	<b>596</b>		MnDOT AFF.
A-07-S-01-FM-13	12/06/2007	1		<b>225</b>	<b>319</b>		MnDOT AFF.
A-07-S-01-FM-14	12/13/2007	1		<b>896</b>	<b>396</b>		MnDOT AFF.
A-08-S-00-FM-22	2007	0		<b>2610</b>	< 300		AECOM
A-08-S-00-FM-23	2007	0		<b>225</b>	< 300		AECOM
A-08-S-00-FM-26	2007	0		<b>943</b>	< 300		AECOM
A-08-S-01-FM-14	2007	1		<b>3790</b>	<b>304</b>		AECOM
A-08-S-01-FM-15	11/29/2007	1		<b>147</b>	< 300		MnDOT AFF.
A-08-S-01-FM-39	2007	1		<b>446</b>	< 300		AECOM
A-08-S-01-FM-42	2007	1		<b>321</b>	< 300		AECOM
A-08-S-01-FM-47	12/18/2007	1		<b>240</b>	<b>394</b>		MnDOT AFF.
A-08-S-02-FM-07	2007	2		<b>159</b>	< 300		AECOM
A-08-S-02-FM-08	2007	2		<b>1720</b>	<b>1020</b>		AECOM
A-08-S-02-FM-09	2007	2		<b>310</b>	< 300		AECOM
A-08-S-02-FM-10	2007	2		<b>4040</b>	<b>1440</b>		AECOM
A-08-S-02-FM-24	2007	2		<b>1760</b>	< 300		AECOM
A-08-S-02-FM-28	2007	2		<b>428</b>	< 300		AECOM
A-08-S-02-FM-34	12/05/2007	2		<b>103</b>	< 300		MnDOT AFF.
A-08-S-02-FM-36	12/05/2007	2		<b>348</b>	< 300		MnDOT AFF.
A-08-S-02-FM-37	12/05/2007	2		<b>622</b>			MnDOT AFF.
A-08-S-02-FM-40	2007	2		<b>4330</b>	<b>1250</b>		AECOM
A-08-S-03-FM-30	2007	3		<b>212</b>	< 300		AECOM
A-08-S-03-FM-31	12/04/2007	3		<b>163</b>	<b>523</b>		MnDOT AFF.
A-09-S-01-AL-07	11/15/2007	1		<b>102</b>	< 300		MnDOT AFF.
A-07-D-01-FM-10	2007	1		<b>404</b>	<b>770</b>		AECOM
A-08-D-02-FM-41	2007	2		<b>1600</b>	<b>553</b>		AECOM

**BOLD** = Tier 2 Recreational SRV Exceedance

Data compiled from historical site investigation reports.

MnDOT AFF. = Referenced in MPCA Affidavit

AECOM = in data review but not in MnDOT Affidavit



# Minnesota Pollution Control Agency

520 Lafayette Road North | St. Paul, MN 55155-4194 | 651-296-6300 | 800-657-3864 | 651-282-5332 TTY | [www.pca.state.mn.us](http://www.pca.state.mn.us)

March 17, 2011

Ms. Nancy Radle  
Minnesota Department of Transportation  
395 John Ireland Blvd.  
St. Paul, MN 55155-1899

RE: Duluth, Winnipeg & Pacific RR, 6900 Polk Street, West Duluth  
MPCA Project Number VP4140  
No Further Action Determination

Dear Ms. Radle:

The Minnesota Pollution Control Agency (MPCA) staff in the Voluntary Investigation and Cleanup (VIC) Program has been requested to provide a No Further Action Determination for releases identified at the Duluth, Winnipeg & Pacific RR, located at the address referenced above (the Site).

The MPCA staff has reviewed the information submitted for the Site, an approximately 60-acre vacant former rail yard corridor bordered by a residential area in West Duluth and extending up to Interstate Highway 35. The Site was formerly occupied by a railroad roundhouse and a brass foundry. Rail yard operations included fueling locations, engine repair and maintenance activities. After the railroad ceased operating at the Site, several buildings, including a portion of the old roundhouse, housed the foundry operation. Areas of the Site (primarily ravine areas) were historically filled with soil/cinder material and spent foundry sand.

Numerous subsurface investigations were completed at the Site between 1986 and 2009. The investigations identified levels of lead, copper, and polycyclic aromatic hydrocarbons (PAHs) in soil that exceeded MPCA's Tier II Industrial Soil Reference Values (SRVs); 700 mg/kg for lead, 9,000 mg/kg for copper, and 3 mg/kg for PAHs as measured by benzo(a)pyrene equivalents (BaP). Asbestos containing material (ACM) and petroleum constituents were also found in the Site soils. Groundwater testing conducted at the Site showed no elevated detections of volatile organic compounds (VOCs), PAHs, metals, pesticides, or polychlorinated biphenyls (PCBs). For the purpose of this letter, the identified release at the Site is defined as lead, copper, PAHs, and ACM in the Site soil (Identified Release).

Response actions were conducted by the Minnesota Department of Transportation (Mn/DOT) in 2007 and 2009 and involved removing contaminated soil and the former building foundations from the Site. Approximately 9,109 cubic yards of soil contaminated with lead, copper, PAHs, ACM, and petroleum hydrocarbons were excavated and disposed of off-site. Approximately 2,077 cubic yards of the 9,109 cubic yards of soil tested hazardous for lead and was stabilized on site prior to offsite disposal. The project also included removal and disposal or recycling of about 5,209 tons of concrete from former building foundations and disposal of over 2.5 tons of solid waste, including appliances, tires, and treated wood. Final excavation confirmation soil samples were analyzed for lead, copper, and/or PAHs; with analytical results being below Industrial SRVs. Site restoration work concluded in December 2009 with the placement, grading, and seeding of a six inch layer of clean topsoil across the excavated areas.

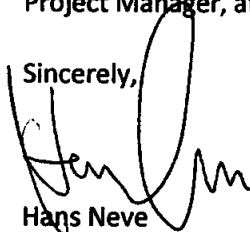
Ms. Nancy Radle  
Page 2  
March 17, 2011

As specified in the Affidavit Concerning Real Property Contaminated with Hazardous Substances (Document No. 01155825) as recorded at the Office of the County Recorder in St. Louis County, Minnesota on February 22, 2011, the response actions were performed based on the assumption that the property would be used for industrial use. If the property use is changed, additional response actions may be required.

Based on a review of the information provided to the MPCA, the MPCA staff will not request Mn/DOT, to conduct any further investigation or remediation of the Identified Release at the Site. Furthermore, the MPCA is issuing a determination to take no action under Minn. Stat. §§ 115B.01-115B.18, against Mn/DOT with respect to the Identified Release. Specifically, the MPCA staff will not refer the Identified Release to the U.S. Environmental Protection Agency for inclusion on the Comprehensive Environmental Response, Compensation and Liability Information System list, to the State Site Assessment staff for preparation of a Hazard Ranking System score, or to the MPCA Commissioner for the placement of the Site on the Permanent List of Priorities.

Please be advised that the determination made in this letter is subject to the disclaimers found in Attachment A. If you have any questions about the contents of this letter, please contact David Knight, Project Manager, at 651-757-2857.

Sincerely,



Hans Neve  
Supervisor  
VIC and Emergency Response Section  
Remediation Division

HN:jmp

Attachment

cc: Jeff Cox, City Clerk of Duluth  
Kevin Gray, County Administrator, St. Louis County  
James F. Simonet, Groundwater and Environmental Services, Inc.

ATTACHMENT A  
DISCLAIMERS  
Duluth, Winnipeg & Pacific RR  
MPCA Project Number VP4140

1. Reservation of Authorities

The MPCA Commissioner reserves the authority to take any appropriate actions with respect to any release, threatened release, or other conditions at the Site. The MPCA Commissioner also reserves the authority to take such actions if the voluntary party does not proceed in the manner described in this letter or if actions taken or omitted by the voluntary party with respect to the Site contribute to any release or threatened release, or create an imminent and substantial danger to public health and welfare.

2. No MPCA Assumption of Liability

The MPCA, its Commissioner and staff do not assume any liability for any release, threatened release or other conditions at the Site or for any actions taken or omitted by the voluntary party with regard to the release, threatened release, or other conditions at the Site, whether the actions taken or omitted are in accordance with this letter or otherwise.

3. Letter Based on Current Information

All statements, conclusions and representations in this letter are based upon information known to the MPCA Commissioner and staff at the time this letter was issued. The MPCA Commissioner and staff reserve the authority to modify or rescind any such statement, conclusion or representation and to take any appropriate action under his authority if the MPCA Commissioner or staff acquires information after issuance of this letter that provides a basis for such modification or action.

4. Disclaimer Regarding Use or Development of the Property

The MPCA, its Commissioner and staff do not warrant that the Site is suitable or appropriate for any particular use.

5. Disclaimer Regarding Investigative or Response Action at the Property

Nothing in this letter is intended to authorize any response action under Minn. Stat. § 115B.17, subd. 12.

## **Appendix B – 2014 Sampling and Analysis Summary**

## Technical Memorandum

**To:** Rosita Clark, USEPA  
**From:** Sheryl Filby Williams, Barr Engineering  
**Subject:** Revised 2014 Sampling and Analysis Summary  
DWP Railroad Site Redevelopment Project  
**Date:** August 19, 2014  
**Project:** USEPA Grant #00E00899-0; Barr #49161510  
**c:** Jim Filby Williams, City of Duluth; Heidi Timm-Bijold, DEDA; Ross Lovely, DEDA

On behalf of the City of Duluth and the Duluth Economic Development Authority (DEDA), the purpose of this technical memorandum is to provide a summary of observations and findings from the soil sampling investigation conducted in June of 2014 at the DWP Railroad Site Redevelopment Project (the Property). This summary describes work outlined in the "*Sampling and Analysis Plan, DWP Railroad Site Redevelopment Project, Duluth, Minnesota*" (SAP) dated June, 2014. The SAP was approved by the EPA on June 13, 2014 and work was performed in accordance with the SAP on June 17-19, 2014. The results of the investigation will be used to inform planning for future potential remediation and development activities at the Property. This revised sampling and analysis summary includes the results of the Toxic Characteristics Leaching Procedure (TCLP) extraction that was completed on discrete sample TP-N9-SE for copper and lead analyses.

### Introduction

The Site is located at 6900 Polk Street, Duluth, Saint Louis County, Minnesota (Figure 1), which was the address used by the former DWP Railroad Yard and the Duluth Brass Works and Aluminum facility. The Site covers approximately 60 acres along the former DWP Railroad right-of-way. Additional Property history is summarized in the SAP. The investigative work summarized in this memorandum was concentrated around areas where historical sampling has detected contaminants that exceed the MPCA Tier 2 Recreational Soil Reference Values (SRVs) and in areas where existing soil surfaces would not be capped with infrastructure or fill based on preliminary information provided to Barr by the City of Duluth.

### Summary of Completed Work

Field screening and analytical sampling methods are described in the SAP. Test pits and hand auger borings were used to collect representative soil samples. Twin Ports Environmental Construction from Duluth, MN was the test pit excavation contractor and Barr field staff completed the hand auger borings.

Thirty-six (36) test pits were excavated during the investigation (Figure 2). Soil aliquots from the test pits were composited into 11 samples. Each composite sample represented 3 to 4 test pit locations as follows:

Comp-01	TP-(C19-NW, B20-NE, A21-SE)
Comp-02	TP-(E17-NE, F17-NW, F18-NW)

**To:** Rosita Clark, USEPA  
**From:** Sheryl Filby Williams, Barr Engineering  
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Comp-03 TP-(G14-SW, G14-NE, H15-NW)  
Comp-04 TP-(H13-SW, I13-NE, G16-SE)  
Comp-05 TP-(I13-SE, I14-SE, J14-NW)  
Comp-06 TP-(M16-NE, M17-NW, M17-NE)  
Comp-07 TP-(M14-NW, M14-SE, M15-SE)  
Comp-08 TP-(K11-NW, J11-NW, J12-NW, K12-NW)  
Comp-09 TP-(M10-SE, L9-SE, K9-SE, J10-SE)  
Comp-10 TP-(N9-SE, O9-SW, O10-NW)  
Comp-11 TP-(O7-SE, N7-SE, O8-NE, N8-SE)

Discrete soil samples from each test pit were also submitted on-hold to the laboratory for potential analysis, pending the composite sample results.

Additionally, six (6) hand auger borings were advanced during the investigation (Figure 2). Discrete soil samples from each soil boring were collected and analyzed, and one composite sample was created from soil aliquots from each boring as follows:

Comp-12 SB-(J17-NE, K18-NE, L18-SW, M19-NW, M18-SW, N18-NW)

Decisions on which parameters to test for were based on contaminant trends identified in the historical investigation documentation referenced in the SAP. Analytical soil samples were submitted to Legend Technical Services in St. Paul, MN for analysis. The laboratory results are summarized in Table 1 and the laboratory reports are attached.

## Results of Completed Work

Analyte concentrations detected in the following samples were below MPCA Tier 2 Recreational SRVs for Copper (100 mg/kg) and Lead (300 mg/kg): *COMP-2, COMP-3, COMP-4, COMP-5, COMP-7, COMP-8, COMP-9, COMP-11, COMP-12, SB-M19-NW, SB-M18-SW, SB-J17-NE, SB-L18-SW, SB-N18-NW.*

Analyte concentrations exceeding MPCA Tier 2 Recreational SRVs were detected in the following composite samples:

- *COMP-01*: copper at 230 mg/kg
- *COMP-06*: copper at 210 mg/kg and lead at 340 mg/kg
- *COMP-10*: copper at 280 mg/kg and lead at 1,900 mg/kg
- *SB-K18-NE*: copper at 120 mg/kg

Based on these results, laboratory analyses were run on the following discrete test pit soil samples:

- Total Copper: *TP-C19-NW, TP-B20-NE, TP-A21-SE*

**To:** Rosita Clark, USEPA  
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- Total Copper and Total Lead: *TP-M16-NE, TP-M17-NW, TP-M17-NE, TP-N9-SE, TP-O9-SW, TP-O10-NW*

Analyte concentrations exceeded the MPCA Tier II Recreational SRVs in the following discrete test pit soil samples listed above:

- *TP-C19-NW*: copper at 150 mg/kg
- *TP-B20-NE*: copper at 170 mg/kg
- *TP-A21-SE*: copper at 120 mg/kg
- *TP-M16-NE*: copper at 180 mg/kg
- *TP-M17-NE*: copper at 130 mg/kg and lead at 1,900 mg/kg
- *TP-N9-SE*: copper at 720 mg/kg and lead at 7,200 mg/kg
- *TP-O9-SW*: copper at 490 mg/kg and lead at 2,500 mg/kg
- *TP-O10-NW*: copper at 99 mg/kg and lead at 570 mg/kg

TCLP extraction was completed on discrete sample *TP-N9-SE* for copper and lead analyses. The TCLP results indicate the copper result was 0.14 mg/L, which is below the regulatory limit. The lead result was 11 mg/L, which exceeds the regulatory limit of 5 mg/L. Waste characterization information will be used to identify soils which may require stabilization, and to assist with planning soil management for potential on-site use and/or landfill disposal.

The revised 2014 sampling investigation results reported in this technical memorandum will be used in the development of a Voluntary Response Action Plan (VRAP) to identify soil target remediation areas for management during implementation of the VRAP.

The City of Duluth and DEDA respectfully request your review of this technical memorandum. Please contact Heidi Timm-Bijold or me (218-529-8211 or [swilliams@barr.com](mailto:swilliams@barr.com)) with any questions or comments.

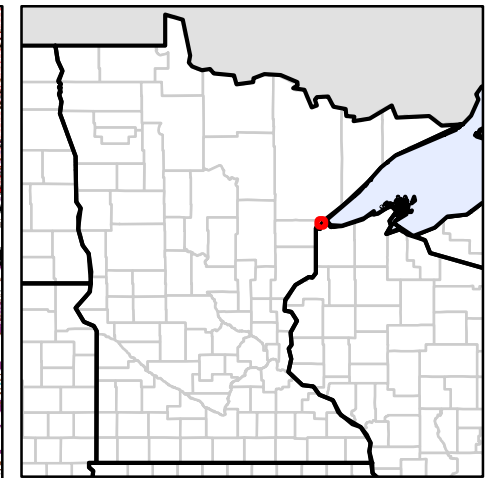
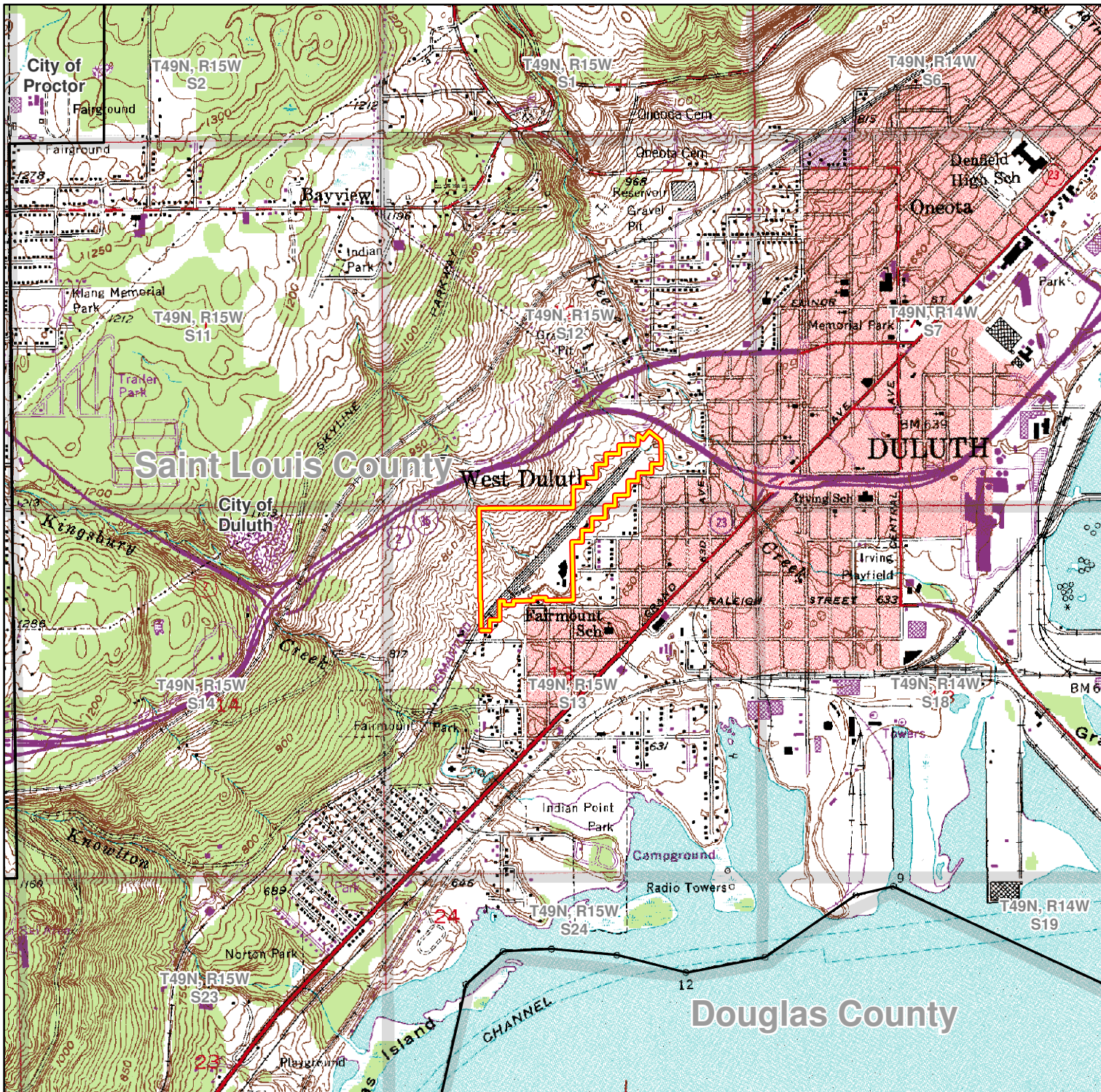
Sincerely,



Sheryl Filby Williams, P.G.  
Project Manager

Attachment A - Figures  
Attachment B - Tables  
Attachment C - Analytical Laboratory Reports

## **Attachment A - Figures**



— DWP Property Boundary



0 2,000 4,000

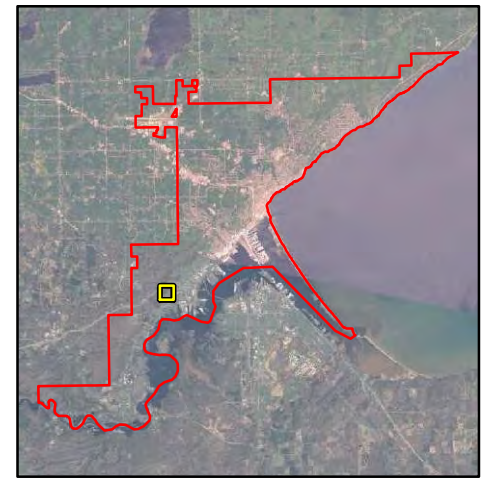
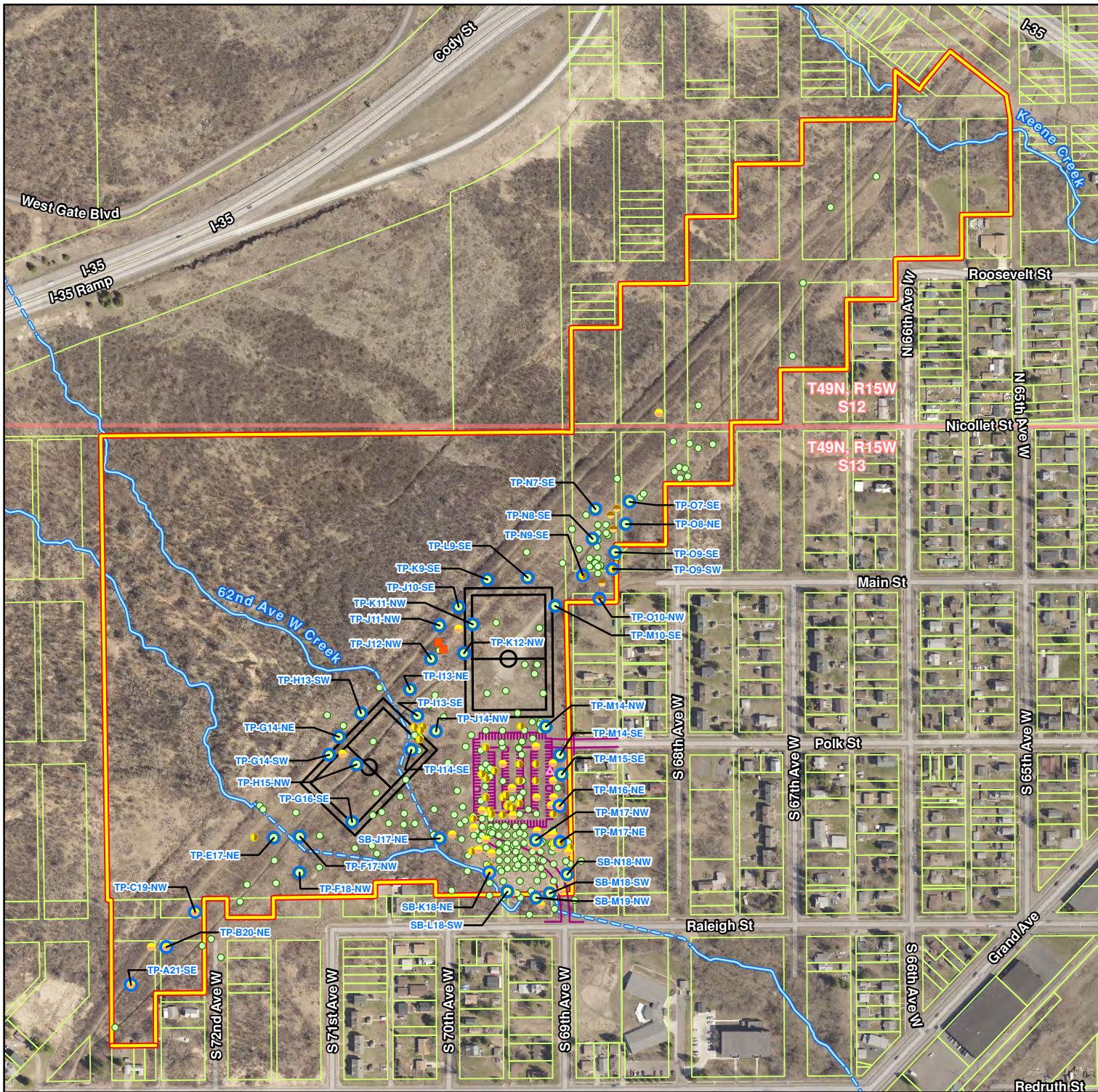
Feet

1 Inch = 2,000 Feet

Figure 1

**SITE LOCATION**  
 DWP Redevelopment Site  
 Duluth, Minnesota





- Historical Sample Locations**
- ▲ Exceedance Sample Location - Arsenic
  - Exceedance Sample Location - PAH
  - Exceedance Sample Location - Copper
  - Exceedance Sample Location - Lead
  - Exceedance Sample Location - Copper and Lead
  - Sample Locations - No Exceedance
- Legend**
- DWP Property Boundary
  - Proposed Fields
  - Proposed Roads/Parking
  - Parcel Lines
  - City of Duluth Boundary
  - Rivers and Streams
  - Surface Waters
  - Underground (Culvert)

- 2014 Sample Locations**
- Exceedance Sample Location - Copper
  - Exceedance Sample Location - Lead
  - Exceedance Sample Location - Copper and Lead
  - Sample Locations - No Exceedance

\*Note: Exceedance determinations are based on MPCA Tier 2 Recreational Soil Reference Values (SRVs).



Feet  
1 Inch = 400 Feet  
St. Louis County Imagery Circa May, 2013  
Figure 2

**SITE SAMPLING LOCATIONS**  
DWP Redevelopment Site  
Duluth, Minnesota



## **Attachment B - Tables**

**Table 1  
Soil Analytical Data Summary  
City of Duluth - DWP Redevelopment**

Location Date Depth Sample Type	COMP-01	COMP-02	COMP-03	COMP-04	COMP-05	COMP-06		COMP-07	COMP-08		COMP-09	COMP-10	COMP-11	COMP-12		
	6/19/2014	6/19/2014	6/18/2014	6/18/2014	6/18/2014	6/19/2014		6/18/2014	6/18/2014		6/17/2014	6/17/2014	6/17/2014	6/18/2014		
	N	N	N	N	N	N	FD	N	N	FD	N	N	N	N		
Composite Sample Aliquot Sources	TP-A21-SE	TP-E17-NE	TP-G14-SW	TP-G16-SE	TP-I13-SE	TP-M16-NE	TP-M16-NE	TP-M14-NW	TP-J11-NW	TP-J11-NW	TP-J10-SE	TP-N9-SE	TP-N7-SE	Contains aliquot from 6 SB samples collected on 6/18/14		
	TP-B20-NE	TP-F17-NW	TP-G14-NE	TP-H13-SW	TP-I14-SE	TP-M17-NE	TP-M17-NE	TP-M14-SE	TP-J12-NW	TP-J12-NW	TP-K9-SE	TP-O9-SW	TP-N8-SE			
	TP-C19-NW	TP-F18-NW	TP-H15-NW	TP-I13-NE	TP-J14-NW	TP-M17-NW	TP-M17-NW	TP-M15-SE	TP-K11-NW	TP-K11-NW	TP-L9-SE	TP-O10-NW	TP-O7-SE			
Parameter	Analysis Location	Minnesota Tier 2 Recreational Soil Reference Values														
Effective Date		06/22/2009														
Exceedance Key		<b>Bold</b>														
General Parameters																
Solids, percent	Lab		83 %	82 %	86 %	87 %	89 %	80 %	81 %	87 %	87 %	86 %	86 %	78 %	86 %	--
Metals																
Copper	Lab	<b>100 mg/kg</b>	<b>230 mg/kg</b>	57 mg/kg	52 mg/kg	36 mg/kg	88 mg/kg	<b>210 mg/kg</b>	<b>170 mg/kg</b>	68 mg/kg	53 mg/kg	43 mg/kg	46 mg/kg	<b>280 mg/kg</b>	52 mg/kg	--
Lead	Lab	<b>300 mg/kg</b>	120 mg/kg	69 mg/kg	53 mg/kg	90 mg/kg	37 mg/kg	<b>340 mg/kg</b>	260 mg/kg	43 mg/kg	46 mg/kg	46 mg/kg	51 mg/kg	<b>1900 mg/kg</b>	280 mg/kg	--
TCLP Metals																
Copper	Lab		--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.10 * mg/l
Lead	Lab		--	--	--	--	--	--	--	--	--	--	--	--	--	< 0.015 * mg/l
SVOCs																
2-Chloronaphthalene	Lab		--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
2-Methylnaphthalene	Lab	120 mg/kg	--	--	--	--	--	--	--	--	< 0.38 mg/kg	0.40 mg/kg	--	--	--	--
Acenaphthene	Lab	1860 mg/kg	--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
Acenaphthylene	Lab		--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
Anthracene	Lab	10000 mg/kg	--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
Benzo(g,h,i)perylene	Lab		--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
Fluoranthene	Lab	1290 mg/kg	--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
Fluorene	Lab	1200 mg/kg	--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
Naphthalene	Lab	24 mg/kg	--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
Phenanthrene	Lab		--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
Pyrene	Lab	1060 mg/kg	--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
Benz(a)anthracene	Lab	T	--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
Benzo(a)pyrene	Lab	T	--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
Benzo(b)fluoranthene	Lab	T	--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
Benzo(k)fluoranthene	Lab	T	--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
Chrysene	Lab	T	--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
Dibenz(a,h)anthracene	Lab	T	--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
Indeno(1,2,3-cd)pyrene	Lab	T	--	--	--	--	--	--	--	--	< 0.38 mg/kg	< 0.38 mg/kg	--	--	--	--
B(a)P Equivalent, non-detects at 0, 2002 PEFs	Barr Calculation	2 T mg/kg	--	--	--	--	--	--	--	--	ND mg/kg	ND mg/kg	--	--	--	--
B(a)P Equivalent, non-detects at 1/2, 2002 PEFs	Barr Calculation	2 T mg/kg	--	--	--	--	--	--	--	--	0.37 mg/kg	0.37 mg/kg	--	--	--	--
B(a)P Equivalent, non-detects at 1x, 2002 PEFs	Barr Calculation	2 T mg/kg	--	--	--	--	--	--	--	--	0.75 mg/kg	0.75 mg/kg	--	--	--	--

**Table 1**  
**Soil Analytical Data Summary**  
**City of Duluth - DWP Redevelopment**

Location			SB-J17-NE	SB-K18-NE	SB-L18-SW	SB-M18-SW	SB-M19-NW	SB-N18-NW	TP-A21-SE	TP-B20-NE	TP-C19-NW	TP-M16-NE	TP-M17-NE	TP-M17-NW	TP-N9-SE	TP-O10-NW	TP-O9-SW
Date			6/18/2014	6/18/2014	6/18/2014	6/18/2014	6/18/2014	6/18/2014	6/19/2014	6/19/2014	6/19/2014	6/19/2014	6/19/2014	6/19/2014	6/17/2014	6/17/2014	6/17/2014
Depth			0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft	0 - 2 ft
Sample Type			N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	Analysis Location	Minnesota Tier 2 Recreational Soil Reference Values															
Effective Date		06/22/2009															
Exceedance Key		<b>Bold</b>															
General Parameters																	
Solids, percent	Lab		77 %	79 %	80 %	78 %	75 %	81 %	85 %	82 %	82 %	85 %	87 %	68 %	85 %	75 %	69 %
Metals																	
Copper	Lab	<b>100 mg/kg</b>	46 mg/kg	<b>120 mg/kg</b>	30 mg/kg	38 mg/kg	43 mg/kg	33 mg/kg	<b>120 mg/kg</b>	<b>170 mg/kg</b>	<b>150 mg/kg</b>	<b>180 mg/kg</b>	<b>130 mg/kg</b>	22 mg/kg	<b>720 mg/kg</b>	99 mg/kg	<b>490 mg/kg</b>
Lead	Lab	<b>300 mg/kg</b>	35 mg/kg	39 mg/kg	11 mg/kg	17 mg/kg	22 mg/kg	12 mg/kg	--	--	--	97 mg/kg	<b>1400 mg/kg</b>	11 mg/kg	<b>7200 mg/kg</b>	<b>570 mg/kg</b>	<b>2500 mg/kg</b>
TCLP Metals																	
Copper	Lab		--	--	--	--	--	--	--	--	--	--	--	--	0.14 mg/l	--	--
Lead	Lab		--	--	--	--	--	--	--	--	--	--	--	--	11 mg/l	--	--
SVOCs																	
2-Chloronaphthalene	Lab		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	Lab	120 mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	Lab	1860 mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthylene	Lab		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Anthracene	Lab	10000 mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	Lab		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	Lab	1290 mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluorene	Lab	1200 mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	Lab	24 mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	Lab		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pyrene	Lab	1060 mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benz(a)anthracene	Lab	T	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	Lab	T	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	Lab	T	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	Lab	T	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chrysene	Lab	T	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	Lab	T	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	Lab	T	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B(a)P Equivalent, non-detects at 0, 2002 PEFs	Barr Calculation	2 T mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B(a)P Equivalent, non-detects at 1/2, 2002 PEFs	Barr Calculation	2 T mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B(a)P Equivalent, non-detects at 1x, 2002 PEFs	Barr Calculation	2 T mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

## Data Footnotes and Qualifiers

Footnote	
--	Not analyzed/not available.
N	Sample Type: Normal
FD	Sample Type: Field Duplicate
NA	NA (not applicable) indicates that a fractional portion of the sample is not part of the analytical testing or field collection procedures.
ND	Not detected.
TIC	Tentatively identified compound
Validated	Laboratory data has been evaluated following Barr QA/QC procedures and/or project-specific data review requirements. Field data has been verified for transcription errors, consistency and completeness. Data transferred from the previous database (9/2009) were categorized as validated, but may be comprised of any one of the following data status categories: Validated, SSource, No QC or Legacy.
No QC	Laboratory data has been excluded from Barr QA/QC procedures.
SSource	Laboratory and/or field data obtained from a secondary source external to Barr. Second source QA/QC evaluation procedures may or may not have been performed beyond the original data generator.
Legacy	Historical laboratory data (internal at Barr). QA/QC evaluation procedures may or may not have been performed beyond the original data generator

Qualifier	
a	Estimated value, calculated using some or all values that are estimates.
b	Potential false positive value based on blank data validation procedures.
c	Coeluting compound.
e	Estimated value, exceeded the instrument calibration range.
f	Sample was collected at a flowrate exceeding the recommended rate of 200 mL/minute.
h	EPA recommended sample preservation, extraction or analysis holding time was exceeded.
i	Indeterminate value based on failure of blind duplicate data to meet quality assurance criteria.
j	Reported value is less than the stated laboratory quantitation limit and is considered an estimated value.
p	Relative percent difference is >40% (25% CLP pesticides) between primary and confirmation GC columns.
pp	Small peak in chromatogram below method detection limit.
r	The presence of the compound is suspect based on the ID criteria of the retention time and relative retention time obtained from the examination of the chromatograms.
s	Potential false positive value based on statistical analysis of blank sample data.
t	Sample positive for total coliforms but negative for <i>E. coli</i> .
v	Sample was collected under a vacuum of greater than XX inches of mercury.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
AT	Sample chromatogram is noted to be atypical of a petroleum product.
EMPC	Estimated maximum possible concentration.
BQA	Barr-applied project specific qualifier: extraction and/or analyses conducted using an alternative method and/or procedure.
BQC	Barr-applied project specific qualifier: plant shut down.
BQD	Barr-applied project specific qualifier: equipment malfunction.
BQE	Barr-applied project specific qualifier: equipment adjustment.
BQM	Barr-applied project specific qualifier: manual measurement.
BQN	Barr-applied project specific qualifier: unable to be sampled or measured due to various reasons.
BQP	Barr-applied project specific qualifier: atypical chromatographic pattern.
BQQ	Barr-applied project specific qualifier: some aspect of QA/QC was not met.
BQR	Barr-applied project specific qualifier: location was re-sampled.
BQS	Barr-applied project specific qualifier: data is considered suspect.
BQT	Barr-applied project specific qualifier: summed value not displayed due to insufficient field length.
BQU	Barr-applied project specific qualifier: historical qualifier - definition unknown.
BQV	Barr-applied project specific qualifier: estimated value.
BQX	Barr-applied project specific qualifier: see notes for qualifier definition.
BQZ	Barr-applied project specific qualifier: data is considered unusable.

## **Attachment C – Analytical Laboratory Reports**



88 Empire Drive  
St Paul, MN 55103  
Tel: 651-642-1150  
Fax: 651-642-1239

July 25, 2014

## REVISION

Mr. James E. Taraldsen  
Barr Engineering Co.  
4700 W 77th St  
Minneapolis, MN 55435

Work Order Number: 1402673  
RE: 23691510

This is a revised report. The details of the revision are listed in the case narrative on the following page.

Enclosed are the results of analyses for samples received by the laboratory on 06/20/14. If you have any questions concerning this report, please feel free to contact me.

Results are not blank corrected unless noted within the report. Additionally, all QC results meet requirements unless noted.

All samples will be retained by Legend Technical Services, Inc., unless consumed in the analysis, at ambient conditions for 30 days from the date of this report and then discarded unless other arrangements are made. All samples were received in acceptable condition unless otherwise noted.

All test results and QC meet requirements of the 2003 NELAC standard.

MDH (NELAC) Certification #027-123-295

Prepared by,  
LEGEND TECHNICAL SERVICES, INC

A handwritten signature in black ink, appearing to read "BACH PHAM".

---

Bach Pham  
Client Manager II  
bpham@legend-group.com

A handwritten signature in black ink, appearing to read "KELLY FRENCH".

---

Kelly French  
Chemist III/Department Manager  
kfrench@legend-group.com

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 23691510 Project Number: 23691510 Project Manager: Mr. James E. Taraldsen	Work Order #: 1402673 Date Reported: 07/25/14
---	--	--

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
COMP-01	1402673-01	Soil	06/19/14 11:30	06/20/14 09:20
COMP-02	1402673-02	Soil	06/19/14 09:30	06/20/14 09:20
COMP-03	1402673-03	Soil	06/18/14 14:30	06/20/14 09:20
COMP-04	1402673-04	Soil	06/18/14 16:30	06/20/14 09:20
COMP-05	1402673-05	Soil	06/18/14 11:30	06/20/14 09:20
COMP-06	1402673-06	Soil	06/19/14 13:30	06/20/14 09:20
COMP-07	1402673-07	Soil	06/18/14 17:40	06/20/14 09:20
COMP-08	1402673-08	Soil	06/18/14 09:15	06/20/14 09:20
COMP-09	1402673-09	Soil	06/17/14 17:00	06/20/14 09:20
COMP-10	1402673-10	Soil	06/17/14 12:20	06/20/14 09:20
COMP-11	1402673-11	Soil	06/17/14 10:00	06/20/14 09:20
COMP-12	1402673-12	Soil	06/18/14 13:00	06/20/14 09:20
DUP-01	1402673-13	Soil	06/17/14 00:00	06/20/14 09:20
DUP-02	1402673-14	Soil	06/17/14 00:00	06/20/14 09:20
EB-01	1402673-15	Water	06/18/14 17:45	06/20/14 09:20
EB-02	1402673-16	Water	06/18/14 17:55	06/20/14 09:20
TP-C19-NW	1402673-17	Soil	06/19/14 11:00	06/20/14 09:20
TP-B20-NE	1402673-18	Soil	06/19/14 10:45	06/20/14 09:20
TP-A21-SE	1402673-19	Soil	06/19/14 10:20	06/20/14 09:20
TP-M16-NE	1402673-32	Soil	06/19/14 12:20	06/20/14 09:20
TP-M17-NW	1402673-33	Soil	06/19/14 12:50	06/20/14 09:20
TP-M17-NE	1402673-34	Soil	06/19/14 12:35	06/20/14 09:20
TP-N9-SE	1402673-46	Soil	06/17/14 11:20	06/20/14 09:20
TP-O9-SW	1402673-47	Soil	06/17/14 11:35	06/20/14 09:20
TP-O10-NW	1402673-48	Soil	06/17/14 11:50	06/20/14 09:20
SB-M19-NW_0-2	1402673-53	Soil	06/18/14 12:50	06/20/14 09:20
SB-M18-SW_0-2	1402673-54	Soil	06/18/14 12:20	06/20/14 09:20
SB-J17-NE_0-2	1402673-55	Soil	06/18/14 11:40	06/20/14 09:20
SB-L18-SW_0-2	1402673-56	Soil	06/18/14 12:10	06/20/14 09:20
SB-N18-NW_0-2	1402673-57	Soil	06/18/14 12:30	06/20/14 09:20
SB-K18-NE_0-2	1402673-58	Soil	06/18/14 12:00	06/20/14 09:20

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**Shipping Container Information**

<b>Cooler 1</b>	Temperature (°C): 1.7		
Received on ice: Yes	Temperature blank was present	Received on ice pack: No	
Received on melt water: No	Ambient: No	Acceptable (IH/ISO only): No	
Custody seals: Yes			
<b>Cooler 2</b>	Temperature (°C): 4.7		
Received on ice: Yes	Temperature blank was present	Received on ice pack: No	
Received on melt water: No	Ambient: No	Acceptable (IH/ISO only): No	
Custody seals: Yes			
<b>Cooler 3</b>	Temperature (°C): 8.6		
Received on ice: Yes	Temperature blank was present	Received on ice pack: No	
Received on melt water: No	Ambient: No	Acceptable (IH/ISO only): No	
Custody seals: Yes			
<b>Cooler 4</b>	Temperature (°C): 5.6		
Received on ice: Yes	Temperature blank was present	Received on ice pack: No	
Received on melt water: No	Ambient: No	Acceptable (IH/ISO only): No	
Custody seals: Yes			
<b>Cooler 5</b>	Temperature (°C): 1.2		
Received on ice: Yes	Temperature blank was present	Received on ice pack: No	
Received on melt water: No	Ambient: No	Acceptable (IH/ISO only): No	
Custody seals: Yes			

**Case Narrative:**

The MS/MSD recovery for copper was outside the method control limits for the 6010C batch B4F1209. The LCS, LCS duplicate, and % RPD were within the control limits. The source sample was COMP-06.

The MS/MSD recovery for lead was outside the method control limits for the 6010C batch B4F1209. The LCS and LCS duplicate were within the control limits. The source sample was COMP-06.

At the client's request, this report was revised on July 17, 2014 to include total copper analysis for samples TP-C19-NW, TP-B20-NE, and TP-A21-SE; and to include total copper and total lead analyses for samples TP-M16-NE, TP-M17-NW, TP-M17-NE, TP-N9-SE, TP-O9-SW, and TP-O10-NW. This report supersedes the report dated June 30, 2014.

At the client's request, this report was revised on July 25, 2014 to include TCLP copper and TCLP lead analyses for sample TP-N9-SE. This report supersedes the report dated July 17, 2014.

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 23691510 Project Number: 23691510 Project Manager: Mr. James E. Taraldsen	Work Order #: 1402673 Date Reported: 07/25/14
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**TOTAL METALS ANALYSIS**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>COMP-01 (1402673-01) Soil</b> <b>Sampled: 06/19/14 11:30</b> <b>Received: 06/20/14 9:20</b>										
Copper	230	1.2	0.058	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	120	1.2	0.17	mg/kg dry	1	"	"	"	"	
<b>COMP-02 (1402673-02) Soil</b> <b>Sampled: 06/19/14 09:30</b> <b>Received: 06/20/14 9:20</b>										
Copper	57	1.2	0.059	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	69	1.2	0.17	mg/kg dry	1	"	"	"	"	
<b>COMP-03 (1402673-03) Soil</b> <b>Sampled: 06/18/14 14:30</b> <b>Received: 06/20/14 9:20</b>										
Copper	52	1.2	0.056	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	53	1.2	0.16	mg/kg dry	1	"	"	"	"	
<b>COMP-04 (1402673-04) Soil</b> <b>Sampled: 06/18/14 16:30</b> <b>Received: 06/20/14 9:20</b>										
Copper	36	1.1	0.055	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	90	1.1	0.16	mg/kg dry	1	"	"	"	"	
<b>COMP-05 (1402673-05) Soil</b> <b>Sampled: 06/18/14 11:30</b> <b>Received: 06/20/14 9:20</b>										
Copper	88	1.1	0.054	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	37	1.1	0.16	mg/kg dry	1	"	"	"	"	
<b>COMP-06 (1402673-06) Soil</b> <b>Sampled: 06/19/14 13:30</b> <b>Received: 06/20/14 9:20</b>										
Copper	210	1.2	0.060	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	M3
Lead	340	1.2	0.18	mg/kg dry	1	"	"	"	"	QM-06
<b>COMP-07 (1402673-07) Soil</b> <b>Sampled: 06/18/14 17:40</b> <b>Received: 06/20/14 9:20</b>										
Copper	68	1.1	0.055	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	43	1.1	0.16	mg/kg dry	1	"	"	"	"	
<b>COMP-08 (1402673-08) Soil</b> <b>Sampled: 06/18/14 09:15</b> <b>Received: 06/20/14 9:20</b>										
Copper	53	1.1	0.055	mg/kg dry	1	B4F2312	06/23/14	06/24/14	EPA 6010C	
Lead	46	1.1	0.16	mg/kg dry	1	"	"	"	"	
<b>COMP-09 (1402673-09) Soil</b> <b>Sampled: 06/17/14 17:00</b> <b>Received: 06/20/14 9:20</b>										
Copper	46	1.2	0.056	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	51	1.2	0.16	mg/kg dry	1	"	"	"	"	
<b>COMP-10 (1402673-10) Soil</b> <b>Sampled: 06/17/14 12:20</b> <b>Received: 06/20/14 9:20</b>										
Copper	280	1.3	0.062	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	1900	1.3	0.18	mg/kg dry	1	"	"	"	"	
<b>COMP-11 (1402673-11) Soil</b> <b>Sampled: 06/17/14 10:00</b> <b>Received: 06/20/14 9:20</b>										
Copper	52	1.2	0.056	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	280	1.2	0.16	mg/kg dry	1	"	"	"	"	

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**TOTAL METALS ANALYSIS**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>DUP-01 (1402673-13) Soil Sampled: 06/17/14 00:00 Received: 06/20/14 9:20</b>										
Copper	43	1.2	0.056	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	46	1.2	0.16	mg/kg dry	1	"	"	"	"	
<b>DUP-02 (1402673-14) Soil Sampled: 06/17/14 00:00 Received: 06/20/14 9:20</b>										
Copper	170	1.2	0.059	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	260	1.2	0.17	mg/kg dry	1	"	"	"	"	
<b>EB-01 (1402673-15) Water Sampled: 06/18/14 17:45 Received: 06/20/14 9:20</b>										
Copper	<0.020	0.020	0.0013	mg/L	1	B4F2314	06/23/14	06/24/14	EPA 6010C	
Lead	<0.0030	0.0030	0.00058	mg/L	1	"	"	"	"	
<b>EB-02 (1402673-16) Water Sampled: 06/18/14 17:55 Received: 06/20/14 9:20</b>										
Copper	<0.020	0.020	0.0013	mg/L	1	B4F2314	06/23/14	06/24/14	EPA 6010C	
Lead	<0.0030	0.0030	0.00058	mg/L	1	"	"	"	"	
<b>TP-C19-NW (1402673-17) Soil Sampled: 06/19/14 11:00 Received: 06/20/14 9:20</b>										
Copper	150	1.2	0.059	mg/kg dry	1	B4G1011	07/10/14	07/11/14	EPA 6010C	M3
<b>TP-B20-NE (1402673-18) Soil Sampled: 06/19/14 10:45 Received: 06/20/14 9:20</b>										
Copper	170	1.2	0.059	mg/kg dry	1	B4G1011	07/10/14	07/14/14	EPA 6010C	
<b>TP-A21-SE (1402673-19) Soil Sampled: 06/19/14 10:20 Received: 06/20/14 9:20</b>										
Copper	120	1.2	0.056	mg/kg dry	1	B4G1011	07/10/14	07/14/14	EPA 6010C	
<b>TP-M16-NE (1402673-32) Soil Sampled: 06/19/14 12:20 Received: 06/20/14 9:20</b>										
Copper	180	1.2	0.056	mg/kg dry	1	B4G1011	07/10/14	07/14/14	EPA 6010C	
Lead	97	1.2	0.16	mg/kg dry	1	"	"	"	"	
<b>TP-M17-NW (1402673-33) Soil Sampled: 06/19/14 12:50 Received: 06/20/14 9:20</b>										
Copper	22	1.5	0.071	mg/kg dry	1	B4G1011	07/10/14	07/14/14	EPA 6010C	
Lead	11	1.5	0.21	mg/kg dry	1	"	"	"	"	
<b>TP-M17-NE (1402673-34) Soil Sampled: 06/19/14 12:35 Received: 06/20/14 9:20</b>										
Copper	130	1.1	0.055	mg/kg dry	1	B4G1011	07/10/14	07/14/14	EPA 6010C	
Lead	1400	1.1	0.16	mg/kg dry	1	"	"	"	"	
<b>TP-N9-SE (1402673-46) Soil Sampled: 06/17/14 11:20 Received: 06/20/14 9:20</b>										
Copper	720	1.2	0.056	mg/kg dry	1	B4G1011	07/10/14	07/14/14	EPA 6010C	
Lead	7200	1.2	0.16	mg/kg dry	1	"	"	"	"	

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**TOTAL METALS ANALYSIS**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>TP-O9-SW (1402673-47) Soil Sampled: 06/17/14 11:35 Received: 06/20/14 9:20</b>										
Copper	490	1.4	0.070	mg/kg dry	1	B4G1011	07/10/14	07/14/14	EPA 6010C	
Lead	2500	1.4	0.20	mg/kg dry	1	"	"	"	"	
<b>TP-O10-NW (1402673-48) Soil Sampled: 06/17/14 11:50 Received: 06/20/14 9:20</b>										
Copper	99	1.3	0.064	mg/kg dry	1	B4G1011	07/10/14	07/14/14	EPA 6010C	
Lead	570	1.3	0.19	mg/kg dry	1	"	"	"	"	
<b>SB-M19-NW_0-2 (1402673-53) Soil Sampled: 06/18/14 12:50 Received: 06/20/14 9:20</b>										
Copper	43	1.3	0.064	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	22	1.3	0.19	mg/kg dry	1	"	"	"	"	
<b>SB-M18-SW_0-2 (1402673-54) Soil Sampled: 06/18/14 12:20 Received: 06/20/14 9:20</b>										
Copper	38	1.3	0.062	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	17	1.3	0.18	mg/kg dry	1	"	"	"	"	
<b>SB-J17-NE_0-2 (1402673-55) Soil Sampled: 06/18/14 11:40 Received: 06/20/14 9:20</b>										
Copper	46	1.3	0.062	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	35	1.3	0.18	mg/kg dry	1	"	"	"	"	
<b>SB-L18-SW_0-2 (1402673-56) Soil Sampled: 06/18/14 12:10 Received: 06/20/14 9:20</b>										
Copper	30	1.2	0.060	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	11	1.2	0.18	mg/kg dry	1	"	"	"	"	
<b>SB-N18-NW_0-2 (1402673-57) Soil Sampled: 06/18/14 12:30 Received: 06/20/14 9:20</b>										
Copper	33	1.2	0.059	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	12	1.2	0.17	mg/kg dry	1	"	"	"	"	
<b>SB-K18-NE_0-2 (1402673-58) Soil Sampled: 06/18/14 12:00 Received: 06/20/14 9:20</b>										
Copper	120	1.3	0.061	mg/kg dry	1	B4F2311	06/23/14	06/24/14	EPA 6010C	
Lead	39	1.3	0.18	mg/kg dry	1	"	"	"	"	

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**PAH 8270D**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>COMP-08 (1402673-08) Soil Sampled: 06/18/14 09:15 Received: 06/20/14 9:20</b>										
2-Chloronaphthalene	<0.38	0.38	0.078	mg/kg dry	1	B4F2303	06/23/14	06/25/14	EPA 8270D	
2-Methylnaphthalene	<0.38	0.38	0.092	mg/kg dry	1	"	"	"	"	
Acenaphthene	<0.38	0.38	0.072	mg/kg dry	1	"	"	"	"	
Acenaphthylene	<0.38	0.38	0.082	mg/kg dry	1	"	"	"	"	
Anthracene	<0.38	0.38	0.079	mg/kg dry	1	"	"	"	"	
Benzo(a)anthracene	<0.38	0.38	0.075	mg/kg dry	1	"	"	"	"	
Benzo(a)pyrene	<0.38	0.38	0.080	mg/kg dry	1	"	"	"	"	
Benzo(b)fluoranthene	<0.38	0.38	0.068	mg/kg dry	1	"	"	"	"	
Benzo(g,h,i)perylene	<0.38	0.38	0.082	mg/kg dry	1	"	"	"	"	
Benzo(k)fluoranthene	<0.38	0.38	0.080	mg/kg dry	1	"	"	"	"	
Chrysene	<0.38	0.38	0.074	mg/kg dry	1	"	"	"	"	
Dibenz(a,h)anthracene	<0.38	0.38	0.094	mg/kg dry	1	"	"	"	"	
Fluoranthene	<0.38	0.38	0.078	mg/kg dry	1	"	"	"	"	
Fluorene	<0.38	0.38	0.075	mg/kg dry	1	"	"	"	"	
Indeno (1,2,3-cd) pyrene	<0.38	0.38	0.083	mg/kg dry	1	"	"	"	"	
Naphthalene	<0.38	0.38	0.082	mg/kg dry	1	"	"	"	"	
Phenanthrene	<0.38	0.38	0.076	mg/kg dry	1	"	"	"	"	
Pyrene	<0.38	0.38	0.068	mg/kg dry	1	"	"	"	"	
Surrogate: 2-Fluorobiphenyl	68.3		46.3-96.2	%		"	"	"	"	
Surrogate: Nitrobenzene-d5	70.4		49.3-94	%		"	"	"	"	
Surrogate: Terphenyl-d14	62.0		51.5-94.6	%		"	"	"	"	

<b>DUP-01 (1402673-13) Soil Sampled: 06/17/14 00:00 Received: 06/20/14 9:20</b>										
2-Chloronaphthalene	<0.38	0.38	0.079	mg/kg dry	1	B4F2303	06/23/14	06/25/14	EPA 8270D	
<b>2-Methylnaphthalene</b>	<b>0.40</b>	0.38	0.093	mg/kg dry	1	"	"	"	"	
Acenaphthene	<0.38	0.38	0.073	mg/kg dry	1	"	"	"	"	
Acenaphthylene	<0.38	0.38	0.083	mg/kg dry	1	"	"	"	"	
Anthracene	<0.38	0.38	0.080	mg/kg dry	1	"	"	"	"	
Benzo(a)anthracene	<0.38	0.38	0.076	mg/kg dry	1	"	"	"	"	
Benzo(a)pyrene	<0.38	0.38	0.081	mg/kg dry	1	"	"	"	"	
Benzo(b)fluoranthene	<0.38	0.38	0.069	mg/kg dry	1	"	"	"	"	
Benzo(g,h,i)perylene	<0.38	0.38	0.083	mg/kg dry	1	"	"	"	"	
Benzo(k)fluoranthene	<0.38	0.38	0.081	mg/kg dry	1	"	"	"	"	
Chrysene	<0.38	0.38	0.074	mg/kg dry	1	"	"	"	"	
Dibenz(a,h)anthracene	<0.38	0.38	0.095	mg/kg dry	1	"	"	"	"	
Fluoranthene	<0.38	0.38	0.079	mg/kg dry	1	"	"	"	"	
Fluorene	<0.38	0.38	0.076	mg/kg dry	1	"	"	"	"	
Indeno (1,2,3-cd) pyrene	<0.38	0.38	0.084	mg/kg dry	1	"	"	"	"	
Naphthalene	<0.38	0.38	0.083	mg/kg dry	1	"	"	"	"	
Phenanthrene	<0.38	0.38	0.077	mg/kg dry	1	"	"	"	"	

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**PAH 8270D**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>DUP-01 (1402673-13) Soil Sampled: 06/17/14 00:00 Received: 06/20/14 9:20</b>										
Pyrene	<0.38	0.38	0.069	mg/kg dry	1	B4F2303	06/23/14	06/25/14	EPA 8270D	
Surrogate: 2-Fluorobiphenyl	69.9			46.3-96.2 %		"	"	"	"	
Surrogate: Nitrobenzene-d5	70.8			49.3-94 %		"	"	"	"	
Surrogate: Terphenyl-d14	61.3			51.5-94.6 %		"	"	"	"	

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**PERCENT SOLIDS**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>COMP-01 (1402673-01) Soil</b>	<b>Sampled: 06/19/14 11:30</b>		<b>Received: 06/20/14 9:20</b>							
% Solids	83			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>COMP-02 (1402673-02) Soil</b>	<b>Sampled: 06/19/14 09:30</b>		<b>Received: 06/20/14 9:20</b>							
% Solids	82			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>COMP-03 (1402673-03) Soil</b>	<b>Sampled: 06/18/14 14:30</b>		<b>Received: 06/20/14 9:20</b>							
% Solids	86			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>COMP-04 (1402673-04) Soil</b>	<b>Sampled: 06/18/14 16:30</b>		<b>Received: 06/20/14 9:20</b>							
% Solids	87			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>COMP-05 (1402673-05) Soil</b>	<b>Sampled: 06/18/14 11:30</b>		<b>Received: 06/20/14 9:20</b>							
% Solids	89			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>COMP-06 (1402673-06) Soil</b>	<b>Sampled: 06/19/14 13:30</b>		<b>Received: 06/20/14 9:20</b>							
% Solids	80			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>COMP-07 (1402673-07) Soil</b>	<b>Sampled: 06/18/14 17:40</b>		<b>Received: 06/20/14 9:20</b>							
% Solids	87			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>COMP-08 (1402673-08) Soil</b>	<b>Sampled: 06/18/14 09:15</b>		<b>Received: 06/20/14 9:20</b>							
% Solids	87			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>COMP-09 (1402673-09) Soil</b>	<b>Sampled: 06/17/14 17:00</b>		<b>Received: 06/20/14 9:20</b>							
% Solids	86			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>COMP-10 (1402673-10) Soil</b>	<b>Sampled: 06/17/14 12:20</b>		<b>Received: 06/20/14 9:20</b>							
% Solids	78			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>COMP-11 (1402673-11) Soil</b>	<b>Sampled: 06/17/14 10:00</b>		<b>Received: 06/20/14 9:20</b>							
% Solids	86			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>DUP-01 (1402673-13) Soil</b>	<b>Sampled: 06/17/14 00:00</b>		<b>Received: 06/20/14 9:20</b>							
% Solids	86			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>DUP-02 (1402673-14) Soil</b>	<b>Sampled: 06/17/14 00:00</b>		<b>Received: 06/20/14 9:20</b>							
% Solids	81			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>TP-C19-NW (1402673-17) Soil</b>	<b>Sampled: 06/19/14 11:00</b>		<b>Received: 06/20/14 9:20</b>							
% Solids	82			%	1	B4G1607	07/16/14	07/16/14	% calculation	



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Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 23691510 Project Number: 23691510 Project Manager: Mr. James E. Taraldsen	Work Order #: 1402673 Date Reported: 07/25/14
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**PERCENT SOLIDS**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>TP-B20-NE (1402673-18) Soil</b> <b>Sampled: 06/19/14 10:45</b> <b>Received: 06/20/14 9:20</b>										
% Solids	82			%	1	B4G1607	07/16/14	07/16/14	% calculation	
<b>TP-A21-SE (1402673-19) Soil</b> <b>Sampled: 06/19/14 10:20</b> <b>Received: 06/20/14 9:20</b>										
% Solids	85			%	1	B4G1607	07/16/14	07/16/14	% calculation	
<b>TP-M16-NE (1402673-32) Soil</b> <b>Sampled: 06/19/14 12:20</b> <b>Received: 06/20/14 9:20</b>										
% Solids	85			%	1	B4G1607	07/16/14	07/16/14	% calculation	
<b>TP-M17-NW (1402673-33) Soil</b> <b>Sampled: 06/19/14 12:50</b> <b>Received: 06/20/14 9:20</b>										
% Solids	68			%	1	B4G1607	07/16/14	07/16/14	% calculation	
<b>TP-M17-NE (1402673-34) Soil</b> <b>Sampled: 06/19/14 12:35</b> <b>Received: 06/20/14 9:20</b>										
% Solids	87			%	1	B4G1607	07/16/14	07/16/14	% calculation	
<b>TP-N9-SE (1402673-46) Soil</b> <b>Sampled: 06/17/14 11:20</b> <b>Received: 06/20/14 9:20</b>										
% Solids	85			%	1	B4G1607	07/16/14	07/16/14	% calculation	
<b>TP-O9-SW (1402673-47) Soil</b> <b>Sampled: 06/17/14 11:35</b> <b>Received: 06/20/14 9:20</b>										
% Solids	69			%	1	B4G1607	07/16/14	07/16/14	% calculation	
<b>TP-O10-NW (1402673-48) Soil</b> <b>Sampled: 06/17/14 11:50</b> <b>Received: 06/20/14 9:20</b>										
% Solids	75			%	1	B4G1607	07/16/14	07/16/14	% calculation	
<b>SB-M19-NW_0-2 (1402673-53) Soil</b> <b>Sampled: 06/18/14 12:50</b> <b>Received: 06/20/14 9:20</b>										
% Solids	75			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>SB-M18-SW_0-2 (1402673-54) Soil</b> <b>Sampled: 06/18/14 12:20</b> <b>Received: 06/20/14 9:20</b>										
% Solids	78			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>SB-J17-NE_0-2 (1402673-55) Soil</b> <b>Sampled: 06/18/14 11:40</b> <b>Received: 06/20/14 9:20</b>										
% Solids	77			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>SB-L18-SW_0-2 (1402673-56) Soil</b> <b>Sampled: 06/18/14 12:10</b> <b>Received: 06/20/14 9:20</b>										
% Solids	80			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>SB-N18-NW_0-2 (1402673-57) Soil</b> <b>Sampled: 06/18/14 12:30</b> <b>Received: 06/20/14 9:20</b>										
% Solids	81			%	1	B4F2709	06/27/14	06/27/14	% calculation	
<b>SB-K18-NE_0-2 (1402673-58) Soil</b> <b>Sampled: 06/18/14 12:00</b> <b>Received: 06/20/14 9:20</b>										
% Solids	79			%	1	B4F2709	06/27/14	06/27/14	% calculation	



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Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 23691510 Project Number: 23691510 Project Manager: Mr. James E. Taraldsen	Work Order #: 1402673 Date Reported: 07/25/14
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**TCLP METALS**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>COMP-12 (1402673-12) Soil</b>										A-01
<b>Sampled: 06/18/14 13:00 Received: 06/20/14 9:20</b>										
Copper	<0.10	0.10	0.0065	mg/L	1	B4F2509	06/25/14	06/25/14	EPA 1311/6010C	
Lead	<0.015	0.015	0.0029	mg/L	1	"	"	"	"	
<b>TP-N9-SE (1402673-46) Soil</b>										
<b>Sampled: 06/17/14 11:20 Received: 06/20/14 9:20</b>										
Copper	<b>0.14</b>	0.10	0.0065	mg/L	1	B4G2407	07/24/14	07/24/14	EPA 1311/6010C	
Lead	<b>11</b>	0.015	0.0029	mg/L	1	"	"	"	"	

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 23691510 Project Number: 23691510 Project Manager: Mr. James E. Taraldsen	Work Order #: 1402673 Date Reported: 07/25/14
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**TOTAL METALS ANALYSIS - Quality Control**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
<b>Batch B4F2311 - EPA 3050B</b>											
<b>Blank (B4F2311-BLK1)</b> Prepared: 06/23/14 Analyzed: 06/24/14											
Copper	< 1.0	1.0	0.048	mg/kg wet							
Lead	< 1.0	1.0	0.14	mg/kg wet							
<b>LCS (B4F2311-BS1)</b> Prepared: 06/23/14 Analyzed: 06/24/14											
Copper	41.3	1.0	0.048	mg/kg wet	39.9		104	80-120			
Lead	42.3	1.0	0.14	mg/kg wet	39.9		106	80-120			
<b>LCS Dup (B4F2311-BSD1)</b> Prepared: 06/23/14 Analyzed: 06/24/14											
Copper	41.4	1.0	0.048	mg/kg wet	39.9		104	80-120	0.295	20	
Lead	42.5	1.0	0.14	mg/kg wet	39.9		106	80-120	0.410	20	
<b>Matrix Spike (B4F2311-MS1)</b> Source: 1402673-06 Prepared: 06/23/14 Analyzed: 06/24/14											
Copper	232	1.2	0.060	mg/kg dry	49.3	215	35.2	75-125			M3
Lead	436	1.2	0.18	mg/kg dry	49.3	340	194	75-125			QM-06
<b>Matrix Spike Dup (B4F2311-MSD1)</b> Source: 1402673-06 Prepared: 06/23/14 Analyzed: 06/24/14											
Copper	275	1.2	0.060	mg/kg dry	49.3	215	123	75-125	17.0	20	M3
Lead	1220	1.2	0.18	mg/kg dry	49.3	340	NR	75-125	94.7	20	QM-06
<b>Batch B4F2312 - EPA 3050B</b>											
<b>Blank (B4F2312-BLK1)</b> Prepared: 06/23/14 Analyzed: 06/24/14											
Copper	< 1.0	1.0	0.048	mg/kg wet							
Lead	< 1.0	1.0	0.14	mg/kg wet							
<b>LCS (B4F2312-BS1)</b> Prepared: 06/23/14 Analyzed: 06/24/14											
Copper	41.5	1.0	0.048	mg/kg wet	39.9		104	80-120			
Lead	42.1	1.0	0.14	mg/kg wet	39.9		105	80-120			
<b>LCS Dup (B4F2312-BSD1)</b> Prepared: 06/23/14 Analyzed: 06/24/14											
Copper	41.2	1.0	0.048	mg/kg wet	39.9		103	80-120	0.808	20	
Lead	42.4	1.0	0.14	mg/kg wet	39.9		106	80-120	0.708	20	
<b>Matrix Spike (B4F2312-MS1)</b> Source: 1402673-08 Prepared: 06/23/14 Analyzed: 06/24/14											
Copper	95.6	1.1	0.055	mg/kg dry	45.5	52.6	94.4	75-125			
Lead	92.0	1.1	0.16	mg/kg dry	45.5	46.0	101	75-125			
<b>Matrix Spike Dup (B4F2312-MSD1)</b> Source: 1402673-08 Prepared: 06/23/14 Analyzed: 06/24/14											
Copper	101	1.1	0.055	mg/kg dry	45.6	52.6	107	75-125	5.78	20	
Lead	97.2	1.1	0.16	mg/kg dry	45.6	46.0	113	75-125	5.50	20	

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 23691510 Project Number: 23691510 Project Manager: Mr. James E. Taraldsen	Work Order #: 1402673 Date Reported: 07/25/14
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**TOTAL METALS ANALYSIS - Quality Control**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
<b>Batch B4F2314 - EPA 200.7/3005A Digestion</b>											
<b>Blank (B4F2314-BLK1)</b> Prepared: 06/23/14 Analyzed: 06/24/14											
Copper	< 0.020	0.020	0.0013	mg/L							
Lead	< 0.0030	0.0030	0.00058	mg/L							
<b>LCS (B4F2314-BS1)</b> Prepared: 06/23/14 Analyzed: 06/24/14											
Copper	0.412	0.020	0.0013	mg/L	0.399		103	80-120			
Lead	0.415	0.0030	0.00058	mg/L	0.399		104	80-120			
<b>LCS Dup (B4F2314-BSD1)</b> Prepared: 06/23/14 Analyzed: 06/24/14											
Copper	0.409	0.020	0.0013	mg/L	0.399		102	80-120	0.671	20	
Lead	0.419	0.0030	0.00058	mg/L	0.399		105	80-120	1.07	20	
<b>Matrix Spike (B4F2314-MS1)</b> Source: 1402681-01 Prepared: 06/23/14 Analyzed: 06/24/14											
Copper	0.420	0.020	0.0013	mg/L	0.399	<0.020	104	75-125			
Lead	0.413	0.0030	0.00058	mg/L	0.399	<0.0030	103	75-125			
<b>Matrix Spike Dup (B4F2314-MSD1)</b> Source: 1402681-01 Prepared: 06/23/14 Analyzed: 06/24/14											
Copper	0.420	0.020	0.0013	mg/L	0.399	<0.020	104	75-125	0.0641	20	
Lead	0.415	0.0030	0.00058	mg/L	0.399	<0.0030	104	75-125	0.466	20	
<b>Batch B4G1011 - EPA 3050B</b>											
<b>Blank (B4G1011-BLK1)</b> Prepared: 07/10/14 Analyzed: 07/11/14											
Copper	< 1.0	1.0	0.048	mg/kg wet							
Lead	< 1.0	1.0	0.14	mg/kg wet							
<b>LCS (B4G1011-BS1)</b> Prepared: 07/10/14 Analyzed: 07/11/14											
Copper	41.0	1.0	0.048	mg/kg wet	39.9		103	80-120			
Lead	42.1	1.0	0.14	mg/kg wet	39.9		106	80-120			
<b>LCS Dup (B4G1011-BSD1)</b> Prepared: 07/10/14 Analyzed: 07/11/14											
Copper	37.0	1.0	0.048	mg/kg wet	39.9		92.7	80-120	10.3	20	
Lead	38.6	1.0	0.14	mg/kg wet	39.9		96.8	80-120	8.74	20	
<b>Matrix Spike (B4G1011-MS1)</b> Source: 1402673-17 Prepared: 07/10/14 Analyzed: 07/11/14											
Copper	174	1.2	0.059	mg/kg dry	48.1	150	49.6	75-125			M3
Lead	246	1.2	0.17	mg/kg dry	48.1	137	228	75-125			M3
<b>Matrix Spike Dup (B4G1011-MSD1)</b> Source: 1402673-17 Prepared: 07/10/14 Analyzed: 07/11/14											
Copper	203	1.2	0.059	mg/kg dry	48.1	150	109	75-125	15.3	20	M3
Lead	200	1.2	0.17	mg/kg dry	48.1	137	132	75-125	20.8	20	M3

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 23691510 Project Number: 23691510 Project Manager: Mr. James E. Taraldsen	Work Order #: 1402673 Date Reported: 07/25/14
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**PAH 8270D - Quality Control**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
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**Batch B4F2303 - EPA 3545 ASE Extraction**

**Blank (B4F2303-BLK1)**

Prepared: 06/23/14 Analyzed: 06/26/14

2-Chloronaphthalene	< 0.33	0.33	0.068	mg/kg wet							
2-Methylnaphthalene	< 0.33	0.33	0.080	mg/kg wet							
Acenaphthene	< 0.33	0.33	0.063	mg/kg wet							
Acenaphthylene	< 0.33	0.33	0.071	mg/kg wet							
Anthracene	< 0.33	0.33	0.069	mg/kg wet							
Benzo(a)anthracene	< 0.33	0.33	0.065	mg/kg wet							
Benzo(a)pyrene	< 0.33	0.33	0.070	mg/kg wet							
Benzo(b)fluoranthene	< 0.33	0.33	0.059	mg/kg wet							
Benzo(g,h,i)perylene	< 0.33	0.33	0.071	mg/kg wet							
Benzo(k)fluoranthene	< 0.33	0.33	0.070	mg/kg wet							
Chrysene	< 0.33	0.33	0.064	mg/kg wet							
Dibenz(a,h)anthracene	< 0.33	0.33	0.082	mg/kg wet							
Fluoranthene	< 0.33	0.33	0.068	mg/kg wet							
Fluorene	< 0.33	0.33	0.065	mg/kg wet							
Indeno (1,2,3-cd) pyrene	< 0.33	0.33	0.072	mg/kg wet							
Naphthalene	< 0.33	0.33	0.071	mg/kg wet							
Phenanthrene	< 0.33	0.33	0.066	mg/kg wet							
Pyrene	< 0.33	0.33	0.059	mg/kg wet							
Surrogate: 2-Fluorobiphenyl	4.45			mg/kg wet	6.67		66.8	46.3-96.2			
Surrogate: Nitrobenzene-d5	4.46			mg/kg wet	6.67		66.9	49.3-94			
Surrogate: Terphenyl-d14	3.79			mg/kg wet	6.67		56.9	51.5-94.6			

**LCS (B4F2303-BS1)**

Prepared: 06/23/14 Analyzed: 06/26/14

Acenaphthylene	2.69	0.33	0.071	mg/kg wet	3.33		80.6	55-95			
Anthracene	2.72	0.33	0.069	mg/kg wet	3.33		81.5	60-100			
Benzo(a)anthracene	2.73	0.33	0.065	mg/kg wet	3.33		82.0	55-100			
Benzo(a)pyrene	2.87	0.33	0.070	mg/kg wet	3.33		86.0	55-100			
Benzo(b)fluoranthene	2.76	0.33	0.059	mg/kg wet	3.33		82.8	55-100			
Benzo(g,h,i)perylene	2.90	0.33	0.071	mg/kg wet	3.33		87.1	50-100			
Benzo(k)fluoranthene	2.73	0.33	0.070	mg/kg wet	3.33		81.8	55-100			
Chrysene	2.75	0.33	0.064	mg/kg wet	3.33		82.5	50-100			
Dibenz(a,h)anthracene	2.90	0.33	0.082	mg/kg wet	3.33		87.0	50-100			
Fluoranthene	2.86	0.33	0.068	mg/kg wet	3.33		85.7	55-100			
Fluorene	2.67	0.33	0.065	mg/kg wet	3.33		80.2	55-95			
Indeno (1,2,3-cd) pyrene	2.91	0.33	0.072	mg/kg wet	3.33		87.4	55-110			
Naphthalene	2.51	0.33	0.071	mg/kg wet	3.33		75.2	50-95			
Phenanthrene	2.73	0.33	0.066	mg/kg wet	3.33		81.9	60-100			
Surrogate: 2-Fluorobiphenyl	4.55			mg/kg wet	6.67		68.3	46.3-96.2			
Surrogate: Nitrobenzene-d5	4.44			mg/kg wet	6.67		66.7	49.3-94			
Surrogate: Terphenyl-d14	4.22			mg/kg wet	6.67		63.3	51.5-94.6			

Barr Engineering Co.  
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 Minneapolis, MN 55435

Project: 23691510  
 Project Number: 23691510  
 Project Manager: Mr. James E. Taraldsen

Work Order #: 1402673  
 Date Reported: 07/25/14

**PAH 8270D - Quality Control**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
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**Batch B4F2303 - EPA 3545 ASE Extraction**

**Matrix Spike (B4F2303-MS1)**

Source: 1402673-08

Prepared: 06/23/14 Analyzed: 06/26/14

Acenaphthylene	3.17	0.38	0.082	mg/kg dry	3.84	<0.38	82.6	40-100			
Anthracene	3.40	0.38	0.079	mg/kg dry	3.84	<0.38	88.5	45-100			
Benzo(a)anthracene	2.82	0.38	0.075	mg/kg dry	3.84	<0.38	71.3	45-100			
Benzo(a)pyrene	3.06	0.38	0.080	mg/kg dry	3.84	<0.38	79.7	40-100			
Benzo(b)fluoranthene	3.36	0.38	0.068	mg/kg dry	3.84	<0.38	83.1	40-100			
Benzo(g,h,i)perylene	3.07	0.38	0.082	mg/kg dry	3.84	<0.38	76.4	35-110			
Benzo(k)fluoranthene	3.29	0.38	0.080	mg/kg dry	3.84	<0.38	85.7	40-100			
Chrysene	3.31	0.38	0.074	mg/kg dry	3.84	<0.38	82.6	40-100			
Dibenz(a,h)anthracene	3.19	0.38	0.094	mg/kg dry	3.84	<0.38	83.1	35-110			
Fluoranthene	3.05	0.38	0.078	mg/kg dry	3.84	<0.38	79.5	45-100			
Fluorene	3.03	0.38	0.075	mg/kg dry	3.84	<0.38	79.0	45-100			
Indeno (1,2,3-cd) pyrene	2.99	0.38	0.083	mg/kg dry	3.84	<0.38	75.3	35-110			
Naphthalene	3.36	0.38	0.082	mg/kg dry	3.84	<0.38	79.9	35-100			
Phenanthrene	3.71	0.38	0.076	mg/kg dry	3.84	<0.38	88.5	45-100			
Surrogate: 2-Fluorobiphenyl	5.45			mg/kg dry	7.67		71.0	46.3-96.2			
Surrogate: Nitrobenzene-d5	5.35			mg/kg dry	7.67		69.8	49.3-94			
Surrogate: Terphenyl-d14	4.43			mg/kg dry	7.67		57.8	51.5-94.6			

**Matrix Spike Dup (B4F2303-MSD1)**

Source: 1402673-08

Prepared: 06/23/14 Analyzed: 06/26/14

Acenaphthylene	3.21	0.38	0.082	mg/kg dry	3.84	<0.38	83.4	40-100	1.17	20	
Anthracene	3.42	0.38	0.079	mg/kg dry	3.84	<0.38	88.9	45-100	0.593	20	
Benzo(a)anthracene	2.85	0.38	0.075	mg/kg dry	3.84	<0.38	72.0	45-100	1.18	20	
Benzo(a)pyrene	3.04	0.38	0.080	mg/kg dry	3.84	<0.38	79.1	40-100	0.524	20	
Benzo(b)fluoranthene	3.37	0.38	0.068	mg/kg dry	3.84	<0.38	83.1	40-100	0.201	20	
Benzo(g,h,i)perylene	2.91	0.38	0.082	mg/kg dry	3.84	<0.38	72.2	35-110	5.28	20	
Benzo(k)fluoranthene	3.28	0.38	0.080	mg/kg dry	3.84	<0.38	85.4	40-100	0.143	20	
Chrysene	3.37	0.38	0.074	mg/kg dry	3.84	<0.38	83.8	40-100	1.64	20	
Dibenz(a,h)anthracene	3.11	0.38	0.094	mg/kg dry	3.84	<0.38	81.0	35-110	2.36	20	
Fluoranthene	3.12	0.38	0.078	mg/kg dry	3.84	<0.38	81.3	45-100	2.48	20	
Fluorene	3.06	0.38	0.075	mg/kg dry	3.84	<0.38	79.6	45-100	1.06	20	
Indeno (1,2,3-cd) pyrene	2.88	0.38	0.083	mg/kg dry	3.84	<0.38	72.3	35-110	3.72	20	
Naphthalene	3.30	0.38	0.082	mg/kg dry	3.84	<0.38	78.2	35-100	1.69	20	
Phenanthrene	3.75	0.38	0.076	mg/kg dry	3.84	<0.38	89.3	45-100	1.04	20	
Surrogate: 2-Fluorobiphenyl	5.49			mg/kg dry	7.69		71.4	46.3-96.2			
Surrogate: Nitrobenzene-d5	5.37			mg/kg dry	7.69		69.9	49.3-94			
Surrogate: Terphenyl-d14	4.70			mg/kg dry	7.69		61.1	51.5-94.6			

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 23691510 Project Number: 23691510 Project Manager: Mr. James E. Taraldsen	Work Order #: 1402673 Date Reported: 07/25/14
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**PERCENT SOLIDS - Quality Control**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
<b>Batch B4F2709 - General Preparation</b>											
<b>Duplicate (B4F2709-DUP1)</b>						<b>Source: 1402673-10</b>			<b>Prepared &amp; Analyzed: 06/27/14</b>		
% Solids	77.0			%		78.0			1.29	20	
<b>Duplicate (B4F2709-DUP2)</b>											
						<b>Source: 1402673-58</b>			<b>Prepared &amp; Analyzed: 06/27/14</b>		
% Solids	82.0			%		79.0			3.73	20	
<b>Batch B4G1607 - General Preparation</b>											
<b>Duplicate (B4G1607-DUP1)</b>						<b>Source: 1403066-01</b>			<b>Prepared &amp; Analyzed: 07/16/14</b>		
% Solids	90.0			%		89.0			1.12	20	
<b>Duplicate (B4G1607-DUP2)</b>											
						<b>Source: 1403066-10</b>			<b>Prepared &amp; Analyzed: 07/16/14</b>		
% Solids	83.0			%		84.0			1.20	20	

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 23691510 Project Number: 23691510 Project Manager: Mr. James E. Taraldsen	Work Order #: 1402673 Date Reported: 07/25/14
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**TCLP METALS - Quality Control**  
**Legend Technical Services, Inc.**

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
<b>Batch B4F2509 - EPA 200.7/3005A Digestion</b>											
<b>Blank (B4F2509-BLK1)</b> Prepared & Analyzed: 06/25/14											
Copper	< 0.10	0.10	0.0065	mg/L							
Lead	< 0.015	0.015	0.0029	mg/L							
<b>Blank (B4F2509-BLK2)</b> Prepared & Analyzed: 06/25/14											
Copper	< 0.10	0.10	0.0065	mg/L							
Lead	< 0.015	0.015	0.0029	mg/L							
<b>LCS (B4F2509-BS1)</b> Prepared & Analyzed: 06/25/14											
Copper	4.16	0.10	0.0065	mg/L	3.99		104	80-120			
Lead	4.30	0.015	0.0029	mg/L	3.99		108	80-120			
<b>LCS Dup (B4F2509-BSD1)</b> Prepared & Analyzed: 06/25/14											
Copper	4.04	0.10	0.0065	mg/L	3.99		101	80-120	2.84	20	
Lead	4.18	0.015	0.0029	mg/L	3.99		105	80-120	2.86	20	
<b>Matrix Spike (B4F2509-MS1)</b> Source: 1402617-01 Prepared & Analyzed: 06/25/14											
Copper	4.26	0.10	0.0065	mg/L	3.99	<0.10	107	75-125			
Lead	4.25	0.015	0.0029	mg/L	3.99	<0.015	106	75-125			
<b>Matrix Spike Dup (B4F2509-MSD1)</b> Source: 1402617-01 Prepared & Analyzed: 06/25/14											
Copper	4.17	0.10	0.0065	mg/L	3.99	<0.10	104	75-125	2.29	20	
Lead	4.12	0.015	0.0029	mg/L	3.99	<0.015	103	75-125	3.11	20	
<b>Batch B4G2407 - EPA 200.7/3005A Digestion</b>											
<b>Blank (B4G2407-BLK1)</b> Prepared & Analyzed: 07/24/14											
Copper	< 0.10	0.10	0.0065	mg/L							
Lead	< 0.015	0.015	0.0029	mg/L							
<b>LCS (B4G2407-BS1)</b> Prepared & Analyzed: 07/24/14											
Copper	3.96	0.10	0.0065	mg/L	3.99		99.2	80-120			
Lead	4.12	0.015	0.0029	mg/L	3.99		103	80-120			
<b>LCS Dup (B4G2407-BSD1)</b> Prepared & Analyzed: 07/24/14											
Copper	3.89	0.10	0.0065	mg/L	3.99		97.4	80-120	1.88	20	
Lead	4.08	0.015	0.0029	mg/L	3.99		102	80-120	0.951	20	
<b>Matrix Spike (B4G2407-MS1)</b> Source: 1403135-01 Prepared & Analyzed: 07/24/14											
Copper	4.10	0.10	0.0065	mg/L	3.99	<0.10	102	75-125			
Lead	113	0.015	0.0029	mg/L	3.99	109	91.7	75-125			
<b>Matrix Spike Dup (B4G2407-MSD1)</b> Source: 1403135-01 Prepared & Analyzed: 07/24/14											
Copper	4.06	0.10	0.0065	mg/L	3.99	<0.10	101	75-125	0.830	20	
Lead	112	0.015	0.0029	mg/L	3.99	109	78.4	75-125	0.470	20	

Barr Engineering Co. 4700 W 77th St Minneapolis, MN 55435	Project: 23691510 Project Number: 23691510 Project Manager: Mr. James E. Taraldsen	Work Order #: 1402673 Date Reported: 07/25/14
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### Notes and Definitions

- QM-06 Due to noted non-homogeneity of the QC sample matrix, the MS/MSD did not provide reliable results for accuracy and precision. Sample results for the QC batch were accepted based on LCS/LCSD percent recoveries and RPD values.
- M3 The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike recovery was acceptable.
- A-01 TCLP extraction temp out of range at 28 C (range: 21-25 C).
- < Less than value listed
- dry Sample results reported on a dry weight basis
- NA Not applicable. The %RPD is not calculated from values less than the reporting limit.
- MDL Method Detection Limit
- RL Reporting Limit
- RPD Relative Percent Difference
- LCS Laboratory Control Spike = Blank Spike (BS) = Laboratory Fortified Blank (LFB)
- MS Matrix Spike = Laboratory Fortified Matrix (LFM)



**Chain of Custody**

4700 West 77th Street  
 Minneapolis, MN 55435-4803  
 (952) 832-2600

1402673

Project Number: 2369 15 10  
 Project Name: DWP Redevelopment  
 Sample Origination State: MN (use two letter postal state abbreviation)  
 COC Number: No 41283

Number of Containers/Preservative		COC <u>1</u> of <u>7</u>
Water	Soil	
VOCs (unpreserved) #1 Dissolved Metals (HNO <sub>3</sub> ) Total Metals (HNO <sub>3</sub> ) General (unpreserved) #1 Biocid: Range Organics (HCl) Nutrients (H <sub>2</sub> SO <sub>4</sub> ) #4 Matrix Spike (Soil) VOCs (tared MeOH) #1 GRO, BTEX (tared MeOH) DRO (tared unpreserved) Metals (unpreserved) Cu, Pb SVOCs (unpreserved) #2 % Solids (plastic vial, unpres.) PAH (EPA 8270C) Matrix Spike		Project Manager: <u>REE</u> Project QC Contact: <u>JET</u> Sampled by: <u>TJB</u> Laboratory: <u>Legend</u>

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix		Type	OC	Total Number Of Containers	Notes
						Water	Soil				
<u>1</u> COMP-D1				<u>6/19/14</u>	<u>11:30 AM</u>	<u>X</u>		<u>X</u>		<u>2</u>	<u>Total Cu (EPA 131-6010B)</u> <u>Total Pb (EPA 131-6010B)</u> <u>Standard TAT</u>
<u>2</u> COMP-D2				<u>6/19/14</u>	<u>09:30</u>					<u>2</u>	
<u>3</u> COMP-03				<u>6/18/14</u>	<u>14:30</u>					<u>2</u>	
<u>4</u> COMP-04				<u>6/18/14</u>	<u>16:30</u>					<u>2</u>	
<u>5</u> COMP-05				<u>6/18/14</u>	<u>11:30</u>					<u>2</u>	
<u>6</u> COMP-06				<u>6/19/14</u>	<u>13:30</u>					<u>2</u>	<u>Matrix Spike</u>
<u>7</u> COMP-07				<u>6/18/14</u>	<u>17:40</u>					<u>2</u>	
<u>8</u> COMP-08				<u>6/18/14</u>	<u>09:15</u>			<u>X</u>		<u>4</u>	<u>+ PAH (8270C)</u> <u>matrix spike</u>
<u>9</u> COMP-09				<u>6/17/14</u>	<u>17:00</u>					<u>2</u>	
<u>10</u> COMP-10				<u>6/17/14</u>	<u>12:20</u>					<u>2</u>	

**Common Parameter/Container - Preservation Key**  
 #1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List  
 #2 - Semivolatile Organics = PAHs, PCB Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs  
 #3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate  
 #4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By: [Signature] On Ice? (N) Date: 6.19.14 Time: 1700  
 Received by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Relinquished By: [Signature] On Ice? (Y) Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Received by: [Signature] Date: 6/20/14 Time: 9:20  
 Samples Shipped VIA:  Air Freight  Federal Express  Sampler  Other: \_\_\_\_\_ Air Bill Number: 1.701 cust

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

**Chain of Custody**  
**BARR**  
 4700 West 77th Street  
 Minneapolis, MN 55435-4803  
 (952) 832-2600

1402673

Project Number: 23691510  
 Project Name: DWP Redevelopment  
 Sample Origination State: MN (use two letter postal state abbreviation)  
 COC Number: NO 41284

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix		Type	Number of Containers/Preservative		COC <u>2</u> of <u>7</u>	Project Manager: <u>REC</u>	Project QC Contact: <u>JET</u>	Sampled by: <u>TTB</u>	Laboratory: <u>Legend</u>	
						Water	Soil		Water	Soil						
1. <u>Comp-11</u>				<u>6/17/14</u>	<u>10:00</u>	X		X			2	Total Cu Total Pb	standard TAT			
2. <u>COMP-12</u>				<u>6/18/14</u>	<u>13:00</u>	X		X			2	TCLP Cu TCLP Pb				
3. <del>DUP-01</del>						X		X			3	Total Cu Total Pb	B			
4. <u>DUP-02</u>						X		X			2					
5. <u>EB-01</u>				<u>6/18/14</u>	<u>17:45</u>	X		X	<u>2</u>		2					
6. <u>EB-02</u>				<u>6/18/14</u>	<u>17:55</u>	X		X	<u>1</u>		1					
7. <u>UH</u>																
9.																
10.																

**Common Parameter/Container - Preservation Key**  
 #1 - Volatile Organics = BTEX, GRQ, TPH, 8260 Full List  
 #2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs  
 #3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate  
 #4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By: [Signature] On Ice?  Date: 6.19.14 Time: 1700  
 Received by: [Signature] Date: 6/20/14 Time: 9:20  
 Samples Shipped VIA:  Air Freight  Federal Express  Sampler  Other: 4.7, Cust, ice  
 Air Bill Number: 4.7, Cust, ice

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

**Chain of Custody**  
 4700 West 77th Street  
**BARR** Minneapolis, MN 55435-4803  
 (952) 832-2600

1402673

Project Number: 23691510  
 Project Name: DWP Redevelopment  
 Sample Origination State MN (use two letter postal state abbreviation)  
 COC Number: **No 41377**

Number of Containers/Preservative		Total Number Of Containers
Water	Soil	
0	0	3 of 7
VOCs (HCl) #1	VOCs (Tared MeOH) #1	Project Manager: REE Project QC Contact: JET Sampled by: TTIS Laboratory: Legend
SVOCs (unpreserved) #2	GRQ, BTEX (Tared MeOH) #1	
Dissolved Metals (HNO <sub>3</sub> )	DRQ (Tared unpreserved)	
Total Metals (HNO <sub>3</sub> )	Metals (unpreserved)	
General (unpreserved) #3	SVOCs (unpreserved) #2	
Diesel Range Organics (HCl)	% Solids (plastic vial, unpres.)	
Nutrients (H <sub>2</sub> SO <sub>4</sub> ) #4		

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix		Type	VOCs (HCl) #1	SVOCs (unpreserved) #2	Dissolved Metals (HNO <sub>3</sub> )	Total Metals (HNO <sub>3</sub> )	General (unpreserved) #3	Diesel Range Organics (HCl)	Nutrients (H <sub>2</sub> SO <sub>4</sub> ) #4	VOCs (Tared MeOH) #1	GRQ, BTEX (Tared MeOH) #1	DRQ (Tared unpreserved)	Metals (unpreserved)	SVOCs (unpreserved) #2	% Solids (plastic vial, unpres.)	Total Number Of Containers	
						Water	Soil																
1. TP-C19-NW				6-19-14	11:00	X	X																Hold
2. TP-B20-NE				6-19-14	10:45																		
3. TP-A21-SE				6-19-14	10:20																		
4. TP-E17-NE				6-19-14	08:20																		
5. TP-F17-NW				6-19-14	08:45																		
6. TP-F18-NW				6-19-14	09:05																		
7. TP-G14-SW				6-18-14	14:15																		
8. TP-G14-NE				6-18-14	13:45																		
9. TP-H15-NW				6-18-14	13:05																		
10. TP-H13-SW				6-18-14	14:55																		

**Common Parameter/Container - Preservation Key**  
 #1 - Volatile Organics = BTEX, GRQ, TPH, 8260 Full List  
 #2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs  
 #3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate  
 #4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By: T. Bayle On Ice?  Date: 6.19.14 Time: 1700  
 Received by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Relinquished By: [Signature] On Ice?  Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Received by: [Signature] Date: 6/20/14 Time: 9:20  
 Samples Shipped VIA:  Air Freight  Federal Express  Sampler Air Bill Number: 8.6°C, cust, iel  
 Other: \_\_\_\_\_

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

**BARR** Chain of Custody  
 4700 West 77th Street  
 Minneapolis, MN 55435-4803  
 (952) 832-2600

1402673

Project Number: 23691510  
 Project Name: DWP Redevelopment  
 Sample Origination State MN (use two letter postal state abbreviation)  
 COC Number: NO 41239

Number of Containers/Preservative		COC <u>4</u> of <u>7</u>
Water	Soil	
VOCs (unpreserved) #1	VOCs (unpreserved) #2	Total Number Of Containers
Dissolved Metals (HNO <sub>3</sub> )		
Total Metals (HNO <sub>3</sub> )		
General (unpreserved) #3		
Diesel Range Organics (HCl)		
Nutrients (H <sub>2</sub> SO <sub>4</sub> ) #4		
VOCs (stared MeOH) #1		
GRQ, BTEX (stared MeOH) #7		
DRQ (stared unpreserved)		
Metals (unpreserved)		
SVOCs (unpreserved) #2		
% Solids (plastic vial, unpres.)		

Project Manager: REE  
 Project QC Contact: JET  
 Sampled by: TTB  
 Laboratory: Legend

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (ht:mm)	Matrix		Type	VOCs (HCl) #1	SVOCs (unpreserved) #2	Dissolved Metals (HNO <sub>3</sub> )	Total Metals (HNO <sub>3</sub> )	General (unpreserved) #3	Diesel Range Organics (HCl)	Nutrients (H <sub>2</sub> SO <sub>4</sub> ) #4	VOCs (stared MeOH) #1	GRQ, BTEX (stared MeOH) #7	DRQ (stared unpreserved)	Metals (unpreserved)	SVOCs (unpreserved) #2	% Solids (plastic vial, unpres.)	Total Number Of Containers		
						Water	Soil																	
1. TP-I13-NE				6-18-14	10:15	X	X																Hold	
2. TP-G16-SE				6-18-14	16:05																			
3. TP-I13-SF				6-18-14	15:25																			
4. TP-I14-SE				6-18-14	11:15																			
5. TP-J14-NW				6-18-14	10:50																			
6. TP-M16-NE				6-19-14	12:20																			
7. TP-M17-NW				6-19-14	12:50																			
8. TP-M17-NE				6-19-14	12:35																			
9. TP-M14-NW				6-18-14	17:00																			
10. TP-M14-SE				6-18-14	17:15																			

Common Parameter/Container - Preservation Key  
 #1 - Volatile Organics = BTEX, GRQ, TPH, 8260 Full List  
 #2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs  
 #3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate  
 #4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By: [Signature] On Ice?  N Date 6.19.14 Time 17:00  
 Relinquished By: [Signature] On Ice?  N Date 6/20/14 Time 9:20  
 Samples Shipped VIA:  Air Freight  Federal Express  Sampler  Other: 8.6°C chest ice  
 Air Bill Number: [Blank]

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

**BARR** Chain of Custody  
 4700 West 77th Street  
 Minneapolis, MN 55435-4803  
 (952) 832-2600

1402673

Project Number: 23691510  
 Project Name: DWP Redevelopment  
 Sample Origination State: MN (use two letter postal state abbreviation)  
 COC Number: No 41240

Number of Containers/Preservative		Total Number Of Containers
Water	Soil	
VOCs (unpreserved) #2	VOCs (unpreserved) #1	COC <u>5</u> of <u>7</u>
Dissolved Metals (HNO <sub>3</sub> )	VOCs (lared MeOH) #1	
Total Metals (HNO <sub>3</sub> )	GRQ, BTEX (lared MeOH) #1	
General (unpreserved) #3	DRQ (lared unpreserved)	
Diesel Range Organics (HCl)	Metals (unpreserved)	
Nutrients (H <sub>2</sub> SO <sub>4</sub> ) #4	SVOCS (unpreserved) #2	
	% Solids (plastic vial, unpres.)	

Project Manager: REE  
 Project QC Contact: JET  
 Sampled by: JTB  
 Laboratory: Legend

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix		Type		Total Number Of Containers
						Water	Soil	Grab	Comp.	
<u>3103</u> 1. TP-M15-SE				<u>6-18-14</u>	<u>17:25</u>					Hold
<u>3015</u> 2. TP-K11-NW				<u>6-18-14</u>	<u>08:25</u>					
<u>3970</u> 3. TP-J11-NW				<u>6-17-14</u>	<u>15:40</u>					
<u>4020</u> 4. TP-J12-NW				<u>6-18-14</u>	<u>09:45</u>					
<u>4110</u> 5. TP-K12-NW				<u>6-18-14</u>	<u>09:10</u>					
<u>4210</u> 6. TP-U10-SE				<u>6-17-14</u>	<u>13:45</u>					
<u>43</u> 7. TP-L9-SE				<u>6-17-14</u>	<u>14:45</u>					
<u>44</u> 8. TP-K9-SE				<u>6-17-14</u>	<u>15:10</u>					
<u>45</u> 9. TP-J10-SE				<u>6-17-14</u>	<u>17:00</u>					
<u>46</u> 10. TP-N9-SE				<u>6-17-14</u>	<u>11:20</u>					

Common Parameter/Container - Preservation Key  
 #1 - Volatile Organics = BTEX, GRQ, TPH, 8260 Full List  
 #2 - Semivolatile Organics = PAHs, PCB, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs  
 #3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate  
 #4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By: [Signature] On Ice?  Date: 6.18.2014 Time: 1700  
 Received by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Relinquished By: [Signature] On Ice?  Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Received by: [Signature] Date: 6/20/14 Time: 9:10

Samples Shipped VIA:  Air Freight  Federal Express  Sampler  Other: \_\_\_\_\_ Air Bill Number: S.V.O.C. cust. inc

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

**Chain of Custody**  
 4700 West 77th Street  
**BARR** Minneapolis, MN 55435-4803  
 (952) 832-2600

1402673

Project Number: 23691510  
 Project Name: DWP Redevelopment  
 Sample Origination State: MN (use two letter postal state abbreviation)  
 COC Number: No 41241

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix		Type		Number of Containers/Preservative		Total Number Of Containers
						Water	Soil	Grab	Comp	QC	Water	
1. TP-09-SW				6-17-14	11:35							COC 6 of 7 Project Manager: REE Project QC Contact: JET Sampled by: TTB Laboratory: Legend
2. TP-010-NW				6-17-14	11:50							
3. TP-07-SE				6-17-14	9:30							
4. TP-N7-SE				6-17-14	10:10							
5. TP-08-NE				6-17-14	9:30							
6. TP-N8-SE				6-17-14	9:10							
7.												
8.												
9.												
10.												

**Common Parameter/Container - Preservation Key**  
 #1 - Volatile Organics = BTEX, GRQ, TPH, 8260 Full List  
 #2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs  
 #3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate  
 #4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By: [Signature] On Ice?  N Date: 6/19/14 Time: 1700  
 Received by: [Signature] Date: 6/20/14 Time: 9:20  
 Relinquished By: [Signature] On Ice?  N Date: [ ] Time: [ ]  
 Received by: [Signature] Date: [ ] Time: [ ]  
 Samples Shipped VIA:  Air Freight  Federal Express  Sampler Air Bill Number: 5-62, west, ice  
 Other: [ ]

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

**BARR** Chain of Custody  
 4700 West 77th Street  
 Minneapolis, MN 55435-4803  
 (952) 832-2600

1402673

Project Number: 23691510  
 Project Name: DWP Redevelopment  
 Sample Origination State: IL (use two letter postal state abbreviation)  
 COC Number: No 41285

Number of Containers/Preservative		COC <u>7</u> of <u>7</u>
Water	Soil	
VOCs (unpreserved) #2		Total Number Of Containers
Dissolved Metals (HNO <sub>3</sub> )		
Total Metals (HNO <sub>3</sub> )		
General (unpreserved) #3		
Diesel Range Organics (HCl)		
Nutrients (H <sub>2</sub> SO <sub>4</sub> ) #4		
VOCs (stared MeOH) #1		
GRX, BTEX (stared MeOH) #7		
DRX (stared unpreserved)		
Metals (unpreserved)		
SVOCs (unpreserved) #2		
% Solids (plastic vial, unpres.)		

Project Manager: REE  
 Project QC Contact: JET  
 Sampled by: TJB  
 Laboratory: Legend

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix		Type		Total Number Of Containers
						Water	Soil	Grab	Comp. QC	
1. SB-MA-NW	0'	2'	ft	6/18/14	12:50	X	X			2
2. SB-MIG-SW	0'	2'	ft	6/18/14	12:20					2
3. SB-J17-NE	0'	2'	ft	6/18/14	11:40					2
4. SB-L19-SW	0'	2'	ft	6/18/14	12:10					2
5. SB-M18-NW	0'	2'	ft	6/18/14	12:30					2
6. SB-K19-NE	0'	2'	ft	6/18/14	12:00					2
7.										
8.										
9.										
10.										

**Common Parameter/Container - Preservation Key**  
 #1 - Volatile Organics = BTEX, GRX, TPH, 8260 Full List  
 #2 - Semivolatile Organics = PAHs, PCB, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs  
 #3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate  
 #4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By: [Signature] On Ice?  N Date: 6.19.14 Time: 1700 Received by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Relinquished By: [Signature] On Ice?  N Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received by: [Signature] Date: 6/20/14 Time: 9:20  
 Samples Shipped VIA:  Air Freight  Federal Express  Sampler Air Bill Number: 1700, must use  
 Other: \_\_\_\_\_

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

**APPENDIX G – DWP Restoration Work Documents  
CITY OF DULUTH**

**RFP# 26-AA14 DWP REDEVELOPMENT SITE**

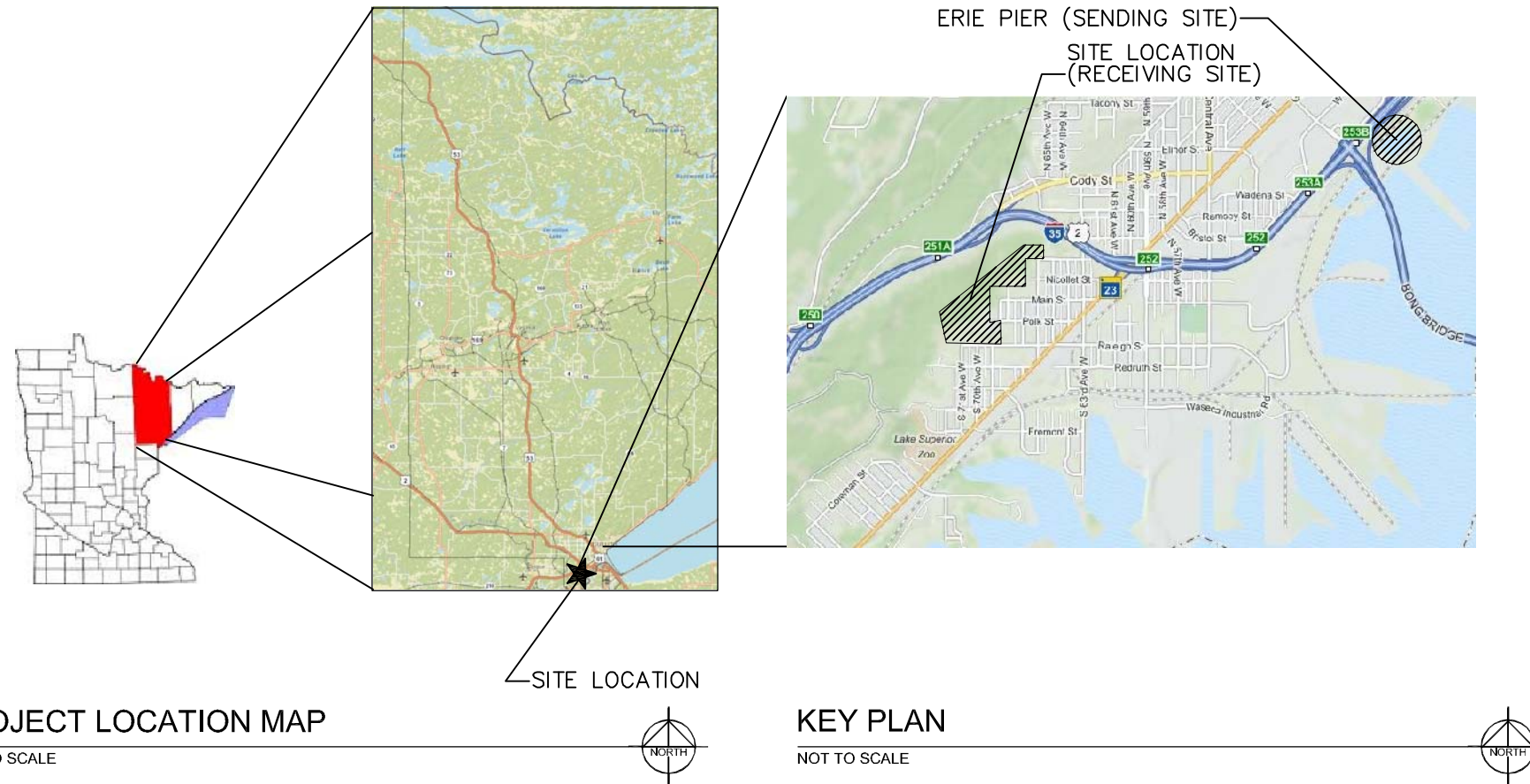
1. DWP Site Restoration Plan Set
2. DWP Earthwork Plan Set
3. DWP Clearing Seeding Planting Plan Set
4. DWP Community Action Duluth Plantings Plan Set

# CITY OF DULUTH

## DEPARTMENT OF PARKS AND RECREATION

### CONSTRUCTION PLANS FOR: DWP RESTORATION

CITY PROJECT NO.



GOVERNING SPECIFICATIONS

THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN. AVAILABLE AT:  
<http://www.dot.state.mn.us/pre-letting/spec/index.html>

THE 2015 EDITION OF THE CITY OF DULUTH PUBLIC WORKS AND UTILITIES DEPARTMENT STANDARD CONSTRUCTION SPECIFICATIONS AND SUPPLEMENTS OR ADDENDUMS SHALL APPLY. \_\_\_\_\_ SHALL BE THE GOVERNING SPECIFICATIONS.

INDEX

SHEET NO.	DESCRIPTION
LA-1.0	TITLE SHEET & INDEX MAP
LA-1.1	RESTORATION SOIL TO CONTAMINATION COMPARISON
LA-1.2	STAGING PLAN
LA-1.3	STAGING PLAN
LA-1.4	STAGING PLAN
LA-1.5	AREAS J & K & SLOPE DETAIL
LA-1.6	MATERIAL HAUL ROUTE
EC-1.1	EROSION CONTROL NOTES
EC-1.2	EROSION CONTROL NOTES AND DETAILS

THIS PLAN CONTAINS 9 SHEETS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

Luke W. Sydow  
LANDSCAPE ARCHITECT (TYPED OR PRINTED NAME)

\_\_\_\_\_  
8/17/15  
LANDSCAPE ARCHITECT DATE REG. NO.

\_\_\_\_\_  
CITY APPROVAL

APPROVED CHIEF ENGINEER OF TRANSPORTATION  
DATE

APPROVED CHIEF ENGINEER OF UTILITIES  
DATE

APPROVED CITY ENGINEER DATE



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ISSUE RECORD/REVISION

PURPOSE	DATE

**DWP SITE RESTORATION**  
 CITY OF DULUTH,  
 MINNESOTA

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

**WARNING:**  
LOCATION OF UNDERGROUND UTILITIES TO BE VERIFIED BY CONTRACTOR. CALL BEFORE DIGGING. GOPHER STATE ONE CALL 1-800-252-1166 REQUIRED BY LAW

Aug 18, 2015, 4:56pm  
P:\1349-DWP\1349DWP\1349DWP\1349DWP.dwg





# DWP SITE RESTORATION

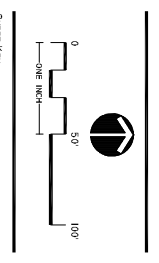
CITY OF DULUTH,  
MINNESOTA



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Issue Record/Revision	Date



SHEET TITLE	STAGING PLAN
DATE	8/17/15
DRAWN BY:	LWS
CHECKED BY:	LWS
PROJECT NUMBER	15240
SHEET NUMBER	LA-1.2



FILL STOCKPILE AREA #3. ENCLOSE WITH SILT FENCE AS FLAGGED ON SITE AND PLACE 1,000 CY OF MATERIAL IN THIS AREA.



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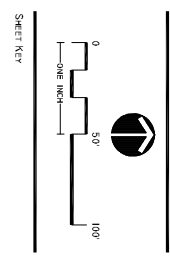
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Issue Record/Revision	Page#	Date

# DWP SITE RESTORATION

CITY OF DULUTH, MINNESOTA



SHEET TITLE  
 STAGING PLAN

DATE: 8/17/15

DRAWN BY: LWS

CHECKED BY: LWS

PROJECT NUMBER: 15240

SHEET NUMBER: LA-1.3



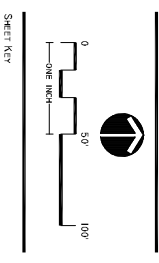
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Issue Record/Revision	Page#	Date

# DWP SITE RESTORATION

CITY OF DULUTH,  
MINNESOTA

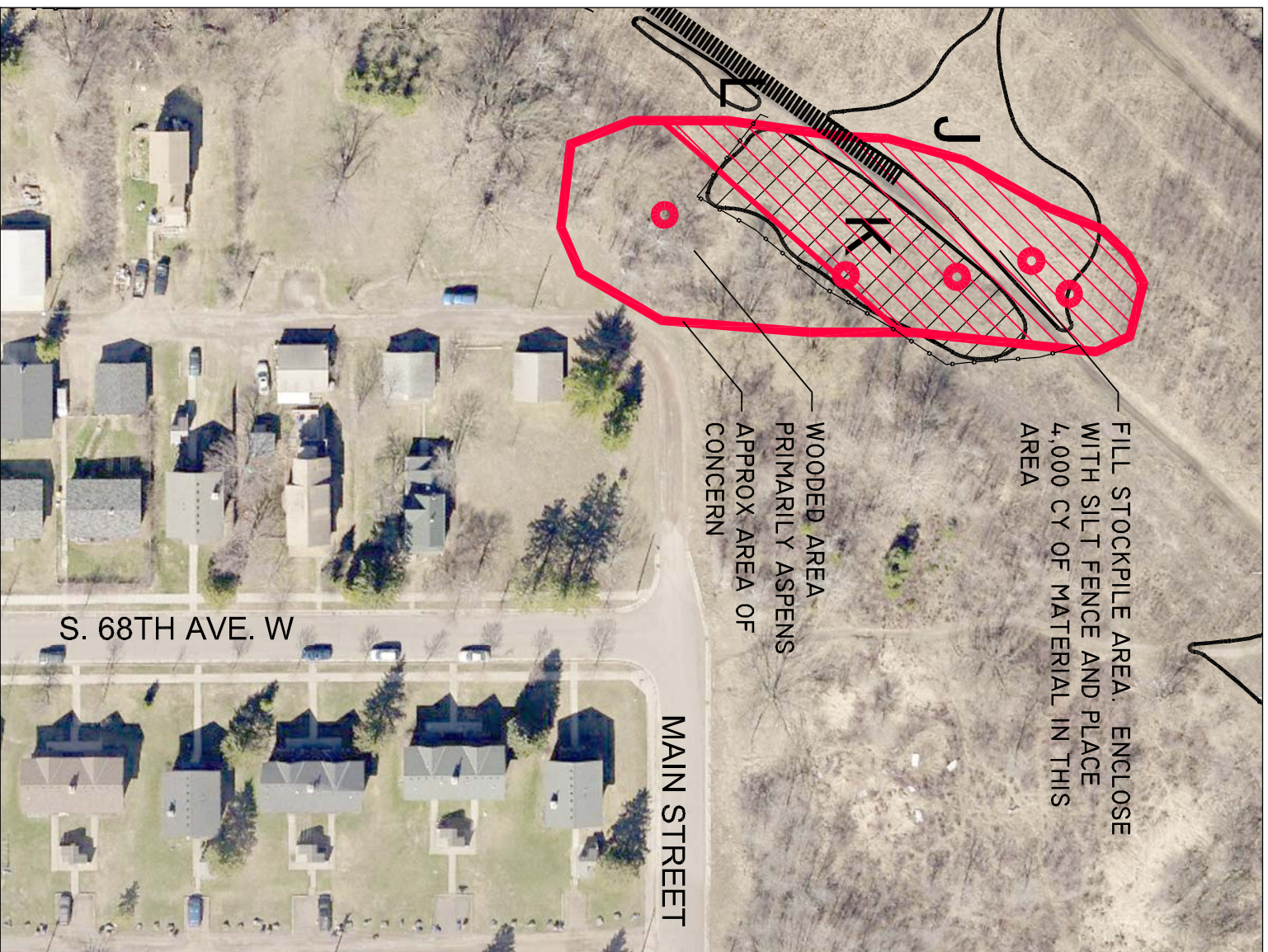


**SHEET TITLE**  
 STAGING PLAN

**DATE:** 8/17/15  
**DRAWN BY:** LWS  
**CHECKED BY:** LWS

**PROJECT NUMBER:** 15240

**SHEET NUMBER:** LA-1.4



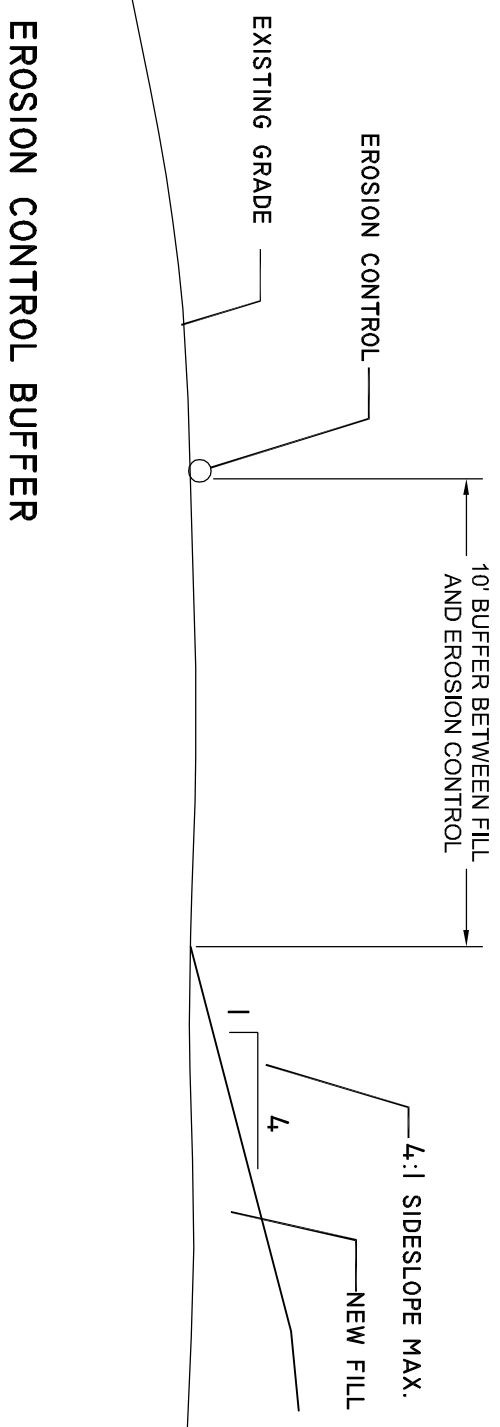
FILL STOCKPILE AREA. ENCLOSE WITH SILT FENCE AND PLACE 4,000 CY OF MATERIAL IN THIS AREA

WOODED AREA - PRIMARILY ASPENS APPROX AREA OF CONCERN

S. 68TH AVE. W

MAIN STREET

**OPTION "A"**  
PLACE UP TO 48" OF SOIL IN NON TREE AREAS  
APPROX. 2400 CY OF SOIL



 **SOIL BORING**  
**LEAD EXCEEDANCE**

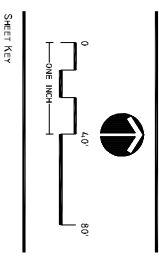


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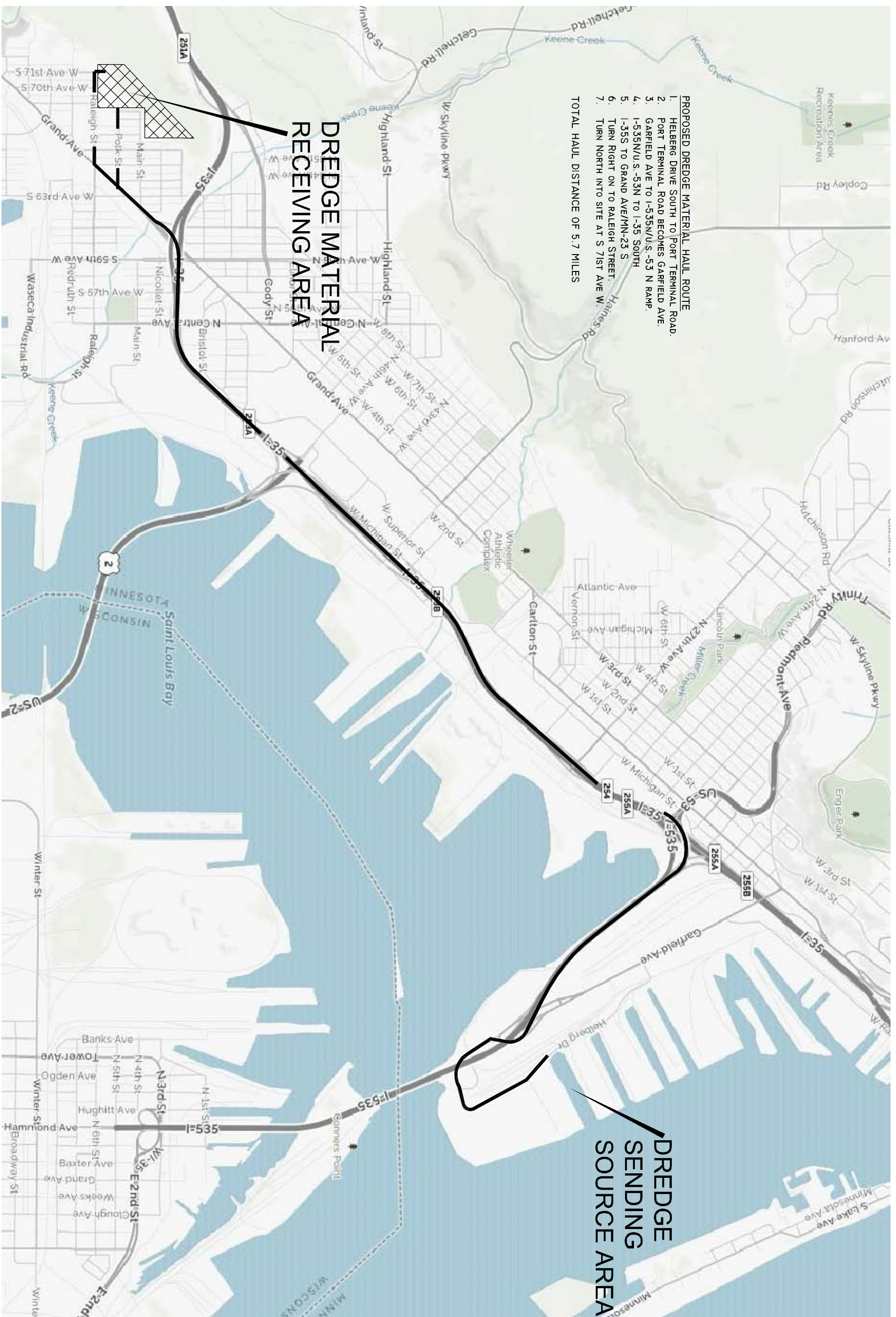
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ISSUE RECORD/REVISION	DATE

**DWP SITE RESTORATION**  
CITY OF DULUTH,  
MINNESOTA



SHEET TITLE	AREAS J & K
DATE	8/17/15
DRAWN BY:	LWS
CHECKED BY:	LWS
PROJECT NUMBER	15240
SHEET NUMBER	LA-1.5



- PROPOSED DREDGE MATERIAL HAUL ROUTE**
1. HELBERG DRIVE SOUTH TO PORT TERMINAL ROAD.
  2. PORT TERMINAL ROAD BECOMES GARFIELD AVE.
  3. GARFIELD AVE TO I-535N/U.S.-53 N RAMP.
  4. I-535N/U.S.-53N TO I-35 SOUTH
  5. I-35S TO GRAND AVE/MN-23 S
  6. TURN RIGHT ON TO RALEIGH STREET.
  7. TURN NORTH INTO SITE AT S 71ST AVE W.
- TOTAL HAUL DISTANCE OF 5.7 MILES

**DREDGE MATERIAL  
 RECEIVING AREA**

**DREDGE  
 SENDING  
 SOURCE AREA**

METHOD #1 (PREFERRED)



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Issue Record/Revision	Date

**DWP SITE  
 RESTORATION**  
 CITY OF DULUTH,  
 MINNESOTA



SHEET KEY	
SHEET TITLE	<b>MATERIAL HAUL ROUTE</b>
DATE	7/8/16
DRAWN BY	MSD
CHECKED BY	LWS
PROJECT NUMBER	15240
SHEET NUMBER	LA-1.6

## SEQUENCE OF CONSTRUCTION

1. CONTRACTOR TO VERIFY THAT ALL PERMITS HAVE BEEN OBTAINED.
2. CONTRACTOR TO SCHEDULE FIELD MEETING WITH OWNER
3. CONTRACTOR TO INSTALL ALL PERIMETER SEDIMENT CONTROL DEVICES, CONSTRUCTION ENTRANCES AND PROTECTIVE FENCING FOR TREES, DITCHES, EXISTING WATER BODIES AND AREAS TO REMAIN UNDISTURBED.
4. CONTRACTOR TO CONSTRUCT STORMWATER AND/OR TEMPORARY SEDIMENTATION BASINS.
5. CONTRACTOR TO CONTACT OWNER FOR APPROVAL OF SEDIMENT CONTROL DEVICES.
6. CONTRACTOR TO ROUGH GRADE SITE AND INSTALL UTILITIES.
7. CONTRACTOR TO INSTALL TEMPORARY EROSION CONTROL DEVICES AS NECESSARY. CONTRACTOR TO FILL TEMPORARY SEDIMENTATION BASINS, COMPACTING TO SPECIFIED DENSITIES. REMOVE ALL UNSUITABLE SEDIMENT PER RECOMMENDATION OF GEOTECHNICAL ENGINEER.
8. CONTRACTOR TO INSTALL SUBBASE AND BASE FOR PAVEMENT.
9. CONTRACTOR TO INSTALL BITUMINOUS SURFACE.
10. CONTRACTOR TO INSTALL EROSION CONTROL BLANKETS WITH PERMANENT SEED MIX.
11. CONTRACTOR TO REMOVE SEDIMENT CONTROL DEVICES WITHIN TWO WEEKS OF WITHIN TWO WEEKS OF FINAL STABILIZATION.
12. SUBMIT NOTICE OF TERMINATION WITHIN 30 DAYS OF FINAL STABILIZATION.

## STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

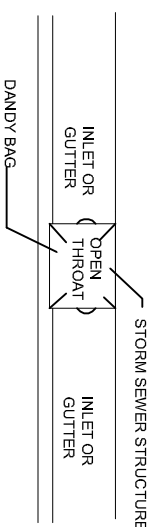
### For Construction Activities

1. BACK-OF-CURB DOWN GRADIENT EROSION CONTROL SHALL BE INSTALLED PRIOR TO BASEMENT/FOUNDATION EXCAVATION. (BACK-OF-CURB DOWN GRADIENT EROSION CONTROL MAY BE REMOVED FOR A TIME PERIOD NO LONGER THAN 48 HOURS FOR BUILDING EXCAVATION AND FOR FINAL GRADE PRIOR TO SOD)
2. ROCK ENTRANCES SHALL BE INSTALLED PRIOR TO BASEMENT/FOUNDATION EXCAVATION
3. ALL STORM DRAIN INLETS THAT RECEIVE DISCHARGE FROM THE LOT UNDER CONSTRUCTION SHALL BE PROTECTED PRIOR TO BASEMENT/FOUNDATION EXCAVATION.
4. PERIMETER EROSION CONTROL SHALL BE INSTALLED PRIOR TO BASEMENT/FOUNDATION EXCAVATION IF ADJACENT LOTS, OPEN AREAS, WETLANDS, OR STORM PONDS ARE AT FINAL STABILIZATION.
5. A TRUCK MOUNTED CONCRETE WASHOUT IS REQUIRED AND SHALL MEET THE PROPER BMP EROSION CONTROL PROVISIONS.
6. STREETS SHALL BE SWEEPED ONCE WEEKLY EXCEPT DURING FROZEN GROUND CONDITIONS.
7. ROCK ENTRANCES SHALL BE INSTALLED FOR OFF STREET ACCESS TO VACANT LOTS FOR PURPOSES OF STORING MATERIALS, SETTING DUMPSTERS OR PARKING.
8. ALL BMPs SHALL BE MAINTAINED UNTIL FINAL STABILIZATION.
9. BMPs MAY NOT BE IN PLACE DUE TO FROZEN GROUND CONDITIONS, BUT SHALL BE INSTALLED AFTER SPRING THAW.

## NOTICE OF TERMINATION

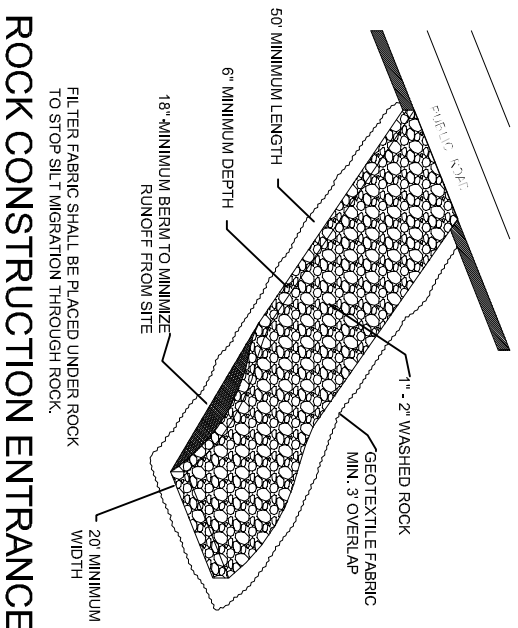
PERMITTEE MUST ENSURE FINAL STABILIZATION OF THE SITE AND SUBMIT THE NOTICE OF FINAL STABILIZATION WITHIN 30 DAYS OF FINAL STABILIZATION.

- FINAL STABILIZATION CAN BE ACHIEVED IN THE FOLLOWING WAY:
1. ALL SOIL DISTURBING ACTIVITIES ARE COMPLETE AND A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 70% OVER THE ENTIRE PERVIOUS SURFACE HAS BEEN ACHIEVED INCLUDING:
    - STABILIZATION OF DITCHES AND SWALES.
    - REMOVAL OF ALL TEMPORARY SYNTHETIC & STRUCTURAL BMPs.
    - REMOVAL OF ALL TEMPORARY SYNTHETIC & STRUCTURAL AND PERMANENT WATER CONVEYANCES



TEMPORARY BARRIER USING DANDY BAGS TO PREVENT SEDIMENT-LADEN WATER FROM ENTERING THE STORM SEWER SYSTEM DURING CONSTRUCTION.

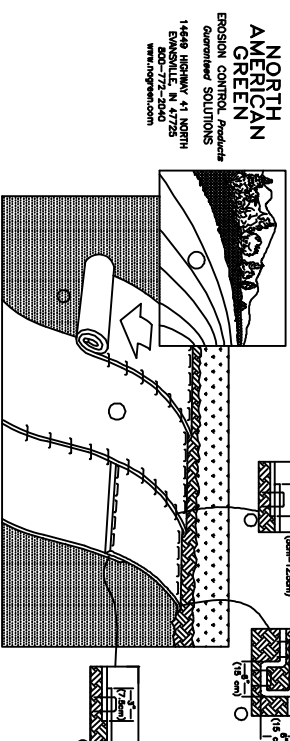
## DANDY BAG PROTECTION



## ROCK CONSTRUCTION ENTRANCE

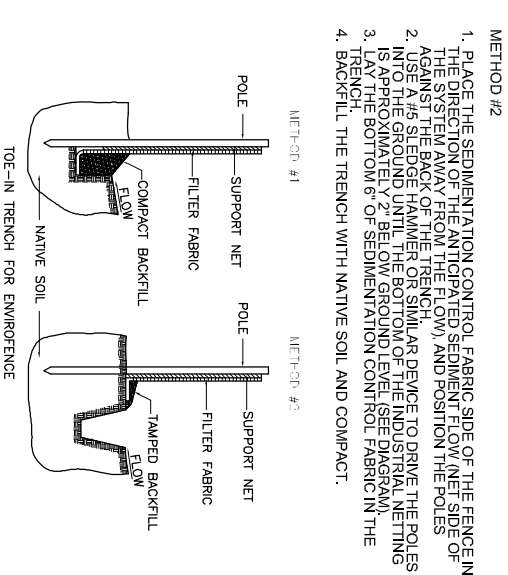
## BIO-ROLL PROTECTION

colt fiber roll install.jpg



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (REC<sup>®</sup>), INCLUDING ANY NECESSARY APPLICATION OF LIMB FERTILIZER AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE REC<sup>®</sup> IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH. THE REC<sup>®</sup> SHALL BE FASTENED TO THE TRENCH WITH A STAPLE. THE REC<sup>®</sup> SHALL BE UNROLLED DOWN THE SLOPE WITH A MINIMUM OF 12" (30 CM) STAPLES/STAPLES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE REC<sup>®</sup>.
3. ROLL THE REC<sup>®</sup> (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. REC<sup>®</sup> WILL UNROLL WITH APPROPRIATE SIDE ANCHORS. ALL REC<sup>®</sup> MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAPLES THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL REC<sup>®</sup> MUST BE STAPLED WITH APPROXIMATELY 2" - 3" (5 CM - 12.5 CM) OVERLAP DEPENDING ON REC<sup>®</sup> TYPE.
5. CONSEQUENT REC<sup>®</sup> SPUN DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 12" (30 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE WIDTH.

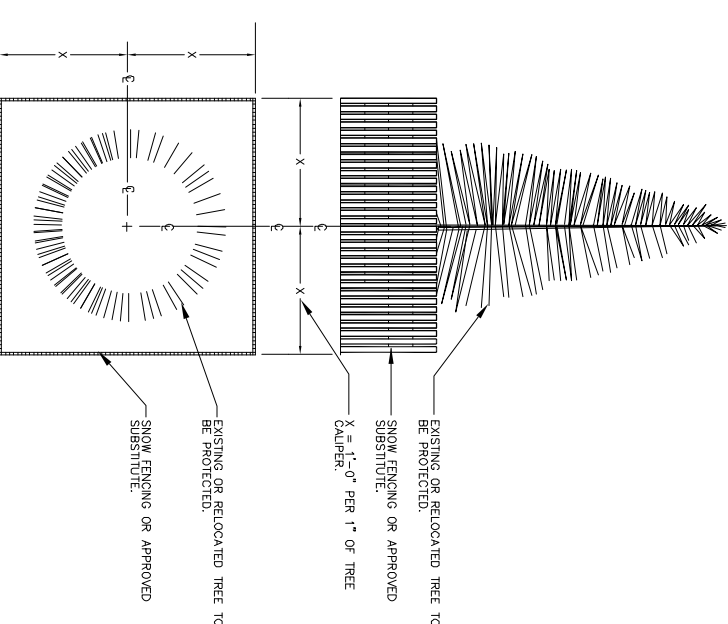
## SLOPE PROTECTION



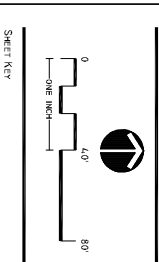
- METHOD #2
1. PLACE THE SEDIMENTATION CONTROL FABRIC SIDE OF THE FENCE IN THE TRENCH. THE FABRIC SHOULD BE SECURED TO THE END OF THE SYSTEM AWAY FROM THE FLOW. AND POSITION THE POLES AGAINST THE BACK OF THE TRENCH.
  2. USE A #5 SLEDGE HAMMER OR SIMILAR DEVICE TO DRIVE THE POLES INTO THE GROUND UNTIL THE BOTTOM OF THE INDUSTRIAL NETTING IS APPROXIMATELY 2" BELOW GROUND LEVEL (SEE DIAGRAM).
  3. TRENCH THE BOTTOM 6" OF SEDIMENTATION CONTROL FABRIC IN THE TRENCH WITH NATIVE SOIL AND COMPACT.

- METHOD #3
1. LAY THE BOTTOM 6" OF SEDIMENTATION CONTROL FABRIC NETTING ON THE NATIVE SOIL. ONE TO TWO FEET BEHIND THE TRENCH.
  2. PLACE BACKFILL ON THE FABRIC AS SHOWN (SEE FIGURE) AND TAMP FIRM WITH FOOT TO PREVENT LEAKAGE UNDER THE ENVIRONMENT UNIT.

## SILT FENCE



## TREE PROTECTION



# DWP SITE RESTORATION

CITY OF DULUTH, MINNESOTA

SHEET TITLE:  
**EROSION CONTROL NOTES AND DETAILS**

DATE: 8/17/15

DRAWN BY: LWS

CHECKED BY: LWS

PROJECT NUMBER: 15240

SHEET NUMBER: EC-1.1



**+ ASSOCIATES**

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ISSUE RECORD/REVISION	DATE



# CITY OF DULUTH

## DEPARTMENT OF PARKS AND RECREATION

### CONSTRUCTION PLANS FOR: DWP RESTORATION - PHASE II

# EARTHWORK PACKAGE

CITY PROJECT NO.

#### GOVERNING SPECIFICATIONS

THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN. AVAILABLE AT:  
<http://www.dot.state.mn.us/pre-letting/spec/index.html>

THE 2015 EDITION OF THE CITY OF DULUTH PUBLIC WORKS AND UTILITIES DEPARTMENT STANDARD CONSTRUCTION SPECIFICATIONS AND SUPPLEMENTS OR ADDENDUMS SHALL APPLY.



LANDSCAPE ARCHITECTURE

**+ ASSOCIATES**

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#### ISSUE RECORD/REVISION

PURPOSE	DATE

#### INDEX

SHEET NO.	DESCRIPTION
C-1	TITLE SHEET & INDEX MAP
EC-1	EROSION CONTROL NOTES AND DETAILS
EC-2	
L-1	OVERALL SITE
L-2	WORK PLAN
L-3	MATERIAL HAUL ROUTE

THIS PLAN CONTAINS 6 SHEETS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

Luke W. Sydow

LANDSCAPE ARCHITECT (TYPED OR PRINTED NAME)

MARCH 30, 2017 25866  
LANDSCAPE ARCHITECT DATE REG. NO.

CITY APPROVAL DATE

APPROVED PARKS AND RECREATION DEPARTMENT

#### SHEET KEY

#### SHEET TITLE

TITLE SHEET & INDEX MAP

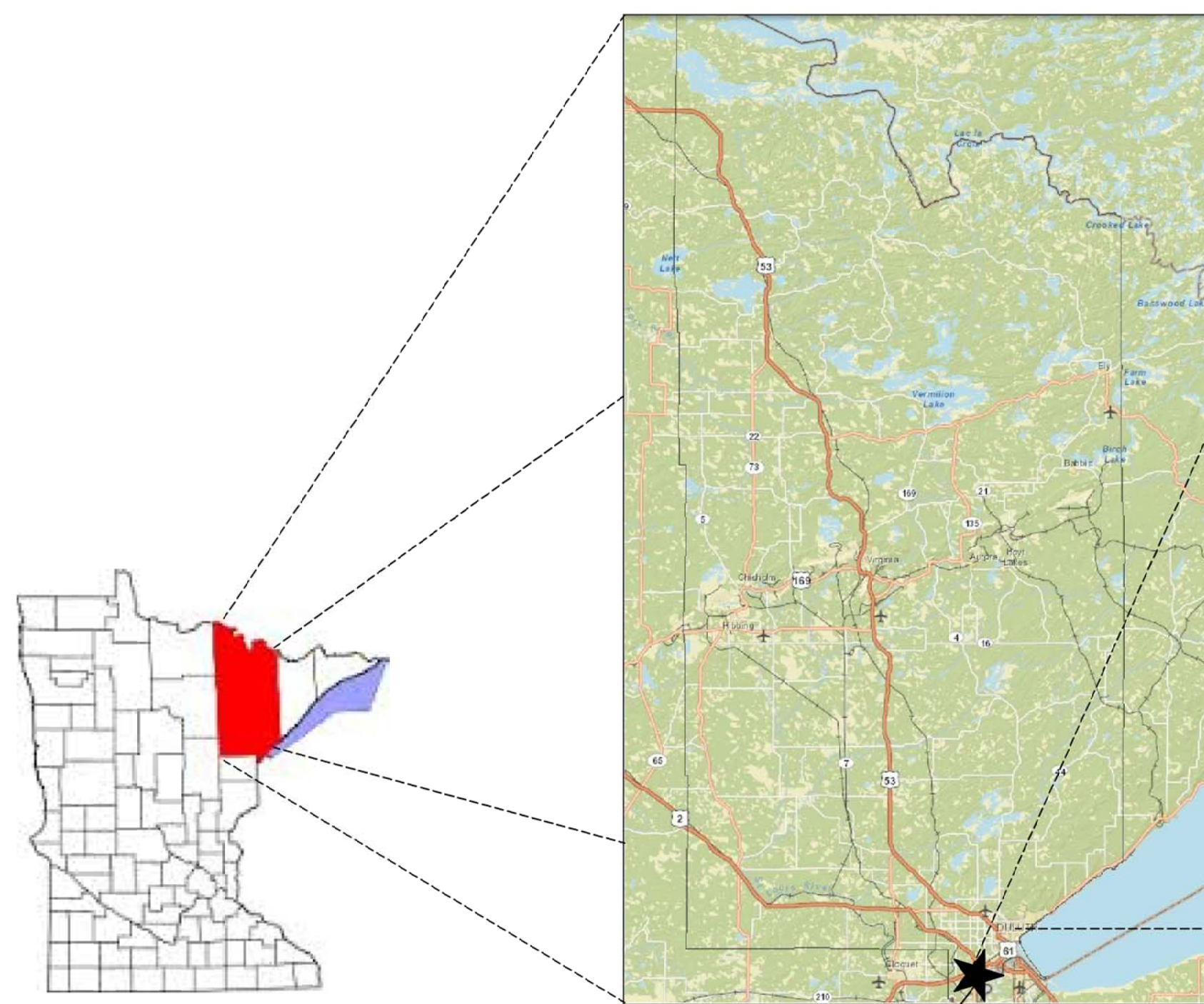
DATE: 3/20/17

DRAWN BY: MSD

CHECKED BY: LWS

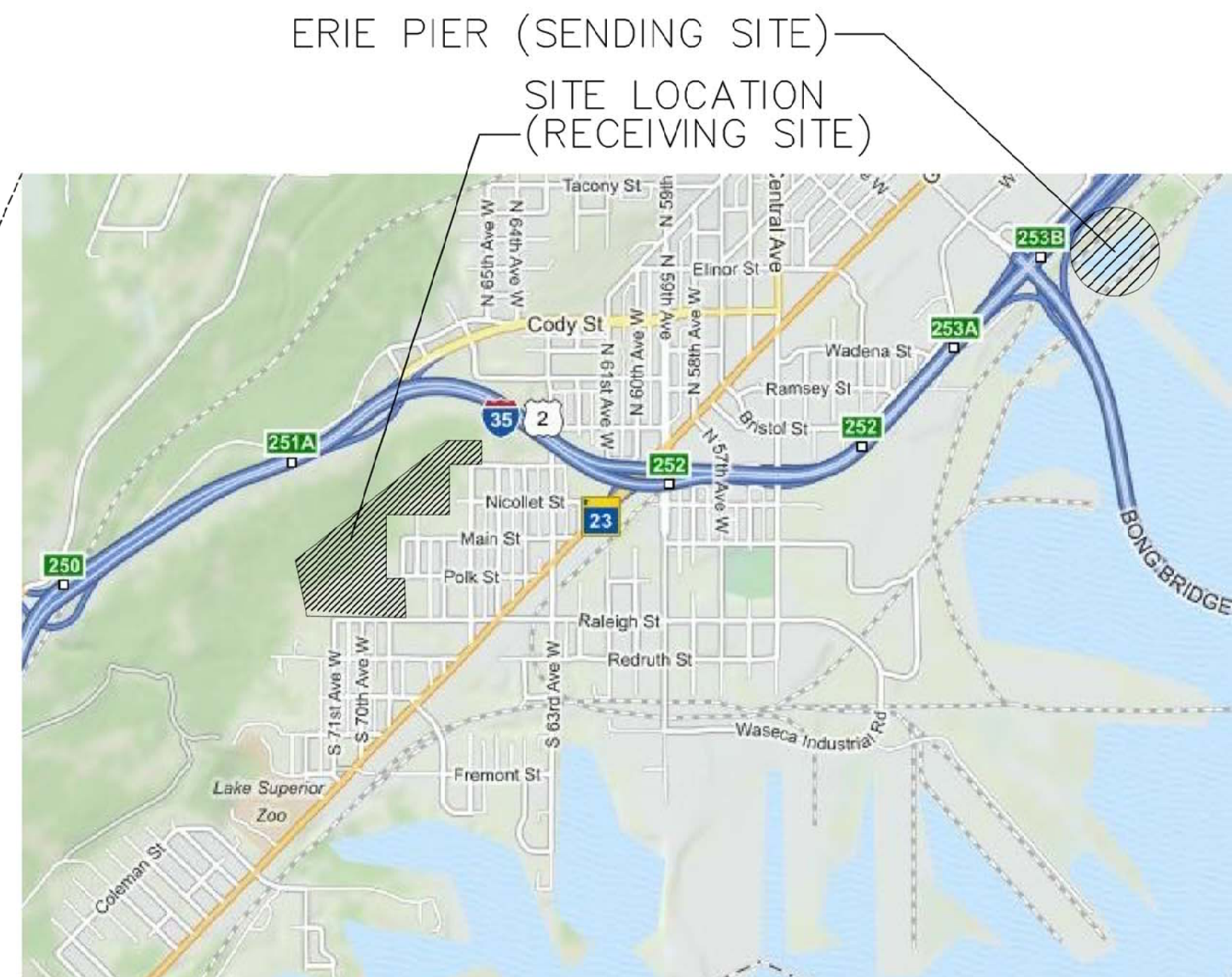
PROJECT NUMBER 15240

SHEET NUMBER C-1



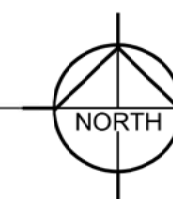
PROJECT LOCATION MAP

NOT TO SCALE



KEY PLAN

NOT TO SCALE



THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

WARNING:  
LOCATION OF UNDERGROUND UTILITIES TO BE VERIFIED BY CONTRACTOR. CALL BEFORE DIGGING. GOPHER STATE ONE CALL 1-800-252-1166 REQUIRED BY LAW

CITY OF DULUTH PROJECT NO. xxxx

DRAWN BY: LWS

SHEET NO. 1 OF 6

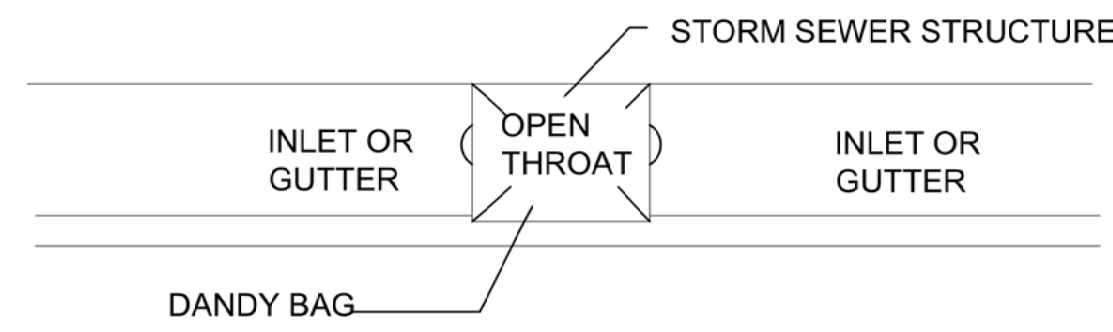
DWP SITE RESTORATION  
PHASE II - EARTHWORK  
CITY OF DULUTH,  
MINNESOTA

## SEQUENCE OF CONSTRUCTION

1. CONTRACTOR TO VERIFY THAT ALL PERMITS HAVE BEEN OBTAINED.
2. CONTRACTOR TO SCHEDULE FIELD MEETING WITH OWNER
3. CONTRACTOR TO INSTALL ALL PERIMETER SEDIMENT CONTROL DEVICES, CONSTRUCTION ENTRANCES AND PROTECTIVE FENCING FOR TREES, DITCHES, EXISTING WATER BODIES AND AREAS TO REMAIN UNDISTURBED.
4. CONTRACTOR TO CONTACT OWNER FOR APPROVAL OF SEDIMENT CONTROL DEVICES.
5. MATERIAL IS TO BE HAULED TO THE SITE BY A CERTIFIED CONTRACTOR. ALL LOADS MUST BE COVERED.
6. CONTRACTOR TO COORDINATE INSTALLATION OF SEED AND MULCH WITH SEEDING CONTRACTOR
7. CONTRACTOR TO REMOVE SEDIMENT CONTROL DEVICES WITHIN ONE WEEK OF FINAL STABILIZATION AND NOTIFICATION BY OWNER OR OWNERS REPRESENTATIVE.
8. SUBMIT NOTICE OF TERMINATION WITHIN 30 DAYS OF FINAL STABILIZATION.

## NOTICE OF TERMINATION

PERMITTEE MUST ENSURE FINAL STABILIZATION OF THE SITE AND SUBMIT THE NOT WITHIN 30 DAYS OF FINAL STABILIZATION.  
FINAL STABILIZATION CAN BE ACHIEVED IN THE FOLLOWING WAY:  
1. ALL SOIL DISTURBING ACTIVITIES ARE COMPLETE AND A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 70% OVER THE ENTIRE PVIOUS SURFACE HAS BEEN ACHIEVED INCLUDING:  
-STABILIZATION OF DITCHES AND SWALES.  
-REMOVAL OF ALL TEMPORARY SYNTHETIC & STRUCTURAL BMP'S.  
-REMOVAL OF SEDIMENTS FROM STORM WATER CONVEYANCES AND PERMANENT WATER QUALITY BASINS.

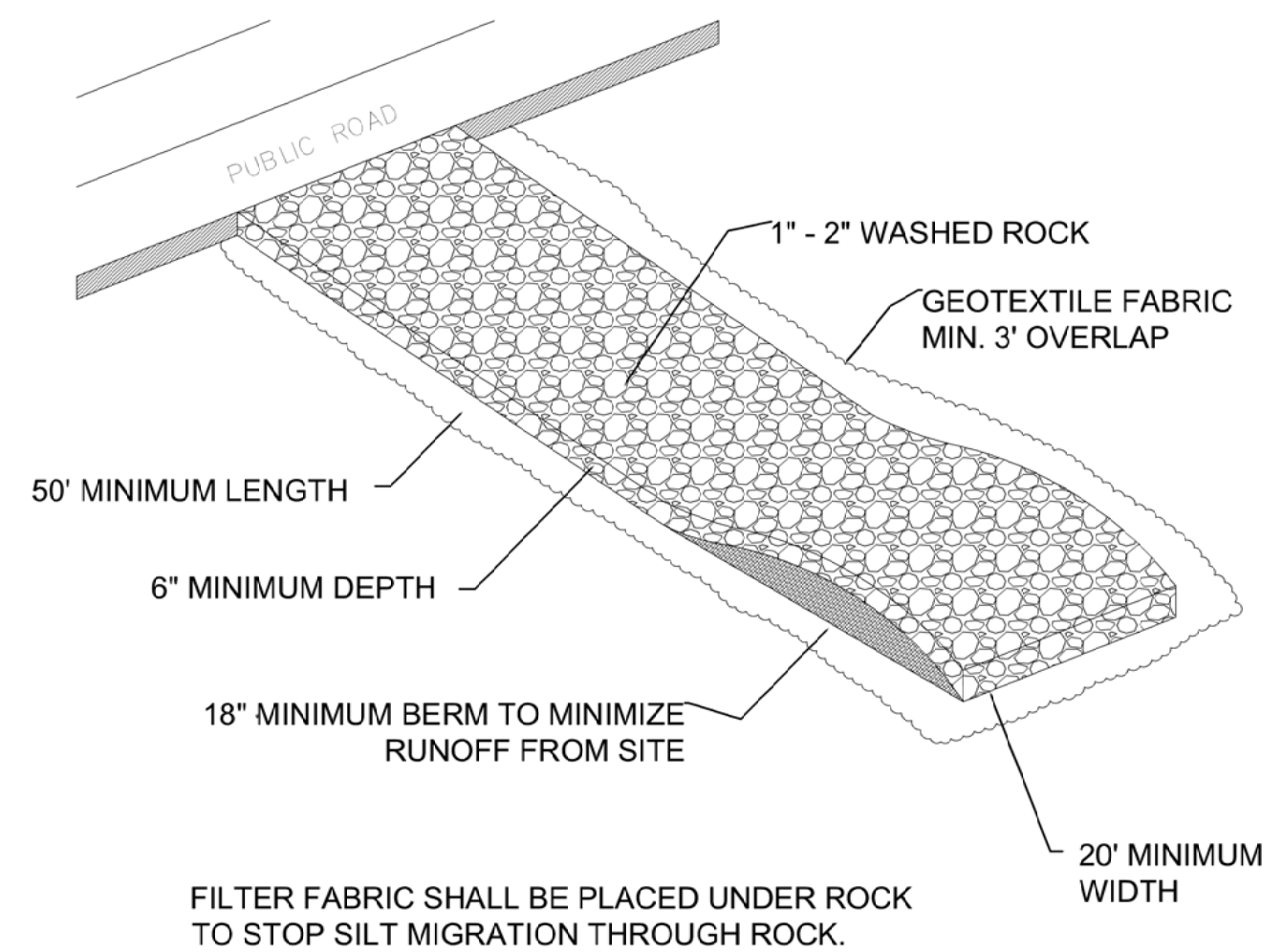


TEMPORARY BARRIER USING DANDY BAGS TO PREVENT SEDIMENT-LADEN WATER FROM ENTERING THE STORM SEWER SYSTEM DURING CONSTRUCTION.

## DANDY BAG PROTECTION

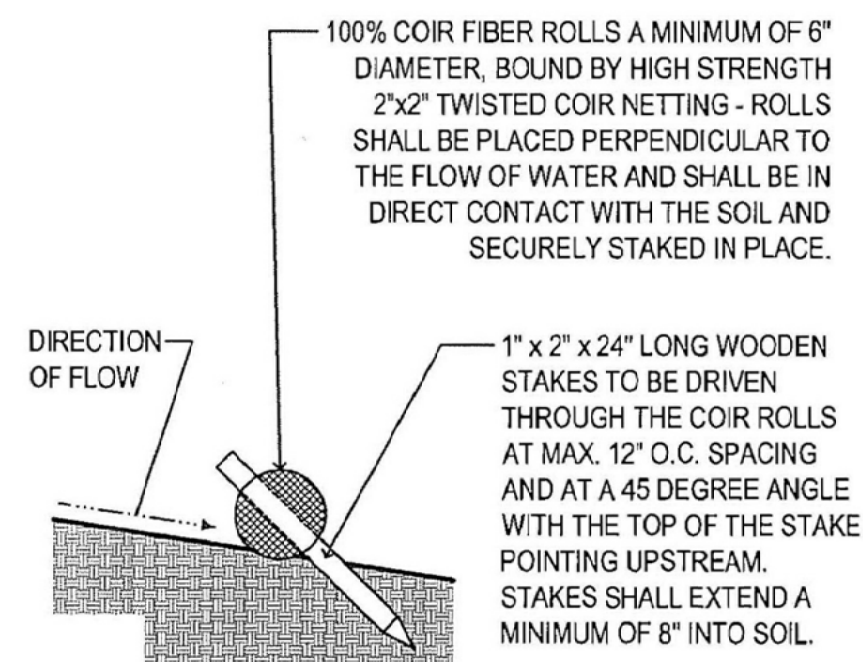
## STORM WATER POLLUTION PREVENTION PLAN (SWPPP) FOR CONSTRUCTION ACTIVITIES

1. BACK-OF-CURB DOWN GRADIENT EROSION CONTROL SHALL BE INSTALLED PRIOR TO ANY OTHER SITE WORK.
  2. ROCK ENTRANCES SHALL BE INSTALLED PRIOR TO ANY FILL BEING PLACED ON SITE, OR OTHER SITE DISTURBANCE.
  3. ALL STORM DRAIN INLETS THAT RECEIVE DISCHARGE FROM THE PROJECT SITE SHALL BE PROTECTED PRIOR TO COMMENCING WORK.
- PERIMETER EROSION CONTROL SHALL BE INSTALLED PRIOR TO FILL BEING PLACED ON SITE.
4. STREETS SHALL BE SWEEPED ONCE WEEKLY, EXCEPT DURING FROZEN GROUND CONDITIONS.
  5. ROCK ENTRANCES SHALL BE INSTALLED FOR OFF STREET ACCESS TO VACANT LOTS FOR PURPOSES OF STORING MATERIALS, SETTING DUMPSTERS OR PARKING.
  6. ALL BMP'S SHALL BE MAINTAINED UNTIL FINAL STABILIZATION.
  7. BMP'S MAY NOT BE IN PLACE DUE TO FROZEN GROUND CONDITIONS, BUT SHALL BE INSTALLED AFTER SPRING THAW.

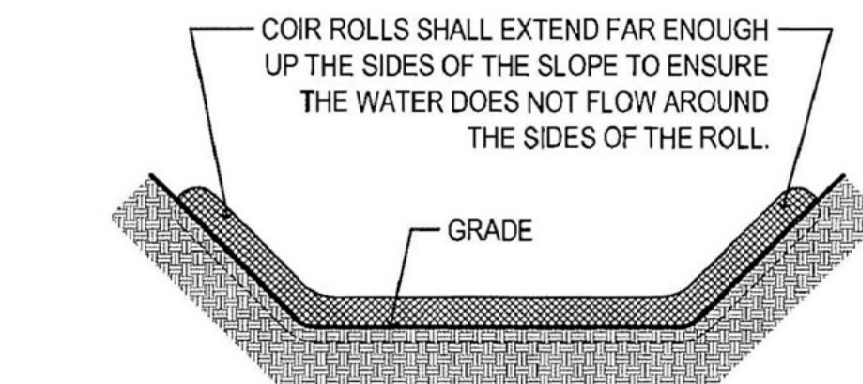


## ROCK CONSTRUCTION ENTRANCE

### METHOD #1 (PREFERRED)



### CROSS-SECTION DETAIL

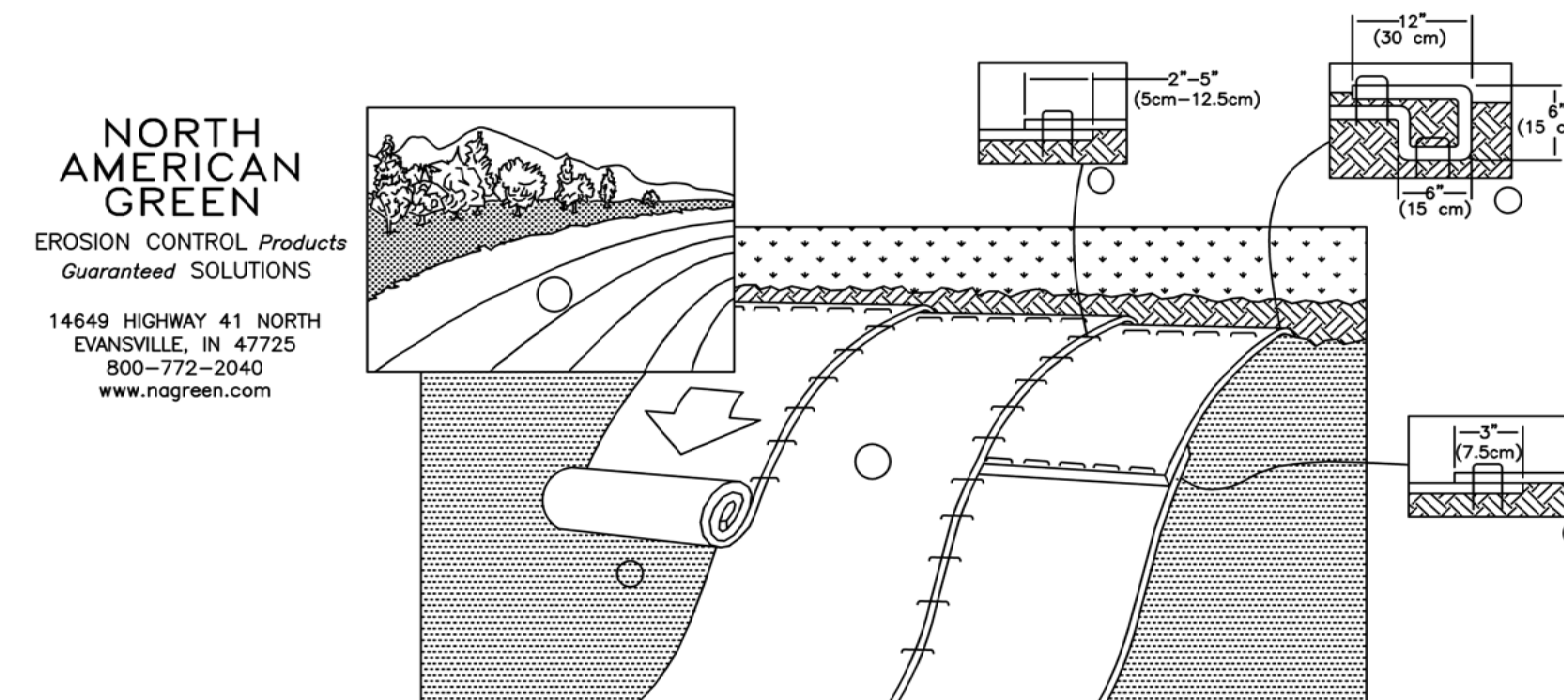


### SECTION VIEW

SILT FENCING IF INSTALLED, MUST BE PROMPTLY ONCE FINAL STABILIZATION HAS BEEN ACHIEVED AND AFTER NOTIFICATION FROM THE OWNER OR THEIR REPRESENTATIVE.

## BIO-ROLL PROTECTION

### SLOPE INSTALLATION



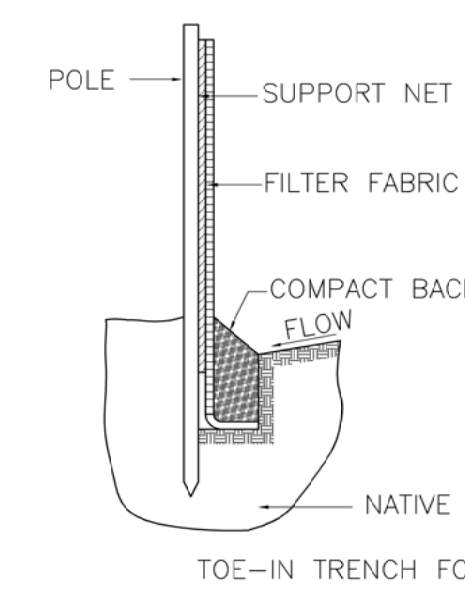
1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.  
NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP'S IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP'S EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP'S WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP'S BACK OVER SEED AND COMPACTED SOIL. SECURE RECP'S OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP'S.
3. ROLL THE RECP'S (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. RECP'S WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP'S MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM\*, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP'S MUST BE STAPLED WITH APPROXIMATELY 2" - 5" (5 CM - 12.5 CM) OVERLAP DEPENDING ON RECP'S TYPE.
5. CONSECUTIVE RECP'S SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP'S WIDTH.  
NOTE:  
\*IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP'S.

## SLOPE PROTECTION

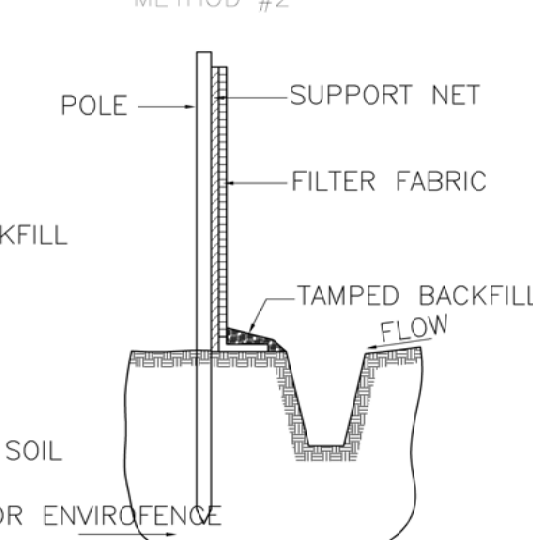
### METHOD #2

1. PLACE THE SEDIMENTATION CONTROL FABRIC SIDE OF THE FENCE IN THE DIRECTION OF THE ANTICIPATED SEDIMENT FLOW (NET SIDE OF THE SYSTEM AWAY FROM THE FLOW), AND POSITION THE POLES AGAINST THE BACK OF THE TRENCH.
2. USE A #5 SLEDGE HAMMER OR SIMILAR DEVICE TO DRIVE THE POLES INTO THE GROUND UNTIL THE BOTTOM OF THE INDUSTRIAL NETTING IS APPROXIMATELY 2" BELOW GROUND LEVEL (SEE DIAGRAM).
3. LAY THE BOTTOM 6" OF SEDIMENTATION CONTROL FABRIC IN THE TRENCH.
4. BACKFILL THE TRENCH WITH NATIVE SOIL AND COMPACT.

### METHOD #1



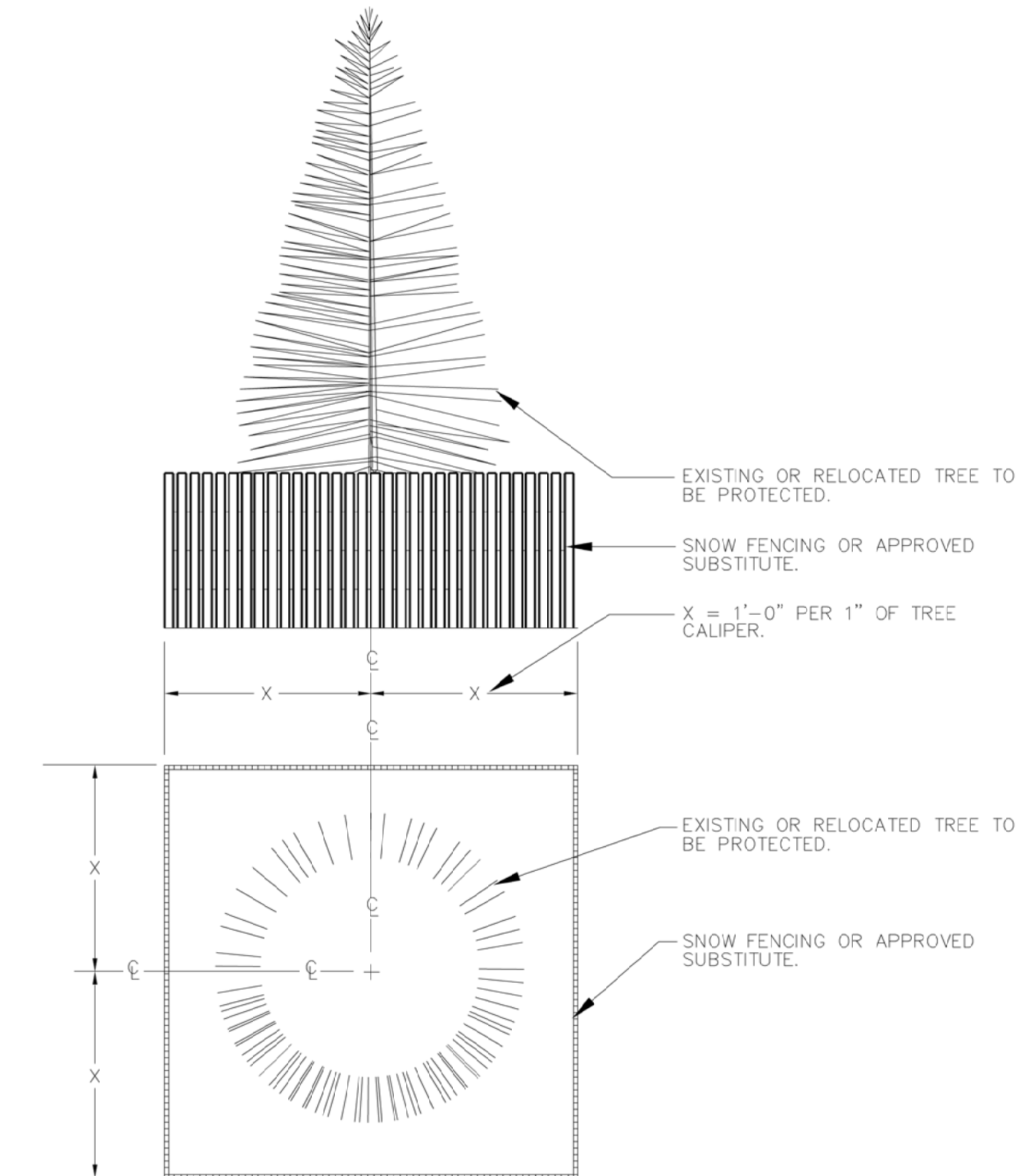
### METHOD #2



### METHOD #3

1. LAY THE BOTTOM 6" OF SEDIMENTATION CONTROL FABRIC NETTING ON THE NATIVE SOIL, ONE TO TWO FEET BEHIND THE TRENCH.
2. PLACE BACKFILL ON THE FABRIC AS SHOWN (SEE FIGURE), AND TAMP FIRM WITH FOOT TO PREVENT LEAKAGE UNDER THE ENVIROFENCE UNIT.

## SILT FENCE



## TREE PROTECTION



LANDSCAPE ARCHITECTURE

+ ASSOCIATES

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ISSUE RECORD/REVISION

PURPOSE	DATE

# DWP SITE RESTORATION PHASE II - EARTHWORK

CITY OF DULUTH, MINNESOTA

SHEET KEY

**DRAFT**  
**NOT FOR CONSTRUCTION**

SHEET TITLE

EROSION CONTROL NOTES AND DETAILS

DATE: 3/20/17

DRAWN BY: MSD

CHECKED BY: LWS

PROJECT NUMBER: 15240

SHEET NUMBER: EC-1

# RESPONSIBILITIES

THE PROPERTY OWNER OR CONTRACTOR MUST SUBMIT A COMPLETED NPDES APPLICATION FORM WITH THE \$REQUIRED APPLICATION FEE.

THE OWNER AND OPERATOR (USUALLY THE GENERAL CONTRACTOR) ARE JOINTLY RESPONSIBLE FOR ALL TERMS AND CONDITIONS OF THE PERMIT.

PROPERTY OWNER TO SUBMIT NPDES NOTICE OF INTENT PERMIT 7 DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

CONTRACTOR TO SUBMIT NPDES NOTICE OF TERMINATION TO OWNER WITHIN ONE WEEK OF FINAL RESTORATION ACCEPTANCE. OWNER WILLSEND INTO MPCA.

CONTRACTOR TO MONITOR AND REPORT ON STORM WATER MANAGEMENT REQUIREMENTS PER MPCA.

FOR STORM WATER DISCHARGES FROM CONSTRUCTION PROJECTS WHERE THE OWNER OR OPERATOR CHANGES, THE NEW OWNER OR OPERATOR MUST SUBMIT A SUBDIVISION REGISTRATION WITHIN SEVEN (7) DAYS OF ANY OF THE FOLLOWING:

1. ASSUMING OPERATIONAL CONTROL OF THE SITE.
2. COMMENCING WORK ON THEIR PORTION OF THE SITE.
3. LEGAL TRANSFER, SALE OR CLOSING ON THE PROPERTY.

THE CONTRACTOR MUST IDENTIFY A PERSON KNOWLEDGEABLE AND EXPERIENCED IN THE APPLICATION OF EROSION PREVENTION AND SEDIMENT CONTROL BMP'S WHO WILL:

1. OVERSEE THE IMPLEMENTATION OF THE SWPPP
2. OVERSEE THE INSTALLATION, INSPECTION AND MAINTENANCE OF EROSION PREVENTION AND SEDIMENT CONTROL BMP'S BEFORE AND DURING CONSTRUCTION.

THE OWNER MUST IDENTIFY WHO WILL HAVE THE LONG TERM RESPONSIBILITY FOR LONG TERM OPERATION AND MAINTENANCE OF THE PERMANENT STORM WATER MANAGEMENT SYSTEM AND DEVELOP A CHAIN OF RESPONSIBILITY WITH ALL OPERATORS ON THE SITE TO ENSURE THAT THE SWPPP WILL BE IMPLEMENTED AND STAY IN EFFECT UNTIL FINAL STABILIZATION AND SUBMITTAL OF THE NOTICE OF TERMINATION.

# REQUIREMENTS

THE SWPPP MUST INCLUDE:

1. LOCATION AND TYPE OF ALL TEMPORARY AND PERMANENT EROSION PREVENTION AND SEDIMENT CONTROL BMP'S, INCLUDING PROCEDURES USED TO ESTABLISH ADDITIONAL TEMPORARY BMP'S AS NECESSARY FOR THE SITE CONDITIONS DURING CONSTRUCTION.
2. A SITE MAP WITH EXISTING AND FINAL GRADES.
3. DRAINAGE DIVIDING LINES AND DIRECTION OF FLOWS FOR PRE AND POST-CONSTRUCTION STORM WATER RUNOFF DRAINAGE AREAS.
4. IMPERVIOUS AREAS AND SOIL TYPES.
5. LOCATION OF AREAS NOT TO BE DISTURBED.
6. LOCATION OF AREAS WHERE CONSTRUCTION WILL BE PHASED TO MINIMIZE DURATION OF EXPOSED SOIL AREAS.
7. ALL SURFACE WATERS AND EXISTING WETLANDS.
8. METHODS TO BE USED FOR FINAL STABILIZATION OF ALL EXPOSED SOIL AREAS.

THE PERMITTEE MUST AMEND THE SWPPP AS NECESSARY TO INCLUDE ADDITIONAL REQUIREMENTS, SUCH AS ADDITIONAL OR MODIFIED BMP'S, DESIGNED TO CORRECT PROBLEMS IDENTIFIED OR ADDRESS SITUATIONS WHENEVER:

1. THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION OR MAINTENANCE.
2. WEATHER OR SEASONAL CONDITIONS THAT HAVE SIGNIFICANT EFFECT ON DISCHARGE.
3. INSPECTION OR INVESTIGATION BY SITE OPERATORS, LOCAL, STATE, OR FEDERAL OFFICIALS INDICATE THE SWPPP IS NOT EFFECTIVE.
4. THE SWPPP IS NOT ACHIEVING THE GENERAL OBJECTIVES OF CONTROLLING POLLUTANTS OR THE SWPPP IS NOT CONSISTENT WITH THE TERMS AND CONDITIONS OF THIS PERMIT.
5. THE MPCA DETERMINES THAT DISCHARGE MAY CAUSE OR CONTRIBUTE TO NON-ATTAINMENT OF ANY APPLICABLE WATER QUALITY STANDARDS OR THE SWPPP DOES NOT INCORPORATE THE REQUIREMENTS RELATED TO AN APPROVED TOTAL MAXIMUM DAILY LOAD (TMDL): THE RUNOFF FROM THE SITE DISCHARGES TO AN IMPAIRED WATER WHICH HAS AN APPROVED TMDL AND HAS NOT BEEN PROPERLY DETAILED IN THE SWPPP.

STORM WATER PONDS, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT ON-SITE WILL BE CONSTRUCTED AS A FIRST STEP IN GRADING, AND WILL BE MADE FUNCTIONAL BEFORE LAND DISTURBANCE TAKES PLACE UPSLOPE. EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS MUST BE SEEDED AND MULCHED WITHIN 48 HOURS OF INSTALLATION.

ALL EROSION CONTROL MEASURES AND PROTECTIVE FENCING MUST BE INSTALLED PRIOR TO BEGINNING OF ANY GRADING.

RESPIREAD TOPSOIL AND ESTABLISH TURF ON ALL FINAL GRADED AREAS WITHIN 72 HOURS AFTER COMPLETION OF FINAL GRADING GENERAL AREA SEED MIX:MNDOT SPEC. 3876.2 MIXTURE 35-241. MULCH: MNDOT TYPE 3 DISC ANCHORED, 2 TONS PER ACRE FERTILIZER: COMMERCIAL 10/10/10 (PHOSPHATE LIMITED TO NO MORE THAN 400 LBS/AC)

MAINTAIN ALL EROSION CONTROL ITEMS, REMOVE ACCUMULATED SEDIMENTS, CLEAN UP MUD TRACKED FROM THE SITE ON TO ADJACENT STREETS, AND CONTROL DUST (PER MNDOT SPEC 2130 AS NECESSARY TO ELIMINATE SIGNIFICANT DUST PER REQUIREMENTS OF ENGINEER, OWNER, AND/OR CITY, UNTIL SUCH TIME AS THE ENGINEER HAS ACCEPTED THE WORK.

TEMPORARY STOCKPILES MAY BE LEFT ON THE SITE FOR USE IN BACKFILL REPLENISHMENT. STOCKPILES MUST HAVE SILT FENCE OR OTHER EFFECTIVE BMP'S TO CONTROL RUNOFF. STOCKPILES CANNOT BE PLACED IN SURFACE WATER CONVEYANCE DEVICES (CURB AND GUTTER, SWALES OR DITCHES). TOPSOIL WILL BE RESPIREAD PROGRESSIVELY AS THE GRADING WORK CONTINUES. IF STOCKPILES ARE TO REMAIN FOR MORE THAN 60 DAYS, TEMPORARY SEEDING MUST BE PLACED.

THE PERMITTEE MUST IMPLEMENT THE SWPPP AND INSTALL BMP'S IDENTIFIED IN THE SWPPP IN AN APPROPRIATE AND FUNCTIONAL MANNER.

THE LOCATION OF AREAS NOT TO BE DISTURBED MUST BE DELINEATED ON THE SITE BEFORE DEVELOPMENT BEGINS.

ALL EXPOSED AREAS WITH A CONTINUOUS POSITIVE SLOPE WITHIN 200 FEET OF A SURFACE WATER MUST HAVE TEMPORARY EROSION PROTECTION OR PERMANENT COVER FOR THE EXPOSED SOIL AREA, YEAR ROUND, WITH THE FOLLOWING MAXIMUM TIMES AND AREA CAN REMAIN OPEN WHEN THE AREA IS NOT ACTIVELY BEING WORKED:

1. SLOPES STEEPER THAN 3:1 (7 DAYS).
2. SLOPES OF 10:1 TO 3:1 (14 DAYS).
3. SLOPES OF 10:1 OR FLATTER (21 DAYS).

THE NORMAL WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT DRAINAGE DITCH THAT DRAINS WATER FROM A CONSTRUCTION SITE OR DIVERTS WATER AROUND A SITE, MUST BE STABILIZED WITHIN 200 FEET FROM THE PROPERTY EDGE, OR FROM THE POINT OF DISCHARGE TO ANY SURFACE WATER WITHIN 24 HOURS OF CONNECTING TO A SURFACE WATER.

THE OWNER WILL INSPECT SILT FENCE PRIOR TO ANY LAND ALTERATION. ALL SILT FENCE SHALL BE CONSTRUCTED WITH WOOD OR STEEL POSTS (SEE DETAIL).

ALL EROSION CONTROL MEASURES MUST BE INSTALLED AND MAINTAINED ACCORDING TO THE DETAILS INCLUDED IN THE CONSTRUCTION DOCUMENTS. ALL SILT MUST BE REMOVED FROM SILT FENCE WHEN IT REACHES A HEIGHT EQUAL TO ONE-THIRD OF THE HEIGHT OF THE SILT FENCE. THE CONTRACTOR MUST PERFORM ANY CORRECTIVE MEASURES ORDERED BY THE OWNER, LOCAL GOVERNMENT UNIT, OR MPCA WITHIN 24 HOURS OF SUCH NOTICE. THE CONTRACTOR SHALL ALSO PLACE ANY ADDITIONAL EROSION CONTROL MEASURES DEEMED NECESSARY BY THE OWNER OR MPCA WITHIN 24 HOURS OF NOTICE. ALL MEASURES MUST BE REPLACED OR REPAIRED WITH THE APPROVAL OF OWNER, AND MPCA, WHEN THEY BECOME NONFUNCTIONAL.

ORANGE POLY SNOW FENCING MUST BE PLACED AROUND ALL NATURAL FEATURES THAT ARE TO BE PRESERVED. THIS INCLUDES ALL TREES, WETLANDS, SLOPES, ETC. IN LOCATIONS WHERE PLACEMENT OF PROTECTION FENCING COINCIDES WITH THE PLACEMENT OF SILT FENCE, THE TOP PORTION OF THE SILT FENCE MAY BE PAINTED ORANGE AND CAUTION RIBBON MAY BE INSTALLED IN ACCORDANCE WITH THE DETAIL PROVIDED IN THE CONSTRUCTION SPECIFICATION. RIBBON MUST BE MAINTAINED AT ALL TIMES IF THIS ALTERNATIVE IS TO BE USED.

CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING EXISTING PAVED SURFACES CLEAN OF SEDIMENT BY STREET SWEEPING ROADWAYS WHEN A SIGNIFICANT ACCUMULATION OF SEDIMENT OCCURS ON THESE SURFACES. ANY SEDIMENT TRACKED OFF-SITE IS TO BE REMOVED WITHIN 24 HOURS. SWEEPING MUST ALSO OCCUR WHEN DIRECTED BY THE CITY.

THE CONTRACTOR IS TO PLACE A THREE FOOT WIDE STRIP OF SOD BEHIND THE CURB FOLLOWING BACKFILLING TO PREVENT EROSION IN THIS AREA.

CONTRACTOR TO PROVIDE DANDY BAG PROTECTION AT ALL CATCH BASIN INLETS (SEE DETAIL).

EROSION CONTROL BLANKET SHALL BE INSTALLED ON ALL SLOPES 3:1 OR STEEPER.

TEMPORARY AND PERMANENT SEDIMENTATION BASINS MUST BE DRAINED AND SEDIMENT REMOVED ONCE THE SEDIMENT COLLECTED REACHES ONE-THIRD THE STORAGE VOLUME WITHIN 72 HOURS, AS FIELD CONDITIONS ALLOW.

ALL SEDIMENT DEPOSITS WITHIN SURFACE WATERS MUST BE REMOVED AND RESTABILIZED WITHIN 7 DAYS OF DISCOVERY. THIS INCLUDES DELTAS AND STORM SEWER SEDIMENT DEPOSITS.

INFILTRATION/FILTRATION SYSTEMS SHOULD NOT BE EXCAVATED TO FINAL GRADE UNTIL THE CONTRIBUTING DRAINAGE AREA HAS BEEN FULLY STABILIZED.

DURING EXCAVATION, SEDIMENT AND EROSION CONTROL DEVICES SHOULD BE UTILIZED TO PREVENT SEDIMENTATION AND THE AREA MUST BE STAKED OFF AND MARKED SO THAT HEAVY CONSTRUCTION EQUIPMENT WILL NOT COMPACT THE SOIL.

ON-SITE TESTING MUST BE CONDUCTED TO VERIFY THAT A MINIMUM OF 3 FEET OF SEPARATION FROM BEDROCK OR SATURATED SOIL IS ACHIEVED.

ALL INFILTRATION AREAS MUST BE INSPECTED TO ENSURE THAT NO SEDIMENT FROM ONGOING CONSTRUCTION IS REACHING THE INFILTRATION AREA.

SEDIMENT CONTROL DEVICES MUST BE USED TO MINIMIZE SEDIMENT ENTERING SURFACE WATER, INCLUDING CURB AND GUTTER AND STORM SEWER INLETS.

IF THE DOWN GRADIENT TREATMENT SYSTEM IS OVER LOADED, THE SWPPP MUST BE AMENDED.

PERMIT REQUIRES THAT THERE BE NO UNBROKEN SLOPE LENGTH GREATER THAN 75' FOR SLOPES WITH A GRADE OF 3:1 OR STEEPER.

ALL DOWN GRADIENT PERIMETER SEDIMENT CONTROLS SHOULD BE IN PLACE BEFORE ANY UP GRADIENT DISTURBANCE BEGINS, AND MAINTAINED UNTIL FINAL STABILIZATION.

TIMING AND INSTALLATION OF SEDIMENT CONTROL DEVICES CAN BE ADJUSTED TO ACCOMMODATE SHORT TERM ACTIVITIES SUCH AS CLEARING AND GRUBBING.

ALL STORM DRAIN INLETS MUST BE PROTECTED WITH BMP'S

ROCK CONSTRUCTION ENTRANCES OR EQUIVALENT SYSTEM MUST BE USED TO MINIMIZE TRACKING FROM SITE.

DEWATERING ACTIVITIES THAT MAY HAVE SEDIMENT-LADEN DISCHARGE MUST DISCHARGE INTO A TEMPORARY OR PERMANENT SEDIMENTATION BASIN WHEN POSSIBLE. OTHERWISE IT MUST BE DISCHARGED THROUGH SOME FORM OF BMP.

ALL OUTFLOWS FROM BMP'S MUST HAVE APPROVED ENERGY DISSIPATION SUCH AS RIP RAP.

THE CONTRACTOR SHALL COMPLETELY REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES UPON ESTABLISHMENT OF FINAL MEASURES AND SITE STABILIZATION. CONTRACTOR SHALL OVER EXCAVATE TEMPORARY SEDIMENT POND BOTTOM IF POOR SUBSOILS BECOME SATURATED AND REPLACE WITH COMPACTED FILL MATERIAL PER REQUIREMENTS OF GEOTECHNICAL REPORT.

# INSPECTION AND RECORD RETENTION

THE SWPPP, ALL CHANGES TO IT, AND INSPECTIONS AND MAINTENANCE RECORDS MUST BE KEPT AT THE SITE DURING CONSTRUCTION BY THE PERMITTEE WHO HAS OPERATIONAL CONTROL OF THE PORTION OF THE SITE. ALL OWNERS MUST KEEP THE SWPPP ON FILE FOR THREE YEARS AFTER THE SUBMITTAL OF THE NOTICE OF TERMINATION, INCLUDING THE FOLLOWING INFORMATION:

1. ANY OTHER PERMITS REQUIRED FOR THE PROJECT.
2. RECORDS OF ALL INSPECTION AND MAINTENANCE CONDUCTED DURING CONSTRUCTION.
3. ALL PERMANENT OPERATION AND MAINTENANCE AGREEMENTS THAT HAVE BEEN IMPLEMENTED, INCLUDING ALL RIGHT OF WAY, CONTRACTS, COVENANTS, AND OTHER BINDING REQUIREMENTS REGARDING PERPETUAL MAINTENANCE.
4. ALL REQUIRED CALCULATIONS FOR DESIGN OF THE TEMPORARY AND PERMANENT STORM WATER MANAGEMENT SYSTEMS.

THE PERMITTEE MUST ROUTINELY INSPECT THE SITE ONCE EVERY 7 DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS.

ALL INSPECTIONS AND MAINTENANCE CONDUCTED DURING CONSTRUCTION MUST BE RECORDED IN WRITING AND RETAINED WITH THE SWPPP.

IN AREAS OF PROJECT WHERE FINAL STABILIZATION IS COMPLETE, INSPECTIONS CAN BE REDUCED TO ONCE A MONTH.

INSPECTIONS CAN BE SUSPENDED DUE TO FROZEN GROUND CONDITIONS UNTIL FIRST RUNOFF OCCURS OR CONSTRUCTION ACTIVITIES RESUME.



LANDSCAPE ARCHITECTURE

+ ASSOCIATES

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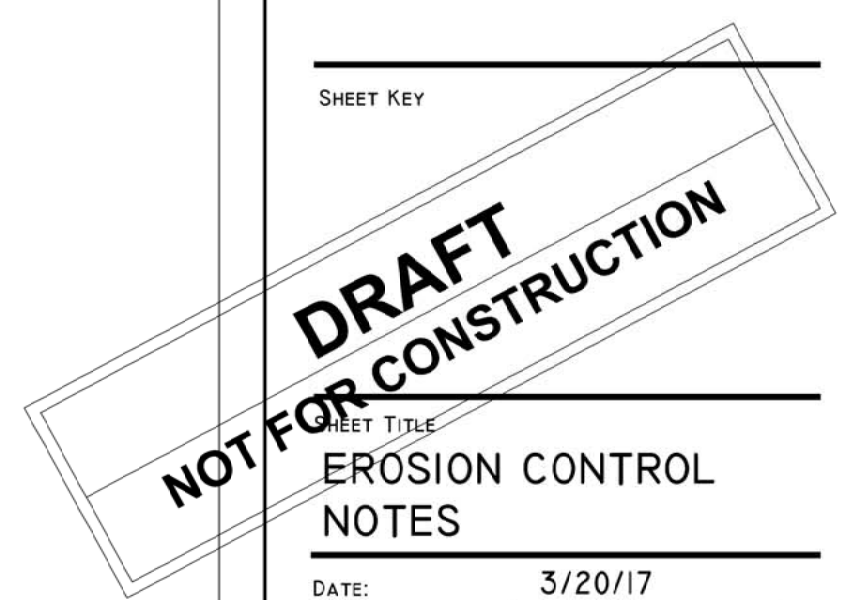
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PURPOSE	DATE

DWP SITE RESTORATION PHASE II - EARTHWORK

CITY OF DULUTH, MINNESOTA



SHEET KEY

SHEET TITLE  
**EROSION CONTROL NOTES**

DATE: 3/20/17

DRAWN BY: MSD

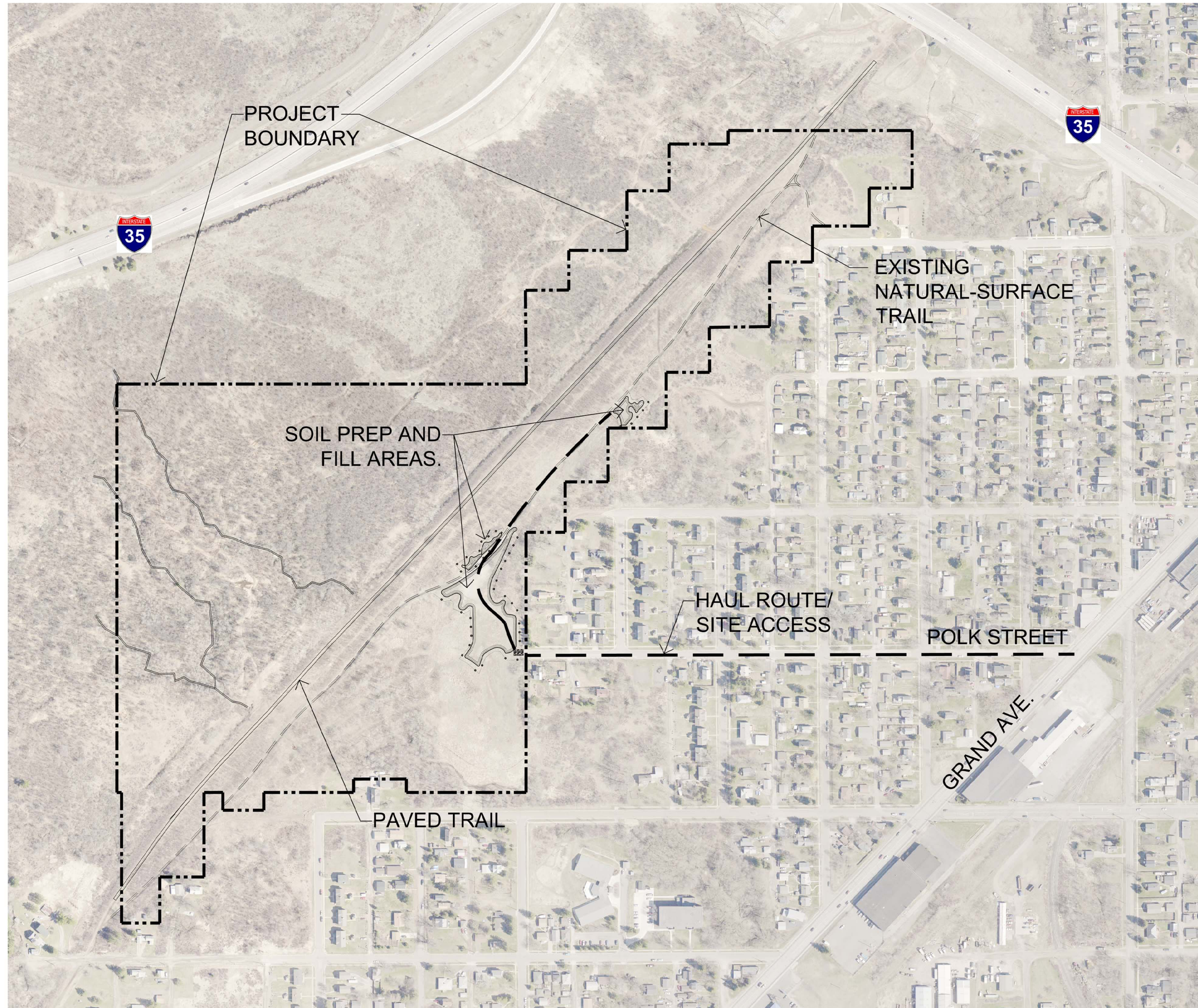
CHECKED BY: LWS

PROJECT NUMBER  
15240

SHEET NUMBER  
EC-2

NOTE:

- 1) CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE CITY OF DULUTH, MPCA, SWPPP, AND THIS PLAN SET AND SPECIFICATIONS.
- 2) CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES AND TOPOGRAPHIC FEATURES. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER OR OWNER'S REPRESENTATIVE, AND THE LANDSCAPE ARCHITECT OF ANY DISCREPANCIES OR VARIATIONS FROM PLANS.
- 3) CONTRACTOR SHALL PROVIDE TO THE OWNER A SCHEDULE OF ANTICIPATED PROJECT DATES INCLUDING:  
 PROJECT START  
 EROSION CONTROL INSTALLATION  
 SOIL RIPPING  
 HAULING OF FILL START & END  
 FINAL GRADE ESTABLISHMENT  
 SOIL STABILIZATION COMPLETION  
 PROJECT COMPLETION
- 6) CONTRACTOR SHALL NOTIFY OWNER 72 HOURS IN ADVANCE OF CONSTRUCTION START.
- 7) CONTRACTOR SHALL CONTACT GOPHER STATE ONE CALL CENTER AT 811 FOR UTILITY LOCATIONS 72 HOURS PRIOR TO COMMENCING WORK
- 8) ALL EROSION CONTROL MEASURES MUST BE INSTALLED PRIOR TO COMMENCEMENT OF FILLING OPERATIONS AND MAINTAINED UNTIL ALL AREAS ALTERED ON THE SITE HAVE BEEN RESTORED. ONCE DISTURBED AREAS HAVE BEEN STABILIZED, INSPECTED AND ACCEPTED IN WRITING BY THE OWNER OR OWNER'S REPRESENTATIVE, ALL MEASURES OF EROSION CONTROL MUST BE PROMPTLY REMOVED FROM THE SITE FOLLOWING NOTIFICATION OF OWNER OR THEIR REPRESENTATIVE. NO SILT FENCING, CHECK DAMS, ETC., MAY BE LEFT ON SITE.
- 9) NO FILL MATERIAL SHALL BE PLACED WITHIN WETLANDS OR DRAINAGE WAYS.
- 10) FILL AREAS WILL BE FLAGGED IN THE FIELD BY SAS+ASSOCIATES PRIOR TO BIDDING.
- 11) EARTHWORK CONTRACTOR TO NOTIFY OWNER AND SAS+ASSOCIATES 72 HOURS PRIOR TO INTENDED TRUCKING DATE.



**1** OVERALL SITE PLAN  
 SCALE: 1"=200'



LANDSCAPE ARCHITECTURE

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ISSUE RECORD/REVISION

PURPOSE	DATE

**DWP SITE RESTORATION  
 PHASE II - EARTHWORK**

CITY OF DULUTH,  
 MINNESOTA

SHEET KEY

SHEET TITLE

OVERALL SITE

DATE: 3/20/17

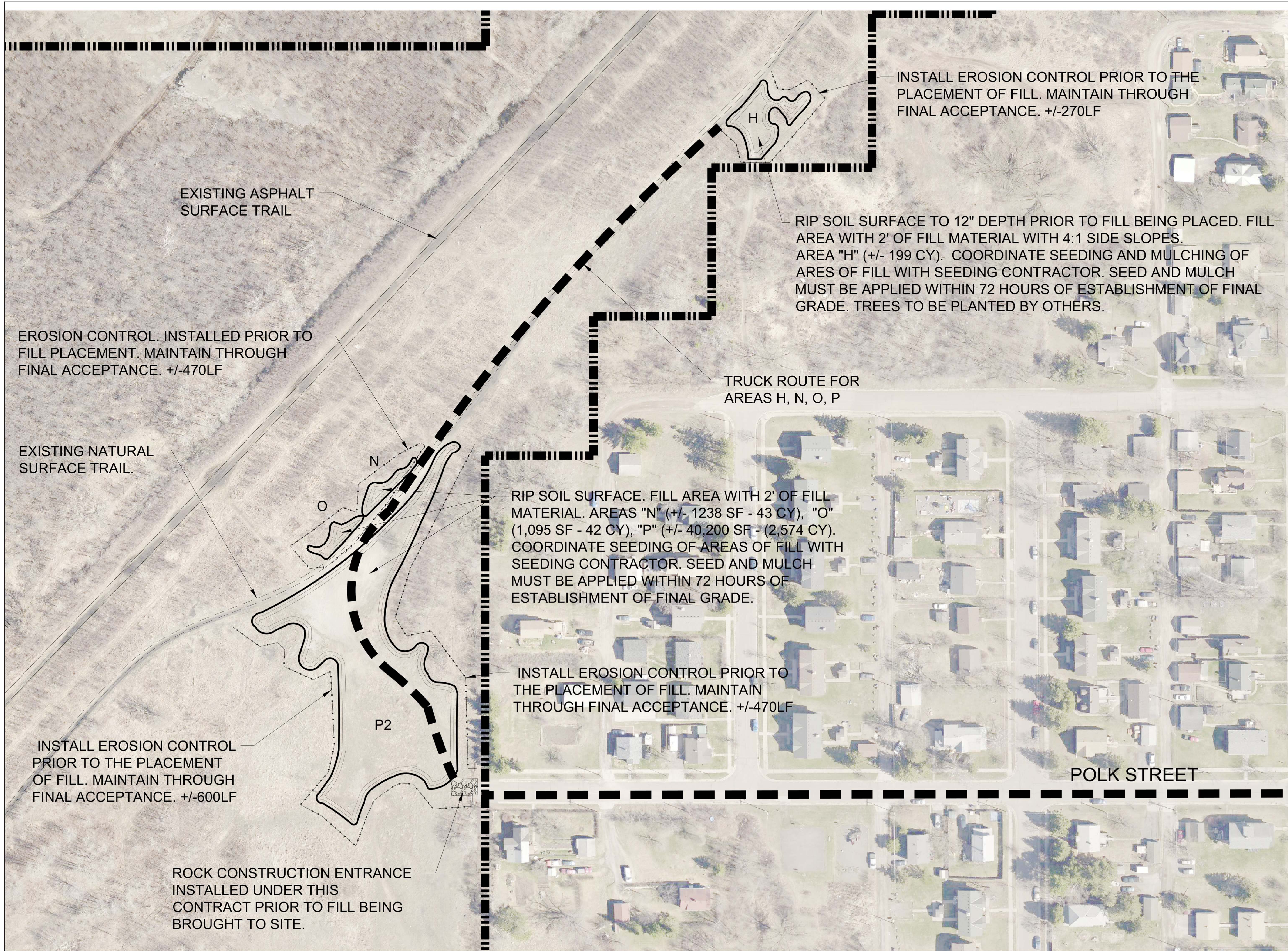
DRAWN BY: MSD

CHECKED BY: LWS

PROJECT NUMBER: 15240

SHEET NUMBER

L-1



INSTALL EROSION CONTROL PRIOR TO THE PLACEMENT OF FILL. MAINTAIN THROUGH FINAL ACCEPTANCE. +/-270LF

RIP SOIL SURFACE TO 12" DEPTH PRIOR TO FILL BEING PLACED. FILL AREA WITH 2' OF FILL MATERIAL WITH 4:1 SIDE SLOPES. AREA "H" (+/- 199 CY). COORDINATE SEEDING AND MULCHING OF AREAS OF FILL WITH SEEDING CONTRACTOR. SEED AND MULCH MUST BE APPLIED WITHIN 72 HOURS OF ESTABLISHMENT OF FINAL GRADE. TREES TO BE PLANTED BY OTHERS.

TRUCK ROUTE FOR AREAS H, N, O, P

RIP SOIL SURFACE. FILL AREA WITH 2' OF FILL MATERIAL. AREAS "N" (+/- 1238 SF - 43 CY), "O" (1,095 SF - 42 CY), "P" (+/- 40,200 SF - (2,574 CY)). COORDINATE SEEDING OF AREAS OF FILL WITH SEEDING CONTRACTOR. SEED AND MULCH MUST BE APPLIED WITHIN 72 HOURS OF ESTABLISHMENT OF FINAL GRADE.

INSTALL EROSION CONTROL PRIOR TO THE PLACEMENT OF FILL. MAINTAIN THROUGH FINAL ACCEPTANCE. +/-470LF

INSTALL EROSION CONTROL PRIOR TO THE PLACEMENT OF FILL. MAINTAIN THROUGH FINAL ACCEPTANCE. +/-600LF

ROCK CONSTRUCTION ENTRANCE INSTALLED UNDER THIS CONTRACT PRIOR TO FILL BEING BROUGHT TO SITE.

EROSION CONTROL. INSTALLED PRIOR TO FILL PLACEMENT. MAINTAIN THROUGH FINAL ACCEPTANCE. +/-470LF

EXISTING ASPHALT SURFACE TRAIL

EXISTING NATURAL SURFACE TRAIL.

POLK STREET



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ISSUE RECORD/REVISION	
PURPOSE	DATE

**DWP SITE RESTORATION  
PHASE II - EARTHWORK**

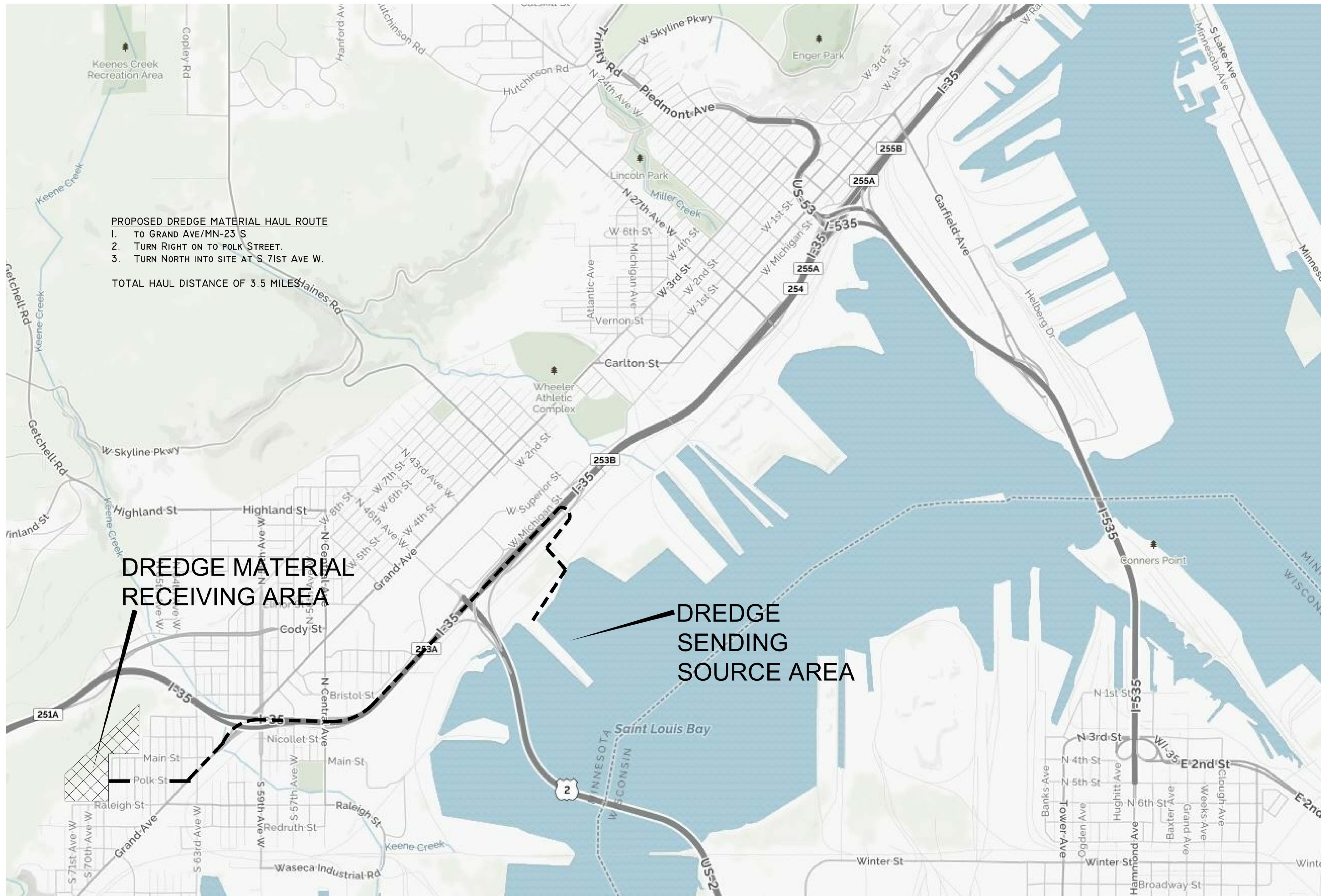
CITY OF DULUTH,  
MINNESOTA

SHEET KEY

SHEET TITLE  
**PLAN - SOUTH SIDE**

DATE: 3/20/17  
DRAWN BY: MSD  
CHECKED BY: LWS  
PROJECT NUMBER: 15240  
SHEET NUMBER: L-2

M:\2017\_1718\15240 - DWP Site Phase 2 Documents\2017 DWP PHASE II EARTHWORK.dwg



**PROPOSED DREDGE MATERIAL HAUL ROUTE**  
 1. TO GRAND AVE/MN-23 S  
 2. TURN RIGHT ON TO POLK STREET.  
 3. TURN NORTH INTO SITE AT S 71ST AVE W.

TOTAL HAUL DISTANCE OF 3.5 MILES

**DREDGE MATERIAL RECEIVING AREA**

**DREDGE SENDING SOURCE AREA**



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ISSUE RECORD/REVISION

PURPOSE	DATE

**DWP SITE RESTORATION  
 PHASE II - EARTHWORK**  
 CITY OF DULUTH,  
 MINNESOTA

SHEET KEY

SHEET TITLE  
**MATERIAL HAUL ROUTE**

DATE: 3/20/17

DRAWN BY: MSD

CHECKED BY: LWS

PROJECT NUMBER  
 15240

SHEET NUMBER  
 L-3

# CITY OF DULUTH

DEPARTMENT OF PARKS AND RECREATION

CONSTRUCTION PLANS FOR:

DWP RESTORATION - PHASE II

## INVASIVES CLEARING, SEEDING, PLANTING

CITY PROJECT NO.

### GOVERNING SPECIFICATIONS

THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN. AVAILABLE AT: <http://www.dot.state.mn.us/pre-letting/spec/index.html>

THE 2015 EDITION OF THE CITY OF DULUTH PUBLIC WORKS AND UTILITIES DEPARTMENT STANDARD CONSTRUCTION SPECIFICATIONS AND SUPPLEMENTS OR ADDENDUMS SHALL APPLY.



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#### ISSUE RECORD/REVISION

PURPOSE	DATE

### INDEX

SHEET NO.	DESCRIPTION
C-1	TITLE SHEET & INDEX MAP
L-1	OVERALL SITE
L-2	INVASIVES REMOVALS
L-3	PLAN - SOUTH SIDE (BASE BID, BID ALT #2)
L-4	PLAN - NORTH SIDE (BID ALT #1)
L-5	DETAILS
L-6	PLANT MATERIAL LISTS

THIS PLAN CONTAINS 7 SHEETS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

Luke W. Sydow

LANDSCAPE ARCHITECT (TYPED OR PRINTED NAME)

MARCH 30, 2017 25866  
LANDSCAPE ARCHITECT DATE REG. NO.

CITY APPROVAL DATE

APPROVED PARKS AND RECREATION DEPARTMENT

SHEET KEY

SHEET TITLE  
TITLE SHEET & INDEX MAP

DATE: 3/20/17

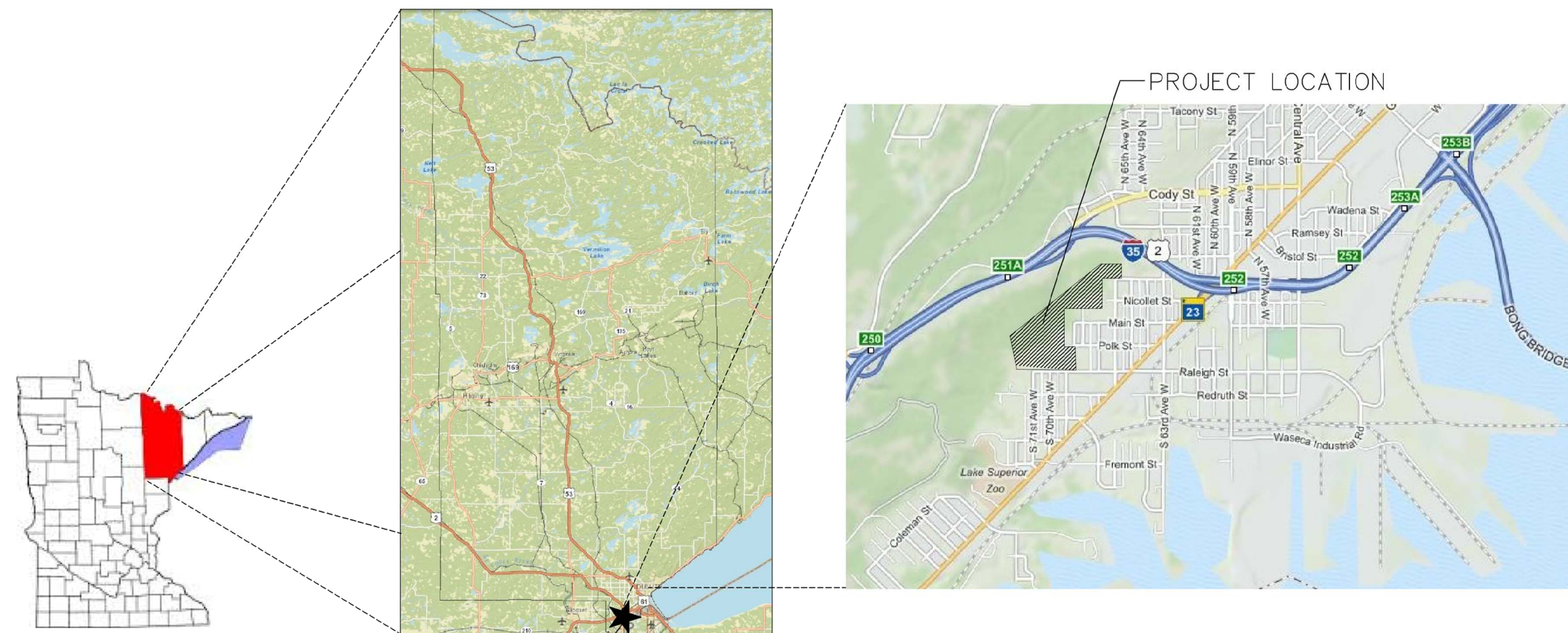
DRAWN BY: MSD

CHECKED BY: LWS

PROJECT NUMBER 15240

SHEET NUMBER C-1

DWP SITE RESTORATION  
PHASE II - CLEARING,  
SEEDING, PLANTING  
CITY OF DULUTH,  
MINNESOTA



### PROJECT LOCATION MAP

NOT TO SCALE



### KEY PLAN

NOT TO SCALE



THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

WARNING:  
LOCATION OF UNDERGROUND UTILITIES TO BE VERIFIED BY CONTRACTOR. CALL BEFORE DIGGING. GOPHER STATE ONE CALL 1-800-252-1166 REQUIRED BY LAW

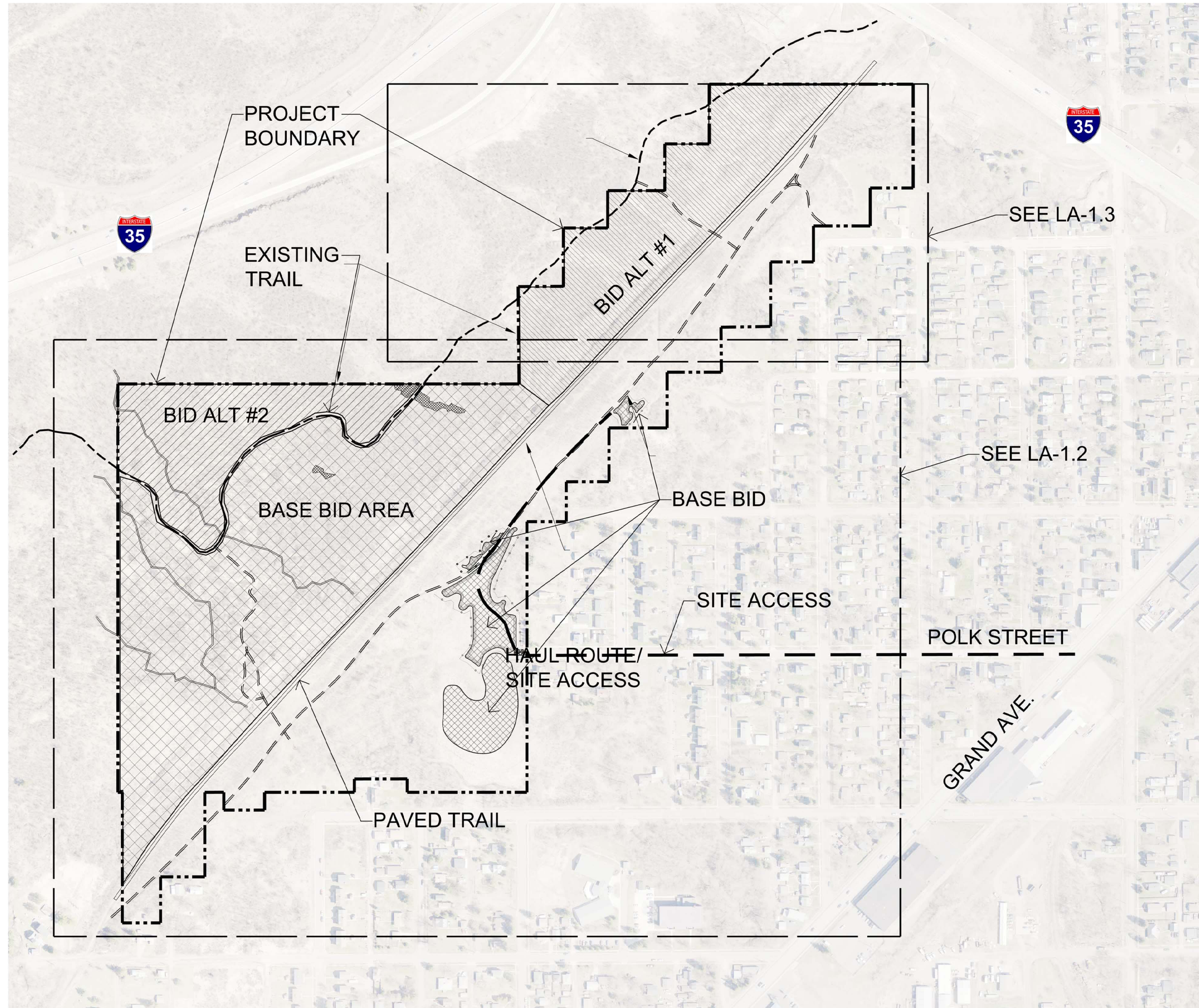
CITY OF DULUTH PROJECT NO. xxxx

DRAWN BY: LWS

SHEET NO.  
1 OF 7

NOTE:

- 1) CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE CITY OF DULUTH, MPCA, SWPPP, AND THIS PLAN SET AND SPECIFICATIONS.
- 2) CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES. CONTRACTOR SHALL CONTACT GOPHER STATE ONE CALL CENTER AT 811 FOR UTILITY LOCATIONS 72 HOURS PRIOR TO EXCAVATION/CONSTRUCTION.
- 3) CONTRACTOR SHALL PROVIDE TO THE OWNER A SCHEDULE OF ANTICIPATED PROJECT DATES INCLUDING:  
 PROJECT START  
 CLEARING OF INVASIVE PLANT MATERIAL START AND END DATES  
 PLANTING START AND END DATES
- 4) CONTRACTOR SHALL NOTIFY OWNER 48 HOURS IN ADVANCE OF CONSTRUCTION START.
- 5) CONTRACTOR SHALL SCHEDULE THE SEEDING OF FILLED AREAS WITH THE EARTHWORK CONTRACTOR.
- 6) SAS+ASSOCIATES WILL FLAG AREAS FOR INVASIVES REMOVAL PRIOR TO BIDDING/START OF WORK.



**1** OVERALL SITE PLAN  
 SCALE: 1"=200'



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**+ ASSOCIATES**

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ISSUE RECORD/REVISION

PURPOSE	DATE

**DWP SITE RESTORATION  
 PHASE II - CLEARING,  
 SEEDING, PLANTING**  
 CITY OF DULUTH,  
 MINNESOTA

**DRAFT**  
 NOT FOR CONSTRUCTION

SHEET TITLE	OVERALL SITE
DATE:	3/20/17
DRAWN BY:	MSD
CHECKED BY:	LWS
PROJECT NUMBER	15240
SHEET NUMBER	L-1

### INVASIVE PLANT REMOVAL AREAS

APPROXIMATE AREAS OF INVASIVE PLANT REMOVAL AND PLANTING. BASE BID.

REMOVAL LOCATION	AREA (ACRES, +/-)
a	0.25
b	0.35
c	0.32
d	1.56
e	1.04
f	7.4
<b>TOTAL (BASE BID)</b>	<b>10.92</b>

APPROXIMATE AREAS OF INVASIVE PLANT REMOVAL AND PLANTING. ALTERNATE #1.

REMOVAL LOCATION	AREA (ACRES, +/-)
ALTERNATE AREA #1	5.1

APPROXIMATE AREAS OF INVASIVE PLANT REMOVAL AND PLANTING. ALTERNATE #2.

REMOVAL LOCATION	AREA (ACRES, +/-)
ALTERNATE AREA #2	4.8

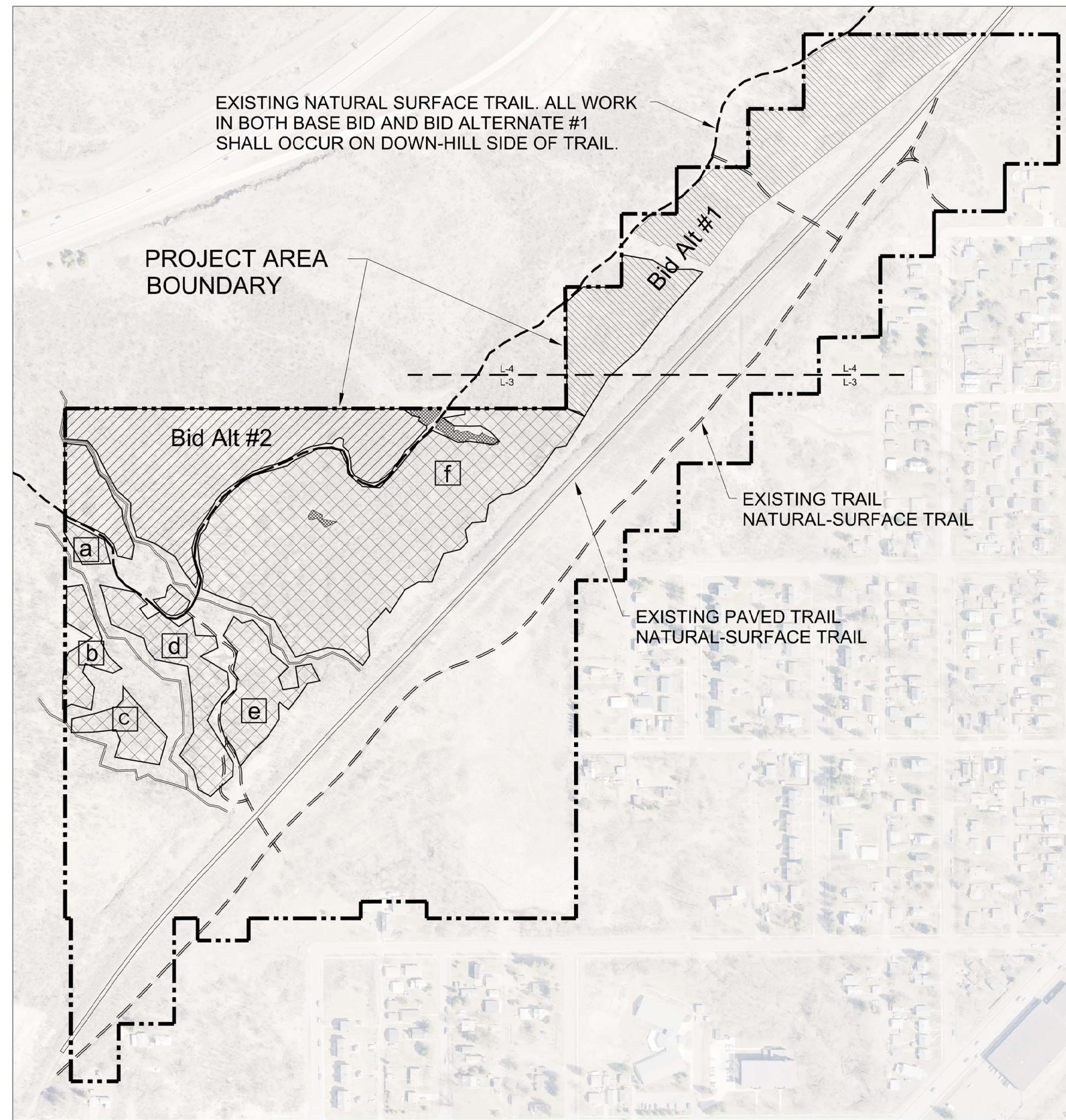
AREAS SHOWN REPRESENT APPROXIMATE AREAS OF MAJOR CONCENTRATIONS OF BUCKTHORN, HONEYSUCKLE AND OTHER INVASIVES. CONTRACTOR SHALL FIELD VERIFY EXTENT OF INVASIVE REMOVALS AND SUBMIT THEIR BID FOR REMOVAL BASED UPON VERIFIED FIELD CONDITIONS.

REMOVAL OF BUCKTHORN, HONEYSUCKLE AND OTHER INVASIVE PLANT MATERIAL SHALL BE AS FOLLOWS --

- 1) IDENTIFY PLANT MATERIAL AND TREES TO REMAIN.
- 2) IDENTIFY PLANT MATERIAL TO REMOVE
- 3) CUT PLANT MATERIAL FLUSH TO GROUND.
- 4) IMMEDIATELY TREAT CUT STUMP WITH GARLON.
- 5) CUT PLANT MATERIAL TO REMAIN ON SITE WHERE CUT. DO NOT PILE OR CONCENTRATE CUT PLANT MATERIAL.
- 6) CONTRACTOR MAY PROPOSE TO BURN SLASH MATERIAL ON SITE. CONTRACTOR MUST APPLY, PAY FOR AND OBTAIN ALL BURNING PERMITS REQUIRED AND COMPLY WITH ALL REGULATIONS CONCERNING BURNING.

**NOTE:**

- CARE SHALL BE TAKEN TO PROTECT SOIL SURFACE FROM RUTTING, DISTURBANCE AND EROSION. NO EQUIPMENT SHALL BE ON SITE WHEN SOIL SURFACE IS WET OR WHEN DISTURBANCE MAY OCCUR.
- ONLY VEHICLES AND EQUIPMENT DIRECTLY NECESSARY FOR VEGETATION REMOVAL IS PERMITTED. PERSONAL VEHICLES AND OTHER NON-NECESSARY EQUIPMENT MUST REMAIN OFF-SITE, ON THE PUBLIC RIGHT-OF-WAY AT ALL TIMES.
- ALL PLANT MATERIAL TO REMAIN MUST BE PROTECTED FROM DAMAGE AND DISTURBANCE, INCLUDING THE SOIL SURFACE AND ROOT ZONE EXTENDING TO THE DRIP LINE OF THE PLANT.
- VEHICLES ON-SITE MUST BE, TO THE GREATEST EXTENT POSSIBLE, CONFINED TO EXISTING TRAILS / PATHS THROUGH THE SITE.



## 1 INVASIVES REMOVAL

SCALE: 1"=200'



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ISSUE RECORD/REVISION

PURPOSE	DATE

**DWP SITE RESTORATION  
PHASE II - CLEARING,  
SEEDING, PLANTING**  
CITY OF DULUTH,  
MINNESOTA

SHEET KEY

SHEET TITLE

INVASIVES REMOVALS

DATE: 3/20/17

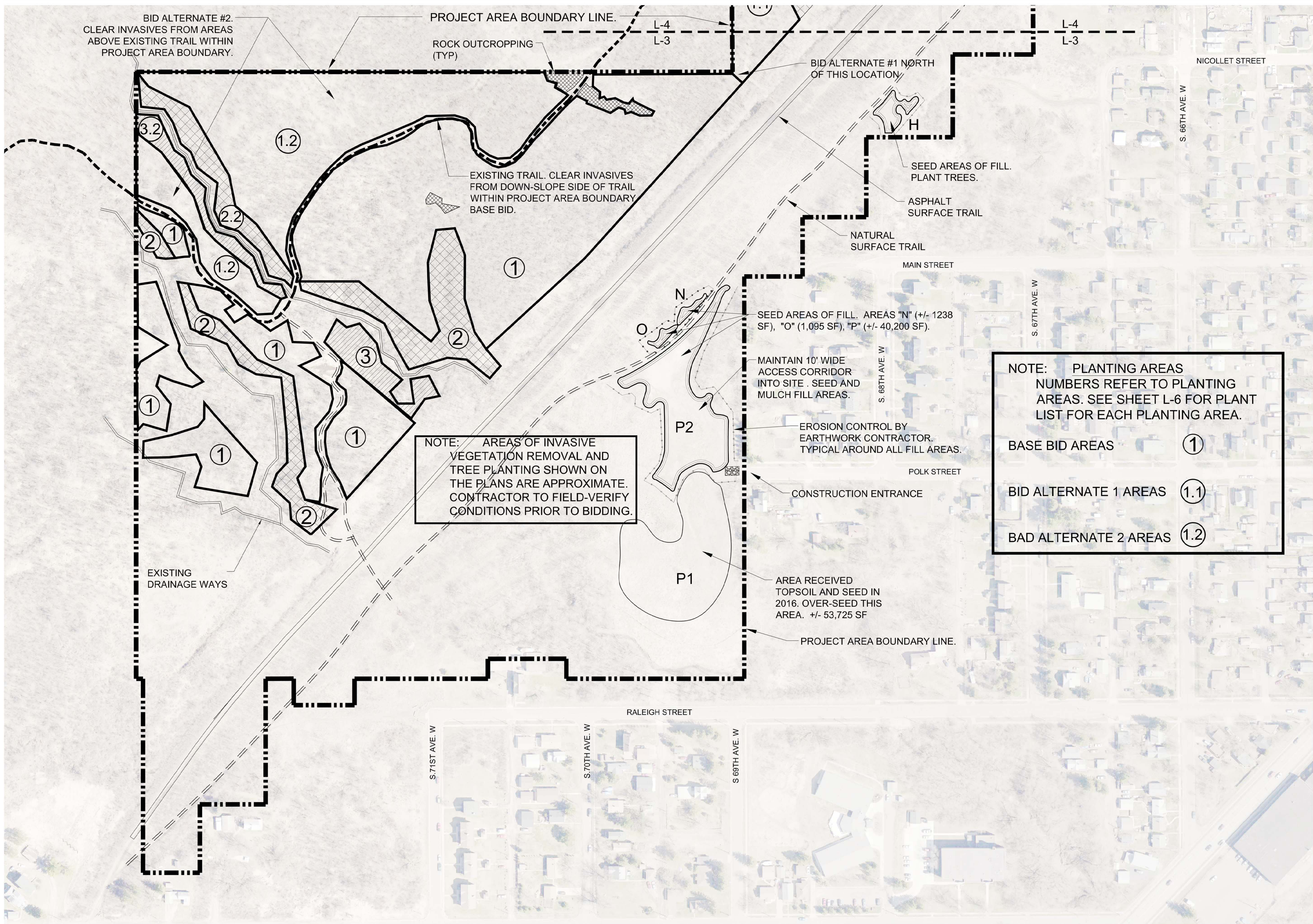
DRAWN BY: MSD

CHECKED BY: LWS

PROJECT NUMBER: 15240

SHEET NUMBER: L-2

Map No. 3112 - 1.dwg  
P:\15240 - DWP Site Phase II Documents\15240 DWP Phase II Clearing Seeding Planting.dwg



NOTE: AREAS OF INVASIVE VEGETATION REMOVAL AND TREE PLANTING SHOWN ON THE PLANS ARE APPROXIMATE. CONTRACTOR TO FIELD-VERIFY CONDITIONS PRIOR TO BIDDING.

NOTE: PLANTING AREAS NUMBERS REFER TO PLANTING AREAS. SEE SHEET L-6 FOR PLANT LIST FOR EACH PLANTING AREA.

BASE BID AREAS ①  
BID ALTERNATE 1 AREAS ①.1  
BAD ALTERNATE 2 AREAS ①.2

**1 PLAN**  
SCALE: 1"=100'



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ISSUE RECORD/REVISION

PURPOSE	DATE

**DWP SITE RESTORATION  
PHASE II - CLEARING,  
SEEDING, PLANTING**  
CITY OF DULUTH,  
MINNESOTA

SHEET KEY

SHEET TITLE  
**PLAN - SOUTH SIDE**

DATE: 3/20/17  
DRAWN BY: MSD  
CHECKED BY: LWS  
PROJECT NUMBER: 15240  
SHEET NUMBER: L-3



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ISSUE RECORD/REVISION

PURPOSE	DATE

**DWP SITE RESTORATION  
PHASE II - CLEARING,  
SEEDING, PLANTING**

CITY OF DULUTH,  
MINNESOTA

SHEET KEY

SHEET TITLE

**BID ALTERNATE #1  
PLAN**

DATE: 3/20/17

DRAWN BY: MSD

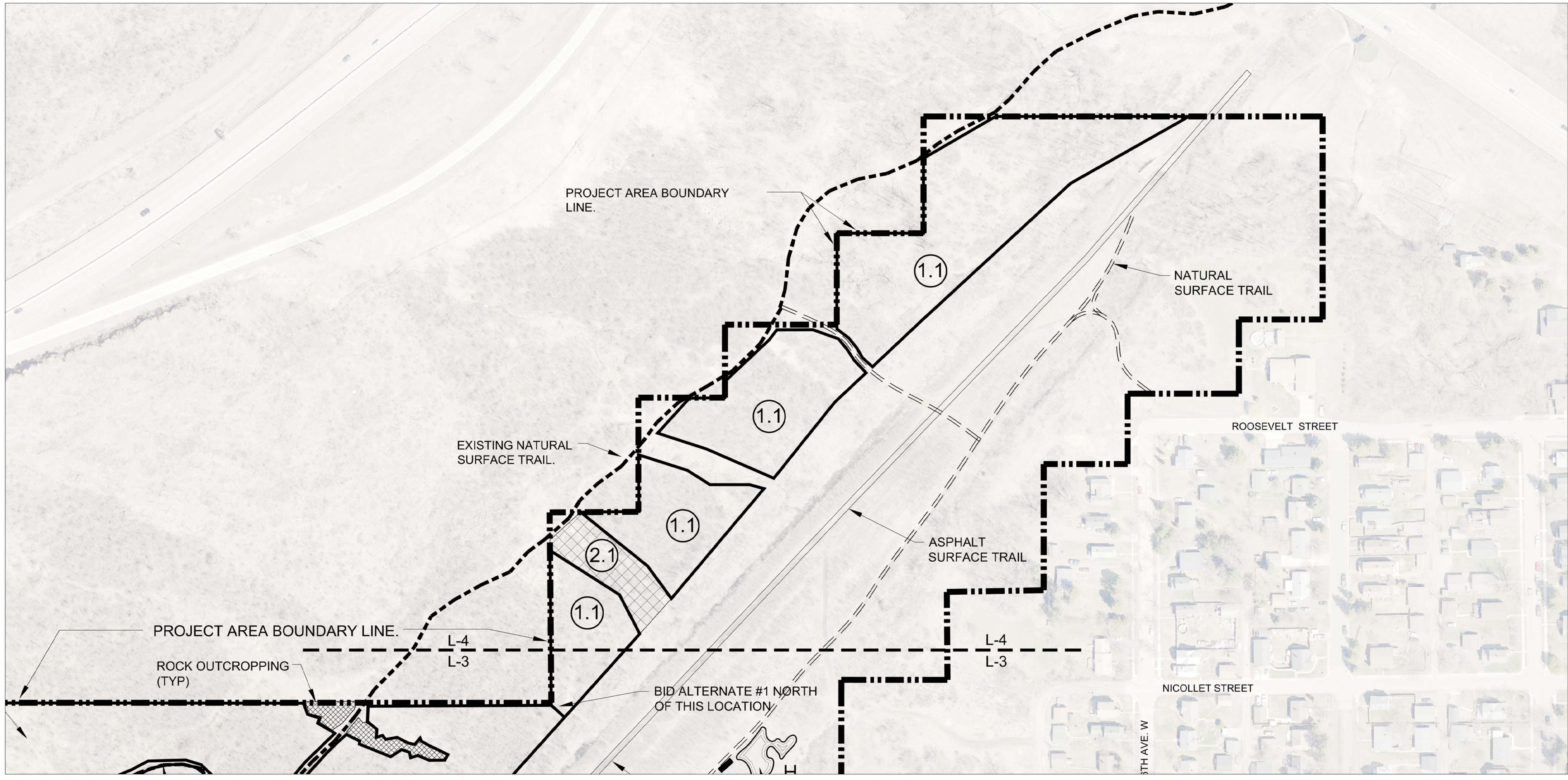
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PROJECT NUMBER

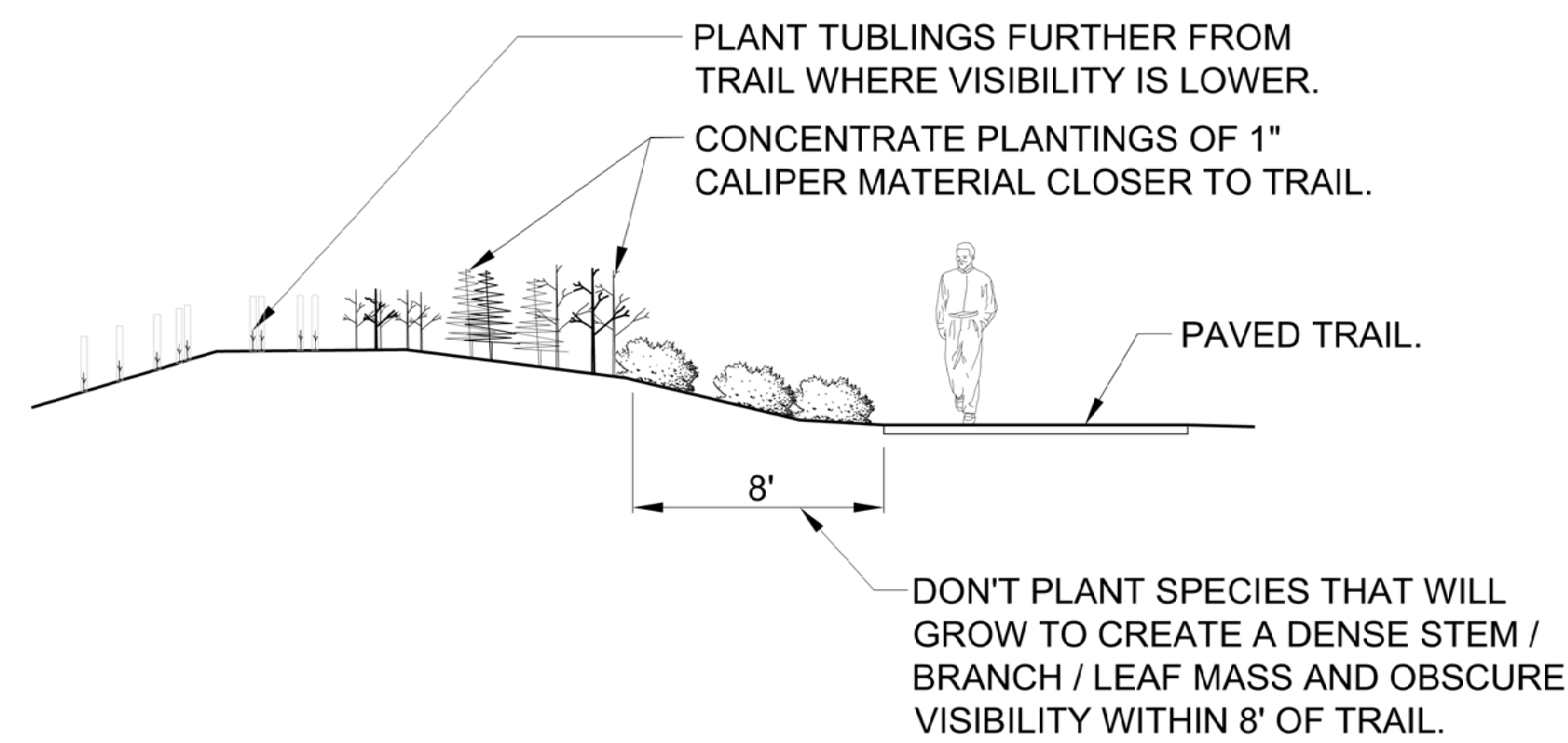
15240

SHEET NUMBER

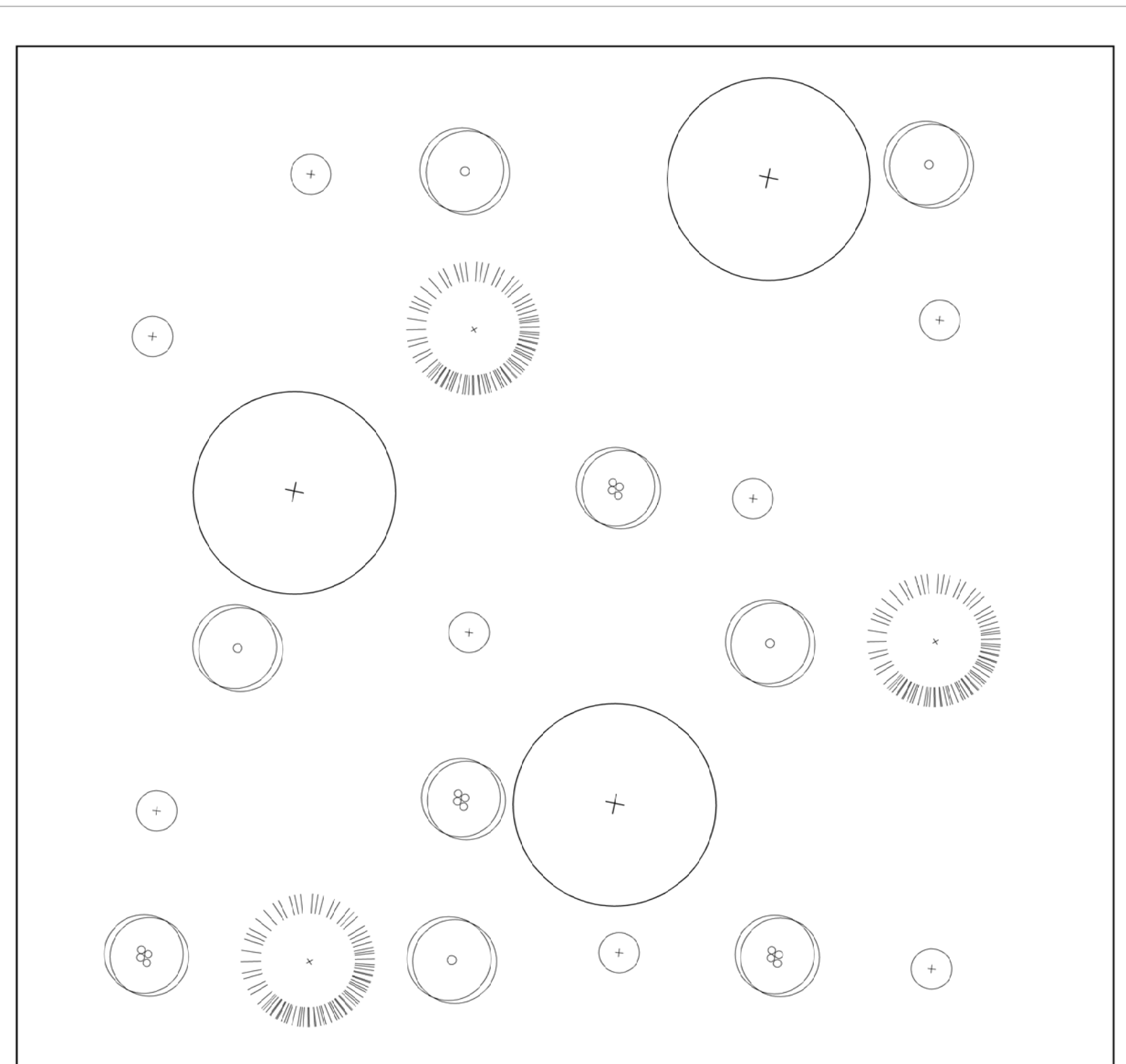
L-4



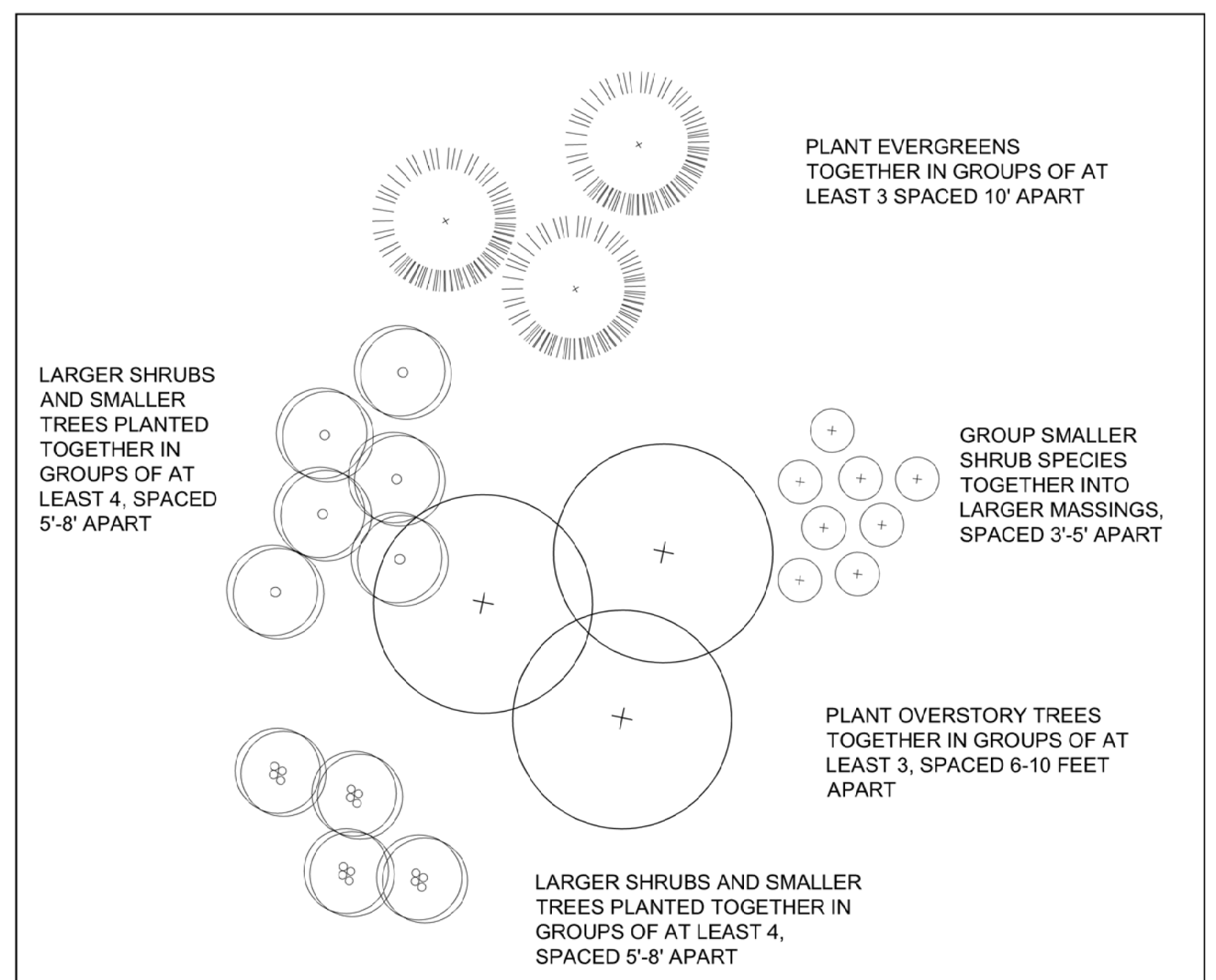
**1 PLAN**  
SCALE: 1"=100'



**1 PLANTING NEAR TRAIL**  
SCALE: NTS

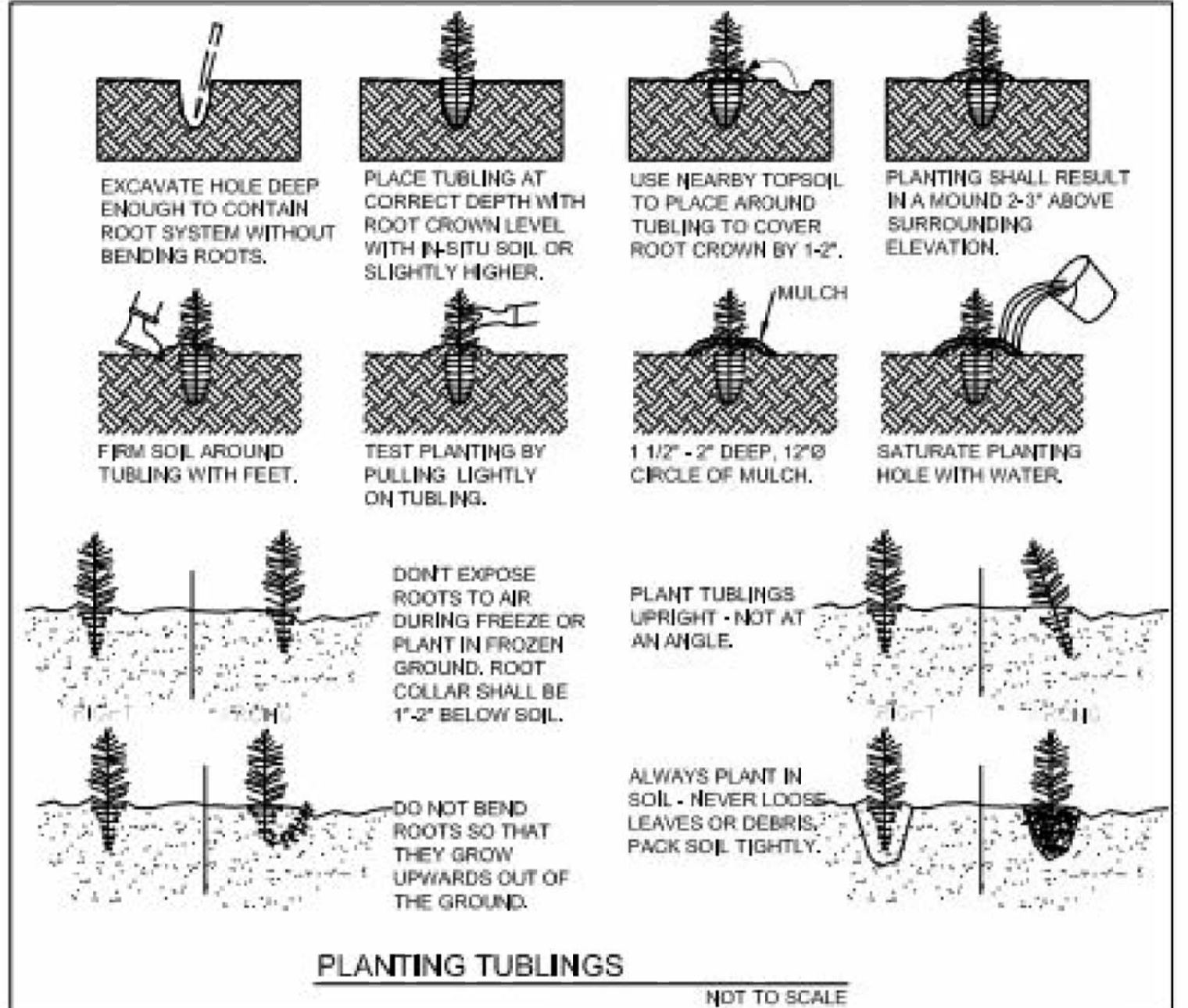
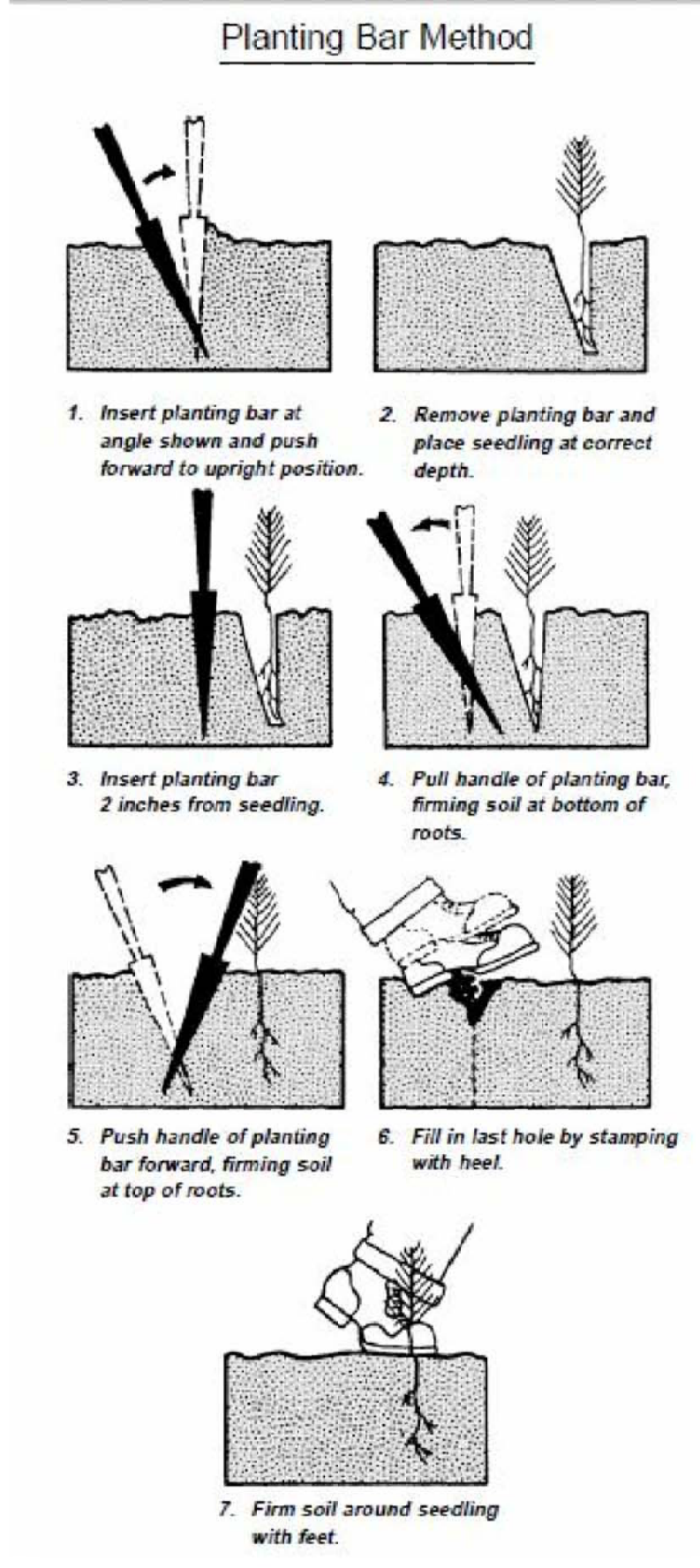


PLANTINGS SHOULD NOT BE RANDOMLY PLANTED AT SIMILAR SPACING AS SHOWN ABOVE.



PLANTINGS SHOULD BE GROUPED AND SPACED BOTH WITHIN AND BETWEEN GROUPINGS ACCORDING TO SPECIES & TYPE (LARGE TREE, SMALL SHRUB, ETC).

**2 PLANTINGS**  
SCALE: NTS



**NOTE:** CONTRACTOR SHALL FURNISH AND INSTALL STAKE, TREE TUBE AND TIES ON EACH TUBLING PLANTED. STAKE SHALL BE 1"X1"X48" LONG (MINIMUM) HARDWOOD. STAKE SHALL BE DRIVEN INTO GROUND 18". STAKE AND TREE TUBE MUST BE VERTICAL AT COMPLETION OF INSTALLATION AND OF SUFFICIENT STABILITY TO WITHSTAND WIND, SNOW, RAIN, ETC., WITHOUT TIPPING.

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ISSUE RECORD/REVISION

PURPOSE	DATE

**DWP SITE RESTORATION  
PHASE II - CLEARING,  
SEEDING, PLANTING**  
CITY OF DULUTH,  
MINNESOTA

SHEET KEY

SHEET TITLE  
**DETAILS**

DATE: 3/20/17  
DRAWN BY: MSD  
CHECKED BY: LWS  
PROJECT NUMBER: 15240  
SHEET NUMBER: L-5

DWP Phase II																																					
Plantings - Spring 2017																																					
Location	AREA	Seed Mix	Quantity (lbs)	White Spruce	Balsam Fir	White Pine	Red Pine	Larch	Eastern White Cedar	Jack Pine	Northern Pin Oak	Bur Oak	Red Maple	American Basswood	Black Cherry	Hackberry	White Birch	Yellow Birch	Quaking Aspen	Nannyberry Viburnum*	Pin Cherry*	American Hazelnut*	American Cherry*	American Plum*	Downy Hawthorn*	Prairie Willow*	Red-osier Dogwood*	Glossy Black Chokecherry*	Showy Mountainash*	Princess Kay Plum*	Regent Serviceberry	Staghorn Sumac*	Smooth Sumac*	Tree / Shrubs* Total			
DWP SITE AREA	SQ.FT. (+/-)																																				
H	4,077	Seed, Mulch	MnDoT #35-241	4																																	
N	1,238	Seed, Mulch	MnDoT #35-241	1																																	
O	1,095	Seed, Mulch	MnDoT #35-241	1																																	
P2	40,200	Seed, Mulch	MnDoT #35-241	34																																	
P1	53,725	Seed, Mulch	MnDoT #35-241	45																																	
<b>SUB TOTALS</b>	<b>53,725</b>			<b>45</b>																																	
<b>BASE BID</b>																																					
1	390,607	Clear Invasives, Replant																																			
		Trees - Tublings			75	75	100	150	50	100	50	200	200	30	30	30	125	75	75	75																	1440
		Trees - 1" Caliper			20	20	20	20	20	20	20	20	20	10	10	10	20	20	20	20																	290
		Shrubs																			125	125	125	150	100	100	100	175	175	175	100	175	200	200	2025		
2	83,735	Clear Invasives, Replant																																			
		Trees - Tublings					50	25		75	75	75	50					75																		425	
		Trees - 1" Caliper					10	10		25	25	25	10					25																		130	
		Shrubs																			40	40	40	40	40	40	40	40	40	40	40	40	40	40	520		
3	16,194	Clear Invasives, Replant																																			
		Trees - Tublings			10	10	15		10	20		15		15		10	20	20	20	20																185	
		Shrubs																			10	10		10							15				65		
<b>SUB TOTALS BASE BID</b>	<b>490,536</b>				<b>105</b>	<b>105</b>	<b>195</b>	<b>205</b>	<b>80</b>	<b>140</b>	<b>170</b>	<b>335</b>	<b>320</b>	<b>55</b>	<b>100</b>	<b>50</b>	<b>165</b>	<b>115</b>	<b>115</b>	<b>215</b>	<b>175</b>	<b>175</b>	<b>165</b>	<b>200</b>	<b>140</b>	<b>150</b>	<b>100</b>	<b>225</b>	<b>215</b>	<b>215</b>	<b>140</b>	<b>230</b>	<b>240</b>	<b>240</b>	<b>5080</b>		
1.1	189,291	Clear Invasives, Replant																																			
		Trees - Tublings					75	75		50	50	50	25	25	25	50			100																	525	
		Shrubs																			50	50	50	50	50	50	50	50	50	50	50	50	50	50	700		
2.1	15,915	Clear Invasives, Replant																																			
		Trees - Tublings			20		10		25	20					10				20	20																125	
		Shrubs																			10			10			20								40		
<b>SUB TOTAL - ALT #1</b>	<b>205,206</b>				<b>20</b>	<b>0</b>	<b>85</b>	<b>75</b>	<b>25</b>	<b>20</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>35</b>	<b>25</b>	<b>25</b>	<b>50</b>	<b>20</b>	<b>20</b>	<b>100</b>	<b>60</b>	<b>50</b>	<b>50</b>	<b>60</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>70</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>1390</b>		
1.2	186,804	Clear Invasives, Replant																																			
		Trees - Tublings					75	75		50	50	50	25	25	25	50			100																	525	
		Shrubs																			20	20	20	20	20	20	20	20	20	20	20	20	20	20	240		
2.2	23,104	Clear Invasives, Replant																																			
		Trees - Tublings						25		25	25	25				25			25																	150	
		Shrubs																			25		25	25		25		25	25		20	20			190		
3.2	14,185	Clear Invasives, Replant																																			0
		Trees - Tublings			10	10	15		20	20					10	10	5	10	10	10	10															140	
		Shrubs																			15	10		10		10		10			20				75		
<b>SUB TOTALS - ALT #2</b>	<b>224,093</b>				<b>10</b>	<b>10</b>	<b>90</b>	<b>100</b>	<b>20</b>	<b>20</b>	<b>75</b>	<b>75</b>	<b>75</b>	<b>35</b>	<b>35</b>	<b>30</b>	<b>85</b>	<b>10</b>	<b>10</b>	<b>135</b>	<b>60</b>	<b>30</b>	<b>45</b>	<b>55</b>	<b>20</b>	<b>55</b>	<b>0</b>	<b>30</b>	<b>45</b>	<b>25</b>	<b>20</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>1320</b>		
<b>TOTAL</b>					<b>135</b>	<b>115</b>	<b>370</b>	<b>380</b>	<b>125</b>	<b>180</b>	<b>295</b>	<b>460</b>	<b>445</b>	<b>125</b>	<b>160</b>	<b>105</b>	<b>300</b>	<b>145</b>	<b>145</b>	<b>450</b>	<b>295</b>	<b>255</b>	<b>260</b>	<b>315</b>	<b>210</b>	<b>255</b>	<b>150</b>	<b>325</b>	<b>310</b>	<b>290</b>	<b>210</b>	<b>320</b>	<b>330</b>	<b>330</b>	<b>7,790</b>		

\*NOTE: ALL SHRUB MATERIAL SHALL BE POTTED 1 GALLON PLANTS.

# 1 PLANT LIST



**SAS**  
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**+ ASSOCIATES**  
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ISSUE RECORD/REVISION	
PURPOSE	DATE

## DWP SITE RESTORATION, PHASE II - CLEARING, SEEDING, PLANTING

CITY OF DULUTH, MINNESOTA

SHEET KEY

SHEET TITLE  
**PLANT MATERIAL LIST**

DATE: 3/20/17

DRAWN BY: MSD

CHECKED BY: LWS

PROJECT NUMBER  
15240

SHEET NUMBER  
L-6

# CITY OF DULUTH

DEPARTMENT OF PARKS AND RECREATION  
CONSTRUCTION PLANS FOR:

## DWP RESTORATION - PHASE II COMMUNITY ACTION DULUTH PLANTINGS

CITY PROJECT NO.

### GOVERNING SPECIFICATIONS

THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN. AVAILABLE AT: <http://www.dot.state.mn.us/pre-letting/spec/index.html>

THE 2015 EDITION OF THE CITY OF DULUTH PUBLIC WORKS AND UTILITIES DEPARTMENT STANDARD CONSTRUCTION SPECIFICATIONS AND SUPPLEMENTS OR ADDENDUMS SHALL APPLY.



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### ISSUE RECORD/REVISION

PURPOSE	DATE

### INDEX

SHEET NO.	DESCRIPTION
C-1	TITLE SHEET & INDEX MAP
L-1	OVERALL SITE
L-2	PLAN - SOUTH SIDE
L-3	PLAN - NORTH SIDE
L-4	DETAILS
L-5	PLANT LISTS

THIS PLAN CONTAINS 6 SHEETS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

Luke W. Sydow

LANDSCAPE ARCHITECT (TYPED OR PRINTED NAME)

MARCH 30, 2017 25866

LANDSCAPE ARCHITECT DATE REG. NO.

CITY APPROVAL DATE

APPROVED PARKS AND RECREATION DEPARTMENT

SHEET KEY

SHEET TITLE

TITLE SHEET & INDEX MAP

DATE: 3/20/17

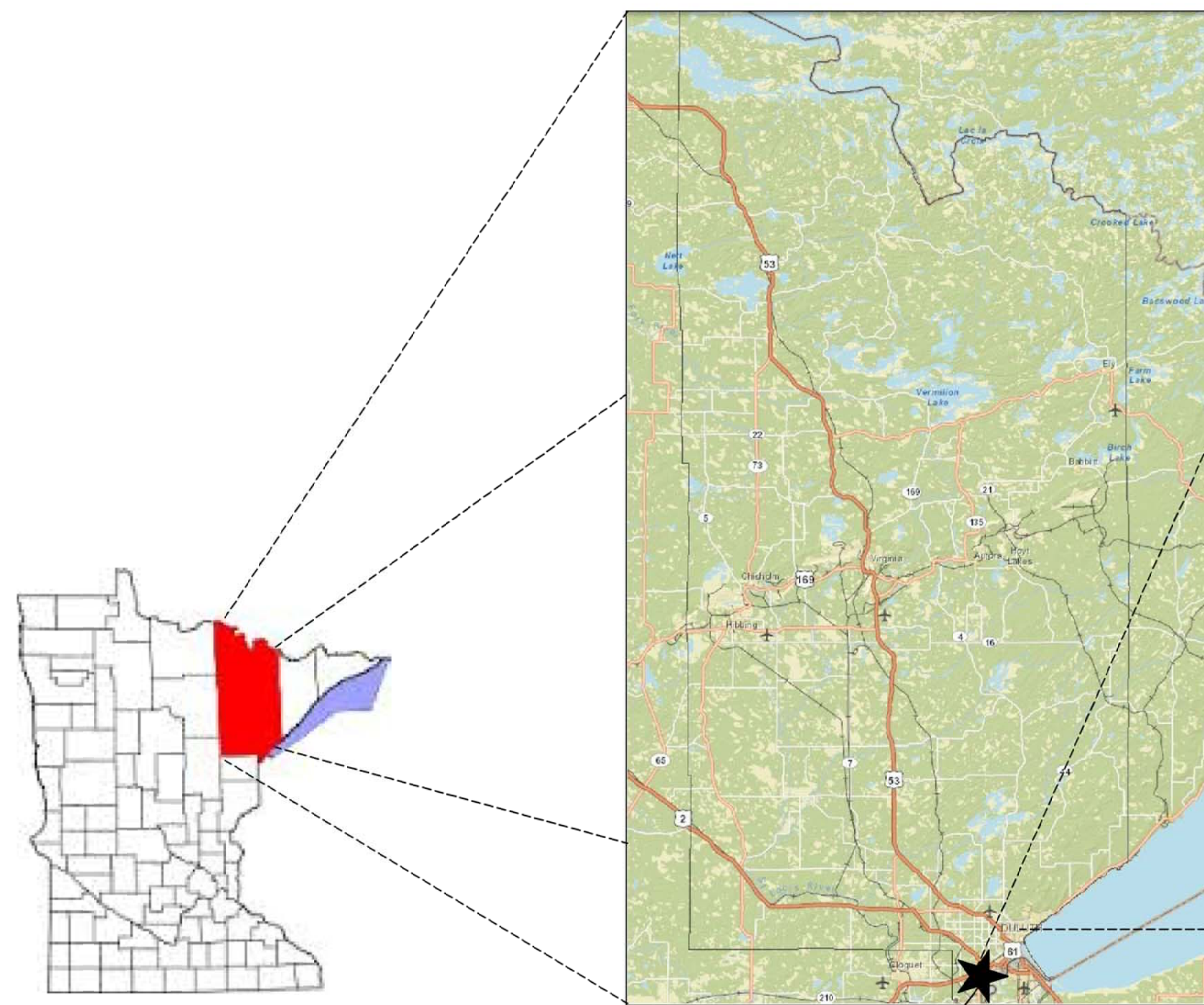
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CHECKED BY: LWS

PROJECT NUMBER 15240

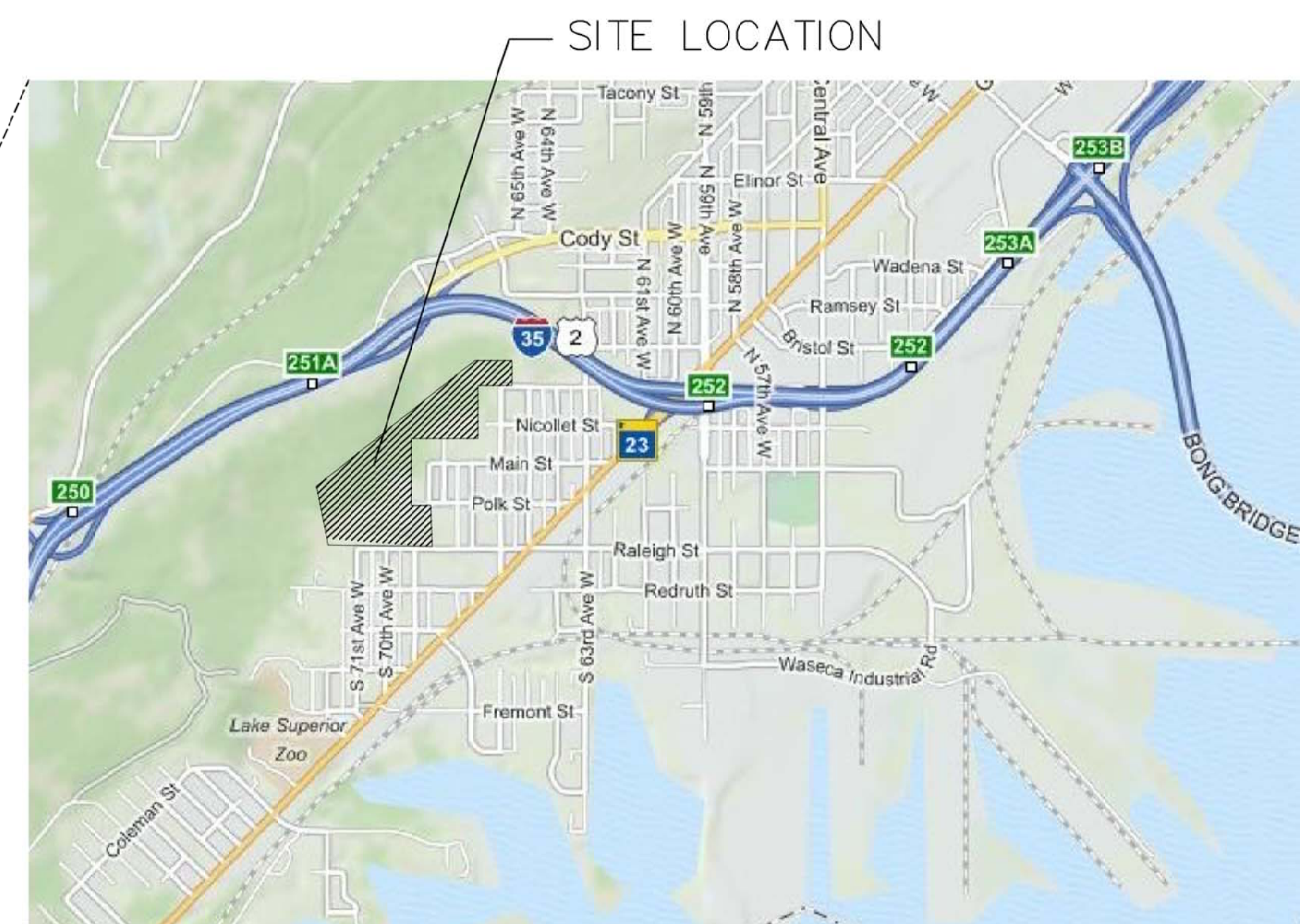
SHEET NUMBER

C-1



PROJECT LOCATION MAP

NOT TO SCALE



KEY PLAN

NOT TO SCALE



THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

WARNING:  
LOCATION OF UNDERGROUND UTILITIES TO BE VERIFIED BY CONTRACTOR. CALL BEFORE DIGGING. GOPHER STATE ONE CALL 1-800-252-1166 REQUIRED BY LAW

CITY OF DULUTH PROJECT NO. xxxx

DRAWN BY: MSD

SHEET NO.  
1 OF 6

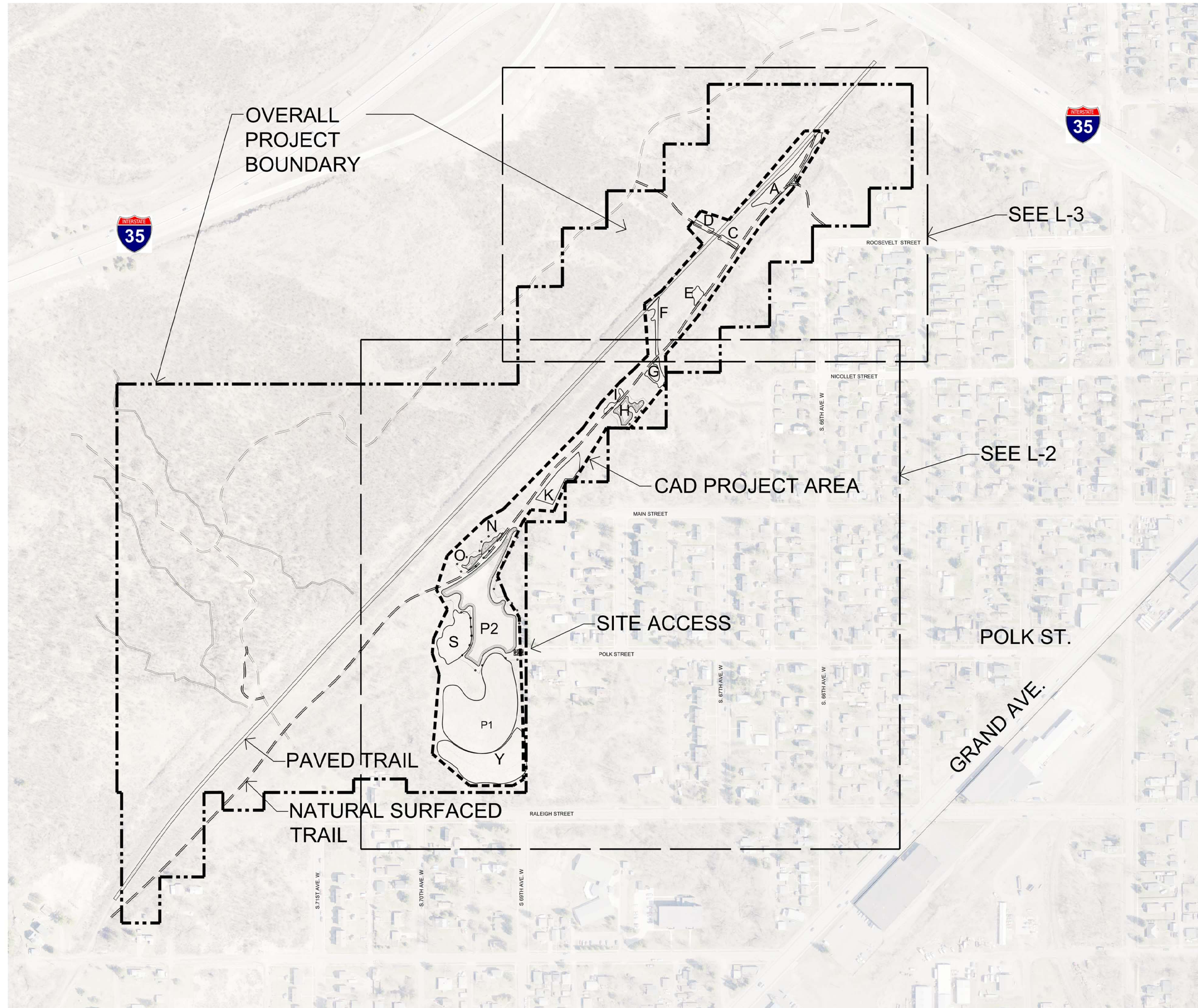
DWP SITE RESTORATION  
PHASE II - CAD PLANTINGS

CITY OF DULUTH,  
MINNESOTA

NOTE:

- 1) CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE CITY OF DULUTH, MPCA, SWPPP, AND THIS PLAN SET AND SPECIFICATIONS.
- 2) CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS PRIOR TO THE START OF PLANTING. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER OR OWNER'S REPRESENTATIVE, AND THE LANDSCAPE ARCHITECT OF ANY DISCREPANCIES OR VARIATIONS FROM PLANS.
- 3) CONTRACTOR SHALL PROVIDE TO THE OWNER A SCHEDULE OF ANTICIPATED PROJECT DATES INCLUDING:  

PROJECT START	_____
PLANTING START AND END DATES	_____
- 4) CONTRACTOR SHALL CONTACT GOPHER STATE ONE CALL CENTER AT 811 FOR UTILITY LOCATIONS 72 HOURS PRIOR TO EXCAVATION/CONSTRUCTION.
- 5) CONTRACTOR SHALL NOTIFY OWNER 48 HOURS IN ADVANCE OF CONSTRUCTION START.
- 6) STOCKPILE WOODCHIPS AT LOCATIONS BY THE OWNER OR OWNERS REPRESENTATIVE.
- 7) COORDINATE TREE PLANTING WITH EARTHWORK CONTRACTOR AND SEEDING CONTRACTOR TO MAXIMIZE EFFICIENCY AND MINIMIZE DISTURBANCE TO THE WORK OF OTHERS.
- 8) PLANTING AREAS WILL BE FLAGGED PRIOR TO BIDDING / PLANTING



**1** OVERALL SITE PLAN  
SCALE: 1"=200'



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ISSUE RECORD/REVISION

PURPOSE	DATE

**DWP SITE RESTORATION  
PHASE II -  
C.A.D. PLANTINGS**  
 CITY OF DULUTH,  
MINNESOTA

SHEET KEY

SHEET TITLE

OVERALL SITE

DATE: 3/20/17

DRAWN BY: MSD

CHECKED BY: LWS

PROJECT NUMBER

15240

SHEET NUMBER

L-1

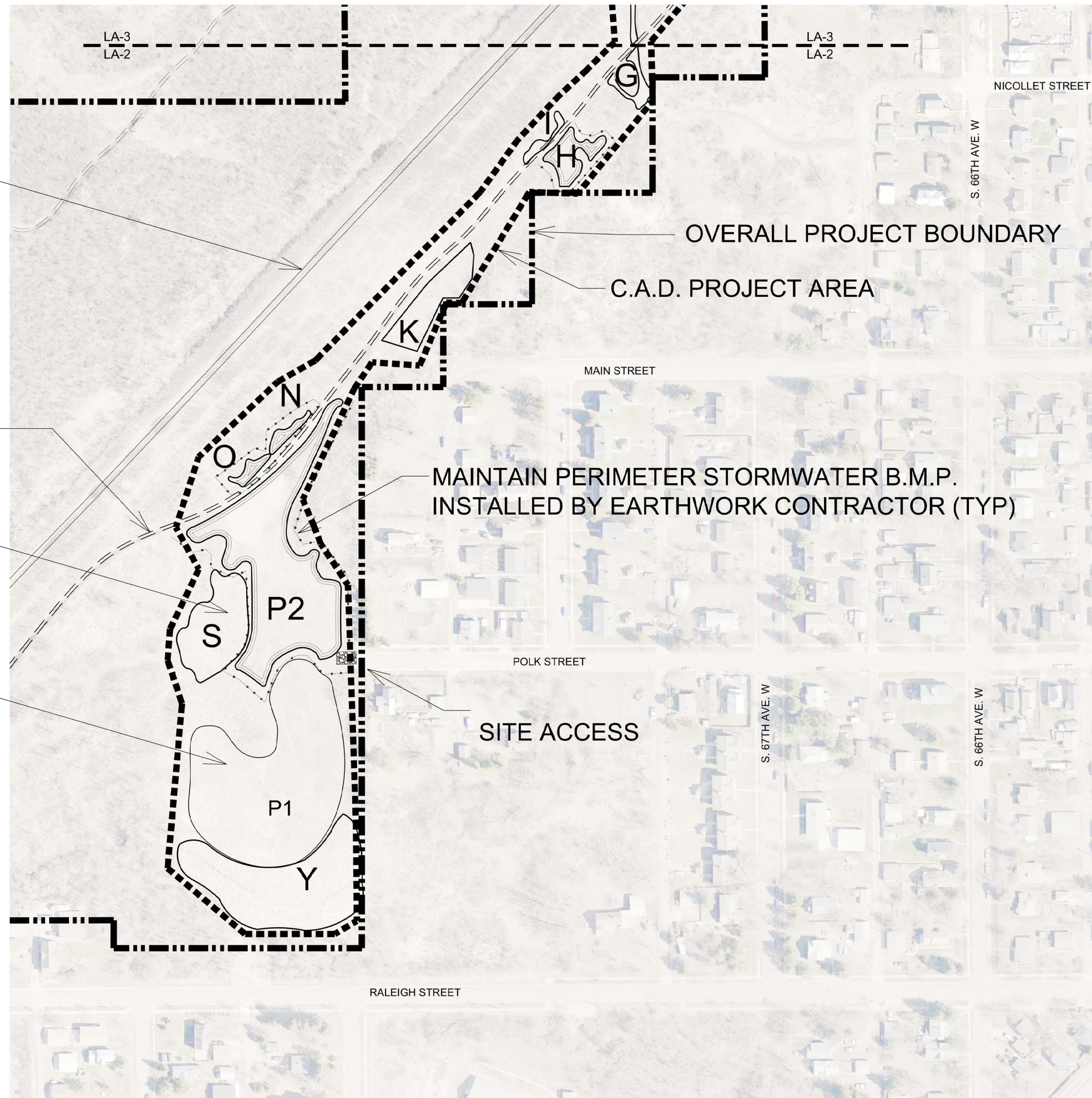
15240 - DWP Site Phase II C.A.D. Plantings.dwg

EXISTING PAVED TRAIL

EXISTING NATURAL SURFACE TRAIL

INTERPLANT NEW TREES  
IN AREA "S"

NO WORK BY C.A.D.  
IN AREA "P"



**1** PLAN  
SCALE: 1"=100'



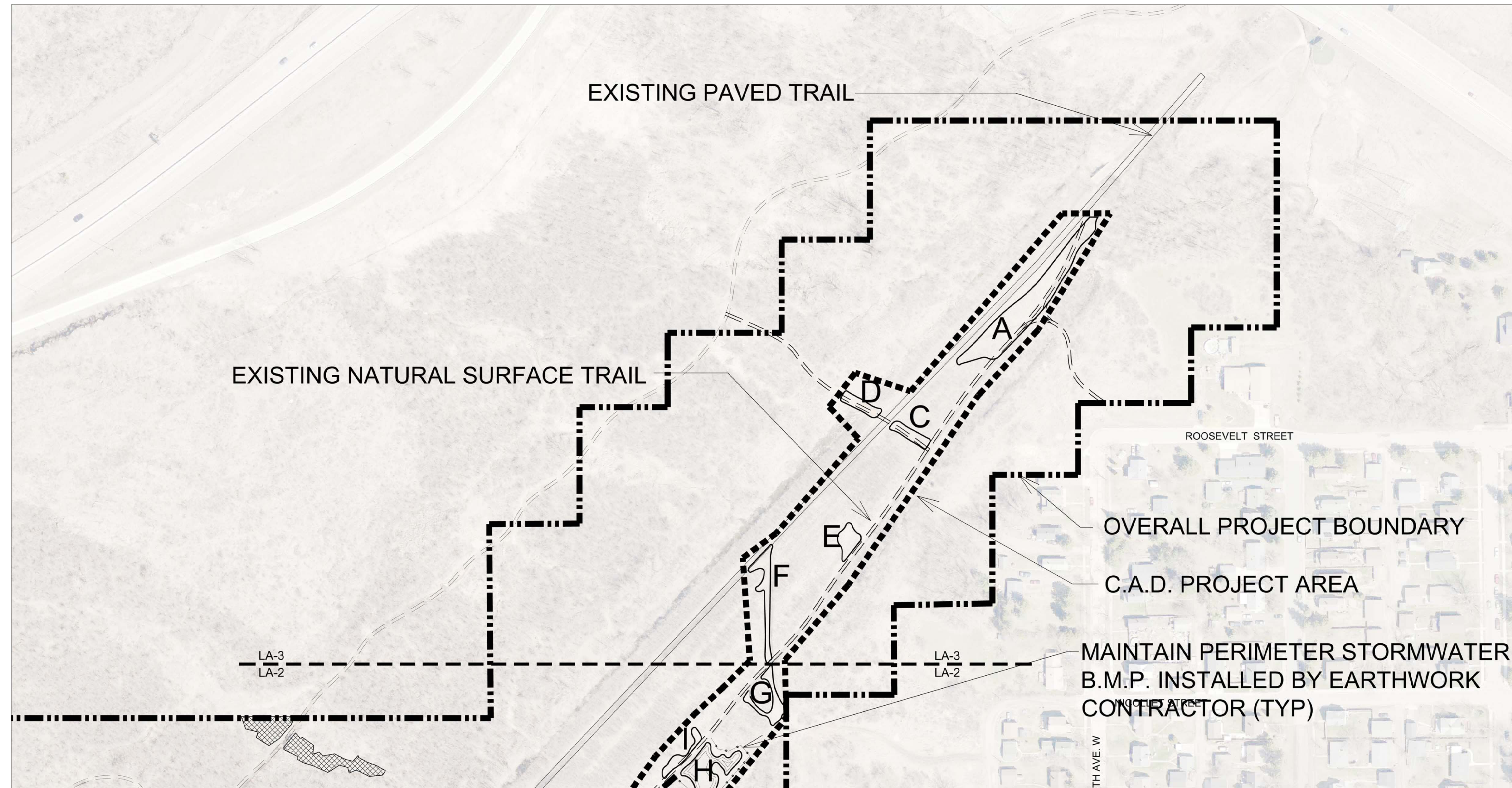
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ISSUE RECORD/REVISION	
PURPOSE	DATE

**DWP SITE RESTORATION  
PHASE II -  
C.A.D. PLANTINGS**  
CITY OF DULUTH,  
MINNESOTA

SHEET KEY	
SHEET TITLE	
PLAN - SOUTH SIDE	
DATE:	3/20/17
DRAWN BY:	MSD
CHECKED BY:	LWS
PROJECT NUMBER	15240
SHEET NUMBER	L-2



**1 PLAN**  
SCALE: 1"=100'



LANDSCAPE ARCHITECTURE

**+ ASSOCIATES**

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ISSUE RECORD/REVISION	
PURPOSE	DATE

**DWP SITE RESTORATION  
PHASE II -  
C.A.D. PLANTINGS**  
CITY OF DULUTH,  
MINNESOTA

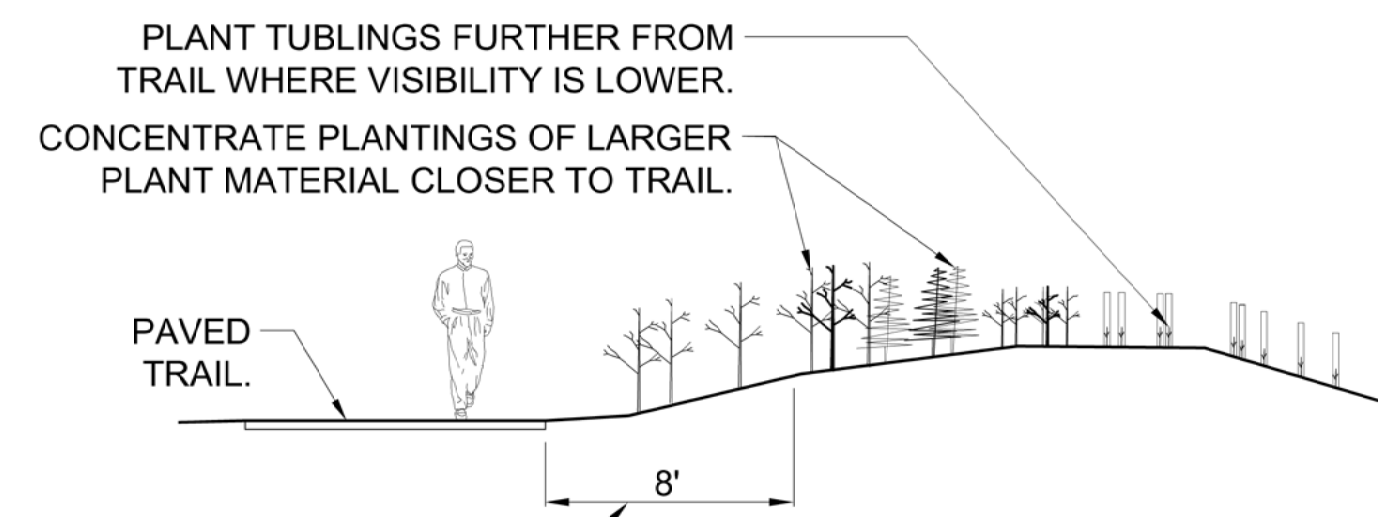
SHEET KEY

SHEET TITLE  
**PLAN - NORTH SIDE**

DATE: 3/20/17  
DRAWN BY: MSD  
CHECKED BY: LWS

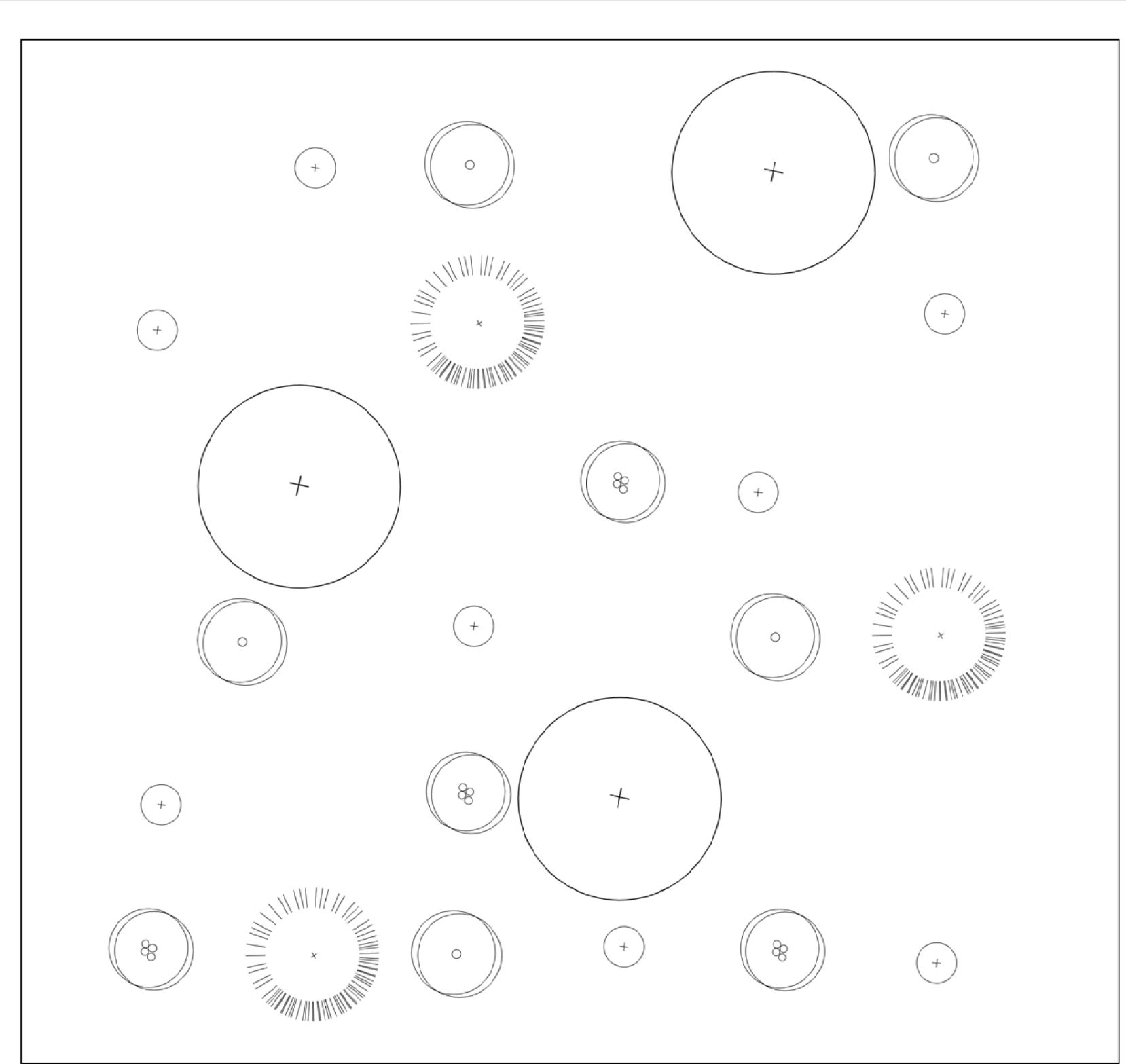
PROJECT NUMBER  
**15240**

SHEET NUMBER  
**L-3**

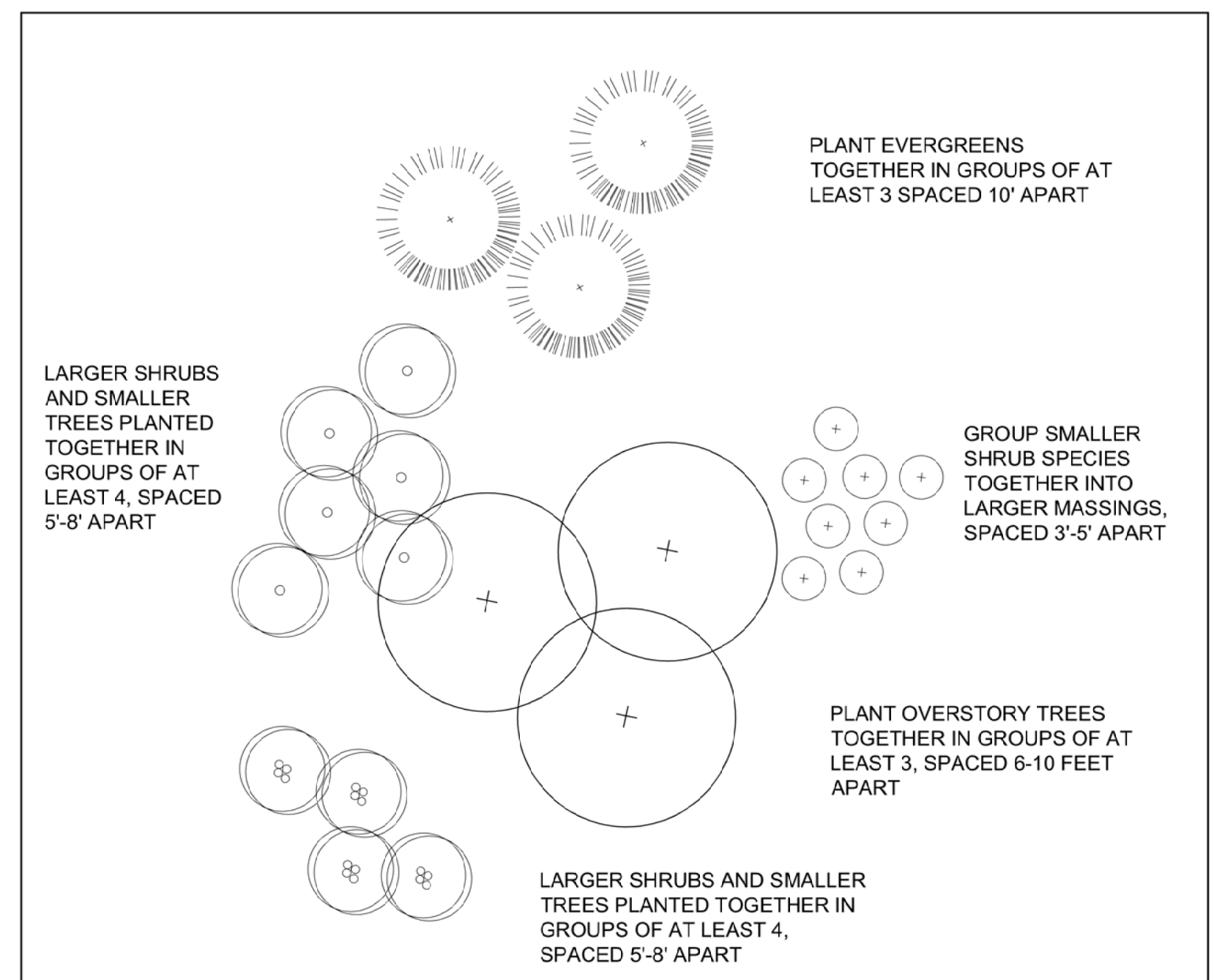


DO NOT PLANT SPECIES THAT WILL GROW TO CREATE A DENSE STEM / BRANCH / LEAF MASS AND OBSCURE VISIBILITY WITHIN 8' OF TRAIL. DO NOT SPACE PLANTS AS DENSELY ALONG TRAIL.

**1 PLANTING NEAR TRAIL**  
SCALE: NTS



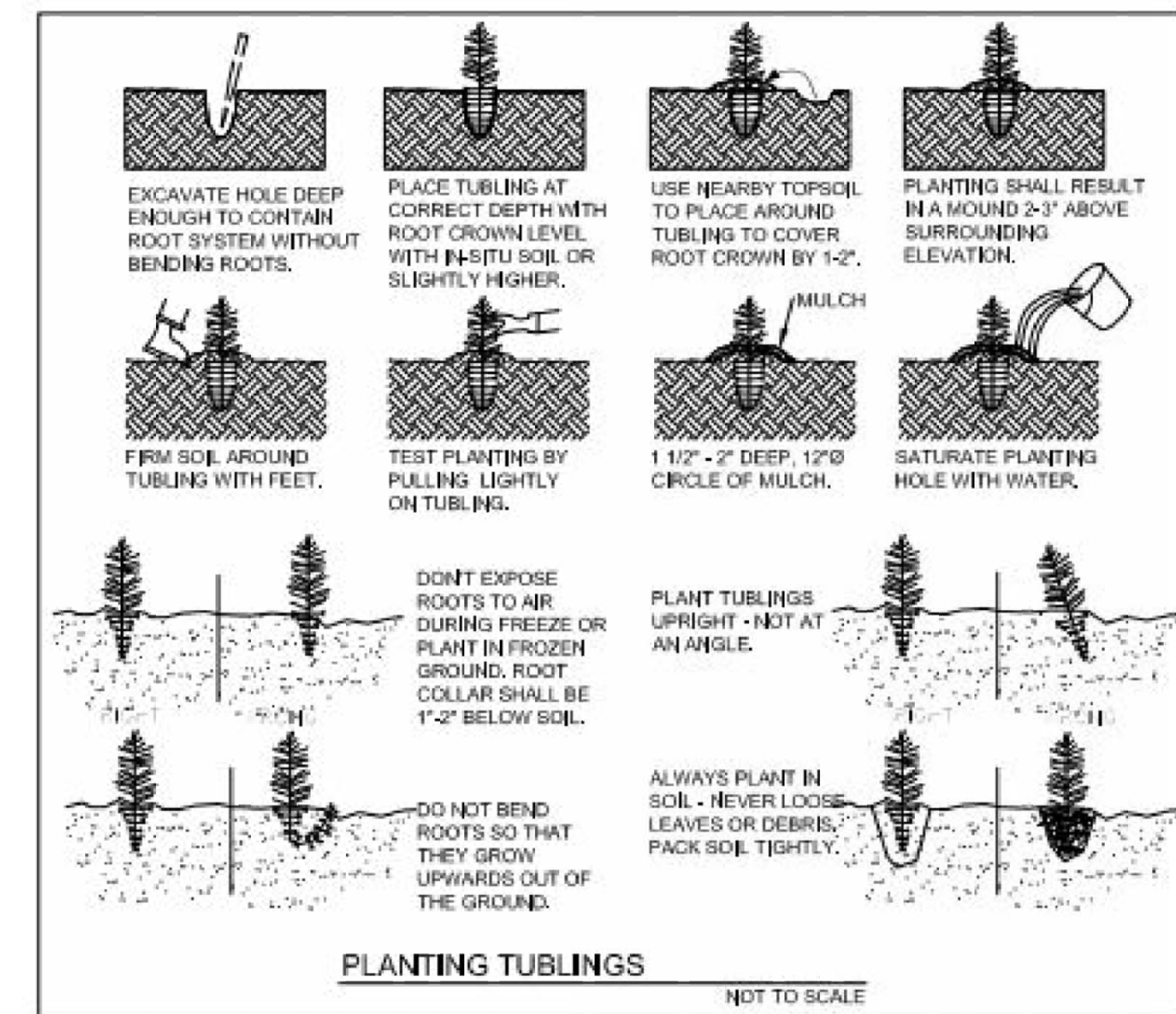
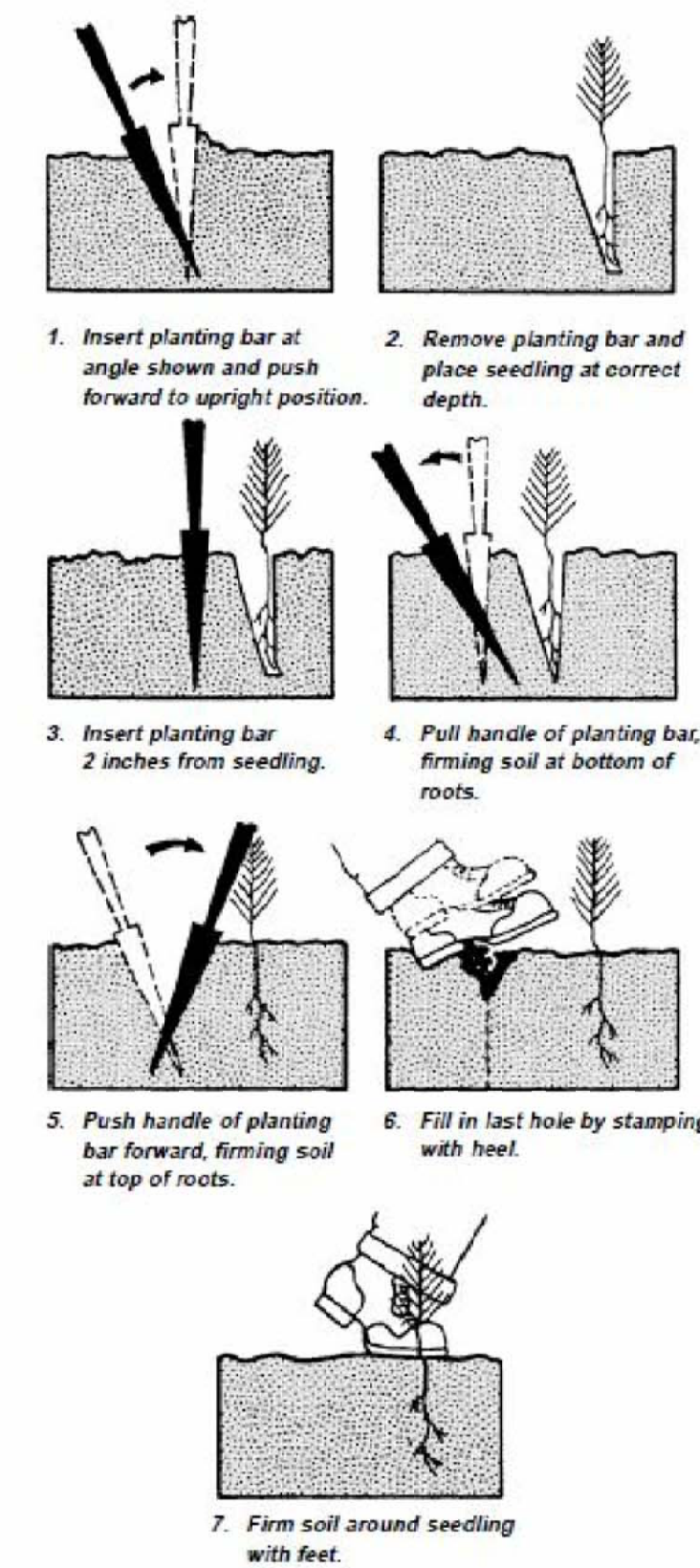
PLANTINGS SHOULD NOT BE RANDOMLY PLANTED AT SIMILAR SPACING AS SHOWN ABOVE.



PLANTINGS SHOULD BE GROUPED AND SPACED BOTH WITHIN AND BETWEEN GROUPINGS ACCORDING TO SPECIES & TYPE (LARGE TREE, SMALL SHRUB, ETC).

**2 PLANTINGS**  
SCALE: NTS

Planting Bar Method



**NOTE:** CONTRACTOR SHALL FURNISH AND INSTALL STAKE, TREE TUBE AND TIES ON EACH TUBLING PLANTED. STAKE SHALL BE 1"X1"X48" LONG (MINIMUM) HARDWOOD. STAKE SHALL BE DRIVEN INTO GROUND 18". STAKE AND TREE TUBE MUST BE VERTICAL AT COMPLETION OF INSTALLATION AND OF SUFFICIENT STABILITY TO WITHSTAND WIND, SNOW, RAIN, ETC., WITHOUT TIPPING.



LANDSCAPE ARCHITECTURE

**+ ASSOCIATES**

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ISSUE RECORD/REVISION

PURPOSE	DATE

DWP SITE RESTORATION  
PHASE II -

C.A.D. PLANTINGS

CITY OF DULUTH,  
MINNESOTA

SHEET KEY

SHEET TITLE  
DETAILS

DATE: 3/20/17

DRAWN BY: MSD

CHECKED BY: LWS

PROJECT NUMBER  
15240

SHEET NUMBER  
L-4



LANDSCAPE ARCHITECTURE

+ ASSOCIATES

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ISSUE RECORD/REVISION

PURPOSE DATE

Table with 2 columns: PURPOSE, DATE. Multiple rows for revisions.

DWP SITE RESTORATION  
PHASE II -  
C.A.D. PLANTINGS  
CITY OF DULUTH,  
MINNESOTA

SHEET KEY

SHEET TITLE

PLANT LIST

DATE: 3/20/17

DRAWN BY: MSD

CHECKED BY: LWS

PROJECT NUMBER: 15240

SHEET NUMBER: L-5

Main table with columns: DWP SITE AREA, SQ.FT. (+/-), Location, AREA, Seed Mix, Quantity (lbs), and various plant species (White Spruce, Balsam Fir, etc.) with numerical values.

\*NOTE: ALL SHRUB MATERIAL SHALL BE POTTED 1 GALLON PLANTS.

1 PLANT LIST - COMMUNITY ACTION DULUTH

Ms: 04\_10\_17\_10:42am  
P:\15240 - DWP Site\Phase 2 Documents\15240 DWP PHASE II CAD PLANTINGS.dwg

**APPENDIX H – DWP Remediation Grant Final Report  
CITY OF DULUTH**

**RFP# 26-AA14 DWP REDEVELOPMENT SITE**

## FINAL REPORT

# Using Green Infrastructure on a Duluth, MN Brownfield Site to Reduce Toxics Load to the St. Louis River Area of Concern

September 25, 2017

Reporting Period: **FINAL REPORT**

Grant Project Period: **May 8, 2014 – June 30, 2017**

Grant Recipient: **City of Duluth**

Grant Number: **14-DG-11420004-009**

Grant Award Amount: \$400,000

Local Match Amount: \$100,672

Total Project: \$500,672

Recipient Contact Person: **Heidi Timm-Bijold**

---

### Progress Achieved in Accomplishing Project Goals & Objectives

(Goals and objectives should correspond to the goals and objectives in the approved grant application).

#### Goal/Objective/Activity 1

Planned: **Eliminate 26 acres of invasives, notably buckthorn, honeysuckle, tansy.**

Status (% completed): **100%**

Actual: **Invasive species were removed from both below and above the DWP railroad grade. Over 3 seasons from 2015 to 2017, Community Action Duluth (CAD) removed invasives from land below the DWP railroad grade, mainly comprised of buckthorn, honeysuckle and tansy. Twenty acres were treated in 2015, 3 acres in 2016 and 3 acres in 2017 for a total of 26 acres.**

**Though a contract in 2017 with the City of Duluth, Boreal Natives, removed invasive species above the DWP railroad grade, mostly well established and mature buckthorn, along with honeysuckle. Final area of removed invasive vegetation above the DWP railroad grade totaled 14.79 acres.**

**Over the course of 3 seasons by CAD and Boreal Natives, a total of 40.79 acres of invasive vegetation was removed from the site, giving native vegetation, as well as newly planted seed, shrubs and trees, a better chance at establishment and long-term success.**

Difficulties Encountered/Resolution: **No difficulties encountered.**

#### Goal/Objective/Activity 2

Planned: **Planting of flood-resistant landscape that includes a high quality, diverse mixture of climate-change-hardy species to stabilize clean fill. Cap (utilizing, to the extent possible, beneficial reuse of clean dredge fines material), to restore 26 acres of urban forest and riparian habitat, and to provide shade for improved trout stream habitat. The landscaping plan calls for ripping the compacted soils and then to have material brought into the site with the most contaminated areas receiving four feet of fill and many of the other areas up to two feet. Tree planting will commence after that.**

Status (% completed): **100%**

**Actual: A diverse plant list was specified for the planting portion of this project. This list was comprised of native shrub and tree plant material to increase diversity, improve habitat, and add resiliency and help insure success of the plantings. The seed mix chosen to help cover and stabilize the soil was the MNDoT seed mix #35-241 which offers mid-term soil stabilization using native species, suitable for tallgrass aspen parklands, prairie parklands and eastern broadleaf forests.**

**CAD planted 1,500 tubling trees in 2015, 2,600 tubling trees in 2016, and 2,000 tublings, 300 #10 containerized trees, and 100 4' B&B trees in 2017 for a total of 6,500 trees below the DWP railroad grade. See Appendix 1 for plant list of 2017 plantings.**

**In 2017 the City of Duluth contracted with Boreal Natives to seed and plant the areas filled with soil. Boreal Natives planted 5,181 plants in the area above the DWP railroad grade which was cleared of invasive species. (See attached detailed plant list from Boreal Natives) Approximately 3.5 acres were planted in areas that did not require fill to be brought in. See Appendix 2 for plant list.**

**\*See Goal / Objective / Activity 3 below for completed work pertaining to capping of contaminated soils.**

**Difficulties Encountered/Resolution: Vandalism is turning out to be an issue with ATV and pedestrians taking out plantings. To date there has been over 100 trees lost due to vandalism. Signage has been put up to educate the public on the importance of the project and what it is doing for the landscape. The police department has also been made aware of this on-going problem. CAD has been putting in extra time after the grant expired to monitor the site.**

### **Goal/Objective/Activity 3**

**Planned: Cleanup of 26 acres of contaminated brownfield site, as part of the reuse of a larger 55-acre brownfield, leveraging the creation of a trail and recreational hub in an underserved community to prevent lead (Pb) and copper (Cu) contamination moving to streams and into AOC (based on average concentrations, 0.5-inch soil depth over project area).**

Status: **100%**

**Actual: 2.0 acres of contaminated lands were capped over two working seasons. In 2016, 1 acre of contaminated land was scarified to loosen the compacted soils and capped with 3.9' of clean fill from the Duluth Port Terminal. In 2017, 4 locations were filled which totaled 1.0 acres of land. The soil ripped to break up the heavily compacted former rail yard and capped with 24" of clean fill from Erie Pier and planted.**

**Difficulties Encountered/Resolution: The original plan called for 0.5" of fill over the entire site. Once a detailed design was underway it was determined that the original plan had to be modified. A good portion of the site was found to have well established vegetation, comprised of both large trees (mainly Poplar) and herbaceous species. The goal/objective/activity 3 was being fulfilled within these vegetated areas by providing soil cover and root material to reduce runoff and hold the contaminated soils in place. It seemed counterintuitive to remove healthy, established vegetation, to disturb the soil and risk contaminated runoff, only to install different plant material. Instead of that, it was determined that it would be both financially and environmentally more responsible to focus the scope of work on areas which were contaminated but not covered with vegetation due to the soil conditions. It was decided that using clean fill from dredge operations in**

the Duluth Harbor to cap the contaminated areas where vegetation was weak or not established was the best course of action. Following placement of the soil, the site was seeded and trees planted to reduce the potential of contamination of other adjacent land and down-stream waters.

### **Staff Summary:**

Thank you for the opportunity to provide summary comments in addition to reporting on our formal project goals.

A question was posed: What did I/the City learn from this grant project? Clearly, a take-away for future grantees is to not commit match that is not in-hand, especially when this program did not require a match to be provided. We submitted this application in 2013 with an eye towards an ambitious redevelopment priority that was ultimately redirected. With that went the source of much of the local match we had included in our application. The redirection of the end-use of the site, in addition to the inconsistent availability of the in-kind match (dredge material transported to the site for beneficial reuse), caused us to fall far short of the original match, which resulted in the modification of our grant agreement.

That said: this USFS-funded project is an absolute success! It has contributed to removal of a significant amount of invasive species and planting/seeding that vastly improves the ecological health of the site. Targeted contaminated areas within the site were capped to meet Minnesota Pollution Contract Agency (MPCA) environmental remediation standards to protect public health. Planting and capping also results in the stabilization of stream beds—key to the health of downstream properties and ultimately, the St. Louis River estuary. Key facts:

- Invasive species removal of 40.79 acres exceeds our original goal of 26.0 acres by 57%.
- Plantings totaling 11,681 exceeds our original goal of 7,000 by 67%.
- Overall acreage impacted by this project through invasive removal, capping and/or planting is 55 acres which exceeds our original goal of 33 acres by 67%.
- The majority of work performed under this grant project was provided by employees of the Community Action Duluth's Stream Corp program. This program is dedicated to providing employment opportunities to people who were formerly unemployed, underemployed and sometimes homeless and who use this work opportunity as a chance to gain valuable employment history for their resumes and skills to find future employment.

And finally, the DWP site is located within the study area of an ongoing EPA-funded Area-Wide Planning process. Both infill housing and recreational amenities at the DWP have surfaced as priority strategies; that has been reinforced by community input during the City's 2016/17 updating of its Comprehensive Plan which will guide future land use. The ultimate redevelopment opportunities for portions of the project site are promising—and will be enhanced by the environmental and ecological work this grant supported. The City of Duluth extends its gratitude to you for that. Signage acknowledging this grant have been placed in four locations on the site; a copy of the sign layout is attached.

---

**Appendix 1**

**Community Action Duluth Plant List**

<b>Red Pine</b>	<b>Tubling</b>	<b>500</b>
<b>Bur Oak</b>	<b>Tubling</b>	<b>500</b>
<b>Sugar Maple</b>	<b>Tubling</b>	<b>500</b>
<b>Quaking Aspen</b>	<b>Tubling</b>	<b>500</b>
<b>Red Pine</b>	<b>4' B&amp;B</b>	<b>100</b>
<b>Bur Oak</b>	<b>#10</b>	<b>100</b>
<b>Sugar Maple</b>	<b>#10</b>	<b>100</b>
<b>Quaking Aspen</b>	<b>#10</b>	<b>100</b>

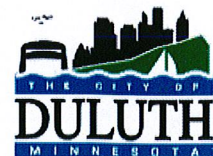
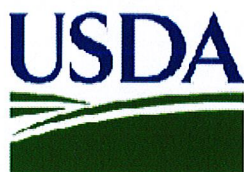
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## Appendix 2

### Boreal Natives DWP Plant List

TREE/SHRUB	SIZE	QUANTITY	LOCATION
Chokecherry	#1	250	Boreal Natives
American Plum	#1	224	Boreal Natives
American Hazelnut	#1	219	Boreal Natives
Pin Cherry	#1	146	Boreal Natives
Nannyberry	#1	219	Boreal Natives
Fireberry hawthorn	#1	55	Boreal Natives
Sandbar Willow	#1	124	Boreal Natives
Red Oesier Dogwood	#1	233	Boreal Natives
Black Chokeberry	#1	250	Boreal Natives
Mountain Ash	#1	196	Boreal Natives
Regent Serviceberry	#1	240	Boreal Natives
Staghorn Sumac	#1	254	Boreal Natives
Smooth Sumac	#1	200	Boreal Natives
Tamarack	#10	20	Boreal Natives
White Spruce	APB35	85	Boreal Natives
Balsam Fir	D38	85	Boreal Natives
White Pine	D38	165	Boreal Natives
Red Pine	APB35	175	Boreal Natives
Tamarack	D38	71	Boreal Natives
White Cedar	D38	120	Boreal Natives
Red Oak	4"	290	Boreal Natives
Bur Oak	APB	275	Boreal Natives
Basswood	D38	100	Boreal Natives
Wild Black Cherry	4"	13	Boreal Natives
Pin Cherry	D38	27	Boreal Natives
Hackberry	D38	150	Boreal Natives
Paper Birch	D38	95	Boreal Natives
Yellow Birch	Styro 77	95	Boreal Natives
Quaking Aspen	D38	130	Boreal Natives
Bigtooth Aspen	D38	40	Boreal Natives
Red Maple	D38	45	Boreal Natives
Jack Pin	Styro 77	125	Boreal Natives
Red Pine	#10	30	Out Back Nursery
Northern White Cedar	#10	20	Out Back Nursery
Jack Pine	#7	45	Out Back Nursery
Northern Pin Oak	#10	45	Out Back Nursery
Bur Oak	#10	45	Out Back Nursery
Red Maple	#10	10	Out Back Nursery
Wild Black Cherry	#7	10	Out Back Nursery
Hackberry	#7	20	Out Back Nursery
Paper Birch	#10	20	Out Back Nursery
Yellow Birch	#10	20	Out Back Nursery
Quaking Aspen	#15	50	Out Back Nursery
White Pine	#10	30	Bachman's
Balsam Fir	#10	20	Bachman's

Funding for the restoration of this site was provided by the Urban and Community Forestry Program of the U.S. Forest Service, Department of Agriculture to the City of Duluth through the Great Lakes Restoration Initiative project “Using Green Infrastructure on a Duluth, MN Brownfield Site to Reduce Toxics Load to the St. Louis River Area of Concern”.



The USDA is an equal opportunity provider.

**APPENDIX I – 2025 Duluth Comprehensive Housing Needs Analysis Executive Summary  
CITY OF DULUTH**

**RFP# 26-AA14 DWP REDEVELOPMENT SITE**

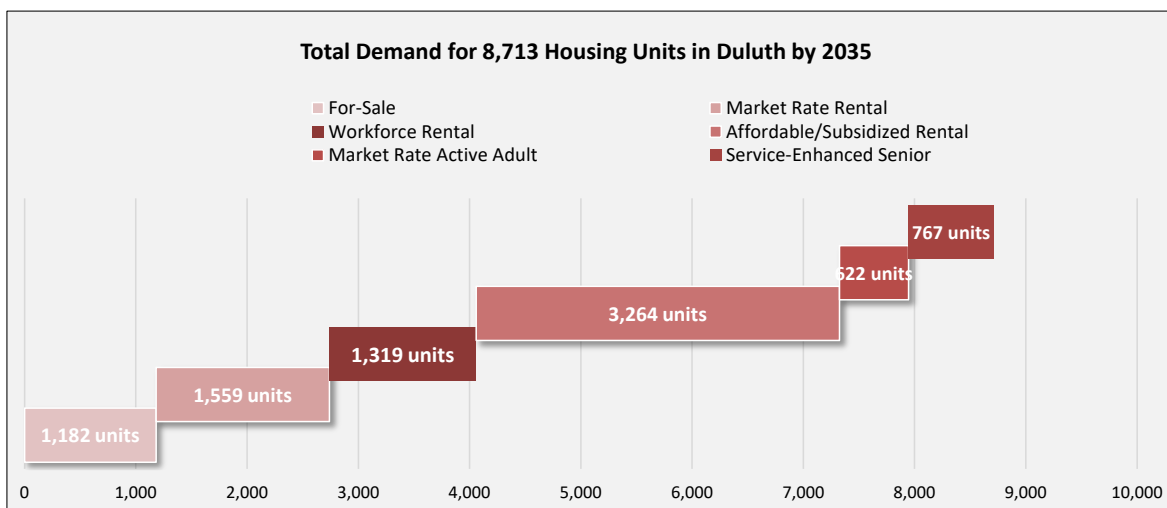
### Purpose and Scope of Study

Maxfield Research and Consulting was engaged by the City of Duluth to prepare a Housing Needs Analysis for the City. The analysis provides recommendations on the amount and types of housing that may be developed to meet the needs of current and future households in the community.

The scope of this study includes an analysis of the demographic and economic characteristics of Duluth and the surrounding Primary Market Area (PMA), a review of existing housing stock characteristics and market analyses covering the for-sale, rental and senior housing markets. Additionally, the study includes an assessment of housing affordability in the area. Detailed housing demand calculations to 2035 and development concept recommendations are provided for the community. The study concludes with an evaluation of challenges and opportunities associated with housing development in Duluth.

### Key Findings

- Demand for nearly all housing product segments was found in Duluth, but there are specific product types that have been identified as being in high demand and should be considered for development priority; moderately priced housing, ownership and rental, targeted to the area’s workforce and housing alternatives targeted to older adults and seniors (townhomes, twin homes) are two of the most pressing needs in Duluth. Demand is also strong for affordable and subsidized housing.
- An estimated 38% of the demand will be for affordable and subsidized rental housing (general occupancy and senior), while 14% will be for for-sale (single-family and owned multi-family). An estimated 18% is for market rate rental; 15% is for workforce rental, 7% is for market rate active adult and 9% is for service-enhanced housing (independent living, assisted living, memory care).



- Much of the projected demand may not be satisfied, particularly senior housing as many seniors prefer to age in place instead of moving to alternative housing. Additionally, funding availability for affordable and subsidized housing is limited and financial programs are extremely competitive for these units, which increases the challenges for developing sufficient new housing to meet the projected demand.

## Demographic Analysis

- As of the 2020 Census, Duluth had 86,697 people and 37,104 households. Between 2010 and 2020, Duluth's population increased 0.5%, adding 435 people, while the household base expanded 3.9% (1,400 households). We estimate that Duluth has experienced solid growth since the COVID-19 pandemic, adding 1,303 people (1.5% growth) and 796 households (2.1% growth) between 2020 and 2025.
- Duluth's population is projected to increase 1.5%, adding 1,300 people between 2025 and 2030, while the household base expands 2.6% (1,000). Duluth is expected to add another 1,200 people (1.3% growth) and 980 households (2.5% growth) between 2030 and 2035.
- Achieving any population and household growth in Duluth will be highly dependent on the availability of suitable housing options in the community catering to a variety of household types, age groups, and income levels. Growth will also be impacted by increased, or decreased, hiring at area employers.
- In 2025, the largest adult cohorts by age in Duluth are 25 to 34 and 35 to 44, totaling an estimated 13,027 people (14.8% of the population) and 11,219 people (12.7%), respectively. By 2035, the largest age group is expected to remain the 24 to 34 age cohort, representing 14.2% of the total population.
- Notable population shifts projected for Duluth between 2025 and 2035 include significant growth in the 75+ age group, and solid growth among the 35 to 44 and 45 to 54 age groups and contractions for other adult age groups.
- In 2025, Duluth's median household income is estimated to be \$66,428, an estimated 30% lower than Minnesota (\$86,801). The projected average annual median household income growth of 2.6% in Duluth between 2025 and 2030 is slightly less than the historic annual inflation rate of 2.7% over the past ten years.
- In Duluth, 58.3% of all households own in 2025, giving it a homeownership rate that is lower than St. Louis County (81.1%) and Minnesota (70.0%). The total number of renter households residing in Duluth grew by an estimated 2,080 households between 2010 and 2025 (14.7%) while owner households expanded by 5.2% (1,115).

- In Duluth, households living alone are estimated to be the most common household type (37% of all households) in 2025, followed by married couple households without children (23%).
- Between 2010 and 2025, family households experienced slight contraction in Duluth, declining by an estimated -139 households (-0.7%). The number of non-family households increased 13.7%, adding 2,334 households, including 11.7% growth among households living alone (1,467 households).

## Employment Analysis

- Duluth and St. Louis County have historically maintained annual unemployment rates that have tracked consistently with Minnesota and the US and generally below equilibrium (generally considered to be 5.0%). The 2024 average annual unemployment rates of 1.9% in Duluth, 3.5% in St. Louis County, and 3.2% in Minnesota shows Duluth at a very low rate compared to historical values.
- The Market Area experienced a solid recovery of jobs post-COVID, and the area is expected to sustain strong employment growth over the next ten years. St. Louis County is projected to add 13,507 jobs between 2024 and 2035 (14.1% growth), including 16.4% growth in Duluth (9,213 jobs), compared to 13.7% growth in the Northeast Region. Labor availability will greatly impact the ability of Duluth to sustain employment levels and achieve the projected job growth. New housing is needed to support economic development in the area.
- An estimated 36,261 workers commute into Duluth for employment daily (inflow), while 13,769 resident workers leave the community (outflow). An estimated 33,600 people both live and work in the City (interior flow).
- Overall, Duluth is an importer of workers as a higher number of nonresidents commute into the City for employment than resident workers commute out. With 36,261 workers commuting into the City for employment daily, 28.4% commuting more than 50 miles away, there is an opportunity to provide housing options for a portion of this workforce.
- A household earning the 2024 average weekly wage in Duluth (\$1,157) would be able to afford an apartment renting for \$1,504 per month to not exceed 30% of its monthly income on housing costs, slightly less than the average rent for market rate rental housing units in the community (\$1,587).
- Assuming that a potential home buyer has good credit and makes a 10% down payment, a household would need a minimum annual income of \$87,600 to be able to afford a single-family home sold at the 2024 median resale price of \$292,000 in Duluth. The median

household income in Duluth as of 2025 is estimated at \$66,428. The average weekly wage in Duluth as of 2<sup>nd</sup> Quarter 2024 equates to an annual income of \$60,164.

- The data indicates that rental housing in Duluth is relatively affordable proportionate to wages, but much of the for-sale housing would not be affordable for many workers.

### **Housing Characteristics**

- There are an estimated 40,530 housing units in Duluth, 96% of which are occupied (38,900). Unoccupied units may be vacant for several reasons or may be under construction and have not yet received a certificate of occupancy.
- Compared to the First-tier cities/townships and St. Louis County, Duluth has notably higher proportions of units in multifamily structures with 10 to 49 units and 50 or more units, as well as mobile homes.
- An estimated 43% of the housing units in Duluth were built prior to 1940, higher than the First-tier cities/townships (14%) and St. Louis County (29%). The 1950s through the 1980s were the most active decades in Duluth for housing unit production. An estimated 30% of Duluth's housing stock was built from 1950 through 1979 (12,287 units).
- From 2018 through 2024, 1,878 new housing units were permitted in the City of Duluth and 268 units were removed for a net increase of 1,610 for an average of 230 new units per year, including 42 new detached single-family units, 6 townhomes and 164 multifamily units per year. During this period, Duluth issued Certificates of Occupancy for 1,484 units after accounting for units demolished.
- Despite a lack of land available for new single-family construction, the pace of construction for new detached single-family homes increased during the period from 2018 through 2024. The highest number of permits issued for new single-family homes was in 2022 with 72 new units. Townhome development had slowed to zero in 2021 and 2022, although four units were constructed in 2023 and two in 2024, despite demand in this segment. Multifamily production fluctuated but remained strong with 346 units permitted in 2023 and 116 permitted in 2024.

### **For-Sale Housing Market Analysis**

- Increased competition for homes (as indicated by the decreasing supply of available housing and extremely short marketing times) has caused significant price appreciation in recent years.

- In Duluth, the median price for detached single-family homes increased 58.7%, climbing from \$184,000 in 2018 to \$292,000 in 2024, averaging a 6.8% increase annually. Median multifamily (townhomes, twin homes, condominiums) resale prices increased 43.4% from \$265,000 in 2018 to \$380,000 in 2024 (5.3% average annual increase).
- Detached single-family homes comprised 95% of all closed resales in Duluth since 2018 and the remaining 5% were multifamily (townhome, twin home, condominium) units.
- New construction detached single-family homes have a median price of \$529,450 in Duluth and \$531,000 in St. Louis County, most of which are in Duluth and Hermantown. New construction multifamily units have a median price of \$495,000 in Duluth. All these units are in Duluth.
- Based on the supply of available for-sale housing in Duluth as of January 2025, there is a 1.6-month supply of homes available for sale on the market, compared to 2.4 months for the Lake Superior Area Realtors (LSAR) Region (Minnesota side).
  - Equilibrium in the for-sale housing market is generally considered to be a six-month supply, although markets throughout Minnesota have not seen a balanced supply for for-sale homes on the market for more than eight years, demonstrating pent-up demand for new for-sale homes in Duluth.
- As of February 2025, there were 49 residential lots listed for sale on the MLS in the PMA. Actively-marketing lots have a median list price of \$4.06 psf (\$135,000) with a median lot size of (0.70 acres). The average lot price is \$167,876 with lot size of 1.45 acres.

## Rental Housing Market Analysis

- Nationally, the equilibrium vacancy rate for market rate rental housing is considered as 5.0%, which allows for normal turnover and an adequate supply of alternatives for prospective renters.
  - Based on the survey of general occupancy rental buildings (apartments and single-family homes) in Duluth, we found that the existing stabilized market rate rental properties are 1.8% vacant, while the affordable properties are 1.1% vacant. Many affordable and subsidized properties have wait lists. The data indicates that there is pent-up demand for rental housing in Duluth.
- We identified 393 units pending in five projects, including 303 market rate units and 90 affordable units affordable and subsidized units. Among the pending projects, 250 units are under construction and 143 units are planned but not fully approved.

- The average monthly rental rate across all market rate general occupancy properties is \$1,587 (\$1.88 per square foot) with a median rental rate of \$1,443 (\$1.71 per square foot). There is a notable difference in rents between older and newer properties, as the five newest properties (opened in the past three years) have an average rent of \$1,792, 13% higher than the average rent among all properties.

### Senior Housing Market Analysis

- Strong growth is occurring among seniors in the PMA. Aging of baby boomers led to a 26% increase in the age 75 to 79 population between 2020 and 2025 (844 people). As this group ages, the 75 and older age group is expected to expand 24% by 2035, adding 2,198 people.
- Maxfield Research identified a total of 40 senior housing facilities in the PMA, totaling 2,630 units, including 35 in Duluth, two properties in Hermantown and three in Proctor. In total, there are 124 market rate active adult rental units, 273 active adult ownership units, 965 affordable and subsidized rental units and 1,268 service-enhanced units. Among the service-enhanced facilities, an estimated 516 units are independent living, 613 are assisted living units and 139 are memory care units.
- At the time of the survey, affordable and subsidized rental properties in Duluth were 4.1% vacant, while the market rate active adult property was fully occupied. Many of these facilities maintain lengthy wait lists. The below-equilibrium vacancy rate, coupled with extensive wait lists, suggests that there is pent-up demand for affordable/subsidized and market rate active adult senior rental housing in Duluth.
- Service-enhanced facilities had an overall vacancy rate of 3.9% which is below the market equilibrium rates of 5% for independent living and 7.0% vacancy for assisted living and memory care. There is pent-up demand for independent living (1.9% vacancy rate) and more limited pent-up demand for assisted living and memory care facilities (5.9% and 5.8% vacancy rates, respectively). We identified demand for additional service-enriched housing in Duluth although different service levels have varying levels of demand.
- Maxfield Research finds that many assisted living facilities in Minnesota, and the Midwest, have experienced elevated vacancy rates since the COVID-19 pandemic. Vacancy rates have moderated in Duluth since the pandemic although labor challenges for these types of facilities continue to impact the ability to service existing units in addition to considering new development.

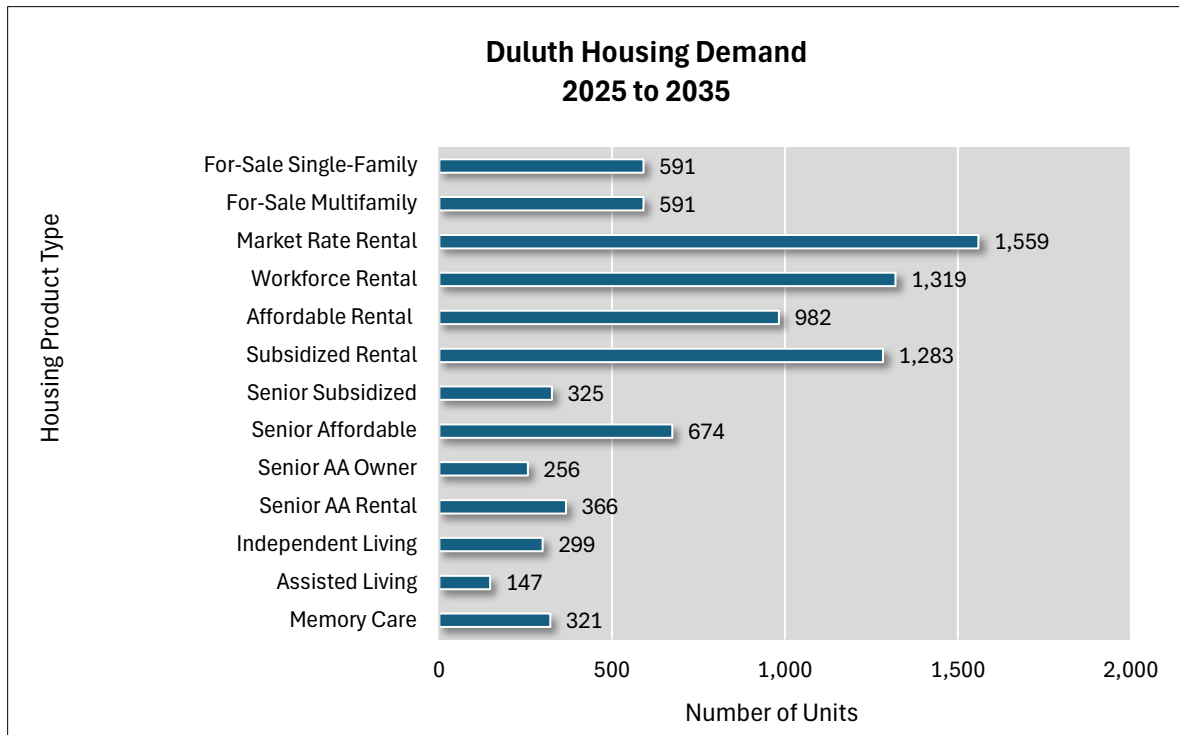
## Housing Affordability

- As of February 2025, the Duluth Housing and Redevelopment Authority (HRA) has 1,309 Housing Choice Vouchers in use with 3,098 applicants on the wait list. The estimated time to obtain an HCV is 20 to 23 months. Sixty-eight vouchers have been issued but the prospect has not yet found a unit.
- An estimated 31% of all households in Duluth are considered cost-burdened (paying more than 30% of their income for housing costs), including 19% of owner households and 53% of renter households. By comparison, 20% of owner households and 53% of renter households are cost burdened in the First-tier cities/townships.
- An estimated 29% of renter households in Duluth are severely cost-burdened (paying 50% or more of their income toward housing), higher than the 16% in the First-tier cities/townships. For owner households in Duluth with incomes of less than \$50,000, 58% are cost-burdened. For renter households with incomes less than \$35,000, 77% are cost-burdened.
- Based on current home prices, 52% of all households in the PMA could afford to purchase an entry-level detached single-family home priced at \$180,000. That proportion drops to 30% that could afford a move-up detached single-family home priced at \$300,000.
- An estimated 48% of renter householders could afford to rent a studio or one-bedroom unit at older market rate rental properties in the community at an average rent of \$950 per month. The income-qualified percent drops to 30% that could afford monthly rents for a new construction one-bedroom unit priced at \$1,500 per month.

## Housing Demand Analysis

- As summarized in the following figure, we find demand for 6,325 general occupancy (not age-restricted) housing units in Duluth from 2025 to 2035, including 1,182 for-sale units and 5,143 rental units. Demand is identified for 679 for-sale units and 3,085 rental units from 2025 to 2035.
- We also estimate demand for 1,437 housing units targeting older adults and seniors in Duluth in 2025, increasing to 2,388 units by 2035.
- As of February 2025, there were 49 existing vacant lots listed for sale on the MLS and located in the PMA. Based on the for-sale housing demand calculations, the existing lot supply is insufficient to support demand. In-fill lots may be utilized in Duluth to create areas for additional for-sale homes in addition to redevelopment sites but even utilizing in-fill and redevelopment sites are not expected to be able to provide enough land to meet demand.

<b>HOUSING DEMAND SUMMARY</b>			
<b>CITY OF DULUTH</b>			
<b>2025 to 2035 (March 2025)</b>			
<b>General Occupancy Housing Demand 2025 to 2035</b>			
	<b>2025 to 2030</b>	<b>2030 to 2035</b>	<b>2025 to 2035</b>
<b>For-Sale Units</b>	679	503	1,182
Detached Single-Family Units	325	266	591
Other/Multifamily Units*	354	237	591
<b>General Occupancy Rental Units</b>	<b>3,085</b>	<b>2,058</b>	<b>5,143</b>
Market Rate	935	624	1,559
Workforce^	791	528	1,319
Affordable^	589	393	982
Subsidized^	770	513	1,283
<b>Total General Occupancy Housing Units</b>	<b>3,764</b>	<b>2,561</b>	<b>6,325</b>
<b>Senior Housing Demand</b>			
	<b>2025</b>	<b>2030</b>	<b>2035</b>
<b>Market Rate Active Adult</b>	<b>438</b>	<b>799</b>	<b>622</b>
Ownership Units	164	344	256
Rental Units	274	455	366
<b>Affordable &amp; Subsidized Senior Housing^</b>	<b>573</b>	<b>735</b>	<b>999</b>
Subsidized Units	105	180	325
Affordable Units	468	555	674
<b>Service-Enhanced Senior Housing</b>	<b>426</b>	<b>894</b>	<b>767</b>
Independent Living (IL)	127	426	299
Assisted Living (AL)	50	141	147
Memory Care (MC)	249	327	321
<b>Total Senior Housing Units</b>	<b>1,437</b>	<b>2,428</b>	<b>2,388</b>
*Includes twin homes, townhomes, condominiums			
^Workforce = affordable to households between 60% and 100% of AMI			
^Affordable = affordable to households at 50% to 60% AMI but incl some lower income HHS			
^Subsidized = affordable to households at 50% AMI or less			
Totals may not add due to rounding			
Note: Sr. Demand is cumulative, meaning that units developed would be subtracted from excess demand for the upcoming period			
Source: Maxfield Research & Consulting			



**Recommendations**

- The following table summarizes a potential pricing breakdown for new construction for-sale housing units in Duluth, including “entry-level”, “move-up”, and “executive” housing for the short-term (2025 to 2030).

NEW CONSTRUCTION FOR-SALE HOUSING PRICING RECOMMENDATIONS			
CITY OF DULUTH			
2025 to 2030 (March 2025)			
	Purchase Price*	Pct.	Units
<b>Detached Single-Family</b>			
Entry-level	Less than \$300,000	30%	98
Move-up	\$350,000 to \$450,000	60%	195
Executive/Luxury	\$600,000+	10%	33
<b>Detached Single-Family Total:</b>		<b>100%</b>	<b>325</b>
<b>Townhome/Twin Home</b>			
Entry-level	Less than \$300,000	50%	177
Move-up	\$350,000 to \$600,000	50%	177
<b>Townhome/Twin Home Total:</b>		<b>100%</b>	<b>354</b>
*Pricing is in 2025 dollars and can be adjusted to account for inflation.			
Source: Maxfield Research & Consulting			

- Based on current local real estate market conditions in Duluth, we consider new construction detached single-family homes priced below \$300,000 to be entry-level housing, while move-up new construction detached single-family homes would likely be priced in the \$350,000 to \$450,000 range. Pricing for a move-up townhome or twin home unit would likely begin at approximately \$300,000.
- We anticipate that 65% of the new detached single-family units (195 units) will target move-up buyers and recommend that 30% (98) be priced for less than \$300,000 to target moderate income buyers (entry-level). A limited percentage (10%) would be priced for the executive/luxury market.
  - A household would need to have a minimum income of \$97,261 to afford a home purchased at \$300,000, which falls within the upper range considered to be “moderate-income” (i.e. \$85,400 at 100% AMI to \$102,480 at 120% AMI for a two-person household).
- We anticipate that 50% of the new construction townhome/twin home units (177) will target move-up buyers and/or empty nesters and recommend that 50% (177 units) should be priced below \$300,000 to target moderate income buyers.
- The development of any new for-sale housing products in Duluth priced to target moderate income buyers will likely require a public-private partnership or alternative development concept (i.e. community land trust, affordable housing cooperative).
- Entry-level home demand is currently not being satisfied through the turnover of the existing supply of older single-family homes in Duluth. Many of the older single-family homes have been purchased by investors and converted to rentals, essentially shifting these homes from a residential to commercial market value. Increased development of townhomes and twin homes will also help to free up some homes for entry level buyers.
- In addition to demand for owned housing products, we find strong demand for additional general occupancy rental housing options in Duluth.
- Below-equilibrium vacancies at the existing market rate, affordable and subsidized rental properties suggest pent-up demand for new rental housing in the community.
- The following figure provides a summary of the recommended rental housing by product type, including monthly rent ranges, development timing, and target markets.

GENERAL OCCUPANCY RENTAL HOUSING RECOMMENDATIONS (Short-Term)					
CITY OF DULUTH					
2025 - 2030 (March 2025)					
		Monthly Rent Range <sup>1</sup>		No. of Units	Development Timing
<b>Market Rate &amp; Workforce Rental</b>					
Apartments	Studio	\$1,100 - \$1,800	2BR	600 - 800	2025+
Townhomes	2BR	\$1,850 - \$2,800	3BR	200 - 250	2025+
Target Markets: An apartment building would likely attract younger workforce renters, lifestyle renters, older adults, and seniors. Rental townhomes would target young family households, empty-nesters, and seniors.					
<b>Affordable Rental<sup>2</sup></b>					
Apartments	Studio	\$930 - \$1,440	2BR	300 - 350	2025+
Townhomes	2BR	\$1,500 - \$1,850	3BR	80 - 100	2025+
Target Markets: We recommend developments targeting households between 40% to 60% AMI, likely comprised of singles, single-parent households, older adults and seniors.					
<sup>1</sup> Pricing in 2025 dollars and can be adjusted to account for inflation.					
<sup>2</sup> Affordability subject to income guidelines; recommended rent ranges based on max rents at 50% and 60% AMI					
Note - Recommended development concepts do not directly equal total demand.					
Source: Maxfield Research & Consulting					

- Based on housing needs identified in the community and based on the demographic analysis, many workers need moderately priced housing (i.e. young teachers, mid-level health care workers and manufacturing workers) who earn between \$21.00 to \$25.00 per hour, which equates to \$44,000 to \$52,000 per year. We recommend the development of market rate workforce rental housing with rent limits set to target households earning from 60% to 80% of AMI and from between 80% to 100% of AMI. These thresholds fill gaps in the moderate-income and upper moderate-income levels for workforce housing
  - (60% to 80%; incomes between \$42,300 (1pp HH) and \$80,480 (4pp HH)
  - (80% to 100%; incomes between \$56,400 (1pp HH) and \$100,600 (4pp HH)
- The growing older adult and senior population will support long-term demand for senior housing units in Duluth to 2035 and beyond. Demand exists for a variety of senior housing products, but needs should be prioritized toward for-sale market rate active adult and independent senior housing in addition to affordable rental active adult housing. These will provide housing options in the short term for those that are seeking to relocate to alternate housing products.

- The development of new senior housing will satisfy housing needs in Duluth by increasing the number of options for older adult and senior residents that want to relocate to new age-restricted housing. Additionally, the development of housing alternatives for seniors will stimulate the turnover of existing homes and rental units occupied by seniors, creating more opportunities for general occupancy buyers and renters.
- **We estimate that the development of senior housing could generate the availability of at least a ratio of 0.5:1 more affordable for-sale units from seniors selling older single-family homes to move into age-restricted housing.**
- The following table summarizes a recommended mix of senior housing units by service level including product type, pricing, project size, and development timing.

RECOMMENDED SENIOR HOUSING DEVELOPMENT (Short-Term)				
CITY OF DULUTH				
2025 to 2030 (March 2025)				
	Pricing Range <sup>1</sup>	No. of Units	Development Timing	
<b>Age Restrictd Senior Housing</b>				
<b>Active Adult For-Sale Housing</b>				
Market Rate Cooperative <sup>2</sup>	\$110,000/1BR+D - \$250,000/2BR/2BR+	100 - 150	2025+	
Market Rate Townhome/Twinhomes	\$350,000 2BR - \$550,000 3BR	80 - 100	2025+	
<b>Active Adult Rental Housing</b>				
Affordable <sup>2,3</sup>	\$900/1BR - \$1,240/2BR	100 - 120	2026+	
<b>Market Rate Service-Enhanced Senior Housing</b>				
Independent Living	\$2,500/1BR - \$4,000/2BR	100 - 120	2025+	
Assisted Living	\$3,200/Studio - \$5,000/2BR	36 - 48	2028+	
Memory Care <sup>4</sup>	\$4,500/Studio - \$6,000/1BR	36 - 48	2025+	
<sup>1</sup> Pricing in 2025 dollars. Pricing can be adjusted to account for inflation. <sup>2</sup> Alternative concept is to combine affordable and market rate active adult into mixed-income building. <sup>3</sup> Affordability subject to income guidelines; rates based on max rents at 50% AMI <sup>4</sup> Memory care housing could be a component of an assisted-living or service-intensive building. Note - Unit amounts reflect recommended size of property that for a single project, but do not equal total calculated long-term demand				

Because of the large size of the Baby Boom population, there will be demand for housing products targeted to this group well beyond 2035.

**APPENDIX J – Imagine Duluth 2035 Comprehensive Land Use Plan Executive Summary  
CITY OF DULUTH**

**RFP# 26-AA14 DWP REDEVELOPMENT SITE**



# EXECUTIVE SUMMARY

Imagine a city of vibrant, people-centered neighborhoods – connected by good streets, convenient bus routes, and safe bike lanes – from Fond-du-Lac to the Lester River, up and down the hillside.

Imagine neighborhood places where people can gather to build community. Local places you can go to shop, garden, play with the kids in a park, or simply enjoy time with friends.

Imagine walking to a local coffee shop, a pub, or playground, biking across town to the lakeshore, or taking a bus to work or to a local trail to enjoy a ski, take a walk, or run.

Imagine hundreds of new college graduates connected to local jobs, able to make Duluth their home and raise their families.

Imagine Duluth as a city where housing is affordable, safe, and available to people of all incomes across all neighborhoods.

Imagine a thriving economy with products produced by local businesses, connected to the rest of the country and the world through modern, efficient air, water, and rail transportation.

Imagine Duluth known throughout the state and across the country as a sustainable, prosperous, innovative, and green city, recognized for its thriving urban gardens and locally grown food.

Imagine Duluth's brand as the go-to destination place to enjoy a weekend or week, exploring well-maintained parks and trails, or simply relaxing in the ambience of its history and locally grown culture and talent.

Imagine a city that balances economic growth with its ecology, history, and culture – whose starting values are that no neighborhood is disposable, cities should serve people, and green space has intrinsic value.

Imagine a more connected, more resilient, more accessible, more sustainable, fairer, and healthier Duluth.

Imagine Duluth 2035.





## DULUTH TODAY – AT A GLANCE

### Population and Demographics

86,164 residents

88.6% white

Life expectancy – Chester Park/Congdon = 84.7 years;

Lincoln Park = 73.4 years

### Economy and Jobs

Median household income: \$45,900

Poverty rate: 21%

45,086 people work in the city – top three industries:

Healthcare, Retail Trade, and Education Services

6.7 million tourists annually

47% of land and buildings within city limits is non-taxable

### Public Infrastructure

42 streams and 128 parks

178 miles of trails

450 miles of roads

403 miles of sidewalks

### Housing

38,146 housing units – 40% rental/60% home owners

Half of Duluth's homes are older than 75 years

Median property value: \$148,900

### Education

5,300 university degrees granted each year – UMD,

St. Scholastica, and Lake Superior College

### Transportation

12% of residents have no car

2.8 million annual bus ridership

255,000 air passengers

1,100 lake-carrier and oceangoing ship visits with 38 million metric tons of cargo annually

\$1,000 per lineal foot to build or reconstruct a standard 24 foot-wide, curb and gutter city street

Big, transformational visions have shaped Duluth throughout its history. In 1889 William Rodgers first imagined Duluth's many streams connected by a boulevard winding along the city's bluff. Mayor Snively championed Skyline Parkway and envisioned parks centering residential neighborhoods. Modern streetcars gave birth to Duluth's suburban neighborhoods strung across 26 miles of hillside. Canal Park and the Lakewalk transformed century-old industrial scrapyards and decaying buildings into Duluth's tourist center and one of the city's most used and prized public attractions.

Imagine Duluth 2035 is no less transformational. But unlike previous big ideas, this one didn't come from a singular visionary leader or city planner, but from the collective dreams and ideas of thousands of Duluth residents gathered through an intensive, year-and-a-half long community engagement process. Imagine Duluth 2035 puts people and natural places at its center and shifts away from the auto- and industry-centric development of the past.

Imagine Duluth 2035 balances livability with what it takes to live. It starts with what people love about Duluth – the beauty of Lake Superior, abundant parks, trails and outdoor opportunities, clean air and water, and a deep attachment to place. It connects these with what people need to stay and thrive in Duluth – good paying jobs, affordable housing, good streets as well as diverse transportation options. It deepens a commitment to protect the quiet places that make Duluth unique and emphasizes and focuses more residential, commercial, and craft industrial activities in core investment areas.

Imagine Duluth 2035 connects where people live, work, and play in a vision of vibrant, walkable, neighborhood centers and a thriving downtown, all with diverse housing options and served by modern streets, good sidewalks, efficient utilities, and transit. It positions Duluth to thrive in a future of energy and climate transformation. It

balances preservation and stewardship with growth and development, and it reflects a resilient, forward-looking city that both builds on tradition and welcomes innovation and new approaches. It is grounded in collaborative community partnerships.

Imagine Duluth 2035 addresses our hardest challenges and barriers:

- Persistent inequality
- Significant amount of non-taxable land and buildings
- Challenging geography, geology, and weather
- Aging infrastructure – housing, sewer and water, streets, and public buildings
- Lack of density for efficient transportation and utilities
- A big hill

Imagine Duluth 2035 is more than a land use plan or simple road map for future development. It envisions a wholistic, engaged, inclusive community with all its complexity and diversity. It builds on the hard work and planning from the past 15 years – 2001 and Beyond, the 2006 Comprehensive Land Use Plan, and numerous Small Area and Neighborhood Strategic Plans. Imagine Duluth 2035 unites, amplifies, focuses, and builds on these previous efforts. It connects big ideas like year-round indoor public spaces, aerial gondolas, tree-lined pedestrian friendly boulevards, and a city flag update, with the prosaic details of good city planning: street width and maintenance schedules, building codes, efficient infrastructure, clear signage, water flow and retention, and energy efficiency incentives, to name but a few. All of these issues are viewed through the lenses of health, fairness, sustainability, and accessibility for everyone – for Duluth will only move forward if we move forward together.

Imagine Duluth 2035 puts people and natural places at its center, and shifts away from the auto- and industry-centric development of the past.





The bulk of Imagine Duluth 2035 is structured around five topics – Economic Development, Energy and Conservation, Housing, Open Space, and Transportation. Each topic’s chapter lays out a mission, and the key policies and strategies for achieving that mission. In addition to these five areas, Imagine Duluth 2035 lays out a vision for land use and includes chapters identifying both General Opportunities (ideas that cut across multiple content areas) and Transformational Opportunities (big ideas that represent stand-alone actions, even if their unifying elements may cross issue areas). These five issue areas and transformational opportunities are summarized below.

## Economic Development

**Mission:** Duluth’s economic environment will advance the success and health of our community by promoting growth through an expanded tax base and the creation of new jobs and innovative ideas.

### KEY POLICIES:

Policy #1— Invest in people to increase employees’ skills, ensure workforce availability for employers, and promote income self-sufficiency

Policy #2—Foster growth of existing employers and strategically recruit new employers to Duluth

Policy #3—Build on existing economic strengths and competitive advantages

Policy #4— Embrace the outdoors as an economic engine and source of community wealth

Policy #5— Effectively coordinate marketing, communication, and the city’s image



## Energy and Conservation

**Mission:** Duluth will invest in a healthier, more resilient community by using energy more efficiently and reducing greenhouse gas emissions.

### KEY POLICIES:

Policy #1 – Increase community involvement in decisions about energy and infrastructure investments

Policy #2 – Provide incentives for developers to encourage green buildings and renewable energy use in new residential and commercial buildings

Policy #3 – Incentivize commercial, anchor institution, and large residential building/ facility owners to reduce energy use and increase energy efficiency in existing buildings/facilities and community gathering spaces

Policy #4 – Incentivize households and landlords to reduce energy use and increase residential energy efficiency

Policy #5 – Encourage community-wide investment in appropriate local renewable energy sources, including solar, wind, and biomass

Policy #6 – Adopt energy efficiency and energy saving targets for City owned facilities and City operations

Policy #7 – Increase efficiency of utilities and services



## Housing

**Mission:** Housing in Duluth will promote the essential character of its neighborhoods while providing desired, safe, clean, and equitable living space for all members of the community.

### KEY POLICIES:

Policy #1 – Increase density in and around the designated Core Investment Areas

Policy #2 – Provide affordable, attainable housing opportunities

Policy #3 – Prioritize inclusive housing policies to reflect the city’s social, cultural, economic, and historic diversity and development patterns

Policy #4 – Improve the quality of the city’s housing stock and neighborhoods

Policy #5 – Expand the cohesiveness of “One Duluth” by expanding a variety of housing opportunities throughout the city while maintaining unique community characteristics within distinct individual neighborhoods



## Open Space

**Mission:** Duluth will strive for a sustainable open space system that enriches the lives of all Duluthians. These open spaces will reflect the community's ecological, historic, cultural, and recreational values, and will contribute to the community's resilience to natural disasters.

### KEY POLICIES:

Policy #1 – Improve Duluth's resiliency to flooding and natural disasters

Policy #2 – Examine the value and need for all of Duluth's publicly owned open space

Policy #3 – Remove barriers to accessing parks and open space

Policy #4 – Improve the delivery of parks and open space services to the community

Policy #5 – Encourage urban food growth

## Transportation

**Mission:** Duluth's transportation system will connect all users in a way that promotes safety, health, and quality of life.

### KEY POLICIES:

Policy #1 – Improve street conditions to function better for everyone

Policy #2 – Reduce infrastructure costs through innovation and wholesale design change

Policy #3 – Add to the transportation network by systematically enhancing multi-modal options

Policy #4 – Improve system condition and connections in and between downtown and Canal Park

Policy #5 – Base decisions about transportation infrastructure primarily in the context of improving city and neighborhood vitality, and not solely on automobile through-put

Policy #6 – Protect and enhance regional transportation networks, especially for purposes of expanding opportunities for movement of freight

## Transformational Opportunities

Not all of these transformational opportunities can be pursued, but the Imagine Duluth 2035 process captured these big ideas as a way of sparking continuing discussion, imagining, and planning.

- Identify and invest in 12 Core Investment Areas (CIAs)
- Carry out previously identified downtown plans and investments
- Develop a year-round indoor public space
- Increase uphill connectivity through a n aerial gondola or incline railway
- Identify redevelopment opportunity to create a public market and indoor space
- Limit development in Tier 3 Greenbelt Areas and create an Urban Services Boundary
- Update and modernize Duluth's city flag
- Prioritize key viewsheds – Views of the lake, the estuary, the hill, or landmarks
- Preserve and expand economic opportunities within Duluth's industrial waterfront





**APPENDIX K – Sample Form of Purchase and Development Agreement  
CITY OF DULUTH**

**RFP# 26-AA14 DWP REDEVELOPMENT SITE**

## PURCHASE AGREEMENT

THIS PURCHASE AGREEMENT (this “**Agreement**”) is made as of \_\_\_\_\_, 2025 (“**Effective Date**”), by and between DULUTH ECONOMIC DEVELOPMENT AUTHORITY, a public body, corporate and politic and political subdivision under the laws of the State of Minnesota (“**Seller**”) and [BUYER], a Minnesota [ENTITY TYPE] (“**Buyer**”).

### RECITALS

A. DEDA is the current owner of real property in Duluth, St. Louis County, Minnesota, legally described on the attached **Exhibit A** (the “**Real Property**”);

B. Buyer wishes to obtain title to the Property (defined below) for economic development purposes and is desirous of acquiring the Property for the development of [DEVELOPMENT PROJECT DESCRIPTION]; and the Seller is desirous of Buyer doing so; and

C. DEDA has the power to sell and convey property owned by it if it determines that the sale and conveyance are in the best interest of the City of Duluth (“**City**”) and its people, and that the transaction furthers its general plan of economic development, and the closing of this transaction is conditioned upon DEDA making such findings.

NOW, THEREFORE, in consideration of the mutual covenants and conditions set forth in this Agreement, and other good and valuable consideration, the receipt, sufficiency and mutuality of which are acknowledged, Buyer and Seller agree as follows:

1.0 Property to Be Purchased. Subject to Buyer’s compliance with the terms and conditions of this Agreement, Seller shall sell the Property to Buyer on the terms and conditions set forth in this Agreement. Buyer shall purchase from Seller the following (collectively, the “**Property**”):

- (a) the Real Property; and
- (b) all improvements located on the Real Property, if any.

Seller shall convey and Buyer shall accept title to the Property subject to (i) the easements, restrictions and reversionary clause set forth in the quit claim deed, substantially in the form attached as **Exhibit B** (the “**Deed**”), containing a covenant running with the land pursuant to Minnesota Statutes Sections 469.090 to 469.108; (ii) the Development Agreement, substantially in the form attached as **Exhibit C**; (iii) the Permitted Exceptions (defined in Section 4.2 below).

2.0 Purchase Price. The purchase price to be paid by Buyer for the purchase of the Property shall be [PRICE SPELLED OUT] and no/100 Dollars (\$[XXX,XXX]) (the “**Purchase Price**”).

- 2.1 Deposit of Funds. Buyer shall cause all funds to be paid at Closing (defined below) to be deposited into Seller fund [XXX-XXX-XXX].
- 2.2 Non-Refundable Fee. Pursuant to Seller's fee schedule, Buyer has paid a non-refundable development application fee of \$1,000, the receipt of which is acknowledged by Seller, for the staff time invested in facilitating this transaction.
- 3.0 Closing. The closing of the purchase and sale of the Property from Seller to Buyer contemplated by this Agreement (the "**Closing**") shall occur on a date mutually acceptable to Seller and Buyer but no later than \_\_\_\_\_ (the "**Closing Date**"). The Executive Director ("**Director**") of DEDA has the authority to extend this Closing Date by three months upon a showing of good cause. The Closing shall take place at the office of First American Title & Abstract Company ("**Title**") in Duluth, Minnesota, or at such other place as the parties shall mutually agree upon. At Closing, the Director shall have the authority to amend this Agreement to attach a complete and correct legal description of the Property as determined by survey.
- 4.0 Contingencies.
- 4.1 Seller Contingency. Seller's obligation to sell the Property to Buyer is contingent upon the timely occurrence or satisfaction of each of the following conditions prior to or on the Closing Date:
- Public Hearing. Sale of the Real Property is contingent upon a determination by DEDA as to the advisability of the sale; that the sale and conveyance are in the public interest, the best interests of the City of Duluth and its people; and that the transaction furthers DEDA's general plan for economic development, after a public hearing required under Minnesota Statutes, Section 469.105. The parties understand and agree that the sale/purchase of the Property is contingent upon the Board of Commissioners of DEDA.
  - Preliminary Plans. Prior to the above public hearing required by Minnesota Statutes, Section 469.105, subd. 2, and pursuant to Minnesota Statutes, Section 469.105, subd. 7, the Buyer shall submit to Seller for approval preliminary plans and specifications for the development of the Real Property, which approval by the Director must be in writing. The Buyer has submitted a proposal to purchase the Real Property for [DESCRIBE PROJECT], {the "**Project**"}
  - Final Plans. Prior to the transfer of title of the Real Property, the Buyer shall submit to Seller the final plans and specifications for the development of the Real Property; no transfer shall be made unless and until such plan are approved in writing by the Director. The detail of the plans and specifications shall enable Seller to determine with reasonable certainty that the Project

on the Real Property is or will be in compliance with the law and will, if carried out, provide for the intended use.

- 4.2 Title. Seller shall have no obligation to provide Buyer with a title commitment or an owner's policy of title insurance covering the Property. Buyer may elect to purchase a title commitment at its own expense from Title, which shall in no event delay Closing (the "**Title Commitment**"). In the event that the Title Commitment reflects that the title to the Property is not in a condition that is acceptable to Buyer, Buyer may object to the title defects by specifying its objections in writing to Seller within thirty (30) days of receipt of the Title Commitment (the "**Title Objections**"). At Seller's election, Seller may fix any title defects or may decline to fix any title defects by delivering written notice to Buyer within sixty (60) days of receipt of Buyer's title objections. If Seller agrees to fix the title defects, Seller shall fix the title defects and the parties shall proceed to the Closing subject to the terms and conditions of this Agreement. If Seller declines to fix, the title defects or fails to do so prior to the Closing Date, Buyer may: (i) terminate this Agreement by delivering written notice of termination to Seller; or (ii) waive its Title Objections and proceed to the Closing. If Buyer does not cancel this Agreement prior to Closing, Buyer shall accept title to the Property in as-is condition as of the Closing. For purposes of this Agreement, the term "**Permitted Exceptions**" means (1) title matters that are disclosed by the Title Commitment and are not identified by Buyer as Title Objections, (2) any Title Objections waived by Buyer as provided above, (3) municipal and zoning ordinances and agreements entered under them, (4) recorded easements for the distribution of utility and municipal services directly servicing the Property, (5) recorded building and use restrictions and covenants acceptable to Buyer, (6) taxes in the year of Closing; and (7) any encroachments onto the Property existing as of the Effective Date.
- 4.3 Property Inspection. Buyer shall have determined, on or before the expiration of the Due Diligence Period, that it is satisfied with the condition of the Property. The Due Diligence Period shall terminate sixty (60) days after execution of this Agreement. If Buyer is unsatisfied with the condition of the Property, Buyer may terminate this Agreement by delivering written notice of termination to Seller prior to the Closing Date. If Buyer terminates this Agreement pursuant to this paragraph, the parties shall have no further obligations to one another pursuant to this Agreement except as expressly provided for in this Agreement.
- 4.4 Right of Entry. Seller hereby authorizes the Buyer and its employees, agents or contractors (collectively, the "**Buyer's Representatives**") to enter upon the Property to conduct the Due Diligence Investigations. Buyer, its agents, contractors, employees or invitees shall conduct their activities on the Property in an orderly and lawful manner, securing at their own expense all required permits and licenses. Buyer shall pay all costs and expenses of such investigation and testing, and shall repair any damages it causes to the Property. Buyer agrees to require its contractors to use best efforts to not unnecessarily disrupt the Property.

- 4.5 Hold Harmless and Indemnity. During the Term, Buyer agrees to indemnify, defend and hold harmless Seller from and against any and all liabilities, damages, costs, expenses (including reasonable attorneys' fees), causes of action, suits, claims, demands, or judgments of any nature whatsoever to the extent arising from Buyer or Buyer's Representative's performance of the Due Diligence Investigations (but specifically excluding any liabilities arising from discovery of any hazardous substances or other pre-existing conditions on the Property). On ten (10) days written notice from Seller, Buyer will appear and defend all lawsuits against Seller growing out of such injuries or damage.
- 4.6 Insurance. Prior to Buyer's entry upon the Property, Buyer shall deliver to Seller or cause Buyer's Representatives to deliver to Seller, a certificate or certificates of insurance evidencing general liability and automobile liability insurance with coverage in amounts not less than \$1,500,000.00 Single Limit and shall provide for the following: Liability for Premises, Operations, Completed Operations, Independent Contractors, and Contractual Liability; and other customary coverages including worker's compensation coverage in statutory amounts with "all states" endorsement unless qualified as a self-insurer under Minnesota law; and shall name Seller and the City of Duluth as an additional insured on each policy except Buyer's worker's compensation policy. Umbrella coverage with a "form following" provision may make up the difference between the commercial general and auto liability coverage amounts and the required minimum amount stated above.
- 4.7 Condition of Property. Buyer, at its sole expense, agrees to keep the Property in a clean and safe condition during the Term, not to make any improvements without the prior written approval of Seller, to restore the Property to substantially the condition existing prior to Due Diligence Investigations conducted by Buyer or Buyer's Representatives, and to repair any damaged improvements prior to the end of the Term. Buyer shall not be liable for the mere discovery of existing conditions on the Property and shall have no obligation to remediate any hazardous or dangerous condition created by Seller or existing on the Property prior to Buyer's entry.
- 5.0 Seller's Conditions to Closing. The Closing of the transaction contemplated by this Agreement and the obligation of Seller to sell the Property shall be subject to the following conditions:
- (a) Representations. Buyer's representations in this Agreement shall be true at the time of Closing as though such representations were made at such time.
  - (b) Performance by Buyer. Buyer shall have performed all of its obligations under this Agreement.
  - (c) Approval. The DEDA Board shall have adopted a resolution approving the conveyance on the terms and conditions set forth in this Agreement (the

“DEDA Board Contingency”). The DEDA Board Contingency cannot be waived.

If the conditions set forth at 5.0(a) and (b) have not been satisfied or waived prior to the Closing Date, this Agreement may be terminated, at the option of Seller, by written notice from Seller to Buyer delivered to Buyer no later than the Closing Date. All of the contingencies set forth in Section 5.0 of this Agreement are for the sole and exclusive benefit of Seller and Seller shall have the right to unilaterally waive any contingency by written notice to Buyer.

6.0 Buyer Representations. Buyer makes the following representations:

- (a) Authority to Enter into Agreement. Buyer is a [ENTITY TYPE], which is in good standing under the laws of the State of Minnesota, has the full power and authority to: (i) enter into this Agreement; and (ii) purchase the Property in accordance with this Agreement.
- (b) No Additional Consent Needed. No consent or authorization from any other person, entity or government agency is required for Buyer to enter into and perform Buyer’s obligations under this Agreement except as has already been obtained.
- (c) No Impact on Other Agreements. The execution of this Agreement will not constitute a breach or default under any agreement to which Buyer is bound.
- (d) No Other Actions Affecting Agreement. There is no suit, action, legal, administrative or other proceeding or inquiry pending or threatened against Buyer which could affect Buyer’s ability to enter into and perform Buyer’s obligations under this Agreement. No attachments, execution proceedings, assignments for the benefit of creditors, insolvency, bankruptcy, reorganization, or other proceedings are pending or threatened against Buyer, nor are any such proceedings contemplated by Buyer.
- (e) Prompt Payment of Obligations. Buyer shall promptly pay when due any and all charges for engineering, surveying or other studies, reports, assessments or investigations which are commissioned or requested by Buyer.
- (f) Buyer Investment Commitment. To fulfill the economic development purposes of the sale of the Property, Buyer agrees: (i) to develop [DESCRIPTION OF PROJECT], and [OPERATION OBLIGATIONS] for a duration of [XX] years. Buyer agrees that its development of the Property shall be constructed and installed only in conformance with approved plans and must conform to all applicable building, zoning, or other codes or ordinances. Buyer will acquire any and all necessary permits for the construction on the Property.

- (g) One-year Deadline. Within one (1) year of the date of conveyance of the Property, Buyer shall devote the Property to the intended use as set forth in this Section, or begin improvements to the Property to devote it to that use. If Buyer fails to do so, Seller may cancel the sale and title to the Property shall return to it. Buyer shall not transfer title to the Property within one year of purchase without the consent of Seller.
- (h) Developer Default. If Buyer fails to commence work on time or devote the Property to its intended use on time, Seller may cancel the sale and title to the Property shall revert to Seller, at Seller's election, and in that event, Buyer shall promptly offer a deed to the Property legally described herein, to Seller, who will then refund Buyer the amount of the Purchase Price paid by Buyer to Seller, without interest, less any taxes or other encumbrances affecting the marketability of title. Notwithstanding the foregoing, the DEDA Executive Director may, at their discretion, consider an extension of time for good cause shown by Buyer, and upon conditions to protect the public interest. In the event an extension is granted, such extension shall be to a date certain.

Each of the above representations is material and is relied upon by Seller. Each of the above representations shall be deemed to have been made as of the Closing and shall survive the Closing.

- 7.0 Statutory Disclosures. Seller's employees directly handling the sale of the Property on behalf of Seller have no actual knowledge of the following with respect to the Property: (1) the presence of a well, underground storage tank or subsurface sewage treatment system; (2) methamphetamine production on the Property; (3) records or reports relating to lead-based paint and/or lead-based paint hazards; or (4) radon concentrations.
- 8.0 As Is Provisions. Buyer is purchasing the Property "AS IS" and "WHERE IS", and with all faults. Seller makes no representations or warranties, whether express or implied, by operation of law or otherwise, with respect to the quality, physical condition or value of the Property, the compliance of the Property with applicable building or fire codes or other laws or regulations. Buyer agrees that Seller is not liable or bound by any guarantees, promises, statements, representations or information pertaining to the Property made or furnished by Seller or any agent, officer, director, employee or other person representing or purporting to represent Seller, except as and to the extent expressly set forth in Section 7.0. To the fullest extent allowed by Minnesota and Federal law, Buyer and Seller agree as follows: Buyer expressly waives the requirement of any disclosure not expressly contained in this Agreement (including, without limitation, any disclosure required pursuant to Minn. Stat. §513.52-513.60), and Buyer agrees to take the Property "As Is" notwithstanding any matter set forth in any disclosure statement required by Minnesota law.

BUYER ACKNOWLEDGES AND AGREES THAT, EXCEPT AS SET FORTH IN SECTION 7.0, SELLER HAS NOT MADE, DOES NOT MAKE AND SPECIFICALLY NEGATES AND DISCLAIMS ANY REPRESENTATIONS, WARRANTIES, PROMISES, COVENANTS, AGREEMENTS OR GUARANTIES OF ANY KIND OR CHARACTER WHATSOEVER, WHETHER EXPRESS OR IMPLIED, ORAL OR WRITTEN, PAST, PRESENT OR FUTURE, OF, AS TO, CONCERNING OR WITH RESPECT TO:

- (a) THE VALUE, NATURE, QUALITY OR CONDITION OF THE PROPERTY, INCLUDING, WITHOUT LIMITATION, THE WATER, SOIL AND GEOLOGY;
- (b) THE INCOME TO BE DERIVED FROM THE PROPERTY;
- (c) THE SUITABILITY OF THE PROPERTY FOR ANY AND ALL ACTIVITIES AND USES WHICH BUYER MAY CONDUCT THEREON;
- (d) THE COMPLIANCE OF OR BY THE PROPERTY OR ITS OPERATION WITH ANY LAWS, RULES, ORDINANCE OR REGULATIONS OF ANY APPLICABLE GOVERNMENTAL AUTHORITY OR BODY OR ANY FRANCHISE LICENSE OR AGREEMENT OR ANY GRANT OR SIMILAR AGREEMENT;
- (e) THE HABITABILITY, MERCHANTABILITY, MARKETABILITY, PROFITABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PROPERTY;
- (f) THE MANNER OR QUALITY OF THE CONSTRUCTION OR MATERIALS, IF ANY, INCORPORATED INTO THE PROPERTY;
- (g) THE MANNER, QUALITY, STATE OF REPAIR OR LACK OF REPAIR OF THE PROPERTY;
- (h) THE AVAILABILITY OF WATER OR OTHER RESOURCES OR UTILITIES;  
OR
- (i) ANY OTHER MATTER WITH RESPECT TO THE PROPERTY, AND SPECIFICALLY, THAT SELLER HAS NOT MADE, DOES NOT MAKE, AND SPECIFICALLY DISCLAIMS ANY REPRESENTATIONS REGARDING COMPLIANCE WITH ANY ENVIRONMENTAL PROTECTION OR POLLUTION RULES, REGULATIONS, ORDERS OR REQUIREMENTS, INCLUDING SOLID WASTE, AND INCLUDING THE DISPOSAL, RELEASE OR EXISTENCE, IN OR ON THE PROPERTY, OF ANY HAZARDOUS SUBSTANCE.

9.0 Independent Investigation. The consummation of this transaction shall constitute Buyer's acknowledgment that Buyer has independently inspected and investigated

the Property and has made and entered into this Agreement based upon such inspection and investigation and its own examination of the condition of the Property. Upon Closing, Buyer shall assume the risk that adverse matters, including but not limited to construction defects and adverse physical and environmental conditions and the suitability or unsuitability of the Property for Buyer's intended uses, may not have been revealed by Buyer's investigations. Buyer, upon Closing, shall be deemed to have waived, relinquished and released Seller from and against, and covenanted not to sue any of the foregoing with regard to, any and all claims, demands, causes of action (including causes of action in tort or under any environmental law), losses, damages, liabilities (whether based on strict liability or otherwise), losses, damages, liabilities, costs and expenses (including attorneys' fees and court costs) of any and every kind or character, known or unknown, which Buyer might have asserted or alleged against Seller at any time (including without limitation to the extent covered by or that would be covered by [as opposed to paid] by insurance) by reason of or arising out of any latent or patent construction defects or physical conditions, violations of any applicable laws (including, without limitation, any environmental laws), the suitability of the Property for any purposes contemplated by Buyer and any and all other acts, omissions, events, circumstances or matters regarding the Property.

- 10.0 Buyer Reliance. All information, whether written or oral, previously, now, or hereafter made available to Buyer by Seller, its agents, or any other person acting for or on behalf of Seller, whether in the form of appraisals, market studies, projections, brochures, maps, surveys, soil reports, engineering studies, environmental studies, inspection reports, plans and specifications, and all other information and materials have been or will be furnished by Seller to Buyer solely as an accommodation, and neither Seller nor its agents has verified the accuracy of such information or the qualifications of the persons preparing such information. Buyer agrees that, notwithstanding the fact that Buyer has received certain information from Seller, or its respective agents or consultants, Buyer has relied solely upon and will continue to rely solely upon its own analysis and will not rely on any information provided by Seller, or its agents or consultants.
- 11.0 Real Estate Taxes and Special Assessments. Real estate taxes and any special assessments payable in the year 2025 shall be prorated between Seller and Buyer to the Closing Date. Buyer shall be responsible for all real estate taxes and assessments that are levied or become pending against the Property following Closing and all subsequent years.
- 12.0 Closing Documents. At or prior to Closing, the parties shall execute and deliver the following, as applicable:
- (a) The Deed, substantially in the form attached as Exhibit B;
  - (b) Resolution by Seller, in recordable form, authorizing the conveyance of the Property to Buyer and execution of the Development Agreement;

- (c) The Development Agreement, substantially in the form attached a Exhibit C; and
- (d) All other documents required by this Agreement or reasonably required by Title to effectuate the provisions of this Agreement.

13.0 Closing Costs. The following costs and expenses shall be paid in connection with the Closing:

- (a) Buyer shall pay the cost of:
  - (i) All fees associated with the issuance of a title commitment, if any, including state and federal tax lien, judgment and bankruptcy searches;
  - (ii) The premium for a title policy insuring title to the Property in the name of Buyer in the amount of the Purchase Price;
  - (iii) Any surveys, reports or inspection reports obtained by Buyer;
  - (iv) All state deed taxes and/or transfer taxes on the Deed;
  - (v) All recording fees, including but not limited to record the Deed and Seller's resolution authorizing the sale of the Property to Buyer;
  - (vi) Title's closing fees;
  - (vii) All attorneys' fees and expenses incurred by Buyer; and
  - (viii) Any other item allocated to Buyer in this Agreement.
- (b) Seller shall pay the cost of:
  - (i) All attorneys' fees and expenses incurred by Seller;
  - (ii) All expenses, including recording fees, to correct any objections that Seller elects to undertake pursuant to Section 4.3 above; and
  - (iii) Any other item allocated to Seller in this Agreement.

14.0 Commission. Seller and Buyer represent and warrant to each other that they have not engaged the services of any broker in connection with the sale and purchase contemplated by this Agreement. Seller and Buyer shall each indemnify and hold the other harmless of any claim made by any broker or sales agent or similar party for a commission due or alleged to be due under the terms of any brokerage

agreement entered into by said party.

15.0 Risk of Loss. If there is any loss or damage to the Property between the date of this Agreement and the date of Closing, the risk of loss shall be on Seller, whichever may have title to the Property. If the Property is destroyed or damaged prior to the Closing, Buyer may cancel this Agreement upon written notice to Seller and in such event, the parties shall have no further obligations to one another pursuant to this Agreement except as expressly set forth in this Agreement.

16.0 Default.

(a) If Buyer defaults in the performance of Buyer's obligations under this Agreement due to no fault of Seller, then Seller may, after at least thirty (30) days prior written notice to Buyer and Buyer's failure to cure the default within said notice period, either (i) declare this Agreement terminated, or (ii) Seller may elect to seek specific performance under this Agreement. Termination and specific performance pursuant to this Section are the sole and exclusive remedies afforded to Seller and in no event shall Buyer be liable for any actual, general, specific, punitive, incidental, speculative, consequential or other damages of any kind or nature.

(b) If Seller defaults in the performance of Seller's obligations under this Agreement due to no fault of Buyer, then Buyer may, after at least thirty (30) days prior written notice to Seller and Seller's failure to cure the default within said notice period, either (i) declare this Agreement terminated, or (ii) Buyer may elect to seek specific performance of this Agreement. Termination and specific performance pursuant to this Section are the sole and exclusive remedies afforded to Buyer and in no event shall Seller be liable for any actual, general, specific, punitive, incidental, speculative, consequential or other damages of any kind or nature.

(c) Notwithstanding anything in this Section 16 to the contrary, any action by Buyer or Seller for specific performance must be commenced no later than 180 days after the date of discovery of the default.

(d) The limitation set forth in the preceding sentence shall not apply to claims for indemnification or contribution specifically provided for in this Agreement.

(e) The provisions in this Section 16.0 shall survive any termination or cancellation of this Agreement and shall survive the Closing.

17.0 Assignment. Neither Seller or Buyer may assign its interest in this Agreement.

18.0 Time of Essence. Time is of the essence of this Agreement.

19.0 Governing Law. This Agreement is made and executed under and in all respect to

be governed by the laws of the State of Minnesota. Any dispute that may arise between the parties arising out of this Agreement shall be adjudicated before a court located in St. Louis County, Minnesota and the parties irrevocably submit to the exclusive jurisdiction of the federal and state courts of the State of Minnesota located in St. Louis County with respect to any action or legal proceeding commenced by any party.

20.0 Notices. The mailing addresses for notice purposes of Seller and Buyer are as follows (or to such other respective addresses as may be designated by notice given in accordance with provisions of this Section):

If to Seller: Duluth Economic Development  
Authority Attn: Executive Director  
411 W. First Street  
Duluth, MN 55802

If to Buyer: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Any notice, request, demand or other communication permitted or required under this Agreement shall be in writing and shall be deemed duly delivered when delivered personally or when deposited in the United States mails, First Class, postage prepaid or delivered to a reputable courier addressed to the party for whom it is intended at the address specified above or at such other address as either party shall notify the other of in writing as provided above.

21.0 Headings. The captions and headings of the various sections of this Agreement are for convenience only and are not to be construed as defining or as limiting in any way the scope or intent of the provisions hereof.

22.0 Invalidity. If for any reason any portion or paragraph of this Agreement shall be declared void or unenforceable by any court of law at equity, it shall only affect such particular portion or paragraph of this Agreement and the balance of this Agreement shall remain in full force and effect and shall be binding upon the parties hereto.

23.0 Counterparts/Facsimile/E-Mail Signatures. This Agreement may be executed in any number of counterparts and by different parties on separate counterparts, each of which counterparts, when so executed and delivered, shall be deemed to be an original and all of which counterparts, taken together, shall constitute one and the same Agreement. Facsimile and e-mail signatures shall be binding on the transmitting party and shall have the same force and effect as if the original signature had been delivered.

- 24.0 Waiver. The failure of either party to enforce any provision of this Agreement shall not be construed as a waiver or limitation of that party's right to subsequently enforce and compel strict compliance with every provision of this Agreement.
- 25.0 No Rights or Benefits to Third Parties. The parties do not intend to create rights in, or to grant remedies to, any third-party as a beneficiary of this Agreement or to create any duty to, or standard of care on behalf of, any third-party by any covenant, obligation or undertaking established in this Agreement. There are no incidental third-party beneficiaries to this Agreement.
- 26.0 Construction of Agreement. The parties have participated jointly in the negotiation and drafting of this Agreement. If an ambiguity or question of intent or interpretation arises, this Agreement is to be construed as if drafted jointly by the parties and no presumption or burden of proof will arise favoring or disfavoring a party by virtue of the authorship of any of the provisions of this Agreement.
- 27.0 Entire Agreement and Amendment. This Agreement constitutes the entire understanding of the parties with respect to the subject matter hereof. No modification, amendment or waiver may be made to the terms of this Agreement without the written consent of both parties.

*[Remainder of this page is intentionally left blank.]*

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date indicated above.

**DULUTH ECONOMIC DEVELOPMENT**

**[BUYER]**

**AUTHORITY**

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Its: President  
Dated: \_\_\_\_\_

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Dated: \_\_\_\_\_

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Its: Secretary  
Dated: \_\_\_\_\_

TEMPLATE

**EXHIBIT A TO PURCHASE AGREEMENT**  
**Legal Description**

Property Address:

[LEGAL DESCRIPTION]

St. Louis County, Minnesota

(Tax Parcel ID: XXX-XXXX-XXXXX)

TEMPLATE

**EXHIBIT B TO PURCHASE AGREEMENT  
FORM OF  
QUIT CLAIM DEED**

eCRV Number: \_\_\_\_\_

Deed Tax Due: \$ \_\_\_\_\_

Date: \_\_\_\_\_, 2025

FOR VALUABLE CONSIDERATION, the DULUTH ECONOMIC DEVELOPMENT AUTHORITY, a public body, corporate and politic and political subdivision under the laws of the State of Minnesota, "Grantor," hereby conveys and quitclaims to [BUYER], a Minnesota [ENTITY TYPE], "Grantee," real property in St. Louis County, Minnesota, described as follows (the "Property"):

[LEGAL DESCRIPTION]

together with all hereditaments and appurtenances belonging thereto, and subject to all existing easements, restrictions and reservations of record.

The Property and all improvements, if any, is being conveyed as-is and where-is.

As used in the paragraphs below,

- "Claims" means any and all present, past, or future liabilities, suits, claims, cross claims, counterclaims, causes of action, demands, penalties, debts, obligations, promises, acts, fines, judgments, damages, consequential damages, losses, costs, and expenses of every kind (including without limitation any attorney's fees, consultant's fees, costs, remedial action costs, cleanup costs and expenses which may be related to any Claims);
- "Environmental Law" means all federal, state and local laws, statutes, ordinances, regulations, standards, rules, policies, common law rule and other-binding and nonbinding governmental requirements in effect on the date hereof or adopted or modified after the date of this

agreement, and any judicial or administrative interpretation thereof having the force and effect of law, including, without limitation, any applicable judicial or administrative order, consent decree, judgment, order or requirement conferring rights or imposing duties at common law (including without limitation the common law respecting nuisance and tortious liability) relating in any way to the environment, natural resources, plants and animals, and human health and safety, including without limitation, the Comprehensive Environmental Response Compensation and Liability Act, 42 U.S.C. §9601, et seq.; the Resource Conservation and Recovery Act, 42 U.S.C. §6901, et seq.; Minn. Stat. § 115B.01, et seq. (2014); the Federal Water Pollution Control Act, 33 U.S.C. §1201, et seq.; the Clean Water Act, 33 U.S.C. §1321, et seq.; the Clean Air Act, 42 U.S.C. §7401, et seq.; the Toxic Substances Control Act, 33 U.S.C. §1251, et seq.; the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. §136, et seq.; the Atomic Energy Act, 42 U.S.C. §2011, et seq.; the Hazardous Materials Transportation Act, 49 U.S.C. §5101, et seq.; the Endangered Species Act, 7 U.S.C. §136; 16 U.S.C. §460 et seq.; and any similar or comparable state or local law; and

- "Hazardous substance" means any pollutant, contaminant, hazardous substance or waste, solid waste, petroleum product, distillate, or fraction, radioactive material, chemical known to cause cancer or reproductive toxicity, polychlorinated biphenyl or any other chemical, element, compound, chemical mixture, substance or material listed or identified in or regulated by any Environmental Law.

Grantee, for itself and its successors and assigns, agrees that Grantee has had the opportunity to inspect the property and is not relying on any representations or warranties, express or implied, of any kind whatsoever from Grantor as to any matters concerning the property, including, but not limited to, the physical condition of the property and any defects thereof, zoning status, tax consequences of this transaction, utilities, operating history or projections, valuation, governmental approvals, the presence of any Hazardous Substances in, on, under, or in proximity to the property;

the condition or existence of any of the above ground or underground structures or improvements, including tanks, transformers, and asbestos or lead containing structures or materials in, on or under the property, the condition of title to the property and the leases, easements, permits, orders, licenses, or other agreements, affecting the property. Grantee acknowledges that Hazardous Substances may be on, at, under, or emanating from and in proximity to the property which may or may not be in violation of Environmental Laws and that Grantee's investigation may not have disclosed all such Hazardous Substances or violations or the extent thereof. AS SUCH, GRANTEE ACCEPTS AND IS AWARE THAT GRANTEE IS ACQUIRING THE PROPERTY ON AN "ASIS WITH ALL FAULTS" BASIS WITH ANY AND ALL PATENT AND LATENT DEFECTS, INCLUDING THOSE RELATING TO, ASSOCIATED WITH, OR ARISING FROM THE ENVIRONMENTAL CONDITION OF THE PROPERTY, AND THAT GRANTEE IS NOT RELYING ON ANY REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, OF ANY KIND WHATSOEVER FROM GRANTOR AS TO ANY MATTERS CONCERNING THE PROPERTY. Grantee, in full acknowledgement and aware of such risks shall defend (with counsel acceptable to Grantor), indemnify, hold harmless and hereby waives, releases and discharges forever Grantor (and its officers, directors, employees, agents and contractors, successors and assigns) from any and all Claims and any and all damages, losses, injury, liability, claims or costs, including fines, penalties and judgments, and attorneys' fees and court costs (collectively, "Damages") whether known or unknown, arising from, or in any way related to the condition of the property, any patent or latent defects or alleged or actual presence, use, storage, generation, manufacture, transport, release, leak, spill, disposal or other handling of any Hazardous Substances in, on or under the property. Grantee's release and indemnity to Grantor includes any and all such Claims and Damages whether based in contract, tort, strict liability or Grantor's past, present, sole, concurrent, or contributory negligence as operator, owner, lessor, or landlord. Losses shall include without limitation (a) the cost of any

investigation, removal, remedial or other response that is required by any Environmental Law, that is required by judicial order or by order of or agreement with any governmental authority, or that is necessary or otherwise is reasonable under the circumstances, (b) losses for injury or death of any person, (c) and losses arising under any Environmental Law enacted in the future, and (d) losses for property damage including diminution in value thereof. This indemnity specifically includes the obligation of Grantee to remove, close, remediate, reimburse or take other actions requested or required by any governmental agency concerning any Hazardous Substances on the property.

Grantee agrees not to sue or to assert any claim or cause of action against Grantor arising out of the release of a Hazardous Substance or a pollutant or contaminant occurring on or in the property pursuant to any right of contribution or indemnification provided by any state or federal statutory or common law including, but not limited to Environmental Laws and any other federal, state, local governmental statute, regulation or ordinance, the subject of which is the protection of human health, safety, natural resources, or the environment now in existence or hereafter enacted.

If Grantee causes or allows the property to become contaminated in any manner by a Hazardous Substance or a pollutant or contaminant, Grantee will defend (with counsel acceptable to Grantor), indemnify and hold harmless Grantor. If Grantee causes or permits the release or threatened release of any Hazardous Substance or pollutant or contaminant on or in the property, Grantee shall promptly, at no expense to Grantor, take any and all actions necessary to return the property to a condition that is in accordance with all applicable federal, state, and local laws and regulations.

These covenants shall run with the land and be binding upon Grantee, its assigns and other successors in title or interest of Grantee.

This deed contains as a covenant running with the land the conditions of Minnesota Statutes §§ 469.090 to 469.108 relating to the use of the Property. If said covenant is violated, Grantor may

declare a breach of the covenant and seek a judicial decree from the District Court declaring a forfeiture and a cancellation of this deed.

Check here if all or part of the described real property is Registered (Torrens)

Grantor certifies that the Grantor does not know of any wells on the Property.

*[Remainder of this page is intentionally left blank.]*

TEMPLATE



**EXHIBIT C TO PURCHASE AGREEMENT  
FORM OF  
DEVELOPMENT AGREEMENT**

THIS DEVELOPMENT AGREEMENT (this “Agreement”) is entered into as of \_\_\_\_\_, 2025, (the “Effective Date”) by and between the DULUTH ECONOMIC DEVELOPMENT AUTHORITY, a public body, corporate and politic and political subdivision under the laws of the State of Minnesota (“DEDA”), and [DEVELOPER], a Minnesota [ENTITY TYPE], (“Developer”), relating to that certain real property located in St. Louis County, State of Minnesota and more particularly described in Exhibit A attached hereto and made a part hereof (the “Property”).

**RECITALS**

WHEREAS, DEDA and Developer have entered into the Agreement for the sale and purchase of the Property, containing terms and conditions that the Developer will be allowed to make use of it which DEDA considers necessary and proper to protect the public interest; and

WHEREAS, Developer proposes to construct [DESCRIPTION OF PROJECT] (the hereinafter-described “Project”) on the Property; and

WHEREAS, DEDA has determined that the conveyance of the property to Developer for the Project is in the best interest of the City of Duluth (“City”) and its people, and that the transaction furthers its general plan of economic development.

NOW THEREFORE, in consideration of the mutual covenants and conditions set forth in in the Agreement, DEDA and Developer agree on the terms, and subject to the conditions set forth in the Agreement, among which are the following:

1. Developer Investment Commitment. To fulfill the economic development purposes of the sale of the Property, Developer agrees: to develop the Project, a [DESCRIPTION OF PROJECT] (the “Project”), for a duration of [XX] years, the (“Term”).
2. Final Plans. Prior to construction, Developer shall provide to DEDA, which shall be subject to the approval of the Director in writing, which approval shall not be unreasonably withheld, the final plans and specifications, for the development of the Real Property; the detail of the plans and specifications shall enable DEDA to determine with reasonable certainty that the Project on the Real Property is or will be in compliance with the law and will, if carried out, provide for the intended use.
3. Conformance with Plans. Developer agrees that its development of the Property shall be constructed and installed only in conformance with approved plans and must conform to all applicable building, zoning, or other codes or ordinances, including

compliance with the terms of the City of Duluth Comprehensive Plan. Developer will acquire any and all necessary permits for the construction on the Property.

4. One-year Deadline. Pursuant to Minnesota Statutes Section 469.105, subd. 5, within one (1) year of the date of conveyance of the Property to Developer, Developer shall devote the Property to the intended use as set forth in the Agreement or begin improvements to the Property to devote it to that use. Developer shall not transfer title to the Property within one (1) year of purchase without the consent of DEDA.

If Developer fails to commence work on time or devote the Property to its intended use on time, DEDA may cancel the sale and title to the Property shall revert to DEDA, at DEDA's election, and in that event, Developer shall promptly offer a deed for the Property legally described herein, to DEDA, who will then refund Developer the amount of the Purchase Price paid by Developer to DEDA, without interest, less any taxes or other encumbrances affecting the marketability of title. Notwithstanding the foregoing, the DEDA Executive Director may, at their discretion, consider an extension of time for good cause shown by Developer, and upon conditions to protect the public interest. In the event an extension is granted, such extension shall be to a date certain.

5. Construction. Developer hereby agrees that no later than [DATE] Developer will have completed the construction of the Project, as defined, on the Property. For the purposes of this Agreement, the "Project" shall consist of the construction on the Property of [DESCRIPTION OF PROJECT], for the length of the Term, from the date that the City Building Official has issued Certificates of Occupancy under the State Building Code for all units. The Project shall be constructed only in conformance with the plans and specifications for the Project approved by DEDA's Executive Director or their designee, which consent shall not be unreasonably withheld, and must conform to all applicable building, zoning, or other codes or ordinances. The Developer will acquire any and all necessary permits for the construction of the project.

6. Release of right to receive reconveyance. Upon the determination by DEDA's Executive Director that construction of the Project has been completed and upon Developer's request therefore, DEDA will furnish to the Developer a Release of Right to Receive Reconveyance ("Release") certifying the completion of the Project. The Release shall satisfy and terminate the development obligations of the Developer in this Agreement. The Developer may cause the Release to be recorded in the proper office for recordation of deeds and other instruments pertaining to the Property, however the Release shall in no way release Developer from its obligations set forth in Section 1 [OPERATION OBLIGATIONS], or the maintenance obligations of Developer as set forth herein, for the duration of the Term.

7. Maintenance by Developer. Developer agrees to maintain the Property and operate [HOUSING: all units; DEVELOPMENT: the Project] after construction is

completed in a [HOUSING: clean and habitable manner as set forth in Chapter 29A of the City of Duluth Municipal Code. All units shall remain in compliance with local building and maintenance codes throughout the Term of this Agreement and any and all rental licenses shall not lapse; DEVELOPMENT: neat and orderly condition]. Developer shall perform all needed and proper repairs, renewals, and replacements necessary be made to the Project and Property. The maintenance of the Project and the Property shall include, but not be limited to, maintenance of all foundations, external walls, doors, windows, utility openings, and all roofing systems, as well as outside maintenance including snow removal, landscape maintenance, and all exterior maintenance to the Property and the Project.

8. Provision Against Liens. Developer shall not create or permit any mortgage, encumbrance or allow any mechanic's or materialmen's liens to be filed or established or to remain against the Property or any part thereof which would materially or adversely affect DEDA's interest in the Property or this Agreement during the term of this Agreement, provided that if Developer shall first notify DEDA of its intention to do so and post such security as DEDA reasonably deems necessary, Developer may, in good faith, contest any such mechanic's or other liens filed or established as long as DEDA does not deem its interest or rights in this Agreement to be subject to foreclosure by reason of such context.

9. Provision Against Assignments, Transfers or Change in Identity of Developer. The parties hereto acknowledge that DEDA is relying upon the qualifications and identity of Developer to develop the Property. Therefore, except for the purposes of obtaining financing as hereinafter described or otherwise approved by this Agreement, Developer represents and agrees for itself, its successors and assigns, that it has not made or created, and will not make or create or suffer to be made or created, any total or partial sale, assignment, conveyance, lease, trust, lien or power of attorney, and has not or will not otherwise transfer in any other way all or any portion of the Property or of its rights under this Agreement or any other contract or agreement entered into in connection with carrying out its obligations hereunder; and Developer will not make or create or suffer to be made any such transfer of Developer's rights hereunder without the prior approval of DEDA. Provided, however, that the Developer shall have the right at its sole discretion at any time to assign all of its interest in and to this Agreement to an affiliate of Developer controlled by Developer provided that Developer shall continue to be responsible for fulfilling all of the obligations of Developer under this Agreement.

10. Default and Remedies. In the event that Developer fails to perform or to comply with any of the terms, covenants and conditions of this Agreement, including but not limited to those contained in Paragraphs 2 and 3 above, and said failure to so perform or comply shall continue for a term of thirty (30) days after notice from DEDA to Developer of such nonperformance or noncompliance, Developer shall be in default of its obligations

hereunder and DEDA may, at its option, exercise any one or more of the following rights and remedies. The remedies provided for under this Paragraph shall be deemed to be cumulative and non-exclusive and the election of one remedy shall not be deemed to be a waiver of any other remedy with regard to any occasion of default hereunder. Further, the waiver by DEDA of any default on the part of Developer hereunder or the failure of DEDA to declare default on the part of Developer of any of its obligations pursuant to this Agreement shall not be deemed to be a waiver of any subsequent event of default on the part of Developer of the same or any other obligation of Developer hereunder and, to be effective, any waiver of any default by Developer hereunder shall be in writing by DEDA.

- a. DEDA may terminate this Agreement.
- b. DEDA may seek and be entitled to monetary damages from Developer for any actual damages incurred by DEDA as a result of Developer's default.
- c. DEDA may seek and be entitled to receive reconveyance of the Property from Developer, free and clear of all liens and encumbrances whatsoever, if said default occurs prior to certification by DEDA's Executive Director of the completion of the Project (which certification shall not be unreasonably withheld).
- d. DEDA may seek and be entitled to injunctive and declaratory relief as is necessary to prevent Developer's violation of the terms and conditions.
- e. DEDA may seek such other legal or equitable relief as a court of competent jurisdiction may be determined as available to DEDA.

Notwithstanding the foregoing, if the default reasonably requires more than thirty (30) days to cure, such default shall not constitute an event of default, provided that the curing of the default is promptly commenced upon receipt by the Developer of the notice of the default, and with due diligence is thereafter continuously prosecuted to completion and is completed within a reasonable period of time, and provided that Developer keeps DEDA informed of its progress in curing the default; provided in no event shall such additional cure period extend beyond 90 days.

#### 11. Indemnification.

- a. Generally. Developer will to the fullest extent permitted by law, protect, indemnify and save DEDA and its officers, agents, employees and any person who controls DEDA (the "DEDA Parties") within the meaning of Securities Act of 1933, harmless from and against all liabilities, losses, damages, costs, expenses, including attorneys' fees and expenses, causes of action, suits, claims demands and judgments of any nature ("Losses") arising therefrom:

- i. Any bodily injury to or death of any person or damage to the Property, or growing out of or in connection with the use or non-use, condition or occupancy of the Property or any part resulting from Developer's presence on the Property. The foregoing indemnification shall not be limited in any way by any limitation on the amount or type of damage, compensation or benefits payable by or for the Developer, suppliers or affiliated organizations under any Workers' Compensation Act, Disability Benefit Acts or any other Employee Benefit Acts;
- ii. Any material violation by Developer of any provision of this Agreement;
- iii. Any violation of any contract, agreement or restriction related to Developer's use of the Property which shall have existed at the commencement of the Term of this Agreement or shall have been approved by the Developer; and
- iv. Any violation of any law, ordinance, court order or regulation affecting the Property or the ownership, occupancy or use thereof.

b. Limitations. The foregoing indemnification shall not apply if such losses are caused by any fraud, intentional act or omission, willful misconduct or gross negligence on the part of the DEDA Parties.

c. Indemnification Procedures. Promptly after receipt by Developer of notice of the commencement of any action with respect to which the Developer is required to indemnify such person under this Article, DEDA shall notify the Developer in writing of the commencement thereof, and, subject to the provisions as hereinafter stated, the Developer shall assume the defense of such action. Insofar as such action shall relate to any alleged liability of DEDA with respect to which indemnity may be sought against the Developer, DEDA shall have the right to employ separate counsel in any such action and to participate in the defense thereof, and the fees and expenses of such separate counsel shall be at the expense of Developer.

12. Insurance. Developer shall procure and continuously maintain insurance covering all risks of injury to or death of persons or damage to Property arising in any way out of or as a result of Developer's occupancy of or use of the Property, carried in the names of the Developer and DEDA as additional insured on the commercial general liability and umbrella liability policies, but only to the extent of Developer's acts or omissions. Developer shall carry the policies of insurance with minimum limits as follows:

a. Liability Insurance. The Developer shall procure and maintain continuously in force General Liability Insurance written on an "occurrence" basis under a

Comprehensive General Liability Form in limits of not less than Two Million and No/100 Dollars (\$2,000,000.00) aggregate per occurrence for personal bodily injury and death, and limits of Two Million and No/100 Dollars (\$2,000,000.00) for Property damage liability. If person limits are specified, they shall be for not less than Two Million and No/100 Dollars (\$2,000,000.00) per person and be for the same coverages. The above limits may be met through a combination of the underlying policy limits and an excess or umbrella policy. DEDA shall be named as an additional insured therein. Insurance shall cover:

- i. Public liability, including premises and operations coverage.
- ii. Independent contractors--protective contingent liability.
- iii. Personal injury.
- iv. Owned, non-owned and hired vehicles.
- v. Contractual liability covering the indemnity obligations set forth herein.
- vi. Property of others.

b. Property Insurance. During construction on the Project, Developer shall provide "All Risk" builders' risk insurance on all work on the Project, including foundations, permanent fixtures and attachments, machinery and equipment included in or installed under the construction contract, debris removal, engineers' fees, temporary structures, materials, equipment and supplies of all kinds located on the Project, to the full replacement value thereof, except that such policy may provide for a deductible amount not to exceed Fifty Thousand Dollars (\$50,000) per occurrence. Said insurance shall be endorsed to provide consent for occupancy of the Project. Such insurance shall be provided by Developer as set forth below and shall bear a payee clause in favor of DEDA with loss proceeds under any property policies made payable to DEDA, to the extent of its interest. Said insurance may be written in the name of Developer or may be provided by Developer's Contractor in which case it shall name both Developer, DEDA, and the City as additional insureds. The Developer shall be solely responsible for ensuring that such insurance is provided. Contractor, subcontractors, and suppliers and Developer shall waive all rights against the City and DEDA for damages caused by fire or insured perils, except such rights as are set forth hereunder to the proceeds of such insurance payable in the event of such loss.

c. Workers' Compensation. Workers' Compensation Coverage, if required by Minnesota Statutes, in statutory amounts with "all states" endorsement.

Employees' liability insurance shall be carried in limits of One Hundred Thousand and No/100 Dollars (\$100,000.00) per employee.

d. Requirements for All Insurance. All insurance required in this Section 12 shall be taken out and maintained with responsible insurance companies organized under the laws of the states of the United States and licensed to do business in the State of Minnesota.

e. Certifications. Developer shall provide certificates of insurance evidencing such coverage to DEDA with 30-day's notice of cancellation, non-renewal or material change provisions, such as a reduction in the scope of the coverage or in the coverage amount, included. DEDA does not represent or guarantee that these types or limits of coverage are adequate to protect the Developer's insurance provider's interests and liabilities. If a certificate of insurance is provided, the form of the certificate shall contain an unconditional requirement that the insurer notify DEDA without fail not less than 30 days prior to any cancellation, non-renewal or modification of the policy or coverages evidenced by said certificate and shall further provide that failure to give such notice to DEDA will render any such change or changes in said policy or coverages ineffective as against DEDA.

13. Notices. Any notice, demand or other communication under this agreement by either party to the other shall be deemed to be sufficiently given or delivered if it is dispatched by registered or certified mail, postage prepaid, to:

In the Case of DEDA: Duluth Economic Development Authority  
City Hall – Room 160  
Attn: Executive Director  
411 West 1<sup>st</sup> Street  
Duluth, MN 55802

In the Case of Developer: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

14. Assignment. Developer agrees that it shall not assign this Agreement or any interest herein without the prior written approval of DEDA.

15. Binding Agreement. This Agreement shall be binding upon and inure to the benefit of the parties and their successors and assigns.

16. Applicable Law. This Agreement, together with all of its paragraphs, terms and conditions, is made in the State of Minnesota and shall be construed and interpreted in accordance with the laws of the State of Minnesota.

17. Recording. Developer agrees to record this Development Agreement in the office of the St. Louis County Recorder and/or Registrar of Title against the Property and to pay all costs associated therewith. Upon recordation, Developer shall promptly submit to DEDA evidence of recording showing the date and document numbers of record.

*(Signature page to follow)*

TEMPLATE

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed as of the date first above written.

DULUTH ECONOMIC DEVELOPMENT  
AUTHORITY

[DEVELOPER]

By: \_\_\_\_\_  
\_\_\_\_\_, Its Executive  
Director

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Its: \_\_\_\_\_

TEMPLATE

STATE OF MINNESOTA )  
 ) SS  
COUNTY OF ST. LOUIS )

The foregoing instrument was acknowledged before me this \_\_\_\_\_ day of \_\_\_\_\_, 2025, by \_\_\_\_\_, the Executive Director of the Duluth Economic Development Authority, an economic development authority under Minnesota Statutes Chapter 459, on behalf of the authority.

\_\_\_\_\_  
\_\_\_\_\_  
Notary Public

STATE OF MINNESOTA )  
 ) SS  
COUNTY OF ST. LOUIS )

The foregoing instrument was acknowledged before me this \_\_\_\_\_ day of \_\_\_\_\_, 2025, by \_\_\_\_\_, the \_\_\_\_\_ of the [DEVELOPER] Minnesota [ENTY TYPE], on behalf of the [ENTITY TYPE].

\_\_\_\_\_  
\_\_\_\_\_  
Notary Public

Drafted by:  
Amanda M. Mangan  
Assistant City Attorney  
Attorney for the Duluth Economic Development Authority  
411 West First Street, Room 410  
Duluth, MN 55802

**Exhibit A to Development Agreement  
Legal Description of Property**

Real property in St. Louis County, Minnesota legally described as follows:

PID:

TEMPLATE

**Exhibit B to Development Agreement**

**FORM OF RELEASE OF RIGHT TO RECEIVE RECONVEYANCE**

Dated: \_\_\_\_\_, 20\_\_

The development obligations of the Developer under that certain Development Agreement between the Duluth Economic Development Authority, an economic development authority under current codification of Minnesota Statutes Chapter 469, therein after referred to as “DEDA” and \_\_\_\_\_ therein after referred to as “Developer”, with regard to the below described property (the “Property”), which Agreement is dated \_\_\_\_\_, 2025 and filed of record on \_\_\_\_\_, 2025 in the office of the County Recorder for St. Louis County, Minnesota, as Document Number \_\_\_\_\_, and/or in the office of the Registrar of Title for St. Louis County, Minnesota as Document Number \_\_\_\_\_, having been performed, the undersigned, on behalf of DEDA, hereby certifies that such development obligations under said Agreement have been satisfied and hereby releases any right to receive reconveyance of the Property, however this Release shall in no way release Developer from its obligations set forth in Section 1 to [OPERATION OBLIGATION], or the maintenance obligations of Developer as set forth in the Development Agreement for the duration of the Term.

Further, the undersign certifies that the covenant running with the land for DEDA’s right to receive reconveyance of the Property contained in that certain quit claim deed, dated \_\_\_\_\_, 2025 and filed of record on \_\_\_\_\_, 2025 in the office of the County Recorder for St. Louis County, Minnesota, as Document Number \_\_\_\_\_, and/or in the office of the Registrar of Title for St. Louis County, Minnesota as Document Number \_\_\_\_\_, is hereby canceled and released and shall have no further force and effect.

Real property in St. Louis County, Minnesota legally described as follows:

[LEGAL DESCRIPTION]

PID: [PID]

*(Remainder of page intentionally left blank; signature page to follow)*

