Appendices

Appendix A

2015 Erosion Site Photos

Photo 1. *Site 1.* Historic meander in right overbank (photo is looking upstream)

Photo 2. *Site 2.* Historic meander

Photo 3. *Site 3.* Over-widened stream reach

Photo 4. *Site 4.* Unvegetated overbanks contributing to stream

Photo 5. *Site 5.* Minor to moderate erosion on steep bank

Photo 6. *Site 6.* Erosion around bridge abutments

Photo 7. *Site 8.* Erosion around bridge abutments

Photo 8. *Site 9.* Erosion around bridge abutments

Photo 9. *Site 10.* Incised stream bed

Photo 10. *Site 11.* Minor to moderate erosion on outside of bank meander

Photo 11. *Site 12.* Minor to moderate erosion on stream bank

Photo 12. *Site 13.* Minor to moderate erosion on outside of bank meander

Photo 13. *Site 14.* Eroded culvert outfall

Photo 14. *Site 15.* Minor to moderate erosion on outside of stream bend

Photo 15. *Site 16.* Significant erosion on outside of stream bend

Photo 16. *Site 17.* Minor to moderate erosion on outside of stream bend

Photo 17. *Site 18.* Large woody debris in stream

Photo 18. *Site 19.* Large woody debris in stream

Photo 19. *Site 20.* Meander in process of being cut off

Photo 20. *Site 21.* Over-widened stream reach

Appendix B

Historical Aerial Photos

Historical Channel Centerlines

- 1947
- 1953
- 1957
- 1984
- 1991
- 1997
- 2002
- 2015

N

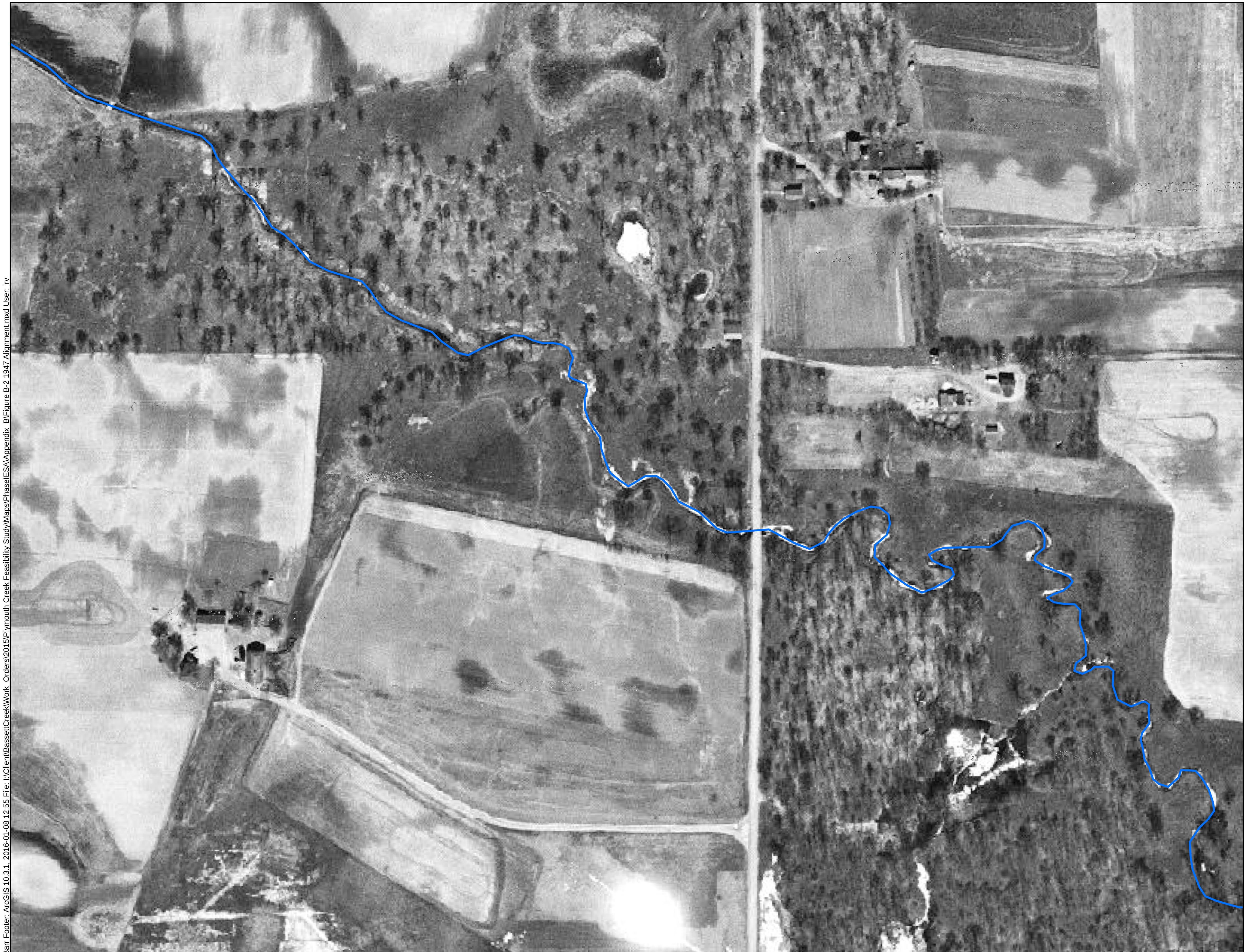
Feet

0 200 400

1 inch = 200 feet

Figure B-1

APPENDIX B
HISTORIC CHANNEL ALIGNMENTS
Plymouth Creek
Plymouth, MN



1947 Channel Alignment

N

Feet

0 200 400

1 inch = 200 feet

Figure B-2

APPENDIX B
1947 CHANNEL ALIGNMENT
Plymouth Creek
Plymouth, MN

1953 Channel Alignment

N

Feet

0 200 400

1 inch = 200 feet

Figure B-3

APPENDIX B
1953 CHANNEL ALIGNMENT
Plymouth Creek
Plymouth, MN

1957 Channel Alignment

N

Feet

0 200 400

1 inch = 200 feet

Figure B-4

APPENDIX B
1957 CHANNEL ALIGNMENT
Plymouth Creek
Plymouth, MN

1984 Channel Alignment

N

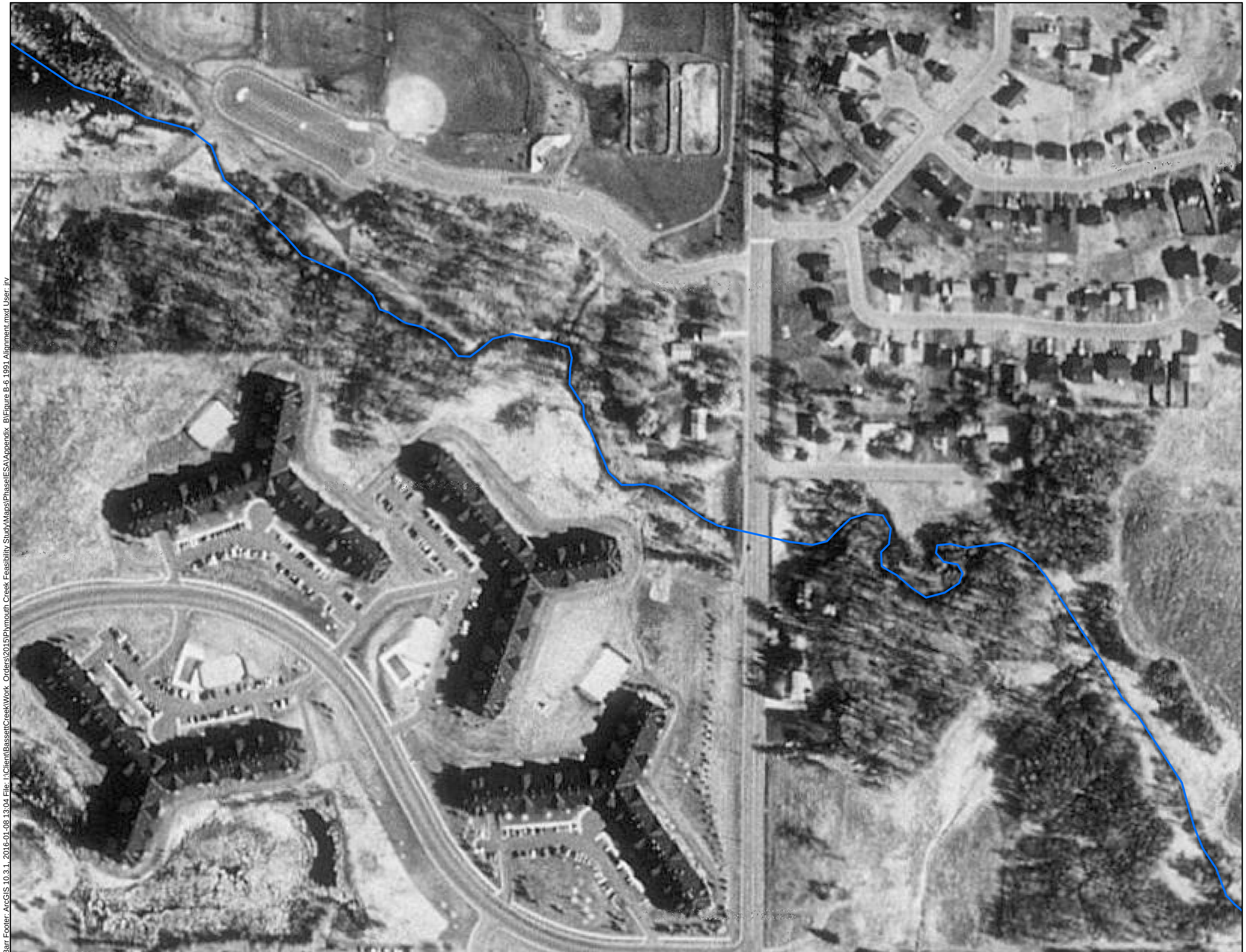
Feet

0 200 400

1 inch = 200 feet

Figure B-5

APPENDIX B
1984 CHANNEL ALIGNMENT
Plymouth Creek
Plymouth, MN



1991 Channel Alignment

N

Feet

0 200 400

1 inch = 200 feet

Figure B-6

APPENDIX B
1991 CHANNEL ALIGNMENT
Plymouth Creek
Plymouth, MN

1997 Channel Alignment

N

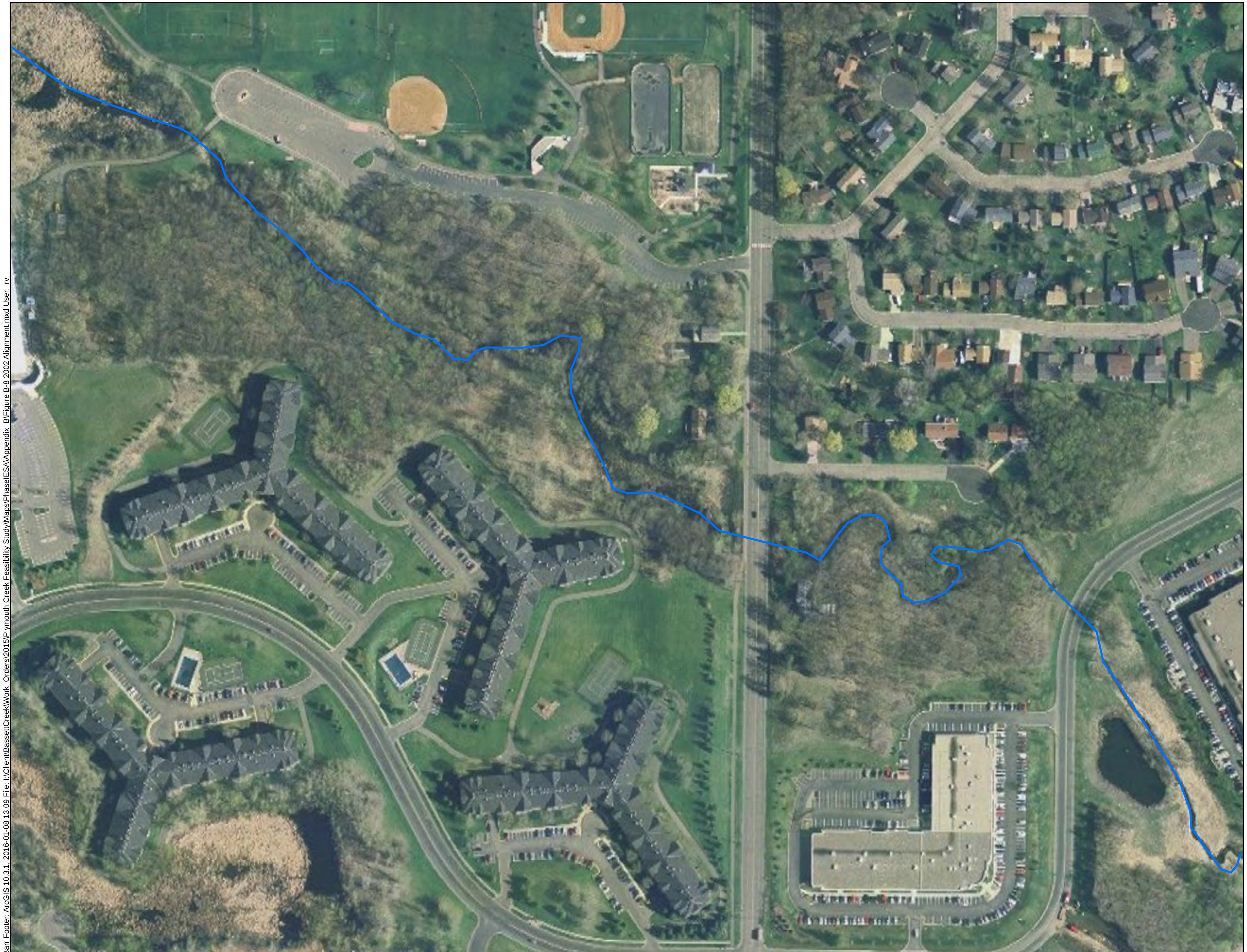
Feet

0 200 400

1 inch = 200 feet

Figure B-7

APPENDIX B
1997 CHANNEL ALIGNMENT
Plymouth Creek
Plymouth, MN



2002 Channel Alignment

N

Feet

0 200 400

1 inch = 200 feet

Figure B-8

APPENDIX B
2002 CHANNEL ALIGNMENT
Plymouth Creek
Plymouth, MN

Figure B-9

APPENDIX B
2015 CHANNEL ALIGNMENT
Plymouth Creek
Plymouth, MN

Appendix C

Phase I Assessment

Phase I Environmental Site Assessment

Plymouth Creek from Plymouth Creek Park to Annapolis Lane
Plymouth, Minnesota
November 2015

Prepared for
Bassett Creek Watershed Management Commission

November 5, 2015

4700 West 77th Street
Minneapolis, MN 55435-4803
Phone: 952.832.2600
Fax: 952.832.2601

Phase I Environmental Site Assessment

Plymouth Creek from Plymouth Creek Park to Annapolis Lane
Plymouth, Minnesota
November 2015

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1.0 Introduction

Barr Engineering Co. (Barr) was retained by the Bassett Creek Watershed Management Commission (BCWMC) to complete a Phase I Environmental Site Assessment (Assessment) of an approximately 2,800-foot long reach of Plymouth Creek. The property is located in the SE ¼ of Section 16, NE ¼ of NE ¼ of Section 21, and NW ¼ of NW ¼ of Section 22, T118N, R22W, in the City of Plymouth, Hennepin County, Minnesota (Property). The Property location is shown on Figure 1.

This report summarizes the findings, opinions, and conclusions of the Assessment. Detailed descriptions of the Property setting, utility information, land-use history, regulatory history, and current Property conditions and features are presented in the Phase I documentation in Appendix A. Informational resources are described in Section 5 of this report and are assigned unique reference numbers, which are used throughout the report and Appendix A.

Barr has performed this Assessment in conformance with ASTM, International (ASTM) Practice E 1527-13 (Practice). No intentional deviations from the Practice were made in performing this Assessment except as described in Section 1.4. In following the Practice, this Assessment also complies with the U.S. Environmental Protection Agency 40 CFR Part 312 Standards and Practices for All Appropriate Inquiries; Final Rule.

1.1 Purpose

The purpose of the Assessment is to identify recognized environmental conditions (RECs) in connection with the Property as defined by the Practice and discussed in the findings and opinions section of the report, and to support planning for a streambank stabilization project. The details of the stabilization project are not yet defined but are anticipated to included measures such as bank flattening, rip rap placement, root wad installation and rock/log vane installation. It is anticipated that the channel alignment will not be changed as part of the stabilization project. As such, the channel, banks and areas immediately surrounding are the focus of the Assessment.

1.2 Scope of Services

The Assessment involved completion of the following five components described in Section 7 of the Practice: records review, site reconnaissance, interviews, reporting, and file reviews. The following tasks were completed during the Assessment. The details of each task are described below and in Appendix A.

Records Review

- A Regulatory Database Report was obtained and federal, state, and readily available tribal records databases were reviewed.
- USGS topographic maps were reviewed and used to determine physical setting information.
- Discretionary physical setting sources including Minnesota Department of Health well and boring records for wells in the Property vicinity and a published geological report were reviewed and used to determine physical setting information.

- Historical aerial photographs; historical maps; reverse city directories;, zoning, and tax assessor's records; and a plat map were reviewed for the Property and surrounding land.
- A fire insurance map search was conducted and no fire insurance maps were available for the Property.
- Fire department records were reviewed.
- The Minnesota Pollution Control Agency's (MPCA) What's in My Neighborhood (WIMN) was reviewed to supplement regulatory data.

Site Reconnaissance

- A visual inspection was conducted of the exterior features on the Property. Current conditions with respect to land use; chemical and waste storage, use, and disposal; facility operations and equipment; utilities; and evidence of potential releases of petroleum products or hazardous substances were documented, if observed. Evidence of historical uses or conditions, if encountered, was also documented. Current land-use and occupants of neighboring properties were documented during the site visit.

Interviews

- Interviews were conducted with the Property owner, the City of Plymouth public works department, and the City of Plymouth fire department.

Evaluation and Report Preparation

- This report was prepared to document the resources used during completion of the Assessment and to describe the findings, opinions, and conclusions of the Assessment.

File Review

- The Property was not identified on any of the standard environmental record sources, so a file review was not conducted.
- The adjoining property, 3540 Fernbrook Avenue N. was identified in the LUAST database, groundwater contamination was not identified; therefore a file review was not conducted.

1.3 Significant Assumptions

The following significant assumptions were made to complete the Assessment:

- The detailed history of ownership and land-use to satisfy the requirements and purpose of the Assessment was determined from the activities listed in Section 1.2, Scope of Work, and a title review was not needed. Lack of a title review is not a significant data gap.

- Property boundaries do not follow typical property boundaries, therefore the Property has been assumed to include the creek channel and banks from where the creek crosses under the pedestrian bridge to the west side of Annapolis Lane (Figure 2).

1.4 Limitations, Exceptions, and Data Gaps

The following limitations and exceptions are associated with this Assessment:

- Gaps of greater than five years in historical documentation are present, and are summarized in the following table.

Date Range	Property Changes
Prior to 1856	Historical documentation was not readily ascertainable; therefore, changes in general Property land-uses are unknown.
1856 to 1873 1873 to 1896 1902 to 1913 1914 to 1937 1940 to 1947 1947 to 1953 1957 to 1964	Gaps greater than five years in historical documentation are present; however, general Property land-uses did not change during the time periods.

Potentially Significant Data Gap	Sources of Information Consulted to Address Data Gap	Opinion on Significance of Data Gap
One of the Property owners was not interviewed. The owner of parcel 22-118-22-22-0030, to the east of Fernbrook Lane which intersects the creek was not contacted. Stabilization work is proposed to occur on this parcel in the future.	Historical documentation including aerial photographs, topographic maps, local street directories, zoning records, HIG Report, and the site visit were used to address the data gap. The City of Plymouth has a conservation easement agreement with the parcel owner.	This is a signigicant data gap. Prior to commencement of any bank stabilization efforts on this parcel it is recommended the owner be interviewed.

1.5 Special Terms and Conditions

The Assessment was conducted in accordance with an Agreement between Barr and BCWMC.

The scope of the Assessment did not involve the collection and analysis of any type of sample. The Assessment did not involve completion of any surveys or the offering of any opinions or advice with respect to structural engineering matters, asbestos-containing materials, radon, lead-based paint, lead in drinking water, wetlands, compliance with environmental regulations, cultural and historic resources, industrial hygiene, health and safety, ecological resources, endangered species, indoor air quality , biological agents, mold, or other conditions that are beyond the scope of the Practice.

Barr has performed its work in a manner consistent with the care and skill ordinarily exercised by members of the environmental profession under similar budget and time constraints. Within this context, Barr assumes responsibility for its own observations, along with its interpretation of the information gathered. No other warranty is made or intended.

Because Barr was not retained to verify information, Barr assumes no responsibility for the accuracy of information that it obtained from other sources including, without limitation, regulatory and government agencies, persons interviewed about the Property, and vendors of public data. Performance of the Practice is intended to reduce, but will not eliminate uncertainty regarding the presence of recognized environmental conditions on the Property. To the extent that Barr does not identify recognized environmental conditions on the Property, Barr's opinions in the report are not representations that the Property is free of such conditions. Under no circumstances can Barr represent or warrant that releases of hazardous substances or petroleum products do not exist on the Property.

1.6 User Reliance

The Assessment has been prepared for the exclusive use of BCWMC, herein referred to as the “Users”. No others may rely on the Assessment without obtaining a formal authorization in the form of a reliance letter from Barr. Barr will provide reliance letters for additional parties only if authorized by the Users.

2.0 Site Description

2.1 Location and Legal Description

The Property is located in the SE ¼ of Section 16, NE ¼ of NE ¼ of Section 21, and NW ¼ of NW ¼ of Section 22, T118N, R22W, in the City of Plymouth, Hennepin County, Minnesota (Property). The Property is approximately 2,800 feet long and 6.47 acres in size, which includes a 50-foot buffer from the centerline of the creek. The Property boundaries are shown on Figure 2.

2.2 Property Setting and Land Use

Topography of the Property generally slopes inward towards the creek channel and slopes to the southeast. The channel is incised approximately one to five feet on average. The shallow groundwater flow direction at the Property is considered to be southwest towards Medicine Lake (Refs. 1e, 2a).

The Property is a stream corridor. The parcels which intersect the creek are zoned public/institutional and multiple family. No buildings are located on the Property. Historically agrciucultal land existed on the Property and adjacent properties.

The current use of adjoining properties includes single and multi-unit residential neighborhood to the south, east and northeast, undeveloped marsh land to the west and a public park to the northwest.

Additional descriptions of the Property setting and land-use are presented in Appendix A.

2.3 User-Provided Information

As detailed in Section 6 of the Practice, the User has responsibilities associated with identifying possible recognized environmental conditions in connection with the Property. Barr provided a User Questionnaire on November 4, 2015to facilitate gathering information required by the Practice. The completed User Questionnaire is included in Appendix F.

The User has no knowledge of any environmental liens or activity and use limitations against the Property, nor any specialized knowledge or experience that is material to identifying recognized environmental conditions in connection with the Property. Since no sale is pending or imminent, no information was provided to the environmental professional regarding the relationship between a potential purchase price and fair market value. Property valuation is not part of the scope of this Assessment. The User did not report conditions indicative of releases or threatened releases, any obvious indicators that point to the presence or likely presence of contamination at the Property, or specialized knowledge about the Property related to the items listed in Section 6 of the Practice (Ref. 4h, Appendix F).

3.0 Findings and Opinions

This section summarizes observations regarding the presence of hazardous substances or petroleum products on the Property (findings) and discusses the basis for concluding if a finding is or is not a recognized environmental condition.

3.1 Definitions

Finding – For the purpose of this Assessment, a finding is an observation regarding the presence of hazardous substances or petroleum products on the Property which may be considered a recognized environmental condition, a historical recognized environmental condition, or de minimis condition.

Recognized environmental condition (REC) - A REC is defined by the Practice as "the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minims conditions are not recognized environmental conditions."

Historical recognized environmental condition (HREC) - An HREC is defined by the Practice as "a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls). Before calling the past release a historical recognized environmental condition, the environmental professional must determine whether the past release is a recognized environmental condition at the time the Phase I Environmental Site Assessment is conducted (for example, if there has been a change in the regulatory criteria). If the EP considers the past release to be a recognized environmental condition at the time the Phase I ESA is conducted, the condition shall be included in the conclusions section of the report as a recognized environmental condition."

Controlled recognized environmental condition (CREC) – A CREC is defined by the Practice as "a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls). A condition considered by the environmental professional to be a controlled recognized environmental condition shall be listed in the findings section of the Phase I Environmental Site Assessment report, and as a recognized environmental condition in the conclusions section of the Phase I Environmental Site Assessment report."

Recognized environmental condition (REC) - For the purpose of this Assessment, a REC is the presence or likely presence of any hazardous substances, pollutants, contaminants, petroleum and petroleum products, or controlled substances (as defined in 21USC 802) on a property under conditions that indicate an existing release, a past release or a material threat of a release into structures on the property or into the ground, groundwater, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include de minimis conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be de minimis are not recognized environmental conditions.

De minimis conditions – As defined by the Practice, conditions determined to be "de minimis" generally do not present a threat to human health or the environment and generally would not be subject of an enforcement action if brought to the attention of appropriate governmental agencies. De minimis conditions are not considered RECs.

3.2 Findings and Opinions

Barr has identified the following findings and developed the following opinions regarding these findings, as summarized in the following table.

Finding ID #	Description of Finding	Opinion with Respect to Finding (REC, CREC, HREC, de minimis)	REC ID #
1	**Potential impact to the property from off-site source**: 3450 Fernbrook Lane discovered a release of fuel oil 1 & 2 on June 25, 1992 and documented in an excavation report. A No Further Action report was issued on August 2, 1992.	Based on the excavation report filing it is assumed the fuel oil tank was been removed. Additionally, the MPCA Leaks and Tanks Site online database (Ref. 5f) reports that groundwater contamination does not exist, and there was no evidence of petroleum impacts (e.g., oil sheen) observed during the site visit on the bank adjacent to the Property. Therefore, this finding is not a REC.	NA
2	**Evidence of on-site dumping:** Debris including, one residential hot water heater, a vehicle hub-cap, plastic, cut wood and a yellow boom were observed on the creek bank east of Fernbrook Lane.	The debris observed is consistent with occasional, scattered surface debris commonly found in vacant areas of the urban environment. There was no indication that the debris represent concentrated dumping activities or the presence of a larger volume of subsurface dump area, and there was no visual indication of a potential release of petroleum or hazardous substances. Based on those observations, the debris are viewed as a de minimis conditions and therefore this finding is not a REC.	NA

4.0 Conclusions

We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527-13 of the SE ¼ of Section 16, NE ¼ of NE ¼ of Section 21, and NW ¼ of NW ¼ of Section 22, T118N, R22W, in the City of Plymouth, Hennepin County, Minnesota, the Property. Any exceptions to, or deletions from, this Practice are described in Section 1.4 of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the Property.

4.1 Deviations

There were no deletions, deviations from, or additions to the Practice associated with the Assessment other than the limitations and exceptions listed in Section 1.4.

5.0 References

The following resources are numbered for use as references.

Ref #	Resource	Years Covered or Item Date
Standard Historical Resources		
1a	Aerial Photographs	1937, 1940, 1947, 1953, 1957, 1964, 1969, 1979, 1984, 1991, 1997, 2003, 2008, 2013
1b	Fire Insurance Maps	Not Available
1c	Property Tax Files	2014
1d	Recorded Land Title Records	Not Reviewed
1e	USGS Topographic Maps	1896, 1902, 1955, 1967, 1972, 1980, 1993, 2013
1f	Local Street Directories	1967, 1972, 1977, 1982, 1988, 1992-1993, 1997-1998, 1999, 2002, 2007, 2012
1g	Building \ Department Records	Not Reviewed
1h	Zoning/Land Use Records	City of Plymouth Zoning Map, dated November 25, 2015
1i	Other Historical Sources: Historical Maps	1856, 1873, 1898, 1913, 1914
1j	Prior Assessments opportunities	Not Available
Discretionary and Non-Standard Physical Setting Sources		
2a	Published Geologic Report Balaban, N.H. 1989. *Geologic Atlas Hennepin County, Minnesota.* Minnesota Geological Survey.	1989
2b	Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/	Accessed September 18, 2015
Standard Environmental Record Sources		
3a	HIG Report (Appendix D)	September 15, 2015
3b	What's in My Neighborhood? October 5, 2015. Minnesota Pollution Control Agency. *October 6, 2015. <http://www.pca.state.mn.us/index.php/data/wimn-whats-in-my-neighborhood/whats-in-my-neighborhood.html>*	October 6, 2015
Interviews		
4a	Property Owner/Key Site Manager: *Diane Evans, Director of Parks & Recreation, City of Plymouth, 763-509-5201.*	October 6, 2015
4b	Public Works/City Engineering: *Peter Moen, Sanitary & Storm Utilities Supervisor,* *763-509-592, pmoen@plymouthmn.gov*	September 22, 2015
4c	Public Works/City Engineering:	October 6, 2015

Ref #	Resource	Years Covered or Item Date
	Ben Scharenbroich, Water Resource Technician *763-509-5527 bscharenbroich@plymouthmn.gov*	
4d	Public Works/City Engineering: *Derek Asche, Water Resources Manager* *dasche@plymouthmn.gov*	October 6, 2015
4e	Public Works/City Engineering: *Scott Newberger, Utilities Manger* *763-509-5999 snewberf@plymouthmn.gov*	October 6, 2015
4f	City of Plymouth Zoning Authority Zoning map available online at http://www.plymouthmn.gov/modules/ShowDocument.aspx?documentid=367	Accessed September 18, 2015
4g	City of Plymouth Fire Department: *Name, Position, Phone No.*	October 6, 2015
4h	User Representative: Laura Jester, BCWMC Administrator, 952-270-1990 *Name, Position, Phone No*	November 4, 2015
Supplemental Resources		
5a	Minnesota Department of Health County Well Index. Available online at http://www.health.state.mn.us/divs/eh/cwi/	Accessed September 18, 2015
5b	Site Visit Michelle Waters, Geoscientist, 952-842-3572	September 16, 2015
5c	Plymouth Public Works Department Records	May 28, 2015
5d	Disc Golf Course Review Available online at http://www.dgcoursereview.com/course.php?id=269	Accessed on October 28, 2015
5f	Minnesota Pollution Control Agency, Leaks and Tanks Site available online at http://www.pca.state.mn.us/index.php/waste/waste-and-cleanup/waste-management/tank-compliance-and-assistance/minnesota-aboveground-/-underground-storage-tank-site-search-data.html	Accessed on October 6, 2015

6.0 Signature and Qualifications of Environmental Professional

I declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental Professional* as defined in §312.10 of 40 CFR 312. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Barr performed this Assessment in conformance with the ASTM, International (ASTM) Practice E 1527-13. Special terms, conditions, limitations, and exceptions that apply to the Assessment are described throughout this Report and in the Appendices

11/5/15

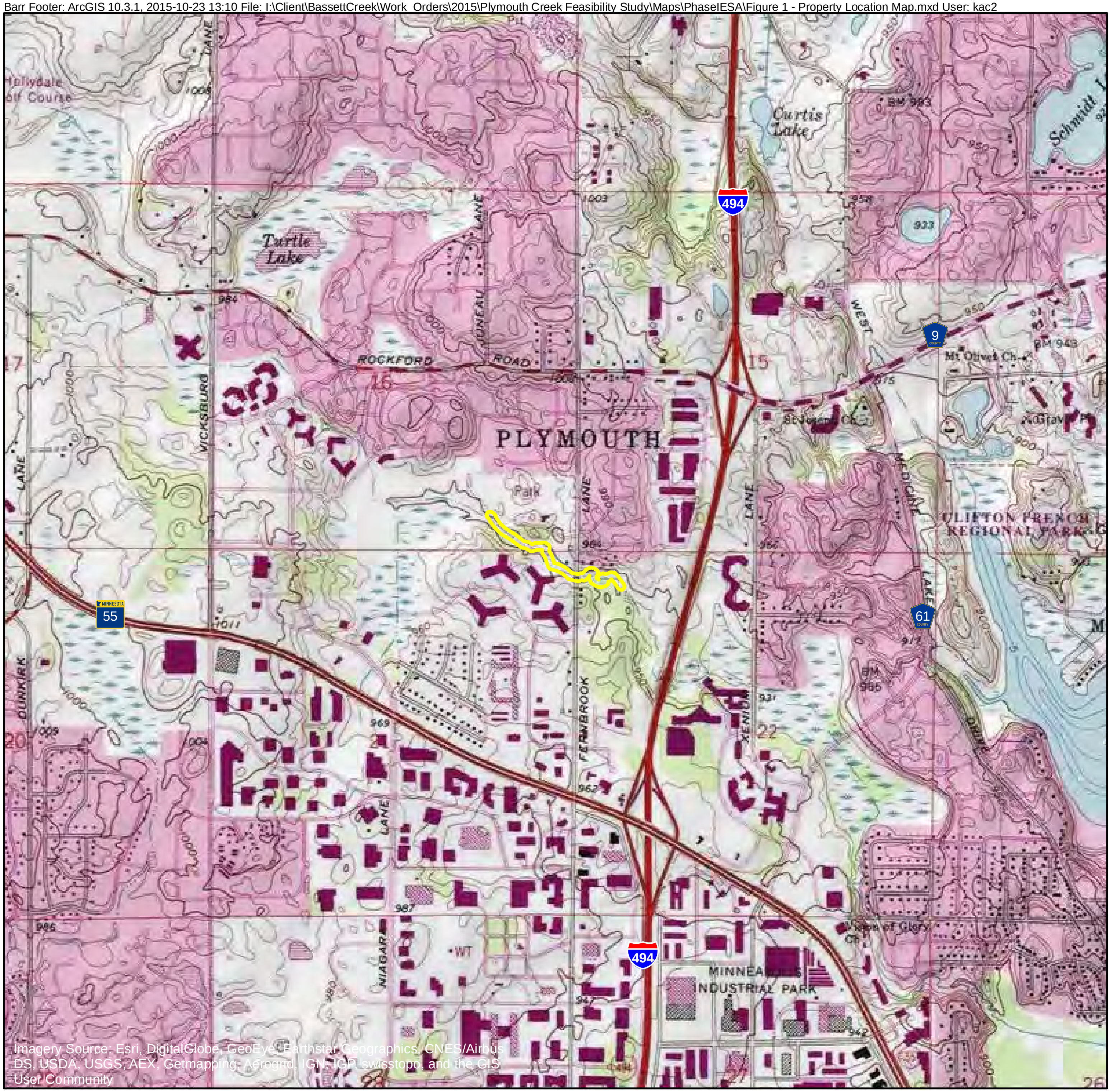
Dan Fetter, Environmental Professional 11/5/15

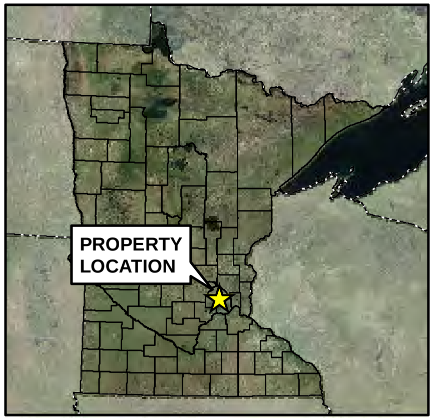
11/5/15

Michelle Waters, Environmental Support Staff 11/5/15

Qualifications of the Environmental Professional are summarized in Appendix G.

Figures





Property Location

N

Feet

0 2,000 4,000

Figure 1

PROPERTY LOCATION MAP
Bassett Creek
Plymouth, MN

Barr Footer: ArcGIS 10.3.1, 2015-11-03 09:52 File: I:\Client\BassettCreek\Work_Orders\2015\Plymouth Creek Feasibility Study\Maps\PhaseIESA\Figure 2 - Property Layout Map.mxd User: KAC2

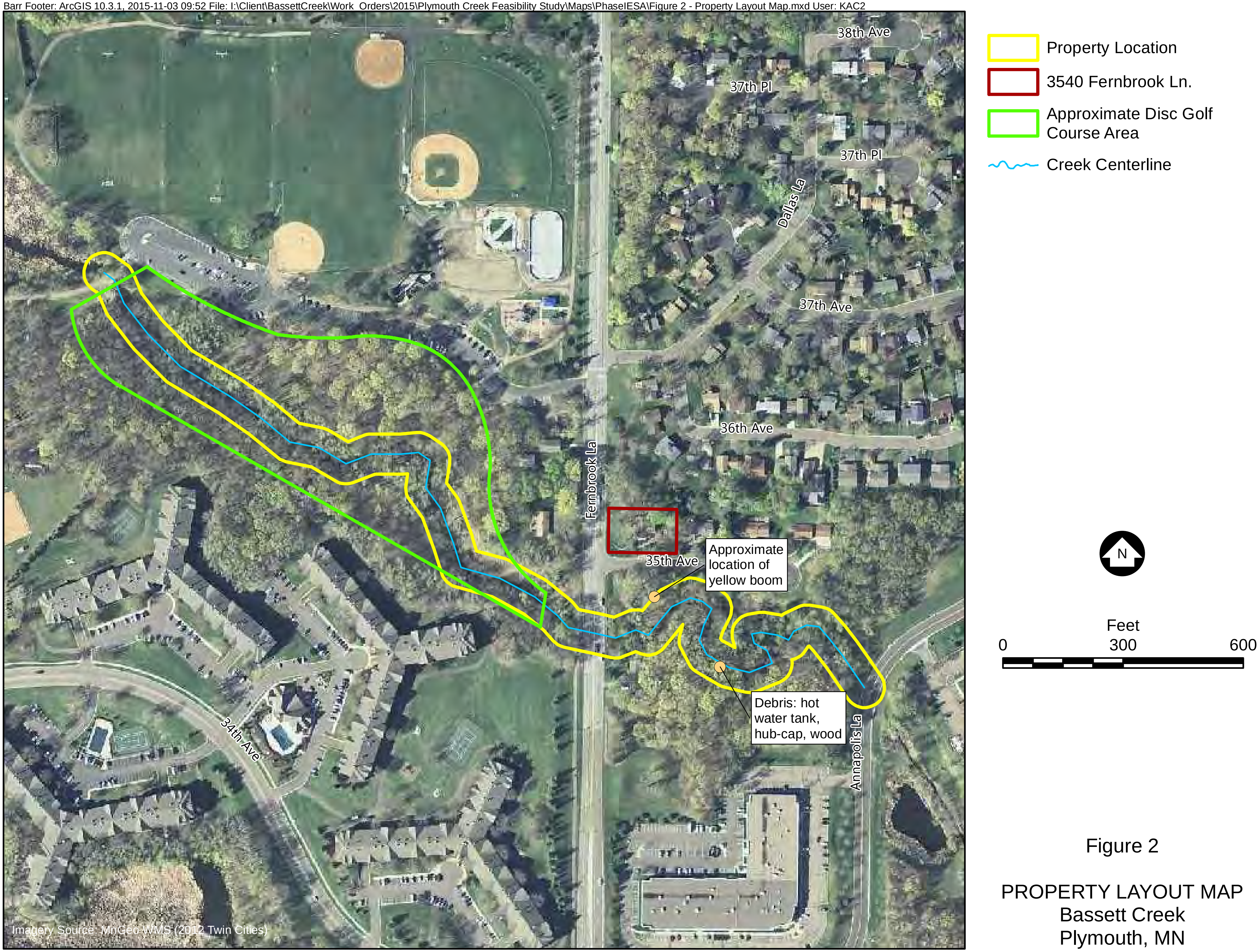


Figure 2

PROPERTY LAYOUT MAP
Bassett Creek
Plymouth, MN

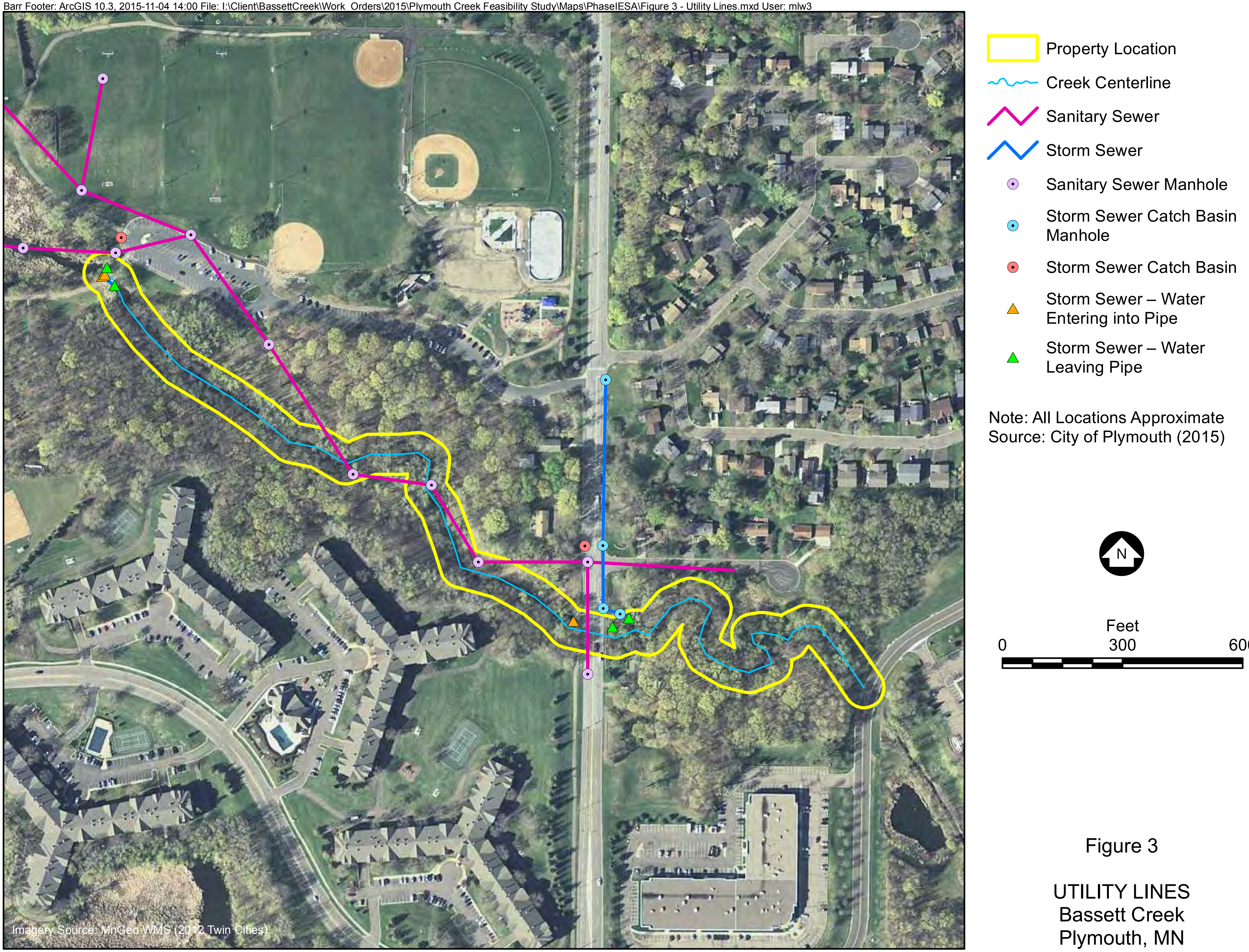


Figure 3

UTILITY LINES
Bassett Creek
Plymouth, MN

Appendices

Appendix A

Phase I Documentation

Appendix A

Phase I Environmental Site Assessment Documentation Plymouth Creek at Plymouth Creek Park Plymouth, Minnesota November, 2015

I. General Property Information

Property location map is shown on Figure 1. Property layout features is shown on Figure 2.

Property name: Plymouth Creek

County: Hennepin

Township: 118N **Range**: 22W **Sections**: SE ¼ of 16, NE ¼ of NE ¼ of 21, and NW ¼ of NW ¼ of 22

Property size: The creek reach is approximately 2,800 feet in length. The Property consists of the creek and a 50-foot buffer on all sides of the creek, totaling approximately 6.47 acres.

Current Property owner and year of purchase: Property is a creek that flows into Medicine Lake. The Property intersects parcels owned by the following entities: City of Plymouth and St. Paul Properties, Inc. (Ref. 1c).

Current Occupant(s): Not applicable

Current Property use: Stream corridor

II. Physical Setting

Surface elevation: The surface elevation at the northwest end of the Property is approximately 950 feet mean sea level (MSL) and the surface elevation at the southeast end of the Property is approximately 940 feet MSL (Ref. 1e).

Topographic conditions of Property: Property is characterized by a creek channel, incised from approximately one to five feet below grade (Ref. 5b). The Property generally slopes from northwest to southeast and the creek flows in the same direction (Refs. 1e, 5b).

Stratigraphy (soils and upper bedrock units): Soils at the Property are loam and clay loams (Ref. 2b). Surficial deposits geology at the north and south ends of the Property are characterized by peat and organic-rich sediment, the middle of the Property is characterized by loamy and sandy till (Ref.2a).

Bedrock underlying the Property consists of St. Peter sandstone found from 101 to 150 feet below ground surface (bgs) (Ref.2a).

Nearest surface water body (name and distance): Medicine Lake is approximately one mile east of the Property (Ref. 1e).

Anticipated groundwater depth/flow direction: Plymouth Creek surface water flows from the headwaters located northwest of the Property to the southeast into Medicine Lake (Refs. 1e, 5b).

Shallow groundwater flow direction is to the east, towards Medicine Lake and the Mississippi River (Ref. 2a). It is anticipated that Plymouth Creek has a local influence on the shallow groundwater in the vicinity (Ref. 1e). Therefore, groundwater flow direction south of the Property is to the north; and groundwater flow direction north of the Property is to the south. The depth to shallow bedrock groundwater ranges between 920 and 900 feet MSL, approximately 20 to 40 feet bgs (Ref. 2a).

Regional aquifer: The regional bedrock aquifer is within the St. Peter Sandstone at 900 to 850 feet MSL and flows east towards the Mississippi River (Ref. 2a).

III. Municipal Information & Utility Service to Property

The locations of Property utilities (wells, septic systems, sewer lines) are shown on Figure 3.

Water Supply

Municipal water supply and intake location(s): The City of Plymouth sources their water for municipal water supply from wells screened in the Jordan and Prairie Du Chien aquifers (Ref. 4e). The nearest well is approximately 6,000 feet from the property (Ref. 4e.)

Property potable/process water supply: None (Refs. 5a, 5b).

Have other potable water supplies serviced the Property? No

Property potable/process water supply well(s) data: None (Ref. 5a, 5b).

Sanitary Service

Type of sanitary service for the Property: None. The City of Plymouth has utility lines in the vicinity of the Property, but the creek is not serviced (Ref. 4a) .

Have other methods of sanitary service been used at the Property? Not aware of any (Ref. 4a.

Evidence of current onsite septic systems or drain fields: None observed.

Stormwater Management

Is the Property serviced by stormwater drains, storm sewers, ponds or drainage ditches? No. There is a stormwater pipeline that cross the creek and stormwater manholes adjacent to the creek as shown on Figure 3 (Ref. 4a).

Do any neighboring properties discharge to the Property? No point discharges were observed (Refs. 4a, 5b).

Are there any dry wells on site? None observed.

Fire Department Information

An interview was conducted with the City of Plymouth fire department. The fire marshal was not aware of any fires, spills, chemical storage or other environmental responses on the Property (Ref. 4g).

Property Zoning

The Property east of Fernbrook Lane is zoned P-1 public/institutional, and the Property west of Fernbrook Lane is zoned RMP-2 multiple family 2 (Ref. 1h).

IV. Current Property Use

Current Property Waste Management

The creek does not generate any waste. The disc golf course west of Fernbrook utilizes trash and recycling containers throughout the course, which are managed by the City of Plymouth (Ref. 5b).

V. Property, Adjoining, and Surrounding Area Regulatory Status

Regulatory database summary and supporting information is in Historical Information Gathers Report located in Appendix D. Only information generated through searches of databases required by ASTM 1527-13 and within the appropriate minimum search distances were reviewed.

Property and Adjoining Property Regulatory Status

Table 1

ASTM List	Address	Listing Status	Potential or Documented Release to Environment	Was a Regulatory File Review Completed?
LUAST	3540 Fernbrook Ave N.	Closed	A release of fuel oil 1 & 2 was discovered on June 25, 1992 and an excavation report resulted in a No Further Action Required determination. The release was closed on August 4, 1992.	No

ASTM List Definitions:
LUST – Leaking Underground Storage Tanks

A file review was not completed because a storage tank of fuel 1 and 2 at a residential parcel is unlikely to impact the soil or groundwater at the Property. Minnesota Pollution Control Agency Leaks and tanks database report no groundwater or soil contamination (Ref. 5f).

Surrounding Area Regulatory Status

No upgradient sites were identified in the regulatory report and downgradient and/or side gradient listings were determined not to have a potential to impact the Property.

Tribal Sites

As part of the HIG Report, locations of Native American reservations equal to or greater than 640 acres in size within the search area are reported. No reservations meeting this size criterion were identified within 1 mile of the Property (Ref. 3a). The local government contact was not aware of Native American reservations or administered lands within 1 mile of the Property (Ref. 4g).

Orphan Site Summary

None identified.

VI. Report and File Review Summary

Previous Environmental Investigations/Remedial Actions of the Property

No previous environmental investigations of the Property were reviewed.

Property Historical Releases

No chemical or petroleum releases were reported for the Property. No remedial actions or environmental violations have occurred on the Property (Ref. 4h). However, debris was observed on the Property (Ref. 5b).

Environmental Liens

No environmental liens were identified for the Property (Ref. 4h).

Activity Use Limitations

No institutional or engineering controls were identified for the Property (Ref. 4h).

Proceedings Involving the Property

No pending, threatened, or past litigation. Administrative proceedings, or government notices relevant to hazardous substances or petroleum products were identified.

VII. Property and Nearby Property Land-Use History

Property Land-use History

Original Property development (year/use): Records showed no development of the Property prior to 1898. The creek is visible in 1856 (Ref. 1i), and is undeveloped on a 1902 aerial (Ref. 1e). The creek shape has changed throughout history via natural flow processes (Refs. 1a, 1e).

Chronology of Past Property use/ownership:

The creek intersects Fernbrook Lane, which was present by at least 1937, and Annapolis Lane, which was present by at least 1997 (Ref. 1a). The playfields to the north of the creek were developed by 1984 (Refs. 1a, 1e), and the disc golf course was created in 1997 (Ref. 5d). Residential structures were present since at least 1937 north of the creek on the east side of Fernbrook Lane.

Historical Property Structures

There were no historic structures that were demolished on the Property.

Demolition Debris: Not applicable

Current Property Structures, Renovations, and Additions

No structures were observed on the Property (Ref. 5b).

Nearby Property Land-Use History

North	**Historical Use:**	Agricultural, residential, playfields (Refs. 1a, 1e, 1f, 1i)
	Current Use:	Residential and playfields (Refs. 1a, 1e, 1f)
South	**Historical Use:**	Agricultural and multi-unit residential (Refs. 1a, 1e)
	Current Use:	Multi-unit residential (Refs. 1a, 1e)
East	**Historical Use:**	Agricultural, residential and commercial (Refs. 1a, 1e)
	Current Use:	Residential and commercial (Refs. 1a, 1e)
West	**Historical Use:**	Agricultural, playfields, marshland (Refs. 1a, 1e)
	Current Use:	Playfields and marshland (Refs. 1a, 1e)

General type of current or past uses in the surrounding areas:
The creek corridor (Property) appears to intersect agricultural land from at least 1898 through 1964 (Ref. 1a). As early, as 1937 Fernbrook Lane is visible and residential structures exist to the north of the future 35th Avenue (Ref. 1a). Residential development slowly begins near the Property in 1957 and rapidly developed by 1984 and is developed similar to current use by 1997 (Refs. 1a, 1e). By 1984 playfields and green space exist to the north of the Property, this space is expanded and improved on through 2003 (Refs. 1a, 1e). By 1997 commercial buildings and Annapolis Lane exist to the east of the Property (Ref. 1a). The City of Plymouth historical town hall exists adjacent to the north, along the west side of Fernbrook Lane (Ref. 1f).

Historical releases associated with adjacent properties or communities: The City of Plymouth Public Works Department provided a May 28, 2015 report regarding an approximately 329-gallon mineral oil leak from a damaged transformer at the Plymouth Ice Center, upgradient from the Property (Ref. 4c). According to the report, adsorbent booms were dispatched downstream and the leak was managed prior to it reaching the wetland adjacent, upgradient, to the Property. The report is provided in Appendix E.

VIII. Site Reconnaissance

The objective of the site reconnaissance is to obtain information indicating the likelihood of identifying recognized environmental conditions in connection with the property (ASTM 1527-13 Sec 9.1). Existing Property features are shown in the Property layout on Figure 2. Photographs obtained during the Property inspection are in Appendix B.

Date of inspection: September 16, 2015

Name of individual conducting site visit: Michelle Waters

Weather information: 82F, sunny, calm

Exterior Observations

Methodology used to observe the Property: Accessed the Property from the northwest and walked the entire length of the creek from northwest to southeast. Walked on banks and in creek, depending on depth of water, surrounding vegetation, and slopes.

Access to the Property (vehicular access and restrictions to public access): A walking trail crosses the creek at the northwest end of the Property. West of Fernbrook Lane is a disc golf course operated by the City of Plymouth and is accessible by foot to the public. East of Fernbrook Lane is restricted by dense vegetation. No vehicular access is available to any portion of the Property, except passing over the creek on Fernbrook Lane.

Periphery of the Property (roads, streets and parking facilities, etc.):
The Property generally extends from the west end of the surface parking lot that services Plymouth Creek Park, crosses under Fernbrook Lane and extends to Annapolis Lane. The backyards of residences of 35th Avenue and the multitenant buildings are adjacent to the Property.

Ground surface cover (paved, gravel, grass): Ground vegetation through the disc golf course, west of Fernbrook Lane, is sparse, mature trees create a dense canopy overhead. Ground vegetation east of Fernbrook Lane is a dense mixture of scrub vegetation and mature trees.

Visible evidence of filling, excavation, or burned areas: None observed.

Visible evidence of vegetative stress: None observed.

Pits, ponds, lagoons, and standing surface water: None observed.

Stained soil or pavement: None observed.

Wastewater, stormwater, and other visible liquid discharge points into a pipe, pond, ditch, stream adjoining property or the Property: None observed.

Indications of past uses of the Property likely to involve the use, treatment, storage, disposal or generation of hazardous substances or petroleum products: None observed.

Nonpotable/process wells: None observed.

Pipelines across or into Property: A gas pipeline was marked on Fernbrook Lane, in a north-south orientation, parallel to Fernbrook Lane.

Rail lines: None observed.

Transformers: None observed.

Outdoor Chemical Storage Areas/Drums: None observed.

Underground Utility Locations: Overhead electrical lines were observed running parallel to Fernbrook Lane in a north-south orientation. At least two sanitary sewer manholes were observed west of Fernbrook Lane. The City of Plymouth utility drawings locate three sanitary manholes and a storm sewer pipe crossing the Property in a northwest to southeast direction as shown on Figure 3 (Ref. 4a).

Odors: None observed.

Other: Debris including, one residential hot water heater, a vehicle hub-cap, plastic and cut wood was observed east of Fernbrook Lane, on the slope of the south creek bank (Photos 13, 14). A yellow boom was observed on the north creek bank, east of Fernbrook Lane (Photo 15).

Scrap metal and concrete debris was observed on the Disc Golf course, approximately 120 feet from the center of the creek (Photo 8).

Liter including, plastic beverage bottles, aluminum cans and plastic was observed throughout the Property.

VIII. Interior and Exterior USTs and ASTs

Not present.

IX. Interviews

The objective of interviews is to obtain information indicating recognized environmental condition in connection with the property (ASTM 1527-13 Sec 10.1). Especially relevant information from the interviews is included and documented throughout the Assessment report and Appendix A.

Appendix B

Property Inspection Photographs

Appendix B
Property Inspection Photographs

Plymouth Creek
Plymouth, Minnesota
September 16,2015

Photo #	Comments
1	Northwest edge of Property, entrance to disc golf course. Facing southeast
2	Typical creek area within disc golf course
3	Typical creek area within disc golf course
4	Typical creek area within disc golf course
5	Trash container within disc golf course. Disc golf tee-box and bench.
6	Disc golf basket hole
7	Litter in creek
8	Scrap metal and concrete debris
9	Sanitary sewer manhole, creek in background
10	Culvert at Fernbrook Lane, looking southeast
11	Fernbrook Lane, looking north
12	Typical creek area east of Fernbrook Lane
13	Debris (hot water heater, plastic, wood) in bank of creek east of Fernbrook Lane
14	Hub-cap debris in creek east of Fernbrook Lane
15	Boom along side the creek, east of Fernbrook Lane.
16	Litter alongside creek, east of Fernbrook Lane

Photo 1: Northwest edge of Property, entrance to disc golf course. Facing southeast

Photo 2: Typical creek area within disc golf course

Photo 3: Typical creek area within disc golf course

Photo 4: Typical creek area within disc golf course

Photo 5: Trash container within disc golf course. Disc golf tee-box and bench.


Photo 6: Disc golf basket hole

Photo 7:   Litter in creek

Photo 8:   Scrap metal and concrete debris

Photo 9: Sanitary sewer manhole, creek in background

Photo 10: Culvert at Fernbrook Lane, looking southeast

Photo 11: Fernbrook Lane, looking north

Photo 12: Typical creek area east of Fernbrook Lane

Photo 13: Debris (hot water heater, plastic, wood) in bank of creek east of Fernbrook Lane

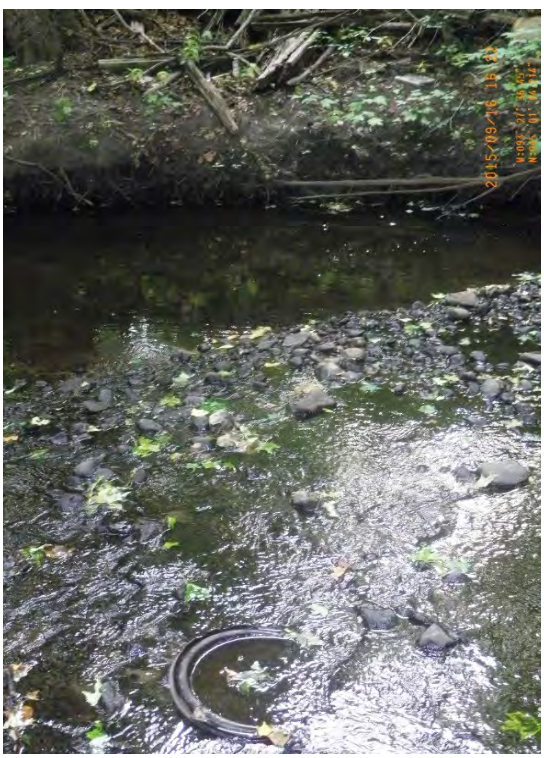


Photo 14: Hub-cap debris in creek east of Fernbrook Lane

Photo 15: Boom along side the creek, east of Fernbrook Lane.

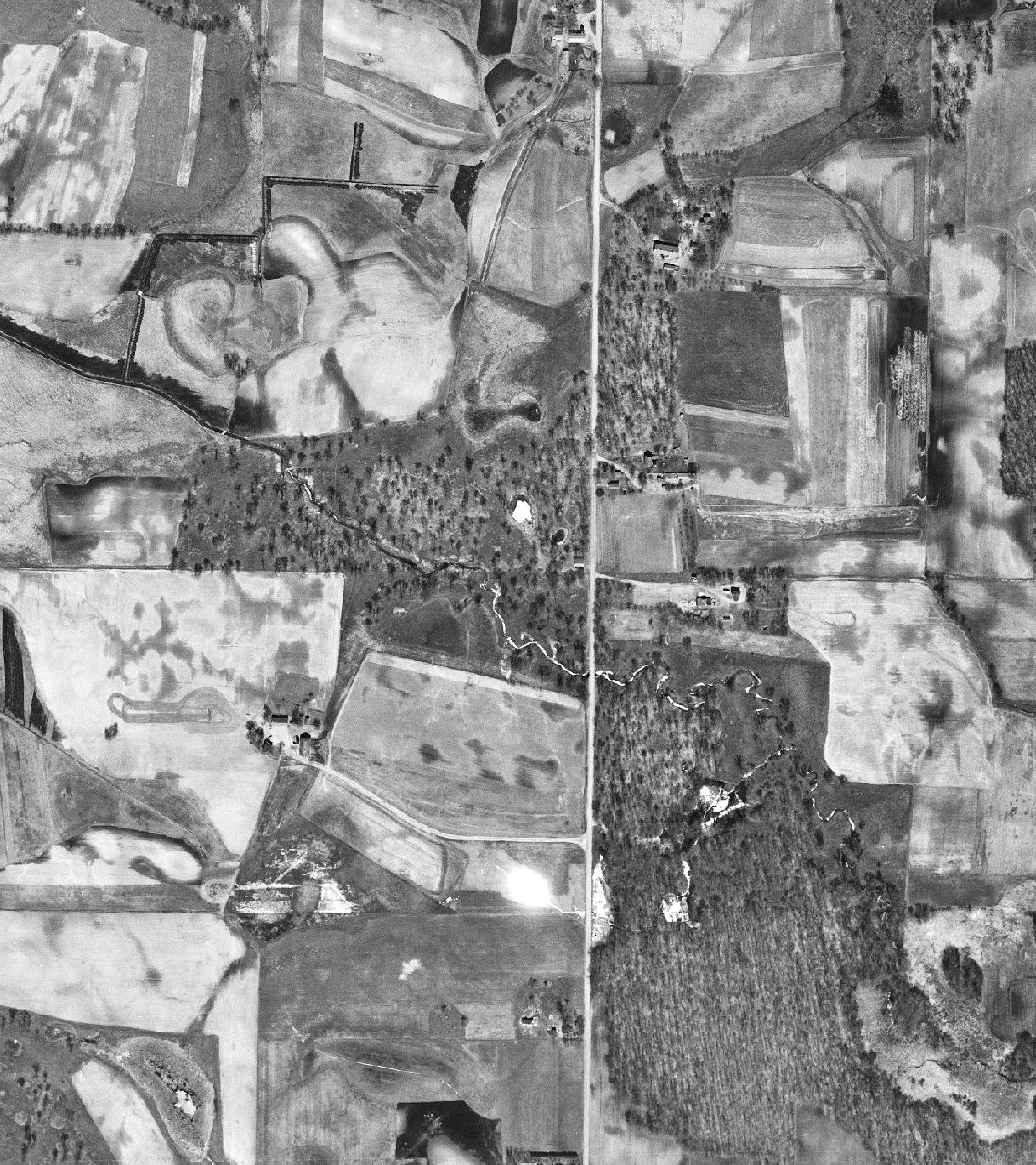
Photo 16: Litter alongside creek, east of Fernbrook Lane

Appendix C

Historical Documentation

(on CD)

Aerial Photographs




0000-WN-24-2

City Directories

104 ★Caryn International ...... + 763.746.3695
134 ★Devcon Security .... + 612.520.7601
★Extron Electronic .... + 763.268.4983
★Extron Electronics .... + 763.208.6160
114 ★Extron Electronics ...... + 763.208.2684
112 ★KRS Consulting Group Inc. 07 763.478.9787
119 ★National Ataxia Foundation 03 763.553.0020
130 ★Pfu Systems Inc 10 763.551.8261
110 ★Source Engineering And Manufacturing
07 763.745.2833
124 ★ThermoDyne Inc 10 763.557.4900
100 ★Triarco Arts & Crafts 10 763.559.5590
116 ★Wellman Sports Marketing 09 763.559.0832
116 ★Wellman Sports Marketing Inc + 763.551.1506
2605 Building
B ★Agfa Corporation 06 763.550.2215
★Johnson Controls 10 763.551.2550
★Neometrics 09 763.559.4440
★Plymouth Historical Society 94 763.559.9201
★TSR Lighting 97 763.550.0001
-27TH AVE N INTS
2724 ★M & N Structures Inc. 05 763.383.6940
★Reinders 10 763.503.0200
-28TH PL N INTS
2800 ★Summit Dance Shoppe ... 07 763.553.1870
-CHESHIRE LN N INTS
-HARBOR LN N INTS
3000 ★Wells Fargo 10 612.316.4525
3020 ★Holiday Stationstores 02 763.559.3690
3050 ★Fernbrook Kindercare 09 763.553.7960
3131 Building
111 ★Anchor Insurance Agency. 10 763.473.4090
102 ★Beltone .... + 763.553.9097
223 ★Foam Fabricators Of Minnesota Inc
09 763.557.8987
223 ★Foam Fabricators Of Minnesota Inc
+ 763.557.9698
206 ★Jacob Restaurant Group .. 06 763.383.1574
114 ★National Courier Service .. 10 763.746.5387
★New World Publishers 02 763.593.5626
100 ★Soundpoint Audiology 07 763.559.1422
100 ★Soundpoint Audiology And Hearing Ser
09 763.515.8222
204 ★Tri 06 763.519.0874
240 ★Websoft Inc 08 763.553.1200
200 ★Writing Assistance 09 763.551.9772
3141 Building
★JTS Group Holdings 08 763.548.1013
201 ★K E Nelson Associates ... 10 763.509.0090
★Ke Nelson And Associates + 763.509.0098
★Nexus Information Systems 06 763.557.5992
3145 ★Select Foods 03 763.550.1426
3161 ★Daniels & Wymore 10 763.201.1206
★Koepke Law Group 10 763.201.1210
3165 ★Headwaters Mortgage ... 05 763.694.9100
3169 Building
★Ashlie Kaess Ameriprise Financial
+ 612.216.4111
LOWR ★Chiropractic Fernbrook ... + 763.201.1285
LOWR ★Fernbrook Chiropractic ... 04 763.201.1284
UPPR ★Forteva Real Estate ...... + 763.746.0985
★Siena Title .... + 763.746.0987
3181 Building
★Hultgren R J 05 763.201.1306
LOWR ★Integra Shield Financial Group Llc
06 763.201.1390
★Minkema Robert L Cpa Ltd 07 763.450.0742
★Ratzlaff William T 03 952.545.6455
★Xpress Cash Financial Services Llc
05 763.201.1280
3185 ★Fidelis Foundation 10 763.201.1268
★Network Management Inc 05 763.201.1240
★Spa .... + 763.253.4091
3189 ★Howse & Thompson Pa ... 03 763.577.0150
3211 ★Dean Shiff Allstate Agent. 10 763.519.2731
★Jacob Group Agency Allstate Agent
10 763.559.4165
3231 ★Northern ConAgg Llp 03 763.509.9344
3235 ★Anderson Judie Secretarial ServiceJ
10 763.553.1144
★Bourgon Hr Solutions .... + 763.559.0100
★Landrum Dobbins Llc .... + 952.893.2300
3239 ★Bemboom Robert J Ltd ... 10 763.557.8844
3251 Building
★Beltrand Mark J Ltd ..... + 763.557.6071
★Farmers Insurance Mark Ylitalo Age
10 763.541.0478
UPPR ★Farmers Insurance Group .. + 763.545.1733
★Farmers InsuranceKelly Eldred Agenc
+ 952.544.8449
3255 Building
★Johnson & Company Ltd .. 05 952.525.9500
★Staffing Dimensions 04 763.201.1320
LOWR ★Triple S Dynamics Inc 09 763.201.1291
3300 Building
★Best Brains Inc 01 763.577.3723
170 ★Criterion Insurance Agency 09 763.253.0590
200 ★Driveline Retail Merchandising 10 763.553.3800
175 ★Equimed Corporation 09 763.557.6810
★Plymouth Woods Office Building 05 763.694.9230
250 ★Shock Doctor Inc 03 763.519.2737
300 ★Sirva Relocation 06 763.551.8998
700 ★State Farm Insurance 09 763.557.0050
100 ★Stewart Title 07 763.519.2828
225 ★Trillium Woods 07 763.553.7600
★Vital Images Inc 05 763.852.4100
160 ★Westminster Mint Inc 10 952.544.4111
-34TH AVE N INTS
3450 John Edward Starczewski 92 NP
Jeanne V Starr .... 92 NP
-35TH AVE N INTS
3535 Robert Jay Bennett (7/00) .. 00● NP
Shelley S Bennett (7/00) .... 00● NP
3540 Bonnie Jean Kott .... 99●763.557.6534
Robert Warren Kott .... 99●763.557.6534
-DALLAS LN N INTS
3800 Melita V Hoese (11/04) .... 04● NP
Randy Edward Hoese (11/04) . 04● NP

3810 3816 .... NP
-38TH AVE N INTS
-39TH AVE N INTS
3920 Audrey Lynn Conrad (5/99) .. 96●763.577.1947
Daniel James Conrad (5/99) 96●763.577.1947
3940 Gregg D Enger (12/99) .... 94● NP
3950 Michele Lee McManigle (6/07) 05● NP
Paul McManigle (6/07) .... 05● NP
-40TH AVE N INTS
4000 Noureddine Latiki (6/98) .... 99● NP
Athena Antoinette Mosley (6/98) 99● NP
4050 Kelly A Peniata (3/95) ..... 94●763.553.7811
Patty Lynn Peniata (3/95) .... 94●763.553.7811
4105 - 6085 55446
-ROCKFORD RD INTS
4105 Mark Clement Goettl (10/00) 00●763.551.1875
Sandra Jean Goettl (10/00) .. 00●763.551.1875
4115♣ Holly Easthouse Schluter ... + NP
♣ John Mitchell Schluter ...... + NP
4120 ★Airport Express Cab 10 763.551.3920
★General Home Improvement Company
10 763.551.5528
★Holdahl Co The 03 612.333.7111
★Vermeulen Law Office Pa . 09 763.450.3088
4125 Vernon George Stubbs (9/80) 80●763.559.5688
4130◊ Christen E Royal (7/08) ..... 08●763.383.6029
-42ND AVE N INTS
4235 David Keith Brinkman (8/95) .. 95●763.551.9696
Linda M Brinkman (8/95) .... 95●763.551.9696
4265 Anatoly Borisovich Gonikman 97●763.577.0568
Tanya A Gonikman .... 97●763.577.0568
-43RD AVE N INTS
4305 .... NP
4315 Kevin Michael Rosen (4/05) .. 05●763.577.9988
Renee A Rosen (4/05) ...... 05●763.577.9988
-44TH AVE N INTS
-46TH AVE N INTS
4630 ★Orchids Limited 94 763.559.6425
5501 5505 .... NP
5511 Paul Wingarden .... 07 NP
5515 David J Benson (3/06) ..... 05●763.559.7797
Lori K Benson (3/06) ...... 05●763.559.7797
5521 Anne Elizabeth Vilkama (9/05) 05● NP
ESA Heikki Vilkama (9/05) ... 05● NP
5525 John Jay Dupay (10/05) .... 05●763.519.0487
Penny Jean Dupay (10/05) ... 05●763.519.0486
5531 Diane Katherine McCollum (3/06) 05●763.383.9412
Jon Alan McCollum (3/06) ... 05●763.383.9412
5535 5541,5545 .... NP
5551◊ Dan Edward Lee (3/06) .... 04●763.557.6461
◊ Jennifer Ann Milligan (3/06) 04●218.963.9930
5555 Cheryl Dawn Chanen (7/10) 06●763.559.6676
6065 ★Lennar Homes 10 763.551.7336
6075 6085 .... NP
96 RESIDENCE 108 BUSINESS

FERNBROOK LN N

Osseo

CT 267.15		6226 - 6323	$A
CT 267.16		6237 - 7505	$A
CT 287.07		10200 - 10775	$D
CT 269.10		10825 - 11640	$C
CT 267.10	0	11491 - 11491	$C

6226 - 7505 55311
6226 Mark Scott Barrett (4/06) .. 05●763.559.9648
Nancy B Barrett (4/06) ..... 05●763.559.9648
6227 Linda L Laak (7/89) .... 89●763.557.9732
Michael J Laak (7/89) ...... 89●763.557.9732
6232 Brian James Ross (5/99) ... 92●763.557.1069
Michelle Marie Ross (5/99) .. 92●763.557.1069
6233 ★Manufacturers Alliance .. 03 763.533.8239
◊ Art Terry Sneen (8/94) .... 02●763.537.7754
◊ Helen Esther Sneen (8/94) .. 02●763.537.7754
6237♣ Dale Jones .... 07 NP
♣ Frances Jones .... 07 NP
6238 Barbara Marie Ross (6/90) .. 90●763.553.9976
Harry Charles Ross II (6/90) . 90●763.553.9976
6239 Brad A Terlson (12/90) .... 90● NP
Cindy A Terlson (12/90) .... 90● NP
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6253 Jeffrey Gerald Wachowak (12/88) 01●763.694.8829
6254 Jolene Agre Carlson (1/94) .. 93● NP
Steven James Carlson (1/94) . 93● NP
★Nanovation .... + 763.577.1648
6257 Ashley Anderson .... + NP
6258 Barry Macdonald Thompson (6/90) 88●763.559.2748
Mary Jo Thompson (6/90) ... 88●763.559.2748
6261 Becky Lindgren Rupp (6/90) .. 89●763.550.1099
John Richard Rupp (6/90) ... 89●763.550.1099
6262 Ghulamabbas Abbas Pyarali (12/97) 96● NP
Shaheen G Pyarali (12/97) ... 96● NP
6265 Brian J Blenkush .... 88●763.553.9297
Hazel S Blenkush .... 88●763.553.9297
6266 Patrick Thomas Sipe (4/08) .. 05●763.550.0277
Sarah J Sipe (4/08) .... 05●763.553.1520
6275 Chaimei P Ma (9/04) ...... 04● NP
Chao J Ma (9/04) .... 04● NP
6287 .... NP
6288 David Ray Baker (3/92) ..... 96●763.551.1287
Pamela Nan Baker (3/92) .... 96●763.551.1287
6320 .... NP
6323 Julie Dee Lambert (11/91) .. 91● NP
Ken Marvin Lambert Jr (11/91) 91● NP
6940 Evan Matthew Harlan (2/78) .. 98●763.420.4968
Kristin Harlan (2/78) ...... 98●763.420.4968
6945◊ David Jerome Lage (11/06) .. 05●763.494.5368
◊ Duane Adolph Lage (11/06) . 05●763.494.5368
6960 Brian Charles Brink (7/99) .. 99● NP
Lynn Kay Brink (7/99) ..... 99● NP
6965 Clyde Leland Spore (10/77) .. 77● NP
Threasa Mary Spore (10/77) . 77● NP
6980 6985 .... NP
-TIMBER CREST DR INTS
7002 Cynthia Jean Bertram (2/04) . 04●763.420.0061
Herb Thomas Bertram (2/04) . 04●763.420.6772
7003 7012 .... NP
7013 Agnes Florence Kubal (4/78) 78● NP
Robert Kenneth Kubal Jr (4/78) 78● NP
7409 Christopher Lynn Konop (2/02) 01●763.416.7122
Wendy Lee Konop (2/02) .... 01●763.416.7122

7415 Ann Ahlhauser Ryan (7/91) .. 91●763.420.8410
Jim Howard Ryan (7/91) .... 91●763.420.8410
7421 Jody David Fjelstad (2/95) .. 95● NP
Lori Jean Fjelstad (2/95) ... 95● NP
7427 Linda S Howington (9/07) ... 05●763.416.9304
Robert A Howington (9/07) .. 05●763.416.9304
7433 Charles Randall Rogers (2/84) 84●763.420.4733
Cynthia Christian Rogers (2/84) 84●763.420.4733
7443 Joy K Vanderwert (3/03) .... 03● NP
Terry Lee Vanderwert (3/03) . 03● NP
7449 Scott Jay Follese .... 92● NP
Susan Ranae Follese ...... 92● NP
7455 Dean Raymond Johnson ... 92●763.420.4589
Peggy Ann Johnson ...... 92●763.420.4589
7463 Flo Margaret Gordon (10/76) 76●763.420.6314
Loren Jay Gordon (10/76) ... 76●763.420.6314
7469 Arlene Elizabeth Niles (4/85) 85●763.420.6115
Timothy John Niles (4/85) ... 85●763.420.6115
7479 Judith A Ball (10/76) ...... 76●763.420.6607
Michael John Ball (10/76) ... 76●763.420.6607
7487 Jacqueline Audrey McMillan . 04 763.420.3631
Seamus Hugh McMillan 04 763.420.3631
7493 James A Galuska (10/77) ... 94●763.420.6476
Barbara A Simmons (10/77) .. 94●763.420.6476
7505 ★Conklin Financial 09 763.315.6500
David Spatafore (1/10) ..... 10● NP
Susan Spatafore (1/10) .... 10● NP
-75TH AVE N INTS
9315 - 11640 55369
-93RD AVE N INTS
9315 ★♣ Henderson Howard Pawluk + 763.420.5353
★♣ Matt Enelmann .... + 763.420.0271
9401 ★Independent School District 279
10 763.391.8777
★Osseo Area Schools .... 10⊙763.391.8777
★Osseo Area Schools 08 763.391.8786
★Osseo School District 279 10⊙763.391.8777
★Osseo School District 279 +⊙763.391.8786
-96TH AVE N INTS
9661 ★Independent School District 279
10 763.420.8888
★Osseo Area Schools ..... + 763.391.8415
★Osseo Area Schools ..... 01⊙763.420.8888
★Osseo Area Schools Independent Schoo
02⊙763.420.8888
9800 ★Independent School District 279
09 763.391.8700
★Osseo Area Schools ..... 10⊙763.391.8700
★Osseo Area Schools Independent Schoo
02⊙763.391.8700
-101ST AVE N INTS
-COUNTY ROAD 81 INTS
10200 Tommy Staples .... + NP
-TERRITORIAL RD INTS
10501 Mark Steven Krieg II ..... 80●763.420.4218
Thomas Gary Krieg ...... 80●763.420.9598
10725 Janice Kay Engelking (4/04) 89●763.420.0281
Walter William Engelking (4/04) 89●763.420.0281
★Engelking Janice K 97 763.420.8999
★Engelking Walter W ..... 03⊙763.420.8999
★Expert Locksmith 10 763.898.5419
★Jans Family Hair Care Inc 02⊙763.420.8999
10775 Cynthia Renae McCartney (12/89) 91●763.494.3011
David Bruce McCartney (12/89) 91●763.494.3011
10825 Bradley Allen Ganzer (10/03) 03● NP
Denise Marie Ganzer (10/03) 03● NP
10855 Jayann Louise Young ..... 84●763.420.6605
Roger Alan Young .... 84●763.420.6605
10921 Phyllis Carole Dehn (3/95) .. 95●763.420.7984
Terri Ann Dehn (3/95) ..... 95●763.420.7984
-ELM CREEK RD INTS
-112TH AVE N INTS
11260 Hilary J McNallan .... 93●763.420.5330
11261 Allen Ignatius Dehn ...... 76●763.420.4084
Thomas Allen Dehn ...... 76●763.420.4084
11280 Genevieve Lila Barber (12/92) 93●763.420.6228
11281 ★Dehns Country Manor ... 09 763.420.6460
-113TH AVE N INTS
11320 Keith B Grover (5/74) ..... 74● NP
Melissa S Grover (5/74) .... 74● NP
11330 Julie Renee North (10/98) .. 98● NP
Robert John North (10/99) .. 98● NP
-114TH AVE N INTS
11421 Ryan Eugene Boyd (4/03) ... 03●763.420.2822
Melissa Vos Vos (4/03) .... 03●763.420.2822
11431 Laura J Culver (2/79) ..... 80●763.420.5883
Scott R Culver (2/79) ..... 80●763.420.5883
11441 Enid Theresa Kalla ...... 76●763.420.5655
Floyd Joseph Kalla ...... 76●763.420.5655
11451 Jeremy Victor Monahan (2/99) 99●763.494.6775
Jill Christine Monahan (2/99) 99●763.494.6775
11471 Elizabeth C Hallquist (6/79) 94●763.420.4240
Jeremy Michael Hallquist (6/79) 94●763.420.4240
11491♣ Jeffrey W Cromahan ...... 02● NP
♣ Jill C Cromahan .... 02● NP
11570 Angela Joyce Kitzman .... 92●763.420.4280
Harry F Kitzman .... 92●763.420.4280
11580◊ Janet R Scherer (2/88) .... 89●763.420.8328
◊ Rick Dean Scherer (2/88) ... 89●763.420.8328
11620 Tanya Danielle Londono (3/79) 99● NP
Vanessa Tomani (3/79) .... 99● NP
11640 James A Saufter (10/83) .... 83●763.420.6124
-117TH AVE N INTS
120 RESIDENCE 22 BUSINESS

FERNCROFT DR

Excelsior

CT 275.04	4795 - 4930	$A

4795 - 4930 55331
-MINNETONKA BLVD INTS
4795 Dana Robin Floring (6/97) .. 94●952.401.0618
Jim Donald Floring (6/97) ... 94●952.401.0618
4805 Jennifer Anissa Fortner (4/98) 96● NP
Michael Jay Fortner (4/98) .. 96● NP
4815 Nicholaus J Dahl (3/10) .... 10● NP
Jessica L Larson (3/10) .... 10● NP
4825 Thomas Michael Jacob (5/96) 93●952.470.8384
Brenda Leppala Thomas (5/96) 93●952.470.8384
4830 Barak Brodnı .... - NP
4840 Terry Jerome Korzendorfer (6/75) 75●952.474.6892

Violet Jean Korzendorfer (6/75) 75●952.474.6892
4845◊ Annette Yvonne Peterson (11/92) 92●952.470.6107
◊ Barry Donald Peterson (11/92) 92●952.470.6107
★Peterson B & A .... + 952.470.6333
4860 Forseth P Larkin (11/09) ... 09● NP
Terrance P Larkin (11/09) .. 09● NP
4865 Ronald Martin Born ...... 80●952.474.6620
4890 Katherine Ann Barnes (5/10) 07●952.513.8957
-IVY LN INTS
4920 Allison R Carls .... 10 NP
Lucas S Grant .... 10 NP
4925 Claudia Mae Easter ...... 80●952.474.7226
James Larry Easter ...... 80●952.474.7226
4930◊ Andre Josephus Boon .... 93● NP
◊ Theresa Ann Boon ...... 93● NP
-FOREST DR INTS
23 RESIDENCE 1 BUSINESS

FERNDALE AVE NE

Minneapolis

CT 512.03	1504 - 1579	$D

1504 - 1579 55432
1504 Nancy Lynne Blegen (2/87) .. 87●763.572.8904
Raymond Blegen (2/87) .... 87●763.572.8904
1505 Cynthia Ann King (7/00) ... 93● NP
James A King Jr (7/00) .... 93● NP
1508 Amy Jo Bronkhorst (5/08) .. 07● NP
Jay Henry Bronkhorst (5/08) . 07● NP
1511 Deborah Jean Olsen ...... 77●763.574.9335
Irving Walter Olsen ...... 77●763.574.9335
1521 Eric Stanley Gardner (9/00) .. 00●763.571.5430
1522 Kathleen Marie Kuempel (5/04) 04● NP
1540 Gary Lee McGee (11/00) .... 00●763.571.7877
Karen L McGee (11/00) ..... 00●763.571.7877
1541 Charles Edward Rice ..... 72●763.571.4054
Faye Leone Rice .... 72●763.571.4054
1560 .... NP
1561 Dragan Loncar (6/04) ..... 04●763.571.2378
Jovanka Loncar (6/04) ..... 04●763.571.2378
1567 Carmen Sims (12/04) ..... 05●763.571.7552
1568 Amy Lynn Severson (8/07) .. 07●763.502.1687
1573 Bobby Joe Donahue ...... 73●763.571.6920
Elizabeth Anne Donahue ... 73●763.571.6920
1579 Vicki Ann Johnson (7/00) ... 93●763.571.5571
James Rowe Million (7/00) .. 93●763.571.5571
-BENJAMIN ST NE INTS
23 RESIDENCE

FERNDALE AVE NE

Prior Lake

CT 809.05	0	14435 - 14435	$A

0 14435 - 14435 55372
-HAMPTON ST NE INTS
14435 Karen Jane Farrell ...... 87●952.445.0453
William Agustain Farrell .... 87●952.445.0453
-ASH CIR NE INTS
2 RESIDENCE

FERNDALE DR

Rogers

CT 269.09	14279 - 14484	$A

14279 - 14484 55374
-NORDEN DR INTS
14279 .... NP
14337 .... NP
14342 Jeffrey Gerard Steeno (7/09) 07● NP
14362 .... NP
14379 Kristine Alvina Welle ..... + NP
Scott Darrell Welle .... + NP
14382 Rachel Obnen .... 08 NP
Robert Donald Obnen ..... 08 NP
14437 Christopher George Nalezny (6/00) 00●763.428.1224
Elizabeth Nalezny (6/00) ... 00●763.428.1224
14448 David Jason Klein Jr ..... 86●763.428.4290
Judy Ann Klein .... 86●763.428.4290
14475 Veomany Chanthirath (8/00) 00● NP
Bounlap N Khiemphasouk (8/00) 00● NP
14484 Amy S Carlson (4/00) ..... 00● NP
Mark Daniel Carlson (4/00) . 00● NP
-LINDEN DR INTS
16 RESIDENCE

FERNDALE DR NE

Braham

CT 1302.00	E	41494 - 41494	$E

E 41494 - 41494 55006
41494♣ Larray R Propotnik .... 01● NP
♣ Larry R Propotnik ...... 01● NP
2 RESIDENCE

FERNDALE DR S

Braham

CT 1302.00	100 - 605	$E

100 - 605 55006
-CENTRAL DR W INTS
100 Brandi Kay Eickstadt (12/06) 07● NP
Colleen K Eickstadt (12/06) 07● NP
108 Russ D Poderzay (8/10) ... 09● NP
109 Brian Allen Moffet (8/05) ... 02●320.396.2903
Carrie Corrine Moffet (8/05) 02●320.396.2903
117♣ Roger Alcide Lafontaine .... 79●320.396.3020
120 Jerry Daproza .... 88●320.396.3917
Linda M Torgeson .... 88●320.396.3917
130 Andrew Joseph Maile (9/03) 04● NP
Tricia Maile (9/03) .... 04● NP
135 Carol Weicherding 10 320.396.2145
Sheldon G Weicherding 10 320.396.2145
145 .... NP
150 Toni R Donatell (3/10) .... 09● NP
Campbell Tyler (3/10) ..... 09● NP
200 James George Lyon (8/01) .. 01●320.396.0498
Lisa Ann Lyon (8/01) ..... 01●320.396.0498
201 Janis Joy Mohs .... 06 NP
221♣ Debbie Ann Grell .... 92●320.396.0015
♣ Gordon G Grell .... 92●320.396.0015

CT - Census Tract AB,Etc. - Census Tract Home Value Rating   ★ - Business Listing   ⊙ - Duplicate Phone Number At This Business Address   ◊ - No Mail Solicitation

★John Rumus Roberson . . . . 98•763.420.4166
11901★Fresh Horses Productions. 05 763.416.2113
Patricia C Sizer . . . . 95•763.416.2113
Ted J Sizer . . . . 95•763.416.2113
11920◊ Annette K Gallery 96 763.420.4980
◊ Michael E Gallery 96 763.420.4980
11970 Cindy Joyce Rassatt . . . . 04•763.420.6287
Richard Eugene Rassatt . . . . 04•763.420.6287
11971 . . . . NP
11980 Georgiann Schmitz . . . . 05• NP
Terrance V Schmitz . . . . 05• NP
11981★Bears Premium Snacks . . +
Michael Stark . . . . 04• NP
Paula Stark . . . . 04• NP
12001◊ Craig Allen Gustafson . . . . 79•763.416.4221
◊ Julie Ann Gustafson . . . . 79•763.416.4221
12020 Terrance Schmitz . . . . 83•763.420.4745
Vincent Schmitz . . . . 83•763.420.5502
12041 Kathleen U Blake . . . . 96• NP
Richard E Blake . . . . 96• NP
12081 Gregory Lee Stolp . . . . 80•763.420.6680
Jodeen Kay Stolp . . . . 80•763.420.6680
12131 . . . . NP
12400 Michael Fischer . . . . +763.323.3985
12450★Karlsburger Foods Inc. . . . 77 763.421.5481
★Sl Real Estate Holdings Llc 05
12530 Gerald D Peterson . . . . 84•763.421.5555
Louise Annette Peterson . . . . 84•763.421.5555
12700 Daniel Scott Buranen . . . . 00• NP
Sean Buranen . . . . 00• NP
★Top Line Fence 04 763.576.9003
12921◊ Earl J Dehn . . . . 77•763.421.3431
35 RESIDENCE 6 BUSINESS

●FERNBROOK LN N

Minneapolis

CT 266.09 875 - 1711 $B
CT 265.14 1700 - 4050 $B
CT 266.03 4105 - 5555 $A
➧ 875 - 4050 55447
875 Anthony James Heppelmann . 91•763.473.4692
Paula Jean Heppelmann . . . . 91•763.473.4692
880◊ Roland W Anderson Cpa . . . . 93•763.476.2432
◊ Shari Joanne Anderson . . . . 93•763.476.2432
885★Shakespearean Youth Theatre 05
◊ Patricia A Verdoorn . . . . 03•763.476.5875
◊ Todd A Verdoorn . . . . 03•763.476.5875
890 Aris F Burt . . . . 94•763.258.8024
Patrick W Burt . . . . 94•763.258.8024
895 Don Charles Smith . . . . 93•763.476.9694
Susan S Smith . . . . 93•763.476.9694
900 Gayle R Crummer . . . . 94• NP
Philip Crummer . . . . 94• NP
905 Jessica L Dunnagan . . . . 94•763.476.6055
Charles Peter Jungman . . . . 94•763.476.6055
910 Daesun Rae Messer . . . . 94•763.404.1785
Steve Edward Messer . . . . 94•763.404.1785
915 . . . . NP
920 Christine Lynn Jagerson . . . . 95•763.476.4772
Jeffrey Alan Jagerson . . . . 95•763.476.4772
925 Ellen S Adelman . . . . 96• NP
Stuart Jay Adelman . . . . 96• NP
930 Christopher Thomas Gormley 01• NP
Lavonne B Gormley . . . . 01• NP
940 Bonnie J Sain . . . . +•763.473.7777
Jonathan Emanuel Sain . . . . +•763.473.7777
–8TH AVE N INTS
1000 Carmen Denise Diamond . . . . 93• NP
Rick N Diamond . . . . 93• NP
★Infopoint Solutions Llc . . +
1010◊ Sherry L Holtz . . . . 93•763.473.6163
◊ Peter J Rudolf . . . . 93•763.473.6163
1020◊ Katie M Busch . . . . 93•763.476.8072
◊ Mike Clarence Busch . . . . 95•763.476.8072
1030 Pamela R Galanter . . . . 93• NP
1040 Amy P Pernill . . . . 04•763.473.0014
Jay Wendel Pernill . . . . 04•763.473.0014
1115 Lois Ann Olson . . . . 88•763.473.0509
Ronald Duane Olson . . . . 88•763.473.0509
★Ron Olson Construction Inc 90 763.473.0509
1125◊ Kimetha E Scheerer . . . . 99•763.476.2984
◊ Michael Scott Wilson . . . . 99•763.476.2984
1135★Pizza Vera . . . . +
Donald A Shea . . . . 05• NP
Pamela J Shea . . . . 05• NP
–13TH AVE N INTS
1205 Erik John Otto . . . . 01•763.473.1657
Lori Grace Otto . . . . 01•763.473.1657
–17TH AVE N INTS
1615 Gloria Mae Larson . . . . 90•763.473.1743
Harold Leonard Larson . . . . 90•763.473.1743
–18TH AVE N INTS
1700★★ Wagner Holdings 04 763.553.7000
1705 Anna R Allen 04 763.404.1433
1710★★ All Pro Carpet Restretchi + 763.789.0500
1711 Dennis Seymour Evenson . . . . 72•763.473.0085
Renae Dawn Evenson . . . . 72•763.473.0085
1770★Wagner Holdings Inc. . . . 83 763.553.7020
★Wagner Spray Tech Corp. . 82 763.519.3555
1940★Storage Equipment Inc . . . 77 763.559.2743
–23RD AVE N INTS
2100★Nu Aire Inc. 77 763.553.1270
2220★Seelye Craftsmen Co. . . . 94 763.577.0700
2340★RSC Equipment Rental . . . 05 763.557.1234
2440 Building
★★ PRI Robotics Inc 98 763.559.0647
200★Sonus Acoustics Inc . . . . + 763.557.0720
200★Sonus Interiors Inc . . . . 98⊙763.557.0720
2455★West Metro 05 952.476.3042
2500★Davey Tree Expert Co . . . 86 763.553.9740
2525★Precision Graphics Inc . . . 80 763.476.4100
2533★Fernbrook Cards & Stationery 87 763.476.6797
2545★Conquest Enterprise Inc . . 03 763.591.1730
★Franklin Press Inc 79 763.546.7656
2600 Building
138★CFC Financial Services . . . 01 763.235.5300
138★CFC Technology Corp . . . 04 952.746.5191
100★Creative Educational Materials 86 763.553.0768
104★Digital Focus Inc 02 763.404.0133
132★Gaynor & Associates Inc . . 95 763.559.3915
100★Good Time Attractions . . . 95 763.557.1696
119★National Ataxia Foundation 88 763.553.0020
★★ Pfu Systems Inc 03 952.345.0085
★★ Wellman Sports Marketing + 763.559.0832
110★Wes Hamilton Enterprises Inc 97 763.557.5706
–28TH PL N INTS
2722★Jme Precision Inc . . . . + 763.509.0607
2730★Pauls Woodcraft Co. . . . 77 763.559.2990
–CHESHIRE LN N INTS
2800★Dance Shoppe The 89 763.553.1870
★Dancers Dream Wear Inc . 04 763.553.1818
★In The Spotlight Inc . . . . 97⊙763.553.1818

3000★Wells Fargo Bank Minnesota 93 612.316.4525
3020★Fairway Foods Inc. . . . . +
★Holiday Co Inc 05 763.559.3690
3050★Children Of Tomorrow . . . + 952.448.7829
★Childrens World Learning Centers
88 763.553.7960
–12TH AVE N INTS
3131 Building
★★ Accounting & Tax Soluti 04 763.553.1824
★★ Altura Communication Solu 03 763.249.6500
★★ Ameribanc Mortgage&Fin Ll 04
★★ Assocd Consultants Engine 77 763.559.5511
102★Beltone 04 763.553.9097
★★ General Realty Inc 05 763.551.1674
★★ Hear Clear Inc . . . . 04⊙763.553.9097
★★ Home Savers Group . . . 03
111★In Construction Specifications Insti
03 763.744.1424
200★Infinity Packaging Inc. . . . 02 763.551.9772
111★International Facility Management
05 763.398.0848
206★Jakes Sports Cafe 92 763.533.2977
238★Lydiard Foundation . . . . +
238★Maxl Marketing Inc. . . . 87 763.253.0590
111★Mn Precision Mfg Assn. . . 01 763.566.5696
★★ Moe&Nevin Claims Adjuster + 763.553.0188
★★ New World Publishers . . 04 763.593.5626
★★ On Belay Of Minnesota Inc 04
★★ Onbelayminnesota 04 763.559.6601
★★ Society For Marketing Pro + 763.398.0838
210★★ Sourcing Insight 05
111★Synergy Resource Group Inc 01 763.566.5999
★★ Tekdeal Inc 04 763.694.6088
111★University Of Minnesota M Club 03 763.566.5895
★★ Voyageur International. 05 763.595.8143
224★Western Sky Mortgage Co Inc 05⊙763.253.0590
200★Writing Assistance Inc . . . 97⊙763.551.9772
3135★★ Mark Yiitalo Insurance Ag +
3141★Ke Nelson Assocs . . . . + 763.509.0090
★Larkin L Adey 05 763.208.2876
★Michael Faegre 05 612.922.1835
★Nexus Financial 04 763.557.5992
★R & J Industries . . . . + 763.557.2565
3145★Aaron Johnson Insurance 96 763.545.1733
★Creganna Medical Devices Inc 04 763.201.1360
★Lindberg Financial Corp . . 04
★Select Food Products Inc . + 763.550.1426
3149★AF Property Llc 05
★Select Foods Products Inc 99 763.416.9050
★Wells Fargo Home Mortgage 04 763.509.1680
3161★Beskar Holdings Inc 05 763.201.1201
★Bodega Bay Entertainment Inc +
★Diversified Title Insurance Agency I
05
★Dsre Investments Llc 05
★Halusan Business Holdings Inc +
★Halverson Consulting Ltd . . +
★Koepke & Daniels Pa 02 763.201.1200
★Loki Enterprises Inc 05
★Oak Shore Drive Property Llc 05⊙763.201.1201
★Valley Waterproofing 98
★Vanguard Cleaning Systm Of MNS +
3169★★ CEL Public Relations Inc 93 763.559.6058
★★ Fernbrook Chiropractic Lt 00 763.476.1084
3181★Above The Line Leader International
03 763.201.1306
★Gondek Painting Inc 05 763.201.1280
★Integra Shield Fnncl Group Llc +
★Mike Miller Financial 05 763.201.1390
★Ratzlaff William T 03 952.545.6455
3189★Dr Oil 05
★Fidelis Foundation 05 763.201.1268
★Friends Of Hope Academy Llc +
★Grace Strategic Investments Inc
05 763.577.1050
★Hazelwood Properties Llc . . +
★Howse & Thompson Pa . . . 02 763.577.0150
★Metro Investments Of Plymouth +
★Welsh Harbour Apartments Llc +
3211★Allstate Jacob Group Agency + 763.559.4165
★The Rob Jacob Agency . . . 94⊙763.559.4165
3215★Esco Agency Inc 95 763.559.5999
3231★Northern Con AGG Inc. . . . 96 763.509.9344
3235★All Enviro Inc. 89 763.493.5858
★Fine Line Resume Service 99 763.553.9937
★Judie Andersons Secretarial Service
87 763.553.1144
★Shingle Creek Watershed Organization
04⊙763.553.1144
★Vanderbilt Federal Mortgage 05 763.390.4717
3239★Mingtao Inc . . . . + 763.557.8844
★Robert J Bernboom Ltd . . . 94⊙763.557.8844
3255★★ Johnson & Co Ltd 86 763.261.5250
★★ Triple S Dynamics . . . 03 763.249.2206
3259 . . . . NP
–HARBOR LN N INTS
3300
160★Centex Home Equity 83 763.577.3780
★★ Countrywide Home Loans +
175★Equimed Corp 92 763.557.6810
★★ Equity Leadership Group + 763.577.1440
★★ First American Securities 00 763.559.9600
★Trina L Korbs . . . . 01 NP
★Joseph V Ostermann . . . . 01 NP
★★ River City Mortgage Corp 04 763.559.2222
47300 Anne Rudman Rudman . . . . – NP
47300 Scott Robert Sellers . . . . – NP
300★Sirva Relocation 02 763.525.3700
100★Stewart Title Of Minnesota 82 952.888.6353
★Anthony N Truesdale . . . . + NP
3 Luis E Vega . . . . + NP
3 Mari Vega . . . . + NP
170★Walsh Tire And Real Estate 03 763.862.4000
3315★Treehouse . . . . + 612.872.7400
–35TH AVE N INTS
3450★Cirvibe Inc. 94 763.559.5166
Elizabeth Ann Starr . . . . 77•763.208.5351
John E Starr . . . . 77•763.559.0489
–DALLAS LN N INTS
3535 Robert Jay Bennett . . . . 00• NP
Shelley S Bennett . . . . 00• NP
3540 Bonnie Jean Kott . . . . 99•763.557.6534
Robert Warren Kott . . . . 99•763.557.6534
–39TH AVE N INTS
3800★Hisbiz Inc . . . . + 763.519.0759
Melita V Hoese . . . . 04•763.519.0759
Randy Edward Hoese . . . . 04•763.519.0759
3810 Gerald L Schmidt . . . . 65•763.559.4018
Mary Jo Schmidt . . . . 65•763.559.4018
3816 Janet L Eggert . . . . 85• NP
Lloyd William Eggert . . . . 85• NP

–40TH AVE N INTS
3920◊ Audrey Lynn Conrad . . . . 96•763.577.1947
◊ Daniel James Conrad . . . . 96•763.577.1947
3940 Gregg D Enger . . . . 94• NP
3950 Donald George Larson . . . . 78•763.559.1283
–COUNTY ROAD 9 INTS
4000 Athena Antoinette Latiki . . . . 04• NP
Noureddine Latiki . . . . 04• NP
4050 Kelly A Peniata . . . . 94•763.553.7811
Patty L Peniata . . . . 94•763.553.7811
➧ RR5 4105 - 4315 55446
4105 Mark Clement Goetti . . . . 00•763.551.1875
Sandra Jean Goetti . . . . 00•763.551.1875
★Minnesota Sports Central 05
4115 Claire O Lason . . . . 87•763.557.0369
Jonathan M Lason . . . . 87•763.557.0369
4120★Jordans Crane Services Inc 94 763.553.9623
★Mr & Mrs Magic . . . . + 763.553.7777
★Premium Signs 05 763.550.9944
★Rapid Auto Glass 93 763.559.9415
★RJ Miller Home Service Co + 763.553.7709
4125 Delilah Deloras Stubbs . . . . 80•763.559.5688
Vernon G Stubbs . . . . 80•763.559.5688
4130 Jamie L Godley . . . . 00•763.205.5590
Peter Timothy Moran . . . . 00•763.205.5590
–43RD AVE N INTS
4235 David Keith Brinkman . . . . 95•763.551.9696
Linda M Brinkman . . . . 95•763.551.9696
★Farmers Insurance . . . . +
★Linda M Brinkman Insur Agency 05 952.831.9021
4265 Anatoly Borisovich Gorikman 97•763.577.0568
Tanya A Gorikman . . . . 97•763.577.0568
4305 Tommy T Hillman . . . . 04•763.694.0415
4315 Kevin M Rosen . . . . 05•763.577.9988
Renee A Rosen . . . . 05•763.577.9988
➧ RR1 E 4630 - 5000 55446
–47TH AVE N INTS
4630★Orchids Limited 88 763.559.6425
5000★Turck Inc 94 763.553.7300
➧ RR14 O 5515 - 5555 55446
5515 David J Benson . . . . 05•763.559.7797
Lori K Benson . . . . 05•763.559.7797
5521 . . . . NP
5525◊ John Jay Dupay . . . . 05• NP
◊ Penny Jean Dupay . . . . 05• NP
5531 Diane Katherine McCollum . 05•763.383.9412
Jon Alan McCollum . . . . 05•763.383.9412
5551◊ Dan Edward Lee . . . . 04•763.557.6461
◊ Donna Groetsch Lee . . . . 04•763.557.6461
5555 . . . . NP
100 RESIDENCE 142 BUSINESS

●FERNBROOK LN N

Osseo

CT 267.15 6226 - 6323 $A
CT 267.16 6940 - 7505 $A
CT 267.08 9401 - 10075 $B
CT 267.07 O 10501 - 10921 $D
CT 269.10 11260 - 11680 $C
➧ RR5 6226 - 7013 55311
6226 Mark Scott Barrett . . . . 05•763.559.9648
Nicole Lynn Barrett . . . . 05•763.559.9648
6227◊ Linda L Laak . . . . 89•763.557.9732
◊ Michael J Laak . . . . 89•763.557.9732
6232 Brian James Ross . . . . 96•763.557.1069
6233★Mag Inc. 05 763.533.8239
★Manufacturers Alliance . . 93⊙763.533.8239
◊ Art T Sneen . . . . 02•763.537.7754
◊ Helen Esther Sneen . . . . 02•763.537.7754
6238 Barbara Marie Ross . . . . 90•763.553.9976
Harry C Ross III . . . . 90•763.553.9976
6239 Cynthia A Terison . . . . 90•763.550.9162
Brad A Terison . . . . 90•763.550.9162
6253 Corinne A Wachowiak . . . . 01•763.694.8829
Jeffrey Gerald Wachowiak . . . . 01•763.694.8829
6254★Byron Ellis Associates Of Minn 95
◊ Jolene A Carlson . . . . 93•763.557.5844
◊ Steven James Carlson . . . . 93•763.557.5844
6257★Hoffman Family Chiropractic Clinic
05 763.544.3066
Craig A Rubenzer . . . . 05•763.545.2769
Robert James Rubenzer . . . . 05•763.545.2769
6258◊ Barry Macdonald Thompson . 88•763.559.2748
◊ Mary Jo Thompson . . . . 88•763.559.2748
6261 . . . . NP
6262★Amin Aaser . . . . +
★Five Star Prprty & Real Estt S 05
Ghulamabbas Abbas Pyarali 96•763.519.1688
Shaheen G Pyarali . . . . 96•763.519.1688
★USA Real Estt & Invstmnt Srvc +
6265 Brian J Blenkush . . . . 88•763.553.9297
Hazel S Blenkush . . . . 88•763.553.9297
6266 James T Hegedus . . . . 88•763.559.4598
Yvonne M Hegedus . . . . 88•763.559.4598
6275 Chalmer P Ma . . . . 04•763.544.2814
Hulsun Sun Wang . . . . 04•763.544.2814
6276 Dorothy Chamberlain Bangs . 92• NP
John Dwight Bangs . . . . 92• NP
6287★Full Line Enterprises 03 763.551.0382
Dale Richard Jones . . . . 94•763.551.0382
Frances Gayle Jones . . . . 94•763.551.0382
6288 David Ray Baker . . . . 96• NP
Pamela Nan Baker . . . . 96• NP
–GLACIER LN N INTS
6320★DND Management Consulting Llc +
6323★Kenlawn Co 97 763.557.1986
Julie Dee Lambert . . . . 91•763.557.9163
Ken Marvin Lambert Jr . . . . 91•763.557.9163
–TIMBER CREST DR INTS
6940◊ Georgie M Harlan . . . . 98•763.420.4968
◊ Theodore E Harlan . . . . 98•763.420.4968
6945 . . . . NP
6960 Brian Charles Brink . . . . 99•763.416.3809
Lynn Kay Brink . . . . 99•763.416.3809
6965 Clyde Leland Spore . . . . 77•763.420.4214
Threasa Mary Spore . . . . 77•763.420.4214
6985 Ron A Pelous . . . . 99•763.420.6201
7002 Cynthia Jean Bertram . . . . 04•763.420.0061
Herb Thomas Bertram . . . . 04•763.420.6772
★Bertram Building & Remodeling 98 763.420.6772
7003 Rawland J Trombley . . . . 78•763.420.6586
Susan D Trombley . . . . 78•763.420.6586
7012 . . . . NP
7013 Agnes Florence Kubal . . . . 78•763.420.4850
Robert Kenneth Kubal Jr . . . . 78•763.420.4850
➧ RR6 O 7409 - 7505 55311
7409 Christopher L Konop . . . . 01•763.416.7122
Wendy Lee Konop . . . . 01•763.416.7122
7415 Ann A Ryan . . . . 91•763.420.8410
Jim H Ryan . . . . 91•763.420.8410
7421 Jody David Fjelstad . . . . 95• NP
Lori Jean Fjelstad . . . . 95• NP

7427 Lori Ann Freid . . . . 01• NP
Marlys A Freid . . . . 01• NP
7433 Charles Randall Rogers . . . . 84•763.420.4733
Cynthia C Rogers . . . . 84•763.420.4733
7443 . . . . NP
7449 Scott Jay Follese . . . . 92• NP
Susan Ranae Follese . . . . 92• NP
7455 Dean R Johnson . . . . 92•763.537.1098
Peggy A Johnson . . . . 92•763.537.1098
7463◊ Flo Margaret Gordon . . . . 76•763.420.6314
◊ Loren Jay Gordon . . . . 76•763.420.6314
7469★Buzzer Beater Sports And Apparel
01 763.420.6115
Arlene Elizabeth Niles . . . . 85•763.420.6115
Timothy John Niles . . . . 85•763.420.6115
7479 Judith A Ball . . . . 76•763.420.6607
Michael John Ball . . . . 76•763.420.6607
7487 Jacki McMillian 05 763.420.8762
7493 James A Galuska . . . . 94•763.420.6476
Barbara A Simmons . . . . 94•763.420.6476
7505★Conklin Corp. 05 763.416.0534
➧ RR8 9401 - 10075 55369
9401★Early Childhood Special Education
04 763.416.7105
★Osseo Area School Dst N 279 + 763.391.8786
–96TH AVE N INTS
9661★Independent School Dst 279 04 763.420.8888
★Osseo Area Schools . . . . + 763.391.8415
9681★C R Peterson . . . . 01 NP
9800★The Creek Community Church 05 763.494.4451
10075 . . . . NP
➧ RR3 10501 - 11680 55369
10501 Mark Steven Krieg . . . . 80•763.420.4218
Thomas Gary Krieg . . . . 80•763.420.9598
–TERRITORIAL RD INTS
10725◊ Janice Kay Engelking . . . . 89•763.420.0281
◊ Walter William Engelking . . 89•763.420.0281
10775 Cynthia Renae McCartney . 91•763.494.3011
David Bruce McCartney . . . . 91•763.494.3011
10855 Jayann L Young . . . . 84•763.420.6605
Roger A Young . . . . 84•763.420.6605
10921 Michael John Dehn . . . . 95•763.420.7984
Terri Ann Dehn . . . . 95•763.420.7984
–113TH AVE N INTS
11260 . . . . NP
11261◊ Allen Ignatius Dehn . . . . 76•763.420.4084
◊ Phyllis Carole Dehn . . . . 76•763.420.4084
11280 Genevieve Lila Barber . . . . 93•763.420.6228
Robert Francis Barber . . . . 93•763.420.6228
11281★Dehns Country Manor . . . 77 763.420.6460
–114TH AVE N INTS
11320 . . . . NP
11330 Julie Renee North . . . . 98• NP
Robert John North . . . . 98• NP
11421 Ryan E Boyd . . . . 03•763.420.2822
Melissa R Vos . . . . 03•763.420.2822
11431 Mary M Culver . . . . 80•763.420.5883
Scott Culver . . . . 80•763.420.5883
11441 Enid Theresa Kalla . . . . 76•763.420.5655
Floyd Joseph Kalla . . . . 76•763.420.5655
11451 Jeremy Victor Monahan . . . . 99•763.494.6775
Jill Christine Monahan . . . . 99•763.494.6775
11461◊ Kathleen Annette Powers . . 94•763.420.4438
◊ Robert John Powers . . . . 94•763.420.4438
11471 Stanley Lee Hallquist . . . . 94•763.420.4240
11491★Jeffrey W Cromahan . . . . 02• NP
★Jill C Cromahan . . . . 02• NP
11570★Angela Kitzman 05
◊ Angela Joyce Kitzman . . . . 92•763.420.4280
◊ Harry F Kitzman . . . . 92•763.420.4280
★Lasting Memory Photos . . 01 763.420.4280
11580◊ Janet R Scherer . . . . 89•763.420.8328
◊ Rick D Scherer . . . . 89•763.420.8328
–117TH AVE N INTS
11620 Tania Danielle Tomani . . . . 99•763.416.7822
11640★Distinction Renovations . . + 763.420.6124
Dianne Rose Peterson . . . . 83•763.420.6124
James A Sautter . . . . 83•763.420.6124
11680★Lions Club Dayton 00 763.420.6138
115 RESIDENCE 23 BUSINESS

●FERNCROFT DR

Excelsior

CT 275.04 4795 - 4930 $A
➧ RR66 4795 - 4930 55331
4795★Damian Floring Inc 05
Dana Robin Floring . . . . 94•952.401.0618
Jim D Floring . . . . 94•952.401.0618
–MINNETONKA BLVD INTS
4805 Jennifer A Fortner . . . . 96• NP
Michael Jay Fortner . . . . 96• NP
4812 Renee M Lance . . . . 02•952.401.8194
4815 Arvid Martin Dallmann . . . . 74•952.474.9312
4825 . . . . NP
4830 Clifford D Owen . . . . 03•952.470.0573
4840 . . . . NP
4845◊ Annette Yvonne Peterson . . 92•952.470.6107
◊ Barry Donald Peterson . . . . 92•952.470.6107
4860 Chester F Blackowiak . . . . 79•952.474.8606
4865◊ Ronald Martin Born . . . . 80•952.474.6620
4890★John Lee . . . . + 952.474.0968
4920 Cynthia Ann Bradshaw 05 952.401.1035
4925 Claudia Mae Easter . . . . 80•952.474.7226
James Larry Easter . . . . 80•952.474.7226
4930◊ Andre Josephus Boon . . . . 93•952.474.2186
◊ Theresa Ann Boon . . . . 93•952.474.2186
★Strabo Maintenance 01 952.474.2186
19 RESIDENCE 2 BUSINESS

●FERNDALE AVE NE

Minneapolis

CT 512.03 1504 - 1579 $D
➧ 1504 - 1579 55432
–BENJAMIN ST NE INTS
1504 Nancy Lynne Blegen . . . . 87•763.572.8904
Raymond Blegen . . . . 87•763.572.8904
1505 Cynthia Ann King . . . . 93• NP
James A King Jr . . . . 93• NP
1508 . . . . NP
1511 Deborah Jean Olsen . . . . 77•763.574.9335
Irving Walter Olsen . . . . 77•763.574.9335
1521◊ Eric Stanley Gordner . . . . 00•763.571.5430
◊ Nicole M Gordner . . . . 00•763.571.5430
1522 Kathleen Kumpel . . . . 04• NP
1540 Gary L McGee . . . . 00•763.571.7877
Karen L McGee . . . . 00•763.571.7877
1541◊ Charles Edward Rice . . . . 72•763.571.4054
◊ Faye Leone Rice . . . . 72•763.571.4054
1560 Michael Joseph Bensing . . . . 01•763.571.2962
1561 Dragan Loncar . . . . 04•763.571.2378
1567 Carmen Sims . . . . 05• NP

CT - Census Tract AB,Etc. - Census Tract Home Value Rating ★ - Business Listing ⊙ - Duplicate Phone Number At This Business Address ◊ - No Mail Solicitation

. . . . 55447
2722 ★ Apollo Prcsn Inc . 763-509-0607
2724 ★ Medina Elec Inc . 763-478-6828
2730 S W Paul . . . . .00 NP
★ Pauls Archl Wdcrft 763-559-2990
– CHESHIRE LN N INTS
2800 Shawna M Miller .99 NP
★ The Dance Shoppe 763-553-1870
★ Dancers Dreamwear 763-553-1818
– HARBOR LN N INTS
3000 ★ Wells Frg Pvt Clnt 812-316-3873
3020 ★ Holiday Sttnstrs L 763-559-3690
3050 ★ Chldrns Wld Learn 763-553-7960
3131
2 Scott T Hartmann .00 NP
224 Doug Selly . . . . . + NP
★ Assctd Csnltnts . 763-559-5511
★ Atlnta Techl Serv 763-550-1999
★ CES International 763-694-0737
★ Opndbl Trvl&Crss 763-577-0101
★ Eagle Crest NW . 763-553-2726
★ Espeland L H Pa 763-551-9349
★ Foam Frmtrs Mn 763-557-8987
★ Global Cs Tchnlgs 763-553-0651
★ Iida 763-744-1403
★ Jacob Robert Ins 763-559-4165
★ Kaiser Home Ln Inc 763-557-9500
★ Kaiser Home Ln Inc 763-551-6944
★ Martinson Thms Ins ⊙ 763-559-4165
★ Mn Precision Mfg 763-566-5696
★ New Wld Publishers 763-593-5626
★ N Ctrl Dat Assn . 763-553-1860
★ Nrthrn Con-Agg . 763-509-9344
★ Park Vly Agcy Inc 763-559-2221
★ R-G Sales Inc . . 763-553-9188
★ Wai 763-551-9772
★ Writing Asstnce . ⊙ 763-551-9772
3300
Tina U Chappen .00 NP
250 C Convey . . . . . + NP
Debra J Demuth .00 NP
Thomas S Falkowski 00 NP
Wendy K Fisher . .00 NP ◊
300PD Nancy C Howell .00 NP ◊
530 Brenda K Jennings + NP
530 Timothy A Jennings + NP
Trina L Kortis . . + NP
Kimberly E Kraft .00 NP
Nancy D McGinnity 00 NP
Steve M Molitor .00 NP
Terry H ONeal . .00 NP
Joseph V Ostermann + NP
Mel C Rappleyea .00 NP
30 G H Richard . . .00 NP
200 Russell Staiger . . + NP ◊
Larry D Stordahl . + NP
Sandra L Stordahl . + NP
Duane W Wahlin .00 NP
3 Nathan G Weiss 00 NP
Kath P Wesolowski 00 NP
★ Best Brains Inc . 763-577-3723
★ Centex Home Eqty 763-577-3780
★ Convey Development 763-694-9088
★ Convey Development 763-694-7480
★ Corporate Mrtg Svc 763-277-3800
★ Crprt Trnsfr Svc . 763-797-9600
★ Crprt Trnsfr Svc . 763-525-3700
★ Equimed Corp . 763-557-6810
★ Go Pictures . . . 763-577-3720
★ Grat Life Ins Co . 763-509-9860
★ Plymth Woods Ofc 763-694-9230
★ Private Facl Grp . 763-559-9600
140 ★ R HS Title . . . 763-383-8863
140 ★ River Mrtg&Fncl . ⊙ 763-383-8863
★ Sellers Home Ntwrk 763-559-2304
★ State Farm Ins Co 763-557-0050
★ Stewart Title Mn 763-519-2828
★ Trans Natl Mktg . 763-577-3770
★ Vital Images Inc . 763-852-4100
3315 ★ Family HP Serv Inc 763-557-8870
– DALLAS LN N INTS
3535 Robert J Bennett .00 • NP
3540 Benjamin D Hanson 92 • 763-557-7229
Debra L Hanson .92 • 763-557-7229
3605♣ ★ Plymth Historical 83 763-559-9201
– 39TH AVE N INTS
3800 Kay H Fowler . . .96 • NP
3810 Gerald L Schmidt .65 • 763-559-4018
Mary J Schmidt .65 • 763-559-4018
3816 Janet L Eggert . .85 • 763-553-9959
Lloyd W Eggert . .85 • 763-553-9959
– 40TH AVE N INTS
3920 Audrey L Conrad .96 • 763-577 ◊1947
Daniel J Conrad .96 • 763-577 ◊1947
3940 Gregg D Enger . .94 • NP
3950 Corrine D Larson .78 • 763-559-1283
Donald G Larson .78 • 763-559-1283
– COUNTY ROAD 9 INTS
4000 Athena A Mosley .99 • NP
4050 Kelly A Peniata . .94 • 763-553-7811
Patty L Peniata . .94 • 763-553-7811
RR 5 55446
– 42ND AVE N INTS
4105 Mark C Goettl . .00 • 763-551-1875
4115 Claire S Leson . .87 • 763-557-0369
Jonathan M Leson 87 • 763-557-0369
4120 ★ RCK Mortgage Inc 763-559-2001
4125 Delilah D Stubbs .80 • 763-559-5688
Vernon G Stubbs .80 • 763-559-5688
4130 Andrew M Lauseng 96 • 763-553-0398
Stacey A Lauseng .96 • 763-553-0398
4150 . . . . NP
– 43RD AVE N INTS
4235 David K Brinkman .95 • 763-551-9696
4256 . . . . NP
4265 Anatoly B Gonikman 97 • 763-577-0568
Tanya G Gonikman 97 • 763-577-0568
4305 Marie A Linder . .99 • NP
4315 Joe A Johnson . .97 • NP
RR 1 55446
– 47TH AVE N INTS
4630 Jerry L Fischer . .83 • 763-553-1886
Yoko W Fischer .83 • 763-553-1886
★ Orchids Limited . 763-559-0425
4640 Todd A Taylor . .76 • 763-559-1861
5000 Charles R Thurston 00 NP
106 RESIDENCE 92 BUSINESS

FERNBROOK LN N
Osseo
6200– 7599 CT 267.09 $A..
9300–10199 CT 267.08 $A..
10200–10899 CT 267.07 $A..
10900–11699 CT 269.01 $C..

RR 5 55311
6226 Angela K Osatiuk .90 • 763-559-4149
Wayne M Osatiuk .90 • 763-559-4149
6227 Linda L Leak . . .89 • 763-557 ◊9732
Michael J Leak . .89 • 763-557 ◊9732
6232 Brian J Ross . . .96 • 763-557-1069
6233 Barbara R Ireland .94 • 763-557-9067
Jeffrey R Ireland .94 • 763-557-9067
6238 Barbara M Ross .90 • 763-553-9976
Harry C Ross . . .90 • 763-553-9976
6239 Brad A Terlson . .90 • 763-550-9162
Cynthia A Terlson .90 • 763-550-9162
6253 Cathy A Wachowiak + • 763-694-8829
J G Wachowiak . + 763-694-8829
6254 Jolene A Carlson .93 • 763-557-5844
Steven J Carlson .93 • 763-557-5844
6257 Eugene B Gaut . .99 • 763-577-0774
6258 Barry M Thompson 88 • 763-559-2748
Mary J Thompson 88 • 763-559-2748
6261 John R Rupp . . .89 • 763-550 ♦1099
Rebecca L Rupp .89 • 763-550 ♦1099
6262 G A Pyarali . . . .96 • 763-519-1688
Shaheen G Pyarali 96 • 763-519-1688
6265 Brian J Blenkush .88 • 763-553-9297
Hazel S Blenkush .88 • 763-553-9297
6266 James T Hagedus .88 • 763-559-4598
Yvonna M Hagedus 88 • 763-559-4598
6275 Debra A Schumacher 92 • 763-550-9246
Rod R Schumacher 92 • 763-550-9246
6276 Dorothy C Bangs .92 • 763-550-1227
John D Bangs . .92 • 763-550-1227
6287 Dale R Jones . . .94 • 763-551-0382
Frances G Jones .94 • 763-551-0382
6288 David R Baker . .96 • NP
6320 Don N Demorett .91 • NP ◊
6323 Julie D Lambert .91 • 763-557-9163
Ken M Lambert . .91 • 763-557-9163
– TIMBER CREST DR INTS
6940 Georgia M Harlen .94 • 763-420-4968
Theodore E Harlen 94 • 763-420-4968
6945 Andrew J Claude .93 • 763-420-3785
Susan M Claude .93 • 763-420-3785
6960 Brian C Brink . . .99 • 763-416-3809
Lynn K Brink . . .99 • 763-416-3809
6965 Clyde L Spore . .77 • 763-420-4214
Threasa M Spore .77 • 763-420-4214
6980 Lori J Wachter . .78 • 763-420-4440
Robert A Wachter 78 • 763-420-4440
6985 Ron A Peipus . . .99 • 763-420-6201
7002 Susan C Parker . . + NP
Timothy P Parker . + NP
7003 Rawland J Trombley 78 • 763-420-6586
Susan D Trombley 78 • 763-420-6586
7012 Gregory T Murtha .86 • 763-420-8490
Lynn L Murtha . .86 • 763-420-8490
7013 Agnes F Kubal . .78 • 763-420-4850
Rob K Kubal . . .78 • 763-420-4850
RR 6 55311
– 75TH AVE N INTS
7409 James W Larson .89 • 763-420-4012
7415 Ann A Ryan . . .91 • 763-420-9715
James H Ryan . .91 • 763-420-8410
7421 Jody D Fjelstad . .89 • NP
7427 Chad Baumer . . + • NP
7433 Charles R Rogers .84 • 763-420-4733
Cindy C Rogers . .84 • 763-420-4733
7443 Kathryn A Miller .92 • NP
7449 Scott J Follese . .92 • NP
7455 Kelly A Johnson .96 • NP
7463 Florence M Gordon 76 • 763-420 ◊6314
Loren J Gordon . .76 • 763-420 ◊6314
7469 Arlene E Niles . .85 • 763-420-6115
Timothy J Niles .85 • 763-420-6115
7477 Bobbi Oby . . . .98 NP ◊
Maureen Oby . . .98 NP ◊
7479 Judith A Ball . . .76 • NP
7487 Dave W Haas . . .98 • 763-416-2000
7493 Barbara A Simmons 77 • 763-420-6476
7505 Brad J Peterson .89 • 763-420 ♦8210
Lois Peterson . . .89 • 763-420 ♦8210
9302♣ ★ Amt Coast Co + 763-416-0669
9315♣ Gregory L Gerulis . + 763-416-4804
♣ ★ A O Smith 763-416-0569
♣ ★ Acme Grge Door Co 763-420-7644
♣ ★ Chapelwood Comm 763-493-5910
♣ ★ Fireplace Center 763-391-7996
♣ ★ Maple Grv Exec STS 99 763-416-9000
♣ ★ Nrthgt Consulting 763-315-3636
♣ ★ Prime Comm Phlctns + 763-424-0664
♣ ★ Twin City D Js 763-420-2278
RR10 55369
– 93RD AVE N INTS
9401 ★ Early Chldhd Dev 763-416-7105
RR 8 55369
– 96TH AVE N INTS
9661 ★ Osseo Ar Schls Sch 763-420-8888
★ Osseo Ar Schls Sch 763-391-8415
9681 C R Peterson . . . + 763-420-5545
9740♣ Eldin J Walter . . + 763-420-4547
♣ Marjorie Walter . . + 763-420-4547
9800 ★ Osseo Ar Schls Sch 763-391-8900
★ Osseo Ar Schls Sch 763-391-8700
10075 Robert Radintz . .97 • NP
RR 3 55369
10200 Stanley A Blesi . .66 • 763-420-4760
Stanley T Blesi . .66 • 763-420-4760
– TERRITORIAL RD INTS
10501 Donna M Krieg .80 • 763-420-4218
Mark S Krieg . . .80 • 763-420-4218
10725 ★ Engelking Janice K 763-420-8999
★ Engelking Walter W ⊙ 763-420-8999
★ Jens Family Hr Cr ⊙ 763-420-8999
10775 C R McCartney . .91 • 763-494-3011
David B McCartney 91 • 763-494-3011
10825 Richard L Meyers .90 • 763-420-9826
10855 Jeyenn L Young .84 • 763-420-6605
Roger A Young . .84 • 763-420-6605
10921 Michael J Dehn .95 • 763-420-7984
– ELM CREEK RD INTS
11207 Graham Bauer . . .00 NP
Patrice M Bauer .00 NP
11260 Hilary J McNallan .93 • 763-420-5330
11261 Allen I Dehn . . . .76 • 763-420 ◊4084
Phyllis C Dehn . .76 • 763-420 ◊4084
11280 Genevieve L Barber 93 • NP
11281 Meg Dehn 00 763-420-4096
Tom Dehn 00 763-420-4096
★ Dehns Country Mar 763-420-6460
– 114TH AVE N INTS
11320 Keith B Grover . .74 • NP
11330 Julie R North . .98 • NP
11421 Jodi A Schmitz . .88 • 763-420-8092
John P Schmitz . .88 763-420-8092
11431 Mary M Culver . .80 • 763-420-5883
Scott Culver . . .80 • 763-420-5883
11441 Enid T Kalla . . .76 • 763-420-5655
Floyd J Kalla . . .76 • 763-420-5655
11461 Kathleen A Powers 94 • NP
11471 Jeremy M Hallquist 94 • 763-420-4240
S L Hallquist . . .94 • 763-420-4240
– 117TH AVE N INTS
11570 Angela J Kitzman .94 • 763-420 ◊4280
Harry F Kitzman .94 • 763-420 ◊4280
★ Brite Stitch . . .91 763-420-2630
11580 Janet R Scherer .89 • NP ◊
11620 Diane B Prescott .79 • 763-420-4448
Gary L Prescott . .79 • 763-420-4448
11640 James A Sautter .83 • 763-420-6124
11680 James K Rohne .76 • 763-420-6138
Marlene M Rohne 76 • 763-420-6138
118 RESIDENCE 19 BUSINESS

FERNCROFT DR
Excelsior
4700– 4999 CT 275.02 $A..

RR66 55331
4795 Dana R Floring . .94 • 952-401-0618
Jim D Floring . .94 • 952-401-0618
– IVY LN INTS
4805 Michael J Fortner .96 • NP
4812 Renee M Haugh . + • NP
4815 Arvid M Dallmann .74 • 952-474-9312
Darlene Y Dallmann 74 • 952-474-9312
4825 Brenda L Jacob .93 • 952-470-8384
Thomas M Jacob .93 • 952-470-8384
4830 Dale A Dallman . .99 • NP
4840 T J Korzendorfer .75 • 952-474-6892
V J Korzendorfer .75 • 952-474-6892
4845 Annette Y Peterson 92 • 952-470-6107
Barry D Peterson .92 • 952-470-6107
4860 C F Blackowiak . .79 • 952-474-8606
Cath F Blackowiak 79 • 952-474-8606
4865 Ronald M Bom . .80 • 952-474 ◊6620
4890 James P Meyer . .78 • 952-474-3556
Mary K Meyer . .78 • 952-474-3556
– FOREST DR INTS
4900 Paul Flett . . . . . + • NP
4920 Erich J Reitherman + • NP
Heidi E Reitherman + NP
4925 Claudia M Easter .80 • 952-474-7226
James L Easter . .80 • 952-474-7226
4930 Andre J Boon . .93 • 952-474-2186
Theresa A Boon .93 • 952-474-2186
25 RESIDENCE

FERNDALE AVE NE 55432
Minneapolis
1500– 1599 CT 512.03 $B..

– BENJAMIN ST NE INTS
1504 Nancy L Blegen . .87 • 763-572-8904
Raymond Blegen .87 • 763-572-8904
1505 Cynthia A King . .93 • NP
1508 Carolyn B Baune .88 • 763-574 ◊0812
John E Baune . .88 • 763-574 ◊0812
1511 Deborah J Olsen .77 • 763-574-9335
Irving W Olsen . .77 • 763-574-9335
1521 Eric S Gordner . .00 • 763-571 ◊5430
1522 1540 . . . . NP
1541 Charles E Rice . .72 • 763-571 ◊4054
1560 Michael J Bensing + • 763-571-2962
1561 Constance M Evans 96 • NP
1567 Sara L Boelman .90 • 763-586-7832
Tari L Boelman . .90 • 763-586-7832
1568 Melinda Olson . .96 • 763-502-1543
Peter A Olson . .96 • 763-502-1543
1573 . . . . NP
1579 Vicki A Johnson .93 • 763-571-1929
19 RESIDENCE

FERNDALE AVE NE
Prior Lake
14400–14499 CT 809.02 $B..

RR 6 55372
– 140TH ST NE INTS
14435 Karen J Farrell . .87 • 952-445-0453
William A Farrell .87 • 952-445-0453
2 RESIDENCE

FERNDALE DR
Rogers
14200–14499 CT 269.01 $C..

RR 3 55374
14279 Barbara A Rieck .72 • 763-428-2641
Robert H Rieck . .72 • 763-428-2641
14313 Kathleen Katsner . + • NP ◊
14337 Craig M Palm . . + • NP
14342 Ernie J Pepel . . .00 • NP
14362 Amy B Petersen .00 • 763-428-3973
Carl M Petersen .00 • 763-428-3973
14379 Darlene H Collison 94 • 763-428-1228
Russell J Collison .94 • 763-428-1228
14382 Margaret A OBrien 74 • 763-428-2023
Terrance S OBrien 74 • 763-428-2023
– LINDEN DR INTS
14437 C G Nalezny . . .00 • 763-428-1224
14448 David J Klein . . .86 • 763-428-4290
Judy A Klein . . .86 • 763-428-4290
14475 B Khiemphasouk .00 • 763-428-3417
V C Khiemphasouk 00 • 763-428-3417
14484 Amy S Carlson . .00 • 763-428-9213
Mark D Carlson . .00 • 763-428-5552
18 RESIDENCE

FERNDALE GRN 55391
Wayzata
1– 199 CT 272.01 $A..

– FERNDALE RD N INTS
45 Greg R Reese . . .00 • 952-475-2319
Stephanie A Reese 00 • 952-475-2319
★ Dotcom WEB Design 952-473-5287
55 Penny O Mueller .93 • NP
64 . . . . NP
65 Nancy J Laperre .93 • 952-473-5932
Timothy L Laperre 93 • 952-473-5932
70 Ethan M Steinkraus 86 • 952-473-2151
W J Steinkraus . .86 • 952-473-2151
75 Jennifer C Havice . + • 952-473-9310
Jonathan W Havice + 952-473-9310
85 . . . . NP
90 G M Scherer . . .94 • 952-475-3740
K B Scherer . . .94 • 952-475-3740
95 David T Anderson .00 • 952-249-5269
Laura A Anderson 00 • 952-249-5269
100 . . . . NP
165 Deborah A Lipkin . + • NP
17 RESIDENCE 1 BUSINESS

FERNDALE LN 55347
Eden Prairie
8900– 8999 CT 260.11 $A..

– HILLOWAY RD INTS
8955 . . . . NP
8959 Mary C Gaslin . .93 • 952-934-7382
William L Gaslin .93 • 952-934-7382
8967 James G Sneer . .94 • NP
8971 Audrienne Vidman . + • NP ◊
Edward Vidman . . + NP ◊
8979 Barbara J Hokanson 95 • 952-906 ♦1203
Jim W Hokanson .95 • 952-975 ♦9744
8983 Leroy A Prohofsky 91 • 952-949 ◊3662
R L Prohofsky . .91 • 952-949 ◊3662
8991 . . . . NP
8995 B L Quaintance . .93 • 952-975-0755
12 RESIDENCE

FERNDALE PL N 55447
Minneapolis
1100– 1397 CT 266.06 $A..

1220 . . . . NP
1250 Debbie L Edwards + NP ◊
Matthew J Edwards + NP ◊
1270 Lisa R Steffen . .99 • NP
4 RESIDENCE

FERNDALE RD N 55447
Minneapolis
E 300– 1318 CT 266.06 $A..

– BROCKTON LN N INTS
410 James R Tegan . .86 • 763-475-1340
Mary E Tegan . .86 • 763-475-1340
★ Tegan James R . 763-475-1340
★ Tegan Marketing . ⊙ 763-475-1340
498 . . . . NP
1100-1218 E 55447
– 12TH AVE N INTS
1100 Lenore C Miller . .83 • 763-473-3600
Roger A Miller . .83 • 763-473-3600
1110 Ken E Cook . . .99 • 763-473-1653
Peter T Cook . . .99 • 763-473-1653
1120 K Skrowaczewski .96 • NP
8 RESIDENCE 2 BUSINESS

FERNDALE RD N 55391
Wayzata
O 1– 931 CT 272.01 $A..
E 280– 386 CT 266.06 $A..
E 416– 498 CT 266.06 $A..

75 Sonia Y Carty . . + • NP
85 Kenneth C Chermak 00 • NP
– FERNDALE RD S INTS
245 D C Beckstrom . .00 • 952-473-2477
Kerwyn B Beckstrom 00 • 952-473-2477
– NORTHGATE RD INTS
325 Edwin B Murphy .82 • 952-473-0390
344 Cindy B Brinkman .89 • 952-404 ◊0676
Rory J Brinkman .89 • 952-404 ◊0676
345 Andrew W Palmer .02 NP ◊
350 George L Veit . .93 • 952-476-0644
Mary L Veit . . .93 • 952-476-0644
380 Delvin A Helmer .96 • NP
365 Donald B Chase .72 • 952-473-4704
Patricia W Chase .72 • 952-473-4704
375 G J Vandeputte . .92 • 952-404-0669
Saml J Vandeputte 92 • 952-476-8671
395 Damien P Topousis 98 • 952-404-8269
425 Leopold A Hauser .73 • 952-473 ◊1173
Sara D Hauser . .73 • 952-473 ◊1173
426 430 437 440 . . . NP
448 452 . . . . NP
455 Marnie R Dahlberg 90 • 952-449-0565
Michele R Dahlberg 90 • 952-449-0565
475 Laura Z Clapp . .90 • 952-475-3600
Thomas W Clapp .90 • 952-475-3600
★ Morning Starr Inc 952-473-4000
★ Starr Surgical . . ⊙ 952-473-4000
488 491 498 . . . . . NP
503 Dale A Spencer . .91 • 952-476-1072
Patricia A Spencer 91 • 952-476-1072
505 Edward J Bierman 87 • 952-475-1526
Nancy K Bierman .87 • 952-475-1526
507 Azar D Sajadi . .93 • NP
509 David W Thurston 00 • 952-404-1357
Keiko M Thurston 00 • 952-404-1357
511 Charles G Roer . .96 • 952-476 ♦6026
Karen P Roer . . .96 • 952-476 ♦6026
513 . . . . NP
515 Andrew J Smith .82 • 952-475 ◊1388
Mary H Smith . .82 • 952-475 ◊1388
★ Smith Andrew J MD 98 952-475 ◊1388
517 June L Johnson .71 • 952-473-6382
519 Julie N Jorgensen 99 • 952-476-0374
Thos A Micheletti 99 • 952-404-1680
520 522 . . . . NP
525 James W Ogland .91 • 952-476-6218
532 552 . . . . NP
555 Kim M Donaldson .87 • 952-476-1330
T W Donaldson . .87 • 952-476-1330
565 Janet M Martin . .76 • 952-475-3591
Jerry E Martin . .76 • 952-475-3591
575 Jim G Dayton . .96 • 952-404-1553
Megan M Dayton .96 • 952-404-1553
585 Dryw Danielson . .71 • 952-473-3139
Nancy W Danielson 71 • 952-473-3139
605 Hazel P Bowen . .85 • 952-473-4569
621 622 . . . . NP
625 G Bastiaeits . . . + • NP ◊
Liliane Bastiaeits . + NP ◊
627 Bonnie D Johnson 84 • 952-473-2507
Timothy D Johnson 84 • 952-473-2507
629 Kirt Mostrom . . . .99 • 952-473-0555
Margaret C Mostrom 99 • 952-473-0555
635 Larry G Jacobson .91 • 952-476-0055
Victoria A ONeill .91 • 952-473-3947
636 641 . . . . NP

FERN DR (CR)
5155 Brown Clyde R & Shirley [9]+ 479-2617
5165 Puth Jeffrey A & Lorraine [9]+ 479-3538
5175 Hatcher Jeffery A [9]+ 479-1462
5180 Tabery Phillip J & Carol [9]+ 479-2791
5185 Parmenter Stephen R & Judith [9]+ 479-1118
5188 Schlosser Duane L & Karen [9]+ 479-1893
5191 Payette Kenneth W [9]+ 479-1309
5196 Miller Pamela E & Randall [9]+ 479-3398
HOUSEHOLDS 19

FERN DR (MINNEAPOLIS)-FROM 7081 BLOOMINGTON AVE SOUTHEAST
· ZIP CODE 55423 CAR-RT C035
1521 Winkelman Nancy E [9]+ 869-5929
WINKELMAN ELEANOR child day care svcs 869-5929
1524 Nelson Robert A & Corinne [6] 869-6985
1525 Kitson Robert J [6] 798-4363
1528 Lee Brian A & Sandra [5] 861-1835
1529 Mlynarek Cheryl A [9]+ 866-6358
1535 Caspers Glenn R [9]+ 869-4438
1539 Ostby Clayton T [9]+ 861-3587
1545 Clark Kathleen M [8] 869-8452
ⓃHawkinson Melissa 869-1650
+DIAGONAL BLVD INTERSECTS
BUSINESSES 1 HOUSEHOLDS 9

FERN LN (LORETTO)-FROM 4841 SALEM LN
· ZIP CODE 55357 CAR-RT R002
8320 Gabler Richard J [9]+ 498-0001
8325 Eikmeier Bernard D & Sally [3] 498-8851
8370 Butcher Kristin A [9]+ 498-7719
8375 Henrich Dennis M & Amy [9]+ 498-7944
8420 Olson Dianna M [3] 498-8266
8425 Carlson Ronald L & Linda [6] 498-7770
HOUSEHOLDS 6

FERN LN (MOUND)-FROM 5562 TONKAWOOD RD SOUTH
· ZIP CODE 55364 CAR-RT C001
2100 Stueven Jason J [4] 472-3759
2117 Hacklander Brian C [9]+ 472-2144
2126 Carlson Philip P [5] 472-8060
2134 Bailey Melissa A [3] 472-1739
Erickson Roger J [3] 472-7538
+CHURCH RD INTERSECTS
HOUSEHOLDS 5

FERN ST (MAPLE PLAIN)-FROM 3199 CEDAR AVE WEST
· ZIP CODE 55359 CAR-RT R005
4600 Affield Steven D & Rhonda [9]+ 479-1285
ⓃIgnant Carmen 479-1822
4605 Stephens Judith L & Jeffrey [9]+ 479-2114
4615 Shields Mitchell J [3] 479-2805
4660 Klingelhoets Mark L & Gwen [9]+ 479-2784
4672 Olson Dale R [9]+ 479-6559
4675 Breviu James L & Karen [9]+ 479-1980
4680ⓃHamilton Mary C 479-6236
4685 Donahue James R [2] 479-4077
4700 Lambert Terri L [9]+ 479-1785
4705 Overby Sandra L [6] 479-6876
+S LAKESHORE DR INTERSECTS
HOUSEHOLDS 11

FERN LANE TER (SHAKOPEE)-FROM 601 DARDANELLE LN SOUTHWEST
· ZIP CODE 55379 CAR-RT R003
700 Hellmers Gary A & Debra [9]+ 445-6157
701 Leverson Gene C [7] 445-8609
702 Musta Jerome L [4] 445-8326
704 Bishette Jeanne M [9]+ 496-1822
705 Dorweiler Gary J [5] 445-4740
706 Erickson Vernon E [8] 445-8709
707 Siebert Kevin K [9]+ 445-6174
710 Beckrich George F [5] 445-4816
711 Potter James S [9]+ 445-7372
712 Mazurkiewicz Richard J [4] 496-3909
714 Fluto Robert A [2] 496-2174
715ⓃZetina Alma 496-1573
ⓃZetina Raul 496-1573
716 Moran Eric H [9]+ 445-2258
ⓃRodriguez Velia 445-2258
717 Fetting Ricki D & Beverly [2] 496-3933
720 Baker Timothy J & Linda [9]+ 445-2714
721 Dewitt Julie A [7] 445-6386
722ⓃDorn J A 445-9405
723 Timm Jody A & Brian [2] 445-8415
727 Hurd Scott D [2] 496-1581
728 Walton Toni A [9]+ 445-2178
730 Scherman Daniel L [5] 445-9461
731ⓃRenne Greg 496-3399
ⓃRenne Marsi 496-3399
732 Wigfield Howard C [9]+ 445-5579
734 Tongen James F [2] 445-1302
736 Obrien Leo [9]+ 496-2553
738 Nelson Donald J & Patricia [9]+ 445-4995
739 Piotraschke Byron R & Faith [9]+ 445-7621
740ⓃLee Loriann A 445-2829
741 Pieschke Robert E [6] 496-2631

FERN LANE TER (S)
743 Lemert Charles W [9]+ 445-1702
ⓃSeifert Barb 445-1702
745ⓃStahlke Gerald D & Dayna 496-3215
746ⓃHofmann Donald 445-8955
747ⓃRhiger Joanne L 496-1938
748 Schwerzler Robert L [2] 445-0199
749 Gust Glen R [8] 445-0733
750ⓃCastillo Guadalupe A Jr 496-9117
751 Payton James B & Lana [7] 445-1732
753 Sheldon Eugenia M [2] 445-0393
755 *Magnus Christopher A* [9]+ 496-1446
756 Sund Randall M & Joellen [3] 496-9217
757 Mitchell Donald E [9]+ 445-0454
758 Readence Heidi M [8] 445-0821
HOUSEHOLDS 46

FERNBROOK CT N (OSSEO)-FROM 14483 BASS LAKE RD
· ZIP CODE 55311 CAR-RT C005
6579 Davis Gregory C & Mary [3] 553-9745
6580 DORLING KINDERSLEY book stores 553-0003
ⓃZivalich Paul 553-9886
6601 Humbeutel James A [6] 551-4765
6623 Joos Gregory A & Sherryl [7] 559-9262
+SUNNYSLOPE DR BEGINS
BUSINESSES 1 HOUSEHOLDS 4

FERNBROOK LN N (DAYTON)-FROM 16981 117TH AVE N NORTH
· ZIP CODE 55327 CAR-RT R002
11771 *Winn Michael & Pauline* [5] 494-8319
11801 Brandt William C & Christie [4] 420-5769
11820 Volk Edward J & Nancy [9]+ 420-6133
11821 Young Patricia A [9]+ 420-5321
11880 Guimont Kimberly L [9]+ 420-5797
11920ⓃGallery Michael E 420-4980
11971 Jackson Darren L [9]+ 420-4291
11980ⓃBerg Warren E 420-6578
ⓃEcklund Clifton J 420-4759
12020 Schmitz Georgiann S & Terrance [9]+ 420-5502
12081 Stolp Gregory L [9]+ 420-6880
+121ST AVE N ENDS
12131 Cserpes Lisa M [9]+ 421-3171
12400 Staricha James P Jr [3] 506-0112
Swen Jill R [3] 506-0112
12450 Cserpes L [9]+ 421-5157
KARLSBURGER FOODS food prprtns 421-5481
+125TH AVE N BEGINS
12530 Peterson Louise A [9]+ 421-5555
12700ⓃRachner Donald H 427-7997
+129TH AVE N ENDS
12921 Dehn Delmar E [9]+ 421-3431
DEHN'S CORNER FARM corn 421-3431
BUSINESSES 2 HOUSEHOLDS 18

FERNBROOK LN N (MAPLE GROVE)-
9401 MAPLE GROVE CITY OF exec ofcs 494-6000
PLAYHOUSE NURSERY SCHOOL child day care svcs 420-4000
+96TH AVE N INTERSECTS
· ZIP CODE 55369 CAR-RT R008
9661 FERNBROOK ELEMENTARY SCHOOL elmntry scndry sch 420-8888
+101ST AVE N INTERSECTS
+RAILROAD CROSSES
· ZIP CODE 55369 CAR-RT R003
10200 Blesi Stanley A [9]+ 420-4760
+COUNTY ROAD 81 INTERSECTS
+TERRITORIAL RD INTERSECTS
10501 Krieg Donna M [9]+ 420-9598
10725 Engelking Walter W & Janice [9]+ 420-8999
JANS FAMILY HAIR CARE beauty shops 420-8999
10775 McCartney David B & Cynthia [9]+ 494-3011
10825 Meyers Richard L Jr & Teresa [8] 420-9826
10855 *Young Roger A* [9]+ 420-6605
10921 Dehn Michael J [3] 420-7984
11260 McNallan Hilary J [9]+ 420-5330
11261 Dehn Allen I & Phyllis [9]+ 420-4084
11280 Barber Robert F & Genevieve [9]+ 420-6228
11281 DEHN POWER SPORTS auto dlrs 420-2416
DEHN'S COUNTRY MANOR eating places 420-6460
11330 *Kohanek Jeffrey L* [4] 494-9229
+114TH AVE N ENDS
11421 Schmitz Jodi A & John [9]+ 420-8092
11441 Kalla Floyd J & Enid [9]+ 420-5655
11451 *Hanson Wayne L* [9]+ 420-6107
11471 Hallquist Stanley L & Judith [9]+ 420-4240
11570 BRITE STITCH MONOGRAM misc prsnl svcs 420-2630
D & H FENCING CO spcl trd cntrs 295-4381
Kitzman Kenneth D & Kelly [9]+ 420-4280
11620 Prescott Gary L & Diane [9]+ 420-4448
11640 Sautter James A [9]+ 420-6124
11680 Rohne James K & Marlene [9]+ 420-6138
+117TH AVE N INTERSECTS

FERNBROOK LN N (M G)
BUSINESSES 8 HOUSEHOLDS 19

FERNBROOK LN N (OSSEO)-FROM 14398 62ND PL N
· ZIP CODE 55311 CAR-RT R005
6226 Osatiuk Wayne M & Angela [9]+ 559-4149
6232 Moen Mark S & Kelly [9]+ 559-4645
6238 Ross Harry C III & Barbara [9]+ *553-9976*
6253 Kruse Richard R & Rebecca [9]+ 559-7784
6257 Etrheim Ronald R & Margie [9]+ 551-9517
6258ⓃThompson Barry 559-2748
ⓃThompson Mary 559-2748
6261 Rupp Rebecca L & John [9]+ 550-1099
6265 Blenkush Brian J & Hazel [9]+ 553-9297
6266 Hegedus Yvonne M [9]+ 559-4598
UNLIMITED SUPPLIES indus supl 943-2000
6275 Schumacher Roderick R & Debra [8] 550-9246
6276 Bangs John D [6] 550-1227
6287 Peterson Loren L & Sonja [9]+ 557-1409
6323 Lambert Kenneth M Jr [7] 557-9163
+63RD AVE N INTERSECTS
6940 Harlan Theodore E & Georgia [9]+ 420-4968
6945 Claude Andrew J & Susan [7] 420-3785
6960 Christensen Roger D & Katherine [8] 420-9236
6965 Spore Clyde L [9]+ 420-4214
6980 Wachter Robert A & Lori [9]+ 420-4440
+TIMBER CREST DR INTERSECTS
7002 Smith Paul D [2] 420-4799
7013 *Kubal Robert K Jr* [9]+ *420-4850*
· ZIP CODE 55311 CAR-RT R006
7409 BALLROOM SHOPPE dance stdios'schs 509-0995
Larson James W & Virginia [9]+ 420-4012
7415ⓃRyan Ann A 420-8410
ⓃRyan Jim 420-9715
7433 Rogers Charles R & Cynthia [9]+ 420-4733
7469 Niles Timothy J & Arlene [9]+ 420-6115
7479 Ball Michael J & Judith [9]+ 420-6607
7493ⓃSimmons B 420-6476
7505 Peterson Bradley J & Lois [9]+ 420-8210
BUSINESSES 2 HOUSEHOLDS 29

FERNBROOK LN N (MINNEAPOLIS)-FROM 433 HARBOR LN N NORTH
· ZIP CODE 55447 CAR-RT C018
875 Heppelmann Anthony J & Paula [9]+ 473-4692
895 Smith Donald C & Susan [7] *476-9694*
900 Crummer Murry P [2] 745-9278
905ⓃJungman Charles 475-0506
910 Koch Paul R [5] 473-6814
915 Mandery Craig B & Amy [8] 476-6135
920ⓃPint Martin 476-8453
930 Engelstad Robert C [9]+ 475-2594
940 JACOMAR mgmt cnsltng svcs 473-3007
+GLACIER LN N BEGINS
1010ⓃHoltz Sherry 473-6163
1020 Busch Michael C [3] 476-8072
1040 Cranny Sarah R & Joseph [2] 473-4118
· ZIP CODE 55447 CAR-RT C015
1115 Olson Ronald D & Lois [9]+ 473-0509
1125 Wood Enid J [9]+ 475-3615
1135 Dunlap Andrew J [2] 476-4450
+12TH AVE N BEGINS
+13TH AVE N BEGINS
+14TH AVE N BEGINS
+GLACIER LN NE INTERSECTS
+15TH AVE N BEGINS
+COUNTY ROAD 6 CONTINUES
1615 Larson Harold L [9]+ 473-1743
+17TH AVE N BEGINS
1705 Olson Faith [6] 475-3693
1711 Evenson Dennis S & Renae [9]+ 473-0085
1770 WAGNER SPRAY TECH CORPORATION air gas compressor 553-7000
+18TH AVE N BEGINS
+19TH AVE N INTERSECTS
· ZIP CODE 55447 CAR-RT C019
1940 STORAGE EQUIPMENT commrcl equip 920-9415
+21ST AVE N BEGINS
2100 NU AIRE lbrtry apptus furn 553-1270
2220 SEELYE CRAFTSMEN CO sheet metalwork 577-0700
+23RD AVE N INTERSECTS
2340 *METROQUIP eqpt rntl lsing* 559-0541
2440 ACTION MAILING SERVICE drct ml advrtsg svc 557-6767
COLLECTORS GALLERY paper mills 577-0201
ULMER PHARMACAL COMPANY phrmctcl preprtns 559-0601
2500 DAVEY TREE EXPERT COMPANY THE ornmntl tree svcs 553-9740
+25TH AVE N INTERSECTS
2525 FERNBROOK LANE STATIONERY commrcl prtng lith 476-4100
2545 NAVARRE BIOMEDICAL srgl mdcl instrmnt 449-6100

FERNBROOK LN N (P)
2600 AFFILIATED INSURANCE ins agts'svcs 551-1300
ALLEGRA PRINT & IMAGING commrcl prtng grvr 557-5706
AMBASSADOR PERFORMANCE IMPROVEMENT mens'boys clothing 559-8481
ANGIO MEDICS II medical clinic 551-9700
ASANTE PRODUCTS ctlg ml-order hses 553-1624
AUTO INNOVATORS carwashes 559-9150
GAYNOR SALES AGENCY elec appratus equip 559-3915
KERNS OIL & GAS mgmt cnsltng svcs 557-9553
LINDHAUS USA elec appl tel rad 550-1409
NEW AGE FURNITURE SYSTEMS prtns fxtrs 939-6608
NEXT GENERATION GOLF sptg gds'bike shp 936-2317
OCONNOR GEARTY & CO acctng audtng bkp 550-1100
SYNERGY MARKETING INCORPORTATED hardware 559-1974
WALKER RECRUITMENT SERVICES employment agencies 553-1356
WELLMAN SPORTS MARKETING sptg recrtnl goods 559-0832
WILLIAMS ELECTRICAL CONTRACTOR elec work 553-2770
2605 DOMINION ENTERTAINMENT mtn pctre vdeo pro 559-6895
K-TEL INTERNATIONAL rcd prrcrded tp st 559-6800
NONIN MEDICAL srgl mdcl instrmnt 553-9968
PLYMOUTH HISTORICAL SOCIETY mbrshp orgs 559-9201
US DISTRIBUTION SERVICE misc hmfrnshngs str 559-6888
E ENTERTAINMENT PUBLICATIONS commrcl prtng grvr 559-0464
E HAPPENINGS COUPON BOOKS nondurable gds 559-1010
O K-TEL DIRECT busn svcs 378-0278
+27TH AVE N BEGINS
2722 APOLLO PRECISION *indus mach* 509-0607
2724 PRODUCTIVITY WELDING gnrl indus mach 473-3606
2730 PAUL'S WOODCRAFT COMPANY offc furn exc wood 559-2990
+28TH PL N BEGINS
+CHESHIRE LN N ENDS
2800 DANCE SHOPPE THE dance stdios'schs 553-1870
DANCERS DREAM WEAR wmns accy spcty st 553-1818
L M SALON beauty shops 553-1888
+HIGHWAY 55 INTERSECTS
+HARBOR LN N INTERSECTS
· ZIP CODE 55447 CAR-RT C016
3000 NORWEST BANK PLYMOUTH natl commrcl banks 559-5632
3020 HOLIDAY STATION gas stations 559-3690
3050 CHILDRENS WORLD LEARNING CENTER child day care svcs 553-7960
3131 ADVANCE POSSIS TECHNICAL SERVICES help supply svcs 577-9000
ANTHONY LOUIS CENTER *residential care* 559-8601
ASSOCIATED CONS ENGINEERS eng svcs 559-5511
BRADLEY JOHN ARCHITECTURAL CONSULTANT architectural svcs 553-9670
DEPENDABLE TRAVEL travel agcy 577-0101
DOORSTEP MARKETING drct ml advrtsg svc 550-2033
EMBASSY HOMES *operative bldrs* 559-8171
EVANGELICAL FREE CHURCH OF AMERICA religious orgs 553-1860
GENERAL BUSINESS BROKERAGE busn svcs 551-1874
Jacob Robert [2] 559-4165
ESPELAND LAWRENCE H P A *acctng audtng bkp* 551-9349
ⓃMartinson Thomas 559-4165
MIDWEST AUDITING SERVICES acctng audtng bkp 557-8575
MINNESOTA UNITED *SNOWMOBILE mbrshp orgs* 577-0185
NO CNTRL DIS ASSN EVIGLCL FREE religious orgs 553-1873
NORTHERN CON-AGG cnstr sand gravel 441-1817
PARK VALLEY AGENCY ins agts'svcs 559-2221
R-G SALES indus equip 553-9188
SJULSTAD K N CO statnry ofc suppl 553-1218
WRITING ASSISTANCE svcs 551-9772

FERNBROOK LN N
3225 Lavigne Marian L [9]+ 559-2536
3235ⓃMarquis Andrew 559-8306
ⓃMarquis Shawn 559-8306
3315 FAMILY HOPE SERVICES indvdl family svcs 557-8670
+34TH AVE N BEGINS
· ZIP CODE 55447 CAR-RT C017
3430 Turner Dawn M [9]+ 559-2995
3450 Starr John E [9]+ 559-0489
+35TH AVE N INTERSECTS
3535ⓃWolf Kim 559-3160
ⓃWolf Mark 559-3160
3540 Hanson Debra L [9]+ 557-7229
+DALLAS LN N BEGINS
3920 Abresch Jeanne L [9]+ 553-0066
+38TH AVE N BEGINS
3950 Larson Donald G & Corrine [9]+ 559-1283
+39TH AVE N ENDS
+40TH AVE N ENDS
4000 Broughton Deborah J [8] 557-0767
ⓃGohmann Todd 557-0767
+COUNTY ROAD 9 ENDS
· ZIP CODE 55446 CAR-RT R004
4115 Lason Jonathan K [5] 557-0369
4120ⓃAhwash Jeff 694-0032
4125 Stubbs Delilah D [9]+ 559-5688
4130ⓃMarino Todd A 551-3556
+42ND AVE N BEGINS
4235 Brinkman David K & Linda [9]+ 551-9696
4265ⓃGonikman Anatoly B 577-0568
4300 Begin Larry [8] 550-2967
+44TH PL N BEGINS
+45TH AVE N BEGINS
· ZIP CODE 55446 CAR-RT R005
4630 Fischer Yoko W [9]+ 553-1886
ORCHIDS LIMITED florists 559-6425
4640 Taylor Robert D & Paula [9]+ 559-1861
+47TH AVE N BEGINS
BUSINESSES 65 HOUSEHOLDS 40

FERNCROFT DR (EXCELSIOR)-FROM 21109 MINNETONKA BLVD SOUTH
· ZIP CODE 55331 CAR-RT R066
4812Ⓝ*Gysland Scott* 474-1425
4815 Dallmann Arvid M & Darlene [9]+ 474-9312
4825ⓃJacob Tom 470-8384
Thomas Brenda L [5] 470-8384
4840 Korzendorfer Violet J & Terence [9]+ 474-6892
4845 Peterson Barry D [8] 470-6107
UNITED VIDEO PRODUCTIONS svcs alld mtn pict 470-6333
4860 Blackowiak Chester F [9]+ 474-8606
4865 Born Ronald M [9]+ 474-6620
4890 Meyer James E & Mary [9]+ 474-3556
+IVY LN INTERSECTS
4920ⓃAnderson Judd A 474-1655
4925 *Easter James L & Claudia* [9]+ 474-7226
4930 Boon Theresa A & Andreas [9]+ 474-2186
+FOREST DR INTERSECTS
BUSINESSES 1 HOUSEHOLDS 12

FERNDALE AVE NE (MINNEAPOLIS)-FROM 6042 BENJAMIN ST NE
· ZIP CODE 55432 CAR-RT C016
1504 *Blegen Raymond & Nancy* [9]+ 572-8904
1508 Baune John E & Carolyn [9]+ 574-0812
1511 Olsen Irving W & Deborah [9]+ 574-9335
1521ⓃBuech S 502-0470
1522 Prokosch Bonnie L [9]+ 574-1728
1541 Rice Faye L [9]+ 571-4054
1561 Evans Michael P & Constance [9]+ 784-5272
1568 Bargy Michael J [9]+ 572-2246
1573 Clasen Bryan R [9]+ 571-6920
1579 Johnson Vicki A [8] 571-5571
QUESTOR CORPORATE CONSULTING eng svcs 571-5571
BUSINESSES 1 HOUSEHOLDS 10

FERNDALE AVE NE (PRIOR LAKE)-FROM 14101 ASH CIR NE
· ZIP CODE 55372 CAR-RT R006
14435 Farrell William A [9]+ 445-0453
+ASH CIR NE ENDS
+HAMPTON ST NE BEGINS
+140TH ST NE INTERSECTS
HOUSEHOLDS 1

FERNDALE DR (ROGERS)-FROM 14201 NORDEN DR NORTH
· ZIP CODE 55374 CAR-RT R003
14279 Rieck Barbara A [9]+ 428-2641
14313ⓃHilyar Matt 428-7819
ⓃHilyar Phil 428-7819
Kohout Thomas E [9]+ 428-2147
NATIONAL SATELLITE ANTENNA SYSTEM telegrph other comm 428-8468
14337 Christensen Robert L [9]+ 428-2707
HOMETOWN ADVERTISING drct sling estbmnts 428-2707
14342ⓃMcIndoo Douglas E 428-4464
14379 Lashinski Randall T [9]+ 428-2973
14382 Obrien Terrance S & Margaret [9]+ 428-2023
14437 Thiele Dean O & Judy [9]+ 428-4530
14448 Klein Judith A & David [9]+ 428-4290

RR29 55124
13500 Barb Scott .98 891-3134
Lawrence E Scott .84 431-3274
— LOWER 134TH ST W INTS
13518 Allan G Quist .78 432◇2097
13535 J M Pinske .92● 431-5984
13538 Konrad Stroh .98 432-3064
13553 Scott Von Caster .92● 431-3965
13554 M A Putnam .82 432-6274
13571 Kevin Casey .78 432-2087
13572 Thomas R Halter .78 432◇8321
13589 R Johnson .95● 431-5812
13590 M Vanderschaaf .95● 432-0174
13607 Bernie Fraser .88● 432-5373
13608 John G Holliday .76 432-7857
13625 Jeannine Roth .93 431-0808
13626 Dennis J Carpenter .82 431-1881
13652 NP
— 134TH ST W INTS
13730 Richard Derrick ⌑● 432-0353
Richard Derrick ⌑● 432-5386
13745 Ronald J Sailer .96● 432-8804
13750 Carol Conroy - 432-3751
13760 Edw A Brunkhorst ⌑● 891-3810
13765 Mark Linde .96 891-5787
13780 Gary Dietrich ⌑ 953-9843
13805 K F Bauer ⌑● 953-8479
13810 L L Kohlhof -● 953-8353
13820 Marvin Labelle ⌑● 953◇9735
13830 Abby Falek ⌑ 891-2646
13840 Sau Kong Young .96● 431-4398
13850 Ray Gracek .98● 432-2547
13870 Charles Bianchi ⌑● 432-8803
13880 Luverne Ritter ⌑ 891-1982
13890 Kenneth F Dohnen ⌑● 891-5786
13900 James L Ecker ⌑● 432-1146
13910 M L Pieschel .96● 432-2379
13920 Benjamin Brown .96● 431-2827
13930 Bruce Erickson .96● 953-4397
13940 Thomas F Johnson .96● 891-4799
13950 James F Williams .96● 953-4409
13979★ Joe Miller Homes .86 891-8499
13985★ Joe Miller Homes - 891-5546
● 55124
14382 Noreen M Pohl .96 431-7262
60 RESIDENCE 3 BUSINESS

FERNANDO AVE
Rosemount
16200-16399 CT 608.09 $C..F 5
● HUDSONS MAP LOC 2B-136
RR 3 55068
16317 Marcia Kordell .85 431-6028
16347 R C Kelly .85 431-5348
— FERNANDO WAY W INTS
2 RESIDENCE

FERNANDO CT
Apple Valley
6100- 6199 CT 608.04 $A..F 5
● HUDSONS MAP LOC 2C-122
RR29 55124
6100 NP ●
6120 Terry G Ekegren .74 432-7367
6121 John Clinton .94● 431-5342
6140 Kurt A Dobias .88● 431-7297
6141 Chris Ament .94 431-7427
Gary Ament .78 432◇4897
6160 Steve Mixa ⌑ 431-5681
6161 Kurt Hughes .90 891-1936
6180 John Ferrante .88 432-9259
9 RESIDENCE

FERNANDO WAY W
Rosemount
16200-16599 CT 608.09 $C..F 5
● HUDSONS MAP LOC 2B-136
RR 3 55068
16200 NP
16209 David Goetz .86 432-2390
16218 William R Fesser .84 432-2498
16227 Mark Sonnabend - 953-9077
16236 R Nelson .92 431-3247
16245 Keith Knutson .85 432◇4480
16254 J Needecker .84 432-7859
16263 William Alic Brun .95 431-2034
16272 T J Larmer Sr .95● 953-4881
16281 Donald Ross .91 432-5306
16290 Scott Harrison .95● 432-0874
16299 Randy Drescher .91● 891-2823
16308 Steve Gressman ⌑● 891-4883
16326 Christopher Reese .93 432-2893
16344 NP
16357 Clyde Johnstone ⌑● 891-1761
16362 Nho Nguyen .98 432-9555
16371 Jim Little ⌑● 431-5000
Jim Little .92● 432-2222
16381 Steve Serafina .82 431-6304
16391 Hal Burstein .90● 891-1024
16401 C Bonn .94● 431-1763
16411 Gerald Otremba .87● 432-4143
16420 NP
16421 Chuck Bichler .95● 891-3556
16430 James Nokleby .78 432-1959
— FERNANDO AVE INTS
— FLAGSTAFF WAY W INTS
16440 Jolene Komorouski .87● 432-0306
16450 NP
16451 NP ●
16460 D Day Underhill - ● 891-3817
16461 Jack W Metcalf .78 432-4515
16470 NP
16471 Tim Koch .93 953-4157
16480 John J Cihonka .78 432-9637
16481 V Beebe .78 432◇9482
16490 Luis Ayala - 431-9042
16491 Denny Gudim .82 432-2516
16500 NP
16501 James A Meyer .77 432-3950
16510 Glenn W Pollack .93● 953-4215
16511 James Knaeble .95 432-4947
16520 James P Sowada .84 432-9378
16521 16530 NP
16540 James Thompson .87 432-5218
16550 NP ●
46 RESIDENCE

FERNBROOK CT N 55311
Osseo
6500- 6699 CT 267.09 $A..C 4
6580 Paul Zivkich .96 553-9886
★ Dorling Kindrsry ⌑ 553-0083
6601 J M Humbeutel .93● 551-4765
6623 Gregory Joos .94● 559-9262
3 RESIDENCE 1 BUSINESS

FERNBROOK LN N
Dayton
11700-12099 CT 269.01 $C..C 4
● HUDSONS MAP LOC 4B-23
RR 2 55327
11771 Michael Winn .94● 494-8319
11801 William Brandt .98● 420-5789
11820 Ed Volk .84● 420-8133
11821 Patricia A Young .82 420-5321
11880 Neil R Guimont .78● 420-5797
11901 NP ●
11920 Michael E Gallery .81 420-4980
11971 Raymond L Jackson .74● 420-4291
11980 Warren E Berg .96● 420-8578
Clifton J Ecklund .85 420-4759
11981 Philip Zieska .92● 494-3256
11991 NP
12001 Craig Gustafson -● 416-4221
12020 Ed Schmitz .95● 420-5502
Terrance V Schmitz .74● 420-4745
12041 NP
12081 Karl E Stolp .72● 420-8880
12131 Frank R Cserpes Jr .81● 421-3171
12400 Paul Cserpes .93● 421-8222
12450 L Cserpes .92● 421-5157
★ Karlsburger Foods .87 421-5481
12530 Gerald D Peterson .96● 421-5555
12700 Donald H Rachner .78● 427-7997
12921 Earl Dehn .79● 421-3431
23 RESIDENCE 1 BUSINESS

FERNBROOK LN N
Maple Grove
6200- 7599 CT 267.09 $A..C 4
9300-10199 CT 267.08 $A..C 4
10200-10899 CT 267.07 $A..C 4
10900-11699 CT 269.01 $C..C 4
● HUDSONS MAP LOC 4B-23,3A-35
RR 5 55311
6226 Wayne Oestreich .91● 559-4149
6227 Michael Laak .90● 557◇9732
6232 Mark Moan .93● 559-4845
6233 Jeffrey R Ireland .95● 557-9087
6238 Harry C Ross III .91● 553-9976
6239 Brad Terison .92● 550-9162
6253 Richard R Kruse .90● 559-7784
6254 Steven Carlson .95● 557-5844
6257 Ronald Ertheim .94● 551-9617
6258 Barry Thompson .91● 559-2748
6261 John Rupp .91● 550-1099
6265 Brian Blenkush .90● 553-9297
6266 James Hegedus .93● 559-4598
6275 Rod Schumacher .94● 550-9246
6276 John Bangs .93● 550-1227
6287 Loren L Peterson .89● 557-2991
Loren L Peterson .89● 557-2990
6288 NP
6320 Don Demorett .92● 559●7015
6323 Ken Lambert .93● 557-9163
6579 Gregory C Davis ■ 553-9745
6940 Theodore E Harlan .85● 420-4986
6945 Andrew Claude .94● 420-3785
6960 NP ●
6985 Clyde L Spore - ● 420-4214
6980 Robert A Wachter .80● 420-4440
6985 Ron Peipus .89● 420-8201
7002 Paul Capt Smith .88 420-4799
7003 Rowland Trombley .80● 420-0586
7012 NP
7013 Robert K Kubal .80● 420-4850
RR 6 55311
7409 J W Larson .89● 420-4012
7415 Ann A Ryan .92● 420-8410
Jim Ryan .95● 420-9715
7421 NP
7427 NP
7433 Charles R Rogers .85● 420-4733
7443 D Labissoniere .95● 420-5955
7449 7455 NP
7463 NP
7469 Timothy J Niles .86● 420-6115
7479 NP
7487 Sharon Lugert .90 420-6542
7493 B Simmons .79 420-8476
7505 Brad Peterson .91● 420-8210
RR10 55369
9315 R Munsterteiger .96 420-8056
★ Abraham Towing - 416-4534
★ Manor Concrt Const .96 420-5215
★ Mn Mortgage Corp .96 494-9539
9401 Maple Grove City Hall
★ Maple Grv Cty ADM 494-6005
★ MG Cty Hmstd&Txs 494-6240
★ MG Cty Spcl Assmnt 494-6163
★ MG Fire&Bldg Insp 494-6060
★ MG County&Econc Dv 494-6040
★ MPL GR Engineering 494-6150
★ Mple Grv Cty Fince 494-6176
★ Mple Grv Fire Prev 494-6090
★ MG Cty Human Resrs 494-6015
★ Maple Park&Rcrtn 494-6200
★ Maple Park&Rcrtn 494-6500
★ Mple Grv Cy Police 494-6100
★ MPL Grv Cmm Serv 494-6121
★ MG Cy Crime Prevt 494-6108
★ MPL Grv Cy Cmplts 494-6140
★ MPL Grv Pblc Works 494-6170
★ MPL Grv Cntrl Equp 494-6190
★ MPL Grv St Sprvsr 494-6176
★ MPL Grv Utl Sprvs 494-6177
★ MPL Grv Tree&Weed 494-6178
★ MPL Grv Cy Recycl 494-6155
★ MPL Grv Cy Finance 494-6030
★ Maple Grv Cty Hall 494-6000
★ Maple Grve Tran .93 420-4000
9661★ Osseo Area Schls .89 420-8888
9681 NP ●
9900★ Osseo Ar Schools ⌑ 416-3000

RR 3 55369
10200 Stanley Biesi .95● 420-4760
10501 Gary Krieg .85● 420-4218
Thomas Krieg .98● 420-9598
10725 Janice K Engelking .89● 420-8999
Walter W Engelking .89● 420-8999
★ Engelking Janice K .89 420-8999
★ Engelking Walter W .89⊙ 420-8999
★ Jans Family Hr CR .89⊙ 420-8999
10775 David McCartney .93● 494-3011
10825 Richard L Meyers .92● 420-9828
10855 Roger A Young .85● 420-8605
10921 Michael J Dehn .96 420-7984
11260 Hilary J McNallan .96● 420-5330
11261 Allan I Dehn .77● 420-4084
11280 Robert F Barber .94● 420-6228
11281★ Dehn Enterprises .96 420-2418
★ Dehns Country Mnr - 420-6460
11330 Jeffrey L Kohanek .96● 494-9229
11421 John Schmitz .88● 420-8092
11431 Scott Culver .81● 420-5883
11441 Floyd Kalla .78● 420-5655
11451 Wayne L Hanson .78● 420-8107
11461 NP
11471 S Lee Hallquist .80● 420-4240
11570 Harry F Kitzman .79● 420-4260
★ Brite Stitch .91 420-2630
11580 Rick Scherer .89● 420-8328
11620 Gary L Prescott .80● 420-4448
11640 James A Sautter .85● 420-6124
11660 James K Rohne .77● 420-6138
72 RESIDENCE 35 BUSINESS

FERNBROOK LN N 55447
Plymouth
800- 1499 CT 266.09 $A..B 4
E 1600- 1999 CT 266.06 $A..D 4
O 1601- 1999 CT 266.09 $A..D 4
2100- 2899 CT 266.06 $A..D 4
3000- 4099 CT 265.13 $B..D 4
4100- 4899 CT 266.03 $A..B 4
● HUDSONS MAP LOC 3C-49,3B-63
875 Anthony Heppelmann .94 473-4892
880 Roland W Anderson .94● 476-2432
885 Dwight Johnson .94● 476-1851
895 Don C Smith .94● 476-9694
900 Thomas M Garvin .94● 476-4341
910 Paul R Koch .95● 473-6814
915 NP
920 Martin Pint .95● 476-8453
930 Robert A Engelstad .96● 475-2594
1010 Sherry Holtz .95 473-6163
1020 M C & K M Busch ■ 476-8072
Jeffery D Lange .95● 449-0175
1040 Joe Cranny - 473-4118
1115 Ronald D Olson .73● 473-0509
1125 Larry F Wood .78● 475-3815
1135 Andrew J Dunlap ⌑● 476-4460
1205 Patrick Wight .96● 404-1814
1615 Gerald Larson .91● 473-1743
1705 Faith Olson .94● 475-3693
1711 Dennis S Evenson .73● 473-0085
1770★ Wagner Spray Tech .84 553-0759
1940★ Storage Eqp Inc .95 820-3615
2000★ Shell Group ⌑ 551-9899
2100★ Nu Aire Inc .82 553-1270
2220★ Seelye Craftmen .95 577-0700
2340★ Mtrop Rat Centers .86 557-1234
2440★ Capstone Press Inc .93 551-0513
★ Collectors Gallery .88 577-0201
★ Lebens Lab .92 559-0601
★ Ulmer Pharmacal .78⊙ 559-0601
2465★ Mn Stt Offcs Drvr .92 341-7149
★ Mn St Officrs Pub .95⊙ 341-7149
2500★ Davey TrkLsng Ofc .92 553-9740
2525★ Prcsn Grphcs Inc .85 476-4100
2533★ Frnbrk Ln Strngy .93 476-6797
2545★ Navarre Biomedical .95 449-6100
2600 Cheshire Building
See Building Drty
2605★ Agfa Corporation .91 553-1703
★ B Braun Medcl Inc .95 551-9351
★ Omna Entrtn Inc .95 559-6895
★ Entrtmnt Phlctns .91 559-6029
★ Gold C Coupon Bks .91 559-0464
★ Happenings Cpn Bks .89 559-1816
★ K-Tel Intrntl Inc ⌑ 559-6800
★ Nosin Medical Inc .89 553-9960
★ TSR Lighting .86 550-0001
2700 NP
2722★ Apollo Press Inc .86 509-0807
2724★ Prdctvty Wrld Inc - 559-2115
2730★ Paula Woodcraft - 559-2990
2800★ The Ballroom Shp ⌑ 509-0995
★ The Dance Shoppe .96 553-1870
★ Dancers Dreamwear .96 553-1818
★ L & M Sales Inc .98 553-1888
3020★ Holiday Sttns Hldy .95 559-4240
3050★ Chldrns Wld Learn ⌑ 553-7908
3131 Harbor Pl Corp Ctr
See Building Drty
3135 NP
3225 J C Lavigne .63● 559-2536
3235 David Buller ⌑ 550-9414
3315★ Damascus Inc - 559-3482
★ Family HP Serv Inc .90 557-8670
3430 Lowell R Turner .63● 559-2995
3435 3440 NP
3450 John Starr .78● 559-0489
3535 Mark Wolf .93 559-3160
3540 D L Hanson .93● 557-7229
3550 NP
3605★ Plymth Historical .83 559-9201
3800 NP
3810 Gerald L Schmidt .87● 559-4018
3818 3820 3905 NP
3920 Craig Abresch .91● 553-0086
3940 M J Kautz .84● 559-7709
3950 Donald G Larson .79● 559-1283
4000 D Broughton .93 557-0767
Todd Gohmann .93● 557-0767
4050 Kelly Peniata .96● 553-7811
RR 5 55446
4100★ Ames Construction - 550-0470
4105 Edward J Albro .88● 553-9591
4115 J Leson .89● 557-0369
4120★ Grngr D W W Grngr - 559-0405
★ Nrthlnd Mrchndsrs ⌑ 550-9290
4125 V G Stubbs .82● 559-5888
4130 Charlie Pfeffer .95● 557-5188
4150 NP
4235 David Brinkman .98● 551-9696
4265 NP

4300 Kevin C Begin ⌑● 550-2967
Lillian A Begin .95● 557-5123
4315 4825 NP
4830 Lee Jerry .85● 553-1886
★ Orchids Limited .88 559-8425
4840 R D Taylor .79● 559-1861
55 RESIDENCE 41 BUSINESS

FERNCROFT DR
Shorewood
4700- 4999 CT 275.02 $A..E 3
● HUDSONS MAP LOC 3C-75
RR 8 55331
4805 M Maurice .95● 470-8913
4812 Scott Gysland .88● 474-1425
4814 NP
4815 Arvid M Dallmann .77● 474-9312
4825 Tom Jacob - 470-8384
Brenda Thomas ⌑● 470-8384
4830 NP
4840 Terry Korzendorfer .78● 474-6892
4844 NP
4845 B Peterson .93● 470-6333
Barry Peterson .94● 470-6107
★ Peterson B & A .93 470-6333
★ United Productions .93⊙ 470-6333
4860 C F Blackowiak .80● 474-8608
4865 Ronald M Born .82● 474-6620
4890 M K Meyer .80● 474-3556
— IVY LN INTS
4920 Judd A Anderson ■ 474-1655
Kragg Keller .98 470-8038
4925 James Easter .82● 474-7228
4930 Theresa Boon .89● 474-2186
18 RESIDENCE 2 BUSINESS

FERNDALE AVE NE 55432
Brooklyn Park
1500- 1599 CT 512.03 $B..B10
● HUDSONS MAP LOC 5B-37
1504 Raymond Blegen .88● 572-8904
1505 NP
1508 John Bauna .89● 574-0812
1511 I W Olsen .95 574-9335
1521 S Beuch Barber ⌑● 502-0470
T Barber -● 502-0470
1522 Bonnie L Prokosch .91 574-1728
1540 Robert A Nehring .85 571-5321
1541 C E Rice .74 571-4054
1560 Constance Haugen ⌑ 572-0718
1561 NP
1567 L Burgen .88 572-8093
1568 Michael Bargy .88 572-2248
1573 Terry Clasen .75 571-6920
1579 V A Johnson .94 571-5571
James R Million ⌑● 571-5671
James R Million .94● 571-1929
17 RESIDENCE

FERNDALE AVE NE
New Street-1989.
Prior Lake
14400-14499 CT 809.02 $A..F 4
● HUDSONS MAP LOC 5B-119
RR 6 55372
14435 William A Farrell .89 445-0453
1 RESIDENCE

FERNDALE DR
Rogers
RR 3 55374
14200-14499 CT 269.01 $C..C 4
● HUDSONS MAP LOC 4D-15
K Kapsner .91 428-2147
14313 Phil Hilyar .95 428-7819
Thomas Kohout .90● 428-2147
★ National Satellite .92 428-8468
14337 R L Christensen .82● 428-4137
Robert Christensen .89● 428-2707
14342 Douglas E McIndoo .79● 428-4484
14362 Jeff Lloyd .83● 428-4077
14379 Daniel T Lashinski .91● 428◇2973
14382 Terrance S OBrien .76● 428-2023
14437 J Thiele .79● 428-4530
14448 David K Klein .87● 428-4290
14484 Jeffrey Skarsten .86● 428-2168
12 RESIDENCE 1 BUSINESS

FERNDALE GRN 55391
Orono
1- 199 CT 272.01 $A..D 3
● HUDSONS MAP LOC 4C-62
45 Eric Burke ■ 476-4838
Frank Ventura .91● 473-6599
55 NP ●
65 Timothy Laparre .94● 473-5932
70 Walter Steinkraus .87● 473-2151
75 Ken Hopkins .95● 473-2546
85 John Powers ■ 475-0955
John L Powers .79● 473-1391
90 Kristopher Scherer .95● 475-3740
95 Charles A Hulse .78● 473-0744
100 Patrick G Farnand .87● 473-1353
11 RESIDENCE

FERNDALE LN 55347
New Street-1992.
Eden Prairie
8900- 8999 CT 280.11 $A..E 4
● HUDSONS MAP LOC 3A-105
8955 Warren S Carlson .92● 934-5250
8959 William Gaslin ■ 934-7382
8967 Edwin A Groess .93● 934-4298
8971 Edward J Vidmar .93● 949-2932
8979 J Hokanson ⌑● 906◇1203
Jim Hokanson .98● 975●9744
8983 Leroy A Prohofsky .92● 949-3882
8991 Grant I Warfield .92● 937-5491
8995 B L Quaintance .95● 975-0755
9 RESIDENCE

. . . . 55447
2600★ Pres Storage Systm . . ¤ ⊙ 559-3233
★ Stuart Helmer Sles . . 90 ⊙ 559-1974
2605★ Agfa Copal Inc 90 553-0366
★ Clarus Mdcl Systms . . ¤ 559-8640
★ Currentech Computr . . 88 557-7555
★ Entertaint Coupon . . 90 559-0029
★ Entertaint Hotline . . 90 559-0280
★ Entrtaiment Publctn . . 90 ⊙ 559-0029
★ Gold C Cpn Books . . . 90 559-0484
★ Happenings 88 559-1010
★ Jwp Info Systms . . ¤ ⊙ 557-7555
★ Twn Cit Fine Dinng . . 89 559-7083
2700 . . . . NP
2722★ Blank Corp 89 559-3846
★ Blanks USA . . . . 85 ⊙ 559-3846
2730★ Paula Wdcrft Co 559-2990
3050★ Chldrns Wrld Lrng . . 88 553-7960
= HWY 55 INTS
3131 Harbor Pl Corp CNT
See Building Drty
3135 . . . . NP
3225 J C Lavigne 62 559-2536
3235 Tom Chesness . . . . . ¤ 559-2883
3315★ Family Hope Servcs . . 89 557-8670
★ Passages Cnslg Ctr . . 89 557-8671
3430 Lowell R Turner . . . 62 559-2995
3435 3440 . . . . NP
3450 John Starczewski . . . 84 559-9466
John Starr . . . . . . 77 ● 559-0489
= 15000 35TH AVE N INTS
3535 K Shulte 90 559-3160
3540 Dennis Lee Johnson . . 88 ● 553-1767
3550 . . . . NP
3605★ Plymouth Historicl . . 82 559-9201
3625★ City Fernbrk Park . . 90 559-5664
3800 C M Beck 64 559-2760
3810 Gerald L Schmidt . . . 66 559-4018
3816 3820 3905 . . . . . . NP
3920 Craig Abresch . . . . ■ 553-0066
3940 M J Kautz . . . . . 83 ● 559-7709
3950 Donald G Larson . . . 78 ● 559-1283
= 40TH AVE N INTS

● RR 5 55446
= 14300 COUNTY RD 9 INTS
4105 Edward J Albro . . . 87 ● 553-9691
4115 B Biederman . . . . 88 ● 557-0369
★ All Brands Sm Eng . . 89 557-8679
4125 V G Stubbe . . . . 81 ● 559-5088
4150 L K Begin . . . . . . ¤ 550-1168
4235 Jeffrey Rydbom . . . 90 550-1398
4285 Elmer P Beyer 62 559-5456
4300 . . . . NP
4315 Melvin A Schmidt . . . 74 559-3038
4625 . . . . NP
4630 Jerry Lee Fischer . . . 84 553-1886
★ Orchids Ltd 87 559-8425
4640 R D Taylor 78 559-1861
38 RESIDENCE 48 BUSINESS

● FERNCROFT DR
Shorewood

● RR 6 55331
4800- 4899 CT 275.02 $A..E 3
● HUDSONS MAP LOC 3C-31
4805 John Ekelund . . . . 88 ● 470-0411
4812 Scott Gysland . . . . 87 ● 474-1425
4814 . . . . NP
4815 Arvid M Dallmann . . . 76 474-9312
4825 Paul Leland . . . . . 90 ● 470-5119
Matt OBrien 90 470-5119
4830 . . . . NP
4840 Terry Korzendorfer . . 75 ● 474-6892
4845 C R Harris 90 474-3828
William Roath . . . . 90 ● 474-3828
4860 C F Blackowiak . . . 79 474-8606
4865 Ronald M Born 81 474-6620
4890 James E Meyer 79 474-3556
4900 Kent Johnson . . . . 86 ● 474-2082
4920 Sheldon Ferrell . . . . ¤ 474-2481
4925 James Easter 81 474-7226
4930 Theresa Boon 88 474-2186
17 RESIDENCE

● FERNDALE AVE NE 55432
Fridley
1500- 1699 CT 512.03 $B..D10
● HUDSONS MAP LOC 50-10
1504 Raymond Blegen . . . 87 ● 572-8904
1505 Greg R Johnson 79 571-5673
1508 John Baune . . . . . 88 ● 574-0812
1510 I W Olsen 78 574-9335
1521 Gloria Arel 72 571-0978
Roger D Arel 72 571-0978
1522 Bonnie L Prokosch . . . 90 574-1728
1540 Robert A Nehring . . . 84 571-5321
1541 C E Rice 73 571-4054
1560 1561 . . . . NP
1567 Charles Borgan 85 571-4319
1568 Michael Bargy 87 572-2246
1573 Terry Clasen 74 571-8920
1579 D H Nelson 79 572-1195
15 RESIDENCE

● FERNDALE AVE NE
New Street-1988.
Prior Lake

● RR 6 55372
14400-14499 CT 809.02 $B..F 4
● HUDSONS MAP LOC 50-55
14435 William A Farrell . . . 88 445-0453
1 RESIDENCE

● FERNDALE DR
New Street-1978.
Rogers

● RR 3 55374
14200-14249 CT 261.02 $B..E 4
14250-14499 CT 269.01 $C..C 4
● HUDSONS MAP LOC 40-28
14313 Thomas Kohout 89 428-2147
★ Natl Satellite . . . . . ¤ 428-8488
14337 Robt L Christensen . . 81 428-4137
Robt L Christensen . . 88 428-2707
14342 Douglas E Mcladog . . 78 ● 428-4464
14362 Kay T Reed . . . . . 90 ● 428-2624
14379 Daniel T Lashinski . . . 90 428-2973
14382 Terrance S OBrien . . 75 ● 428-2023
14437 Dean O Thiele 78 428-4530
14448 David K Klein 86 428-4290

14484 Jeffrey Skarsten . . . . 85 ● 428-2166
NO # K Kapsner 90 428-2147
11 RESIDENCE 1 BUSINESS

● FERNDALE GREEN 55391
Orono
1- 199 CT 272.01 $A..D 3
● HUDSONS MAP LOC 4C-23
45 Frank Ventura 90 473-6599
55 William A Mueller . . . 84 ● 476-1058
70 Walter Steinkraus . . . 86 ● 473-2151
85 John L Powers Atty . . 78 ● 473-1391
90 John Coleman . . . . 86 ● 475-0232
95 Charles A Hulse . . . 77 ● 473-0744
100 Patrick G Farnand . . . 86 ● 473-1353
7 RESIDENCE

● FERNDALE RD
New Street-1991.
Eden Prairie

● RR 2 55347
● HUDSONS MAP LOC 3A-47
8955 Warren S Carlson . . . . - 934-5250
8969 Alvyn L Pope . . . . - ● 934-3936
8983 Leroy A Prohofsky . . - ● 949-3682
8991 Grant I Warfield . . . - ● 937-5491
4 RESIDENCE

● FERNDALE RD N 55391
Odd Numbers Are
Orono Even Numbers
Are Wayzata
1- 299 CT 273 $A..D 3
E 300- 1298 CT 266.06 $A..D 4
O 301- 1299 CT 272.01 $A..D 3
● HUDSONS MAP LOC 4C-23
75 . . . . NP ●
85 Wilfred Gagne 61 473-2912
★ Gagne Land Co 473-8382
301-1199 Odd Numbers Only Even
Numbers See Plymouth
Orono
● HUDSONS MAP LOC 48-23
325 Edwin B Murphy . . . 71 473-0390
345 Dr Richd F Palmer . . . 84 473-5516
365 Donald B Chase 72 473-4704
375 395 . . . . NP
425 L A Houser III 72 473-5811
445 . . . . NP
455 K J Dahlberg 90 449-0585
475 Thomas Dufresne . . . 90 ● 475-9174
491 . . . . NP
503 Dale A Spencer . . . . - ● 476-1072
505 Edward J Biermen . . . 88 ● 475-1526
507 Wm F Sharpe Jr . . . . - 473-8730
509 Y C Cooke 64 475-1383
511 James K Pfleider . . . 86 ● 473-1367
515 Dr Andrew J Smith . . . 90 475-1388
517 H Glendon Johnson . . . 72 473-8382
519 Edward M Cohen . . . 84 ● 473-2258
525 E S Hendrickson 473-8739
555 T W Donaldson . . . . 87 ● 476-1330
565 Jerry Martin . . . . . 77 ● 475-3591
575 Gary L Vars 83 473-1829
★ Growth Marketing . . . 88 473-2231
585 Dan D Danielson 73 473-3139
605 H P Bowen . . . . . 88 ● 473-4589
625 G Bastiaens 81 475-0560
627 Timothy Johnson . . . 85 ● 473-2507
629 Joe R Thomas . . . . ¤ ● 475-3844
635 Eric Jacobson 476-0055
Larry G Jacobson . . . - ● 473-3947
V A ONeill 473-3947
645 Richard E Strand . . . 71 473-6861
665 J See 80 475-3753
715 Richard J Lyman . . . 84 ● 476-0414
725 Ronald C MacLeod . . 77 ● 473-7464
735 Andrew Pittman 89 473-9414
E E Strickland 89 473-0955
★ Indpt Brokers Rlty . . . ¤ 476-6800
745 John A Berg . . . . . 90 ● 475-1084
755 Lewis Mithun 88 475-3541
783 Ervin Kamm 88 473-8547
785 S V Shanedling . . . 81 ● 475-1048
★ S V Shanedling Aty . . 88 476-2186
775 Bradley A Erickson . . ■ 449-0230
D Schott . . . . ¤ 476-2830
786 Paul L Parker 72 473-5171
Paul L Parker 90 473-5740
793 Laura Boyke 88 476-0744
795 Paul Boyke . . . . . 87 ● 473-2879
Douglas R Fietz . . . . 90 ● 476-0017
885★ St Edward Ca EP Ch . . . 473-2262
49 RESIDENCE 5 BUSINESS

● FERNDALE RD N 55447
300-1198 Even Numbers Only Odd
Numbers See Orono
Plymouth
E 300- 1398 CT 266.06 $A..D 4
● HUDSONS MAP LOC 58-23
344 Allstair Jacques . . . 89 ● 476-2578
350 George Viet 88 476-0644
366 . . . . NP
410★ James R Tegan 86 475-1340
★ Tegan Marketing . . . 86 ⊙ 475-1340
452 Carl W Jones 72 475-0054
= 12TH AVE N INTS
1100 Roger A Miller . . . . 83 ● 473-3600
1110 William J Morkrid . . 84 ● 473-3399
1200 Gary Lindberg . . . . 87 ● 475-1286
Brant Zwiefel 86 475-1266
★ Integral Strtgs Inc . . . ¤ 475-2676
1220 E Wells Spencer . . . 84 ● 473-5334
9 RESIDENCE 3 BUSINESS

● FERNDALE RD S 55391
Wayzata
100- 499 CT 273 $A..D 3
● HUDSONS MAP LOC 48-23
101 George F Piper Sr . . 77 ● 475-1144
127 Mrs P M Harder 90 473-9443
Philip M Harder 473-2938
161 Raymond A Lipkin . . 81 ● 473-7046
162 . . . . NP
170 David H McCaffrey . . . 89 473-2408
180 K S MacKenzie 89 476-2251
181 Charles R Pihl . . . 89 ● 475-3336
206 John W Palmer 74 473-6483
215 F Stimler 89 473-9504
Thomas Stimler 86 476-4985

223 Apartments
301 Robert Ice 72 473-8312
301 David A Nichols 89 473-8312
225 Building
★ Dr Dennis E Arne . . . 88 473-4241
★ Fanny N Freund 473-3821
★ Kallberg Stdies 85 473-7737
★ Dr K M Marine . . . . 88 ⊙ 473-3821
201★ Dr W H Richardson . . 82 475-2484
★ Wayzata Chrprctc . . . 87 ⊙ 473-4241
301 Robert S Lee . . . . 84 ● 475-0393
320 John Vonsteinberg . . 84 ● 476-2182
346 . . . . NP
353 Charlie A Koch 86 475-0676
356 Robert W Amis . . . . 88 ● 475-2424
364 365 . . . . NP
366 Michael Vetsch 88 476-4541
390 . . . . NP
392 K N Dayton 70 473-8514
426 Harry A Johnson . . . . 90 ● 473-1963
David Wojahn 86 476-8018
★ Helen Johnson Int . . . 86 473-3131
498 Howard T Fox 67 475-3209
28 RESIDENCE 7 BUSINESS

● FERNDALE RD W 55391
Wayzata
300- 799 CT 273 $A..D 3
800- 1199 CT 272.01 $A..D 3
● HUDSONS MAP LOC 40-23
300 . . . . NP
306 John Knutson 88 475-2734
308 Susan G MacMillan . . 82 ● 473-6331
312 John Gebbert . . . . 83 ● 473-1698
326 338 . . . . NP
370 M K Doughten . . . . 74 ● 473-7882
374 Richard L Howell . . . 89 ● 475-2585
378 Gordon Murray . . . . 77 ● 473-5919
390 David J Lentz . . . . 80 ● 473-5346

● RR 2 55391
410 Leonard Lilyholm 89 476-2383
430 . . . . NP
437 Pamela J Johnson . . . . ¤ 476-8453
Loren J Simer Jr . . . 83 ● 476-1779
440 David L Owen . . . . 79 ● 473-2978
488 K M Owen 76 473-8342
Tracy L Rice . . . . . . ■ 449-0708
491 . . . . NP
510 Wallace C Dayton . . . 65 475-3228
513 John R Winsor 71 473-2153
520 Dennis W Fischer . . . 90 473-2600
532 Condominium
▣ John W Morrison . . . 72 ● 473-7853
552 Robert F Hartfiel . . . . - 473-3648
555 . . . . NP
585 Gary Capen 473-7791
587 Peter Jewett 80 473-1338
621 Laurence D McCann . . 81 473-9092
622 William H Spoor 74 473-2471
William H Spoor 86 473-8211
623 John Weber . . . . . . - 476-8417
629 G M Asmoth . . . . . 87 ● 476-2819
636 H B Atwater Jr 72 473-7562
648 Mrs T H Lang 77 473-8472
649 Donald S Logan 87 473-2271
670 S D Andrews Jr 75 473-6252
Franklin Quay 86 473-2895
686 Robert R Andrews . . . 72 473-4836
692 Dwight H Ankeny Sr . . 69 473-9597
Orono
865 Larry E Lindberg 87 473-6444
886 D Hanneman . . . . . - 475-1663
905 Alan S McDowell . . . 85 473-6826
Naomi E Peterson . . . 88 476-6225
960 Charles P Floyd . . . 80 ● 473-2384
980 M A Gumucio . . . . 88 ● 475-3817
1345 Henry M Skarp 72 473-9527
1055 Gerald McCourtney . . 90 ● 476-1720
1065 Richd L Lindstrom . . 90 ● 476-0139
1070 Goodrich Lowry 72 473-8214
1080 Jason Shiebler . . . . ¤ ● 476-4082
Joanna Shiebler . . . 89 ● 473-7402
1095 B C Fox 76 475-1236
1101 Robert G Mitchell . . . 72 473-8474
1105 R C Bagley . . . . . 84 ● 473-6272
1185 Bradley C Bowman . . . 87 473-5655
1185 Henry S Kingman Jr . . 81 473-4930
NO #★ Wayz Cmmunty Ch 473-8878
55 RESIDENCE 1 BUSINESS

● FERNDALE WOODS RD
New Street-1988.
Wayzata

● RR 2 55391
400- 499 CT 273 $A..D 3
● HUDSONS MAP LOC 40-23
425 Robert L Bodin . . . 80 ● 475-3839
459 T S Hull 84 473-4483
489 Douglas J Jones . . . 81 473-0305
3 RESIDENCE

● FERN DR
New Street-1978.
Independence

● RR 2 55357
5000- 5599 CT 271.01 $B..D 3
● HUDSONS MAP LOC 3A-14
5010 . . . . NP
5030 Dale S Skroen 88 479-1358
5050 Terry D McMickle . . 88 ● 479-1363
5080 Darwin Kolzer 81 479-1139
5082 Steven Kvistad 85 479-1839
5085 Eugene W Hess . . . 81 ● 479-2127
5090 Les Dalton . . . . . 88 ● 479-2408
5095 Orrin O Stevens . . . 78 479-2781
5110 Apartments
322 William Lax 90 479-8508
322 P J Riedel . . . . . 90 ● 479-8508
5116 William A Stenglis . . . 88 479-1251
5130 Daven Drawert . . . 88 ● 479-4004
5135 Harold Burrows 81 479-1900
5155 Clyde R Brown 74 479-2617
5165 Jeff Puth 85 479-3538
5175 Elton Hatcher 82 479-1482
5178 Joel P Gadbois 88 479-1305
5180 Philip J Tebery 74 479-2791
5185 Stephen Parmenter . . 78 ● 479-1118
5188 Duane L Schlosser . . 85 ● 479-1893
5191 Robert E Payette . . . 86 479-1309
5196 Randy M Miller . . . 88 ● 479-3398
22 RESIDENCE

● FERN DR
Lakeville
● RR12 55044
20700-20999 CT 608.10 $C..G 5
● HUDSONS MAP LOC 5C-80
20790 Dennis B Nielsen . . . 83 481-2043
20801 . . . . NP
20820 Ronald T Cannamore . . 84 461-2744
20900 Steven A French . . . 87 481-3455
20944 B W Cable 89 461-2802
5 RESIDENCE

● FERN DR 55423
Richfield
1500- 1599 CT 248.02 $D..D10
● HUDSONS MAP LOC 48-42
1521 J Brian Winkelman . . . 70 869-5929
1524 Joel Vossen . . . . . 89 ● 866-7781
1528 Richard C Weltz 59 869-1888
1529 Steven Mlynarek . . . . ■ 866-6358
1535 Joe L Caspers 65 869-4438
1538 Clover Hedlund . . . . . ¤ 869-2516
Steve Hooper . . . . 87 ● 869-3957
1539 Clayton T Ostby . . . 72 ● 881-3587
1544 1545 . . . . NP
10 RESIDENCE

● FERNLAND CT 55441
Plymouth
1- 99 CT 265.07 $B..D 4
25 26 . . . . NP
27 Timothy A Baldwin . . . - 545-5145
28 Joseph M Osowski . . . 77 545-7350
4 RESIDENCE

● FERN LN 55364
Mound
2100- 5549 CT 276.01 $C..D 3
● HUDSONS MAP LOC 39-30
2100 Donald T Scholer . . . 72 472-1418
2117 Brian Hackleander . . . - 472-2144
2126 Hubert Pauly 62 472-2429
2134 Greg Hagen 88 472-7380
2142 Barry Garindahl 87 472-4428
2208 . . . . NP
2212 Harold D Nasset . . . 89 472-1205
2221 . . . . NP
8 RESIDENCE

● FERN LANE TERR
Jackson Twp
● RR 3 55379
700- 799 CT 806 $C..F 3
700 Gary A Hellmers 84 445-8157
701 Rose M Brick . . . . . ¤ 445-5703
702 Gordon Benedix 90 445-0591
703 . . . . NP
704 Jeanne Bishette . . . . ¤ 496-1822
Pam Moffitt 89 496-1822
705 Julie Riley 90 445-9253
706 Vernon Erickson . . . . ¤ 445-8709
707 Y Siebert 90 445-6174
708 B Quittschreiber . . . . ¤ 496-3431
709 Pablo Ferreira 89 496-0041
710 George F Beckrich . . . 70 445-4816
711 James S Potter . . . . - 445-7372
712 L A Schroeder 83 445-4782
713 J P Smith 88 445-2555
714 . . . . NP
715 Robert Burggraff 80 445-5627
716 Eric Moran . . . . . . ¤ 445-2258
Velia Rodriguez . . . . ¤ 445-2258
717 Glenda D Schmitt . . . 84 445-5488
720 Linda Baker . . . . . . ¤ 445-2714
721 Scott B Steinmetz . . . 76 445-1819
722 Jeffrey Allen Dorn . . . 85 445-2495
723 William Marks 87 496-2354
724 Brian Challans . . . . . - 496-0623
726 . . . . NP
727 Paul M Benson 88 496-3702
728 Toni Walton 70 445-2178
729 730 . . . . NP
731 Claudia Martin . . . . . ¤ 445-7889
Kelly Martin . . . . . . ¤ 445-7889
732 Howard C Wigfield . . . 74 445-5579
733 Michael Broden 83 445-2482
734 James Tongen 88 445-1302
735 Matt Pederson 90 445-0183
736 Marion OBrien . . . . . ¤ 496-2553
737 Bill Buck . . . . ¤ 496-0416
738 Donald J Nelson 84 445-4995
739 Byron Piotraschke . . . 77 445-7821
740 L Hubers 80 445-4180
741 . . . . NP
742 Pinky Marchione 87 496-2877
743 Chuck Lamert 90 445-1702
Barb Seifert 90 445-1702
744 Brian Shankey 89 445-5726
745 . . . . NP
746 John Theis 90 445-2723
747 Joanne L Rhiger 82 496-1938
748 Shana Exum . . . . . . - 445-8789
749 Glen Gust . . . . - 445-0733
750 Christie Rein 89 445-3216
751 Larry Molenaar . . . . . ¤ 445-3181
752 Donald E Gendee . . . 88 496-0844
753 754 . . . . NP
755 John Magnus 89 496-1446
756 Eugene Krantz 88 496-0924
757 Donald E Mitchell . . . 88 445-0454
758 William Readence . . . . ¤ 445-0821
759 . . . . NP
61 RESIDENCE

● FERNSIDE LN
Mound
● RR 7 55364
2300- 2399 CT 276.02 $C..E 3
● HUDSONS MAP LOC 39-30
2308 Henry Reinitz 75 472-2440
2316 Robert G Wroda . . . 80 ● 472-2817
2332 Alan C Elam . . . . 81 ● 472-4203
2333 Gerald J Henke 79 472-1979
2340 Darrell Shore 83 472-7135
2341 Leonard W Stark . . . 62 472-3461
6 RESIDENCE

ADDRESS

502
FAIRWAY DR (COLUMBUS HEIGHTS)–FROM 49TH AV NE SOUTH THEN EAST 1 EAST OF NE JOHNSON ST

ZIP CODE 55421
1610 Kjellberg Henry @ 571 0044
1620 Strukel Stanley A @ 571-0649
1630 Siegfried Kevin V @ 574-9160
1640 Winter Joseph R @ 574 9118
1650 Kishish Chris J @ 574 1564
1660 Kaczmarczyk Edw J @ 571 9627
1665 Hedblad Roybl C @ 571-4865
1670 Austin Stewart D @
1675 Ihlan Betty G @ 571 0828
1700 Turnquist Philip D @ 571-7496
1710 Mathowetz Marvin J @ 571-5280
1715 Larsen Barry N @ 571 9046
1720 Olm Brian D @ 574 0335
1725 Dufault Donald J @ 571 3066
1730 Murzyn Donald J @ 571 7338
1735 La Hood D E Mrs @ 574 0249
1800 Rempusr Don E @ 571-2281
1805 Whitehill Terrell R archt @ 574 1739
1820 King Dennis E @ 571-7148
1825 No Return
1840★Haggenmiller James L @ 572-2380
1845 Kimber Robt A @ 574-0247
1850★Tatting Fredk D @ 571 0715
1860 Forsmark Alvin C @ 571 4108
1870 No Return
1880 Rothwill Clayton L Jr @ 571 3891
49TH AV NE INTERSECTS
1910 Kinkle Richd @ 571-4825
1920 Young M L @ 571-0682
1930 Fuchs Werner P @ 571 0779
2000 Knott Dale T @ 574 9708
2020 Mikush James V @ 571 1995
2036★Johnson Scott D @ 572-2450
W UPLAND CREST BEGINS
2100 Wold Clifford A @ 571 0307
2101★Chinander David E @ 574 1734
★Chinander Ethel M Mrs ceramics mfg & sls
2102 Muellerleile Len J @ 571 0264
2103 Maldmann Charles W @ 571-0993
2104 Mundy Arth J @ 571-7441
2105 No Return
2106 Swan Fred P @ 571 2254
2108 Koss Helen D Mrs @ 571 0218
2109 Cleveland Eunice P Mrs @ 571-4308
CHATHAM RD INTERSECTS
2113 Roach Armilla V Mrs @ 571 2882
2119 Gapinski Gerald P @ 574 9052
2123 Hartel Robt J @ 571-5940
2127 Maddox Michl @
2133★Dargay John A @ 574 9128
2139 Kuzin Danl E @ 571-8226
HEIGHTS DR INTERSECTS
2201 King Virgil L @ 574-0918
2209 Fowler James E @ 574-1333
2215 Skalicky Alt J @ 574 0579
2221 Zavrandi Ethel M Mrs @ 571-0982
2227 Brendyke Ken @ 571-8414
E UPLAND CREST INTERSECTS
2344 Coleman B L @ 574 7540
2345 Strand Gordon W @ 571 1831
NE STINSON BLVD INTERSECTS

529
FAIRWAY LA (ST LOUIS PARK) FROM 18TH NORTH 1 WEST OF FLAG AV

ZIP CODE 55426
1605 Kaufmann R Marianne Mrs @ 545-7584
1611 Segelbaum Stanley B @ 545 2675
1621★Kaufmann Kenneth M @ 542-9262
1631 Anderson Philip L @ 545 7206

567
FAIRWOOD CIR (MINNETONKA)–FROM FAIRWOOD DR EAST

ZIP CODE 55343
6029 Lundgren Alston @ 934 1284
6031 Wong Donald R @ 934-3714
6037 Jorgensen Harlan H @ 934 3000
6043 Boley Michl @ 934-2695

567-A
FAIRWOOD DR (MINNETONKA) FROM WILLOWWOOD DR SOUTH

ZIP CODE 55343
5908 Lunetta Frank @ 934 1917
5916★Rafshol Steve N 934-8375
5919 Lachmann Giora E @ 934 9209
5924 Vathing Robt S @ 934 1295
5927 Olson Byron K @ 934 9250
5932 No Return
5937 Noble Robt L @ 934-9403
5940 No Return
5961 Mc Clay Dennis E @ 934-2371
5967 Vatland Harlan J @ 934-9401
6001 Galis Virginia V @ 938-8156
6007 Pouliot Vernon L @ 934 3453
6013 No Return
6019 Edstrom Dale R @ 934 1854
6020 Wilmot Carl D @ 934-1274
6025 Finnigan Howard R @ 934-1905
6100 Benjamin Richd D @ 934-1894
6114 Sebald Eug M @ 934 1288
6125 Freed Thos J @ 934-1393

567-A
FAIRWOOD LA (MINNETONKA) FROM FAIRWOOD DR WEST

ZIP CODE 55343
5900 No Return
5901 Applegate Allen C @ 934 1292
5909 Young James @ 934 7686
5916 Ranallo Arth C @ 934 1296
5921 Hansen Shirley L @ 934-9704
5926 Ritzinger Geo B @ 934 1921
5934 Landgraf Fredk H @ 934-1906
5941★Olson James R @ 937-1712
5942 Gillies Donald R @ 934 1922
5949 Kallio Richd A @ 934 1280
5951 Thomas Robt L @ 934 1911
5952 Olson Gene C @
5956 Vacant
5957 Jacobs Donald M @ 934-5638
15603★Lewis Henry A @ 934 5939
15607 Klaus Richd B @ 934-1892
15618 Drake Ronald L @ 934-5287
15619 Vacant
15701 Hall Charles T @ 934-9767
15709 Mc Farland Jas @ 934-7970
15717 Kottke Gale M @ 934-2090

468-A
FALCON CT (EDINA)–FROM OLINGER BLVD NORTH

ZIP CODE 55436
6300 Ranck Marjorie A Mrs @ 922 1671
6304 No Return
6308★Wohlrabe Brian C @ 920 9398
6312 Hamel Robt W @ 922 7897
6316★Schnell Robt L Jr @ 927 0231
6320 Lane Paul D @ 925-2128
6324★Silvers Paul W @
6328 Daughton Eliz J @ 920-2014
6332★Larson Robt W 922-0861
6336 Nederostek J C @ 920-1782
6340★Kaluck P H @ 920 0504
6344★Parvin Louise H 920-6947
6348 Hovde Glenn R @ 929-0718
6352 Rivall Jack W @ 920-0938

442
FARIBAULT ST (GOLDEN VALLEY)–FROM PENNSYLVANIA AV WEST 2 NORTH OF PLYMOUTH AV

ZIP CODE 55427
WINNETKA AV N INTERSECTS
7820 Muddhenst Richd A @ 544 8774
SUMTER AV N INTERSECTS

492-A
FARM LA (MINNETONKA) FROM COUNTY RD 73 WEST 1 NORTH OF ROYZELLE LA

ZIP CODE 55343
11210 Happ Kenneth K @ 938-6544
11211★Schroeder Dean H @ 935-5925
11218 Perrin Gary R @ 938 1812
11219 Holmquist Dale J @ 938-5276
11226 Ballard Gerald W @ 938-1304
11227 Petersen Niel R @ 935-3598

459
FARMDALE RD (HOPKINS) FROM WAYSIDE RD EAST AND NORTH 2 SOUTH OF HWY 7

ZIP CODE 55343
1 Straka Clifford A @ 935 7029
100 Johnson Lawrence E @ 935-5838
102 Helgeson Richd B @ 933-6030
103 Segal Stewart R @ 935-5407
104★Cooper Greg P @ 933-5161
106 Lohmann Arth M @ 938-2114
108 Slaton Paul E @ 935-7324
109 Gaskell Alfred J @ 935 2925
112 La Tondresse J Andre @ 933-7647
116★Walczak Paul @ 938 5911
118 Gartner Marie A Mrs @ 938 5083
HOLLYHOCK LA INTERSECTS
204 Richardson Robt G @ 933 8924
208★Davis Richd C @ 935-4160
209 Uebler Betty M @ 938 1170
210 Otto K Maxfield @ 938-7202
CAMPBELL DR BEGINS
307 Elander Jay C @ 933-3103
313 Young Harold C @ 933-5062
SWEETBRIAR LA BEGINS
417 Niemann Richd O @ 938-5306

492
FARMINGTON RD (MINNETONKA)–FROM INVERNESS RD SOUTH

ZIP CODE 55343
3607 Schmit Joseph L @ 935-1305
3611 Carter John L @ 933 1650
3614 Hlavacek Agnes L @ 938-8620
3617 No Return
3622 Kosmoski Jeffrey S @
3623 Kiefd Russell W @ 933-5403
3628 Vanasek Ann F Mrs @ 933-5962
3629★Hort David L @ 938 5770
3634 Aust Fredk C @ 933-2079
3635 Krantz Harold R @ 935-6656
3700 No Return
3701 Rasmusson Darrell R @ 938-8458
3706 Heath Wm M @ 938-5568
3707★Ewert James C @ 933-7410
3712 Wendt Carl H @ 935-2867
3715 Siska Brian @ 938-1291
3723 Carlson Marjorie Mrs @ 938 7700
3728 Gray Robt A @ 938-8465
3727 Merrill Foster S @ 938-6874
3733 Norris Richd H @ 935 5461
3734 Mc Pherson Fred K @ 933 8458
3740 Hasselbring Bruce A @ 933-4685
3745 Merrill Steve C @ 935-5395
ORCHARD RD INTERSECTS

492
FAVORITE LA (MINNETONKA) FROM SUMMIT LA SOUTH

ZIP CODE 55343
13712 Treloar Kenneth J @ 933-4836
13728 No Return
13827 Larson Gordon J @ 938-8760
13833★Weispfenning Barry K @ 938 1241
13839 Lane David L @ 938-8482
13840 Skoalerud Margie J @ 938-8779

686-A
FAWNRIDGE CIR (BLOOMINGTON)–FROM POPLAR BRIDGE RD WEST

ZIP CODE 55437
9208★Rhoades Jerry K @
9210 Burt Tom 831 1020
9212 Naatogia Atiye @ 831 0935
9214 Johnson Edw J @ 831-5092
9216 Stirratt James R 831-2845
9218★Fox Gary E 830 0857
9220 Corcoran Michl G @ 831 0628
9222 Frank Roger R 835 9973
9224 Stormoen Gene A 831 2785

594
FELTL RD (MINNETONKA) FROM SHADY OAK RD NORTHEAST

ZIP CODE 55343
5400-32 Westfield Center indus & busn cntr
5400 Crane Mc Dowell & Co consulting eng & fire sciences 933 8806
5435 Feltl Stanley B @ 938 8019
5460 Hearing Technology sls & mfg of hearing aides 938-5510
5500 Vacant
5508 Bearman S N Brokerage Co food broker 938 9110
5509 Feltl Cyril M @ 938-7537
5600 Vacant
5640 Evers Heilig Inc candy broker 938 7494
5642 Ecolab pest control 935-0353
5800 Saint Margaret's Cemetery

671
FERN DR (RICHFIELD)–FROM BLOOMINGTON AV SOUTHEAST 1 SOUTH OF E 70TH

ZIP CODE 55423
1521 Winkelman J Brian @ 869-5929
1524 No Return
1525 Raw M D Mrs @
1528 Waltz Richd C @ 869-1666
1529 Evers Neil E @ 869 2723
1535 Caspers Joseph L @ 869-4438
1538★Hoopes Steven J @ 869-3867
1539 Ostby Clayton T @ 861-2587
1544 Schmitt Beverly Mrs @ 861 2765
1545 Vacant
DIAGONAL BLVD INTERSECTS

632
FERNBROOK LA (PLYMOUTH) FROM 16TH AV N NORTH 1 WEST OF HWY 494

ZIP CODE 55447
1615 Mc Kinney B E @ 473-5244
17TH AV INTERSECTS
1705 Bergren Jack M @ 473-6760
1711 Evenson Glennis S @ 473-4085
1770 Wagner Spray Tech Corp paint spraying equip 553-7000
19TH AV INTERSECTS
21ST AV INTERSECTS
2100 Nu Aire Inc mfg biological safety cabts 553 1270
2220 Daily Printing Inc pntrs coml 559-0195
23RD AV INTERSECTS
2315 Minn Dept Trans (Truck Station)
2410 Metroquip Inc constn equip mfg 559-0541
2450 James Phillips Co hosp & phys supply 559-3333
Ulmer Pharmacal Co mfr phys & hosp sups 559 3333
2455 Plymouth City Drivers License Exam Station 341 7149
25TH AV N INTERSECTS
2500 Prest Equipment Co material handling sls cntr 559-3233
2505 Precision Graphics Inc coml pntr 476 4100
2533 Ragged Right Inc graphic arts & design 476 6904
2545 Heidelberg Eastern Inc distr graphic art equip 476-2000

450
1115 Olson Ronald D @ 473 0509
1125 Wood Larry S @ 475-9615
1135 Rolfsrud Virgil K @ 475 1540
12TH AV N INTERSECTS
1205 Schultz T H 476-0134
13TH AV N INTERSECTS
14TH AV N INTERSECTS
GLACIER LA INTERSECTS

642
27TH AV INTERSECTS
2805 Computer Applications computer sls & serv 557-7555
E Williams Lee Enterprises Inc adv 559-1010
2722 Ticket Shack mfg tickets 560-3846
2724 Laser Technology Corporation laser insp electronic sls serv 559-0362
2730 Paul's Woodcraft Co millwork 559 2890
2800 Plymouth Racquet Club 559-3195
CHESHIRE LA INTERSECTS

448-B
HWY 55 INTERSECTS
3131 Office Buildings
Rooms
3000 Norwest Bank (Metro West Plymouth) 559 5022
101 Gronneberg C W & Assoc Inc mfr reps 559-3884
102 Vacant
104 American Family Ins Co 559 1992
3131 Harbor Place Corporate Center 559-1556
107 Vacant
110 Vacant
111 Custom One Golden Builders Inc genl contr 559 7690
112 J E I Properties Inc property mgmt 559-1556
115 Spilstad K N Co Inc business forms 553-1218
120 Dan Bar Homes Inc bldg contr 559-0242
121 Prairie & Associates Inc electronic hdw distr 559 7550
200 Universal Financial Corp leasing broker 559-3775
201 Conference Rm
202 Chem Lawn weed control & fertilizing 553-9751
203 Vacant
204 Associated Consultants engs 559 5511
205 Park Valley Agency Inc ins agcy 559-2221
206 Rogers C E Co processing dairy equip 559-7694
210 Farmers Ins Group 559 5229
212 M C I Inc sls serv fl covering 559-3366
221 Wiss Clinic The psychiatric socl work 559-2962
222 Health Care Insurance Services 559-4921
Kettner & Associates mfg rep electronics 559-5150
223 Systems Assoc Inc hosp data proc 559-9198
227 Vacant
228 Vacant
3135 Campbell Roy J 559 3028
3225 La Vigne James C photog @ 559 2536
3235 Herwig Steven W @ 553-1046
3315 Tipton Corp constn co 559-0090
3330 Lessard Wallace E @ 559-2122
3430 Turner Lowell R @ 559 2995
3440 Johnston Jean G Mrs @ 559-2475
3450 Starr John E @ 559-0489
35TH AV N INTERSECTS
3535 Schulte E F @ 559 3160
Schulte Charrie @ 559-3160
3540 Krupp Glenn D @ 559-5293
3545 Plymouth Historial Town Hall
38TH AV INTERSECTS
DALLAS LA INTERSECTS
3800 Beck Virgil V @ 559 2780
3810 Schmidt Gerald L @ 559-4018
3816★Eggert Lloyd 553-9959
3850 No Return
39TH AV INTERSECTS
3920 Coe Jas L @ 559-3523
40TH AV N INTERSECTS
3940 Kantz Michl J @ 559-7709
3950 Larson Donald G @ 559 1283
4000 Mills Albert D @ 559-9269
COUNTY RD 9 INTERSECTS
ZIP CODE 55442
4105★Albro Edward J 559-8591
4115 Guzman Tony S @ 559-4677
4120 Northwestern Bell (Sub Sta)
4125 Stubbs Vernon G @ 559 5888
4150 No Return
4235 Maus Thos @ 553-9031
4265 Beyer Elmer P @ 559-5456
4300 Begin Kevin C @ 559-4575
Begin Lawr @
4315 Schmidt Melvin A @ 559 3086
44TH AV N INTERSECTS
45TH AV INTERSECTS
4625 Charley's Pony Express amusement devices 559-9216
Malenke Fredk @ 559 9216
4630 Fischer Jerry L @ 559-1886
4640 Taylor Robt D @ 559-1861

425
FERNDALE AV NE (FRIDLEY) FROM 1 WEST OF BENJAMIN ST NE EAST 2 NORTH OF GARDENA AV NE

ZIP CODE 55432
1504★Blegen Raymond @ 572-8904
1506 No Return
1508 Vinewood Builders remodeling contr 571-0311
Scholl Ronald J @ 571 0311
1511 Olsen Irving W @ 574-9035
1521 Arel Roger D @ 571 0978
1522 Richert Andrew H @ 574 1728
1540 Sehring Robt A @ 571-5321
1541 Rice Charles E @ 571-4054
1560 Vacant
1561 No Return
1567 Borgan L @ 571 4319
1568★Bargy Michl J @ 572 2246
1573 Clasen Terry J @ 571-6920
1579 Nelson David B @ 572-1195

594-A
FERNDALE DR (MINNETONKA) FROM EAST OF SHADY OAK RD 1 MI NORTH OF COUNTY RD 62

ZIP CODE 55343

697-A
FERNDALE RD N (PLYMOUTH) FROM 6TH AV N NORTH TO COUNTY RD

ZIP CODE 55447
410★Tegan Jas R @ 475 1340

450-A
11TH AV N INTERSECTS
12TH AV N INTERSECTS
1100★Miller Roger A @ 473-3600
1120 Skrowaczewski Stanislaw
1200 Lindberg Gary R @ 475 1266
1220 Spencer E Wells @ 473-5334
COUNTY 6 INTERSECTS

589
FERNLAND CT (MEDICINE LAKE)–FROM SOUTH SHORE DR AND HIGHWAY 55 WEST

ZIP CODE 55441

567
FERRIS LA (MINNETONKA) FROM EDEN PRAIRIE RD EAST

ZIP CODE 55343
14331 Seefeldt Harold R @ 934 9638
14333★Cavert Harlan M @ 934 5727
14400 Engstrom Walter H @ 934-9642
14401 Wombacher John D @ 934-9627
14409 Vacant
14414 Schoenberg Robt C @ 934-9629
14417 Swanson Trucking 934-9628
Swanson Dennis W @ 934-9628

591-A
FETTERLY LA (MINNETONKA) FROM FETTERLY RD NORTHWEST 3 WEST OF COUNTY RD 73

ZIP CODE 55343
11551 Fitch L L 541-0034
11552 Hallin Thos R @ 544-9585
11559 Colianni Albert J Jr @ 546-3622
11560 Goldman Phyllis @ 544 6831
11568 Quale Paul E @ 544-0611
11612 Dahl Ronald D 546-5023
11616 Carp Howard S @ 545-1634
11600★Melck James 593-0873
11701 Saliterman Mark A @ 544-5907

591-A
FETTERLY RD W (MINNETONKA)–FROM S HOPKINS CROSSROADS WEST

ZIP CODE 55343
11201★Smith Carl S @ 541 0668
11209★Ullom John R @ 545-2552
11217 Van Grasstek L 544-1593
11309 Peavey Jas 545 5065
11320 Bechthold James L @ 546-3798
11324 Pulfer Gary @ 546-8130
NOTTINGHAM CT INTERSECTS
11413 Davidson Harold F @ 546 0758
11506★Fladeland Connie E 546 7068
11512 Crider Lloyd A @ 545-0981
11513 Massie John R 544-9124
11519 Heimerl Richd C @ 544 6025
11527 Hardwick Leonard P 544 5638
11543 Griffith Raymond L @ 546 5013
11544 Fremont Jas W @ 541 0074
11557 Smith Kitty K @ 545 2382
11556★Searle Newell @ 541-4701

518-A
FIELD DR (GOLDEN VALLEY) FROM HANLEY RD WEST AND SOUTH 1 EAST OF BROOKVIEW COUNTRY CLUB

ZIP CODE 55426
420 Cook Marvin D @ 545-1853
500 Hanson James C @ 545-1154
615 Shirley Robt W @ 545-9521
675 Johnson Gregory S @ 544-9884
WAYZATA BLVD INTERSECTS

463
FIELD WAY (EDINA)–FROM LONDONDERRY RD NORTH IN A CIR 3 NORTH OF NINE MILE CREEK

ZIP CODE 55436
6600 Ogurak Melvin @ 935-5068
6601 No Return
6604 Fischer Albert C @ 938-5209
6605 Berman Theo M @
6608 Davis Chas S @ 935-7640
6609 Azar Miguel M @ 938-5216
6612★Prazak Danl 933-4149
6613 Peterson Harold L @ 933-5236
6616★Gast David W @ 936-7070
6617 Edwards Jon J @ 933-5320
6620 Scannanda John @ 938-0564
6621 Stempel Jerrold M @ 935-2527
6629 No Return
6700★Cohen Earl H 931-9239
6701 Austin Wm F @ 933-0092
6704 Schwartzbauer Robert A @ 933 9610
6706★Wright Gregory R @ 931 9701

421
FILLMORE ST NE (COLUMBIA HEIGHTS)–FROM 45TH AV NE NORTH AND WEST 4 EAST OF CENTRAL

406-A
4207★Koss Donald J @ 789-2134
4210★Mc Laughlin James J @ 789 6396

421
ZIP CODE 55421
4506 Larson Lyle M @ 571-3295
4508★Perkins Melvin A 571-7906
4509★Magnuson Lori
★Johnson Teresa 572-8421
4514 Johnson Warren R @ 571-6362
4515 Jensen Grace E Mrs 574 9982
4516 Moore Florence E Mrs @ 574-9911
4517 Battig Dave H @ 574-0696
4519★Kriz Alan J 572-3962
4520 Vacant
4524 Zimmerman Kenneth I @ 571-9450
Vacant
4526 Hall Raymond H 571 8873
45½ AV NE ENDS
4531★Boyce Michl M
4532 Hamrin Christopher H @ 571-8449
4533 Vianakotz

FARMINGTON RD (M)—Contd
3715 Rankin Ronald S @ 935-6782
3723 Carlson Marjorie Mrs @ 938-7700
3726 Gray Robt A @ 938-8465
3727 Merrill Foster S @ 938-6874
3733 Norris Richd H @ 935-5461
3734 Mc Pherson Fred K @ 933-8458
3740 Hasselbring Bruce A @ 933-4685
3745 Hoff Geo A @ 935-5461

492
FAVORITE LA (MINNETONKA) FROM SUMMIT LA SOUTH

ZIP CODE 55343
13712 Treloar Kenneth J @ 933-4606
13728 Tosterud Arth @ 933-6513
13827 Larson Gordon J @ 938-8760
13833★Zesbaugh John H @ 938-6717
13839 Lane David L @ 938-8482
13840 Skaalerud Margie J @ 938-8779

686
FAWNRIDGE CIR (BLOOMINGTON) FROM POPLAR BRIDGE RD WEST

9208 Majestic Marketing Mfg Co carpet
9210 Burt Tom 831-1020
9212 Nasifoglu Atiye 831-0461
9214 Johnson Edw J 831-5092
9216 Stirratt James R 831-2845
9218 Connor Richd A 831-1100
9220 Corcoran Michl G 831-0628
9222 Gottschling Michl 835-4127
9224★Mehringer Ralph G 835-5814

594
FELTL LA (MINNETONKA)—FROM SHADY OAK RD NORTH

ZIP CODE 55343

594
FELTL RD (MINNETONKA)—FROM SHADY OAK RD NORTHEAST

ZIP CODE 55343
5435 Feltl John J @ 938-8019
5509 Feltl Cyril M @ 938-7537
5625 Rell Delores Mrs @ 935-5737
5800 Saint Margaret's Cemetery

671
FERN DR (RICHFIELD)—FROM BLOOMINGTON AV SOUTHEAST 1 SOUTH OF E 70TH

ZIP CODE 55423
1521 Winkelman J Brian @ 869-5029
1524 Wilhelmsen Hans K @ 869-2038
1525 Raw Marvel Mrs @
1528 Waltz Richd C @ 869-1666
1529 Evers Neil E @ 869-2723
1535 Caspers Joseph L @ 869-4436
1538★White Bradley C @ 869-6886
1539 Ostby Clayton T @ 861-3587
1544 Schmitt Beverly Mrs @ 861-2765
1545 Conati Frank @ 861-8967

632
FERNBROOK LA (PLYMOUTH) FROM 16TH AV N NORTH 1 WEST OF HWY 494

ZIP CODE 55441
1115 Olson Ronald D @ 473-0509
1125 Wood Larry S @ 475-3615
1135 No Return
1705 Bergren Jack M 473-6760
1711 Evenson Dennis S @ 473-0085
1770 Wagner Spray Tech paint sprayers 559-1770
2100 Nu Aire Inc air conditioning equip 553-1270
2220 Daily Printing Inc 559-0195
2315 State Dept Transportation
2340 Metroquip Inc sls & rental high reach equip 559-0541
2440 Physicians & Hospitals Supply 559-3333
Phys & Hospital Supply Co (Whse)
2455 West Metro State Drivers Examining Ofc drivers training 473-1592
2500 Prest Equipment Co Inc sls fork lifts & conveyors 559-3233
2515 Software Service computer servs 473-8888
2525 Jones R J Commercial Printing 473-2337
2533 R J C Mechanical 476-0815
2545 Scoville Press Inc prntrs 475-0606

642
2645 Herwig Marvin K @ 559-5898
2705 Anderson D L @ 559-1121
2715 Vacant
2720 Jacobs Wind Electric Co mfg wind driver equip 559-9361
2722 Jacobs Wind Elec (Sub Ofc)
2724 Jacobs Wind Elec (Sub Ofc) bldg contr
2730 Paul's Woodcraft Co millwork 559-2990
2800 Plymouth Racquet Club 559-3196
2805 No Return

448
HWY 55 INTERSECTS
3131 Office Buildings
Rooms
101 Evavold Hamm & Gordon Ltd cpa's 559-4422
101a Blumentritt Paul Sales mfr rep 559-3630
104 New Horizon Homes bldg contr 559-5770
106 Townsend & Young Inc ins 559-1813
107 Vacant
108 M A S Steel Inc 559-0990
109 Johnson Ron & Associates ins 559-5225
110 I D S Marketing Corp Regional Sls Ofc
111 Johnson Ron & Assoc (Sub Ofc)
3131 Vacant
112 Vacant
114 Vacant
115 Sjulstad K N Co Inc business forms 553-1218
119 Crofoot Grant mfg rep 559-4515
120 Vacant
121 Stuart Gronneberg & Associates Inc mfgr rep 559-3884
200 Lunchrm
201 Conference Rm
202 Minnesota Homes Inc 559-4835
203 City Of Lakes Real Estate 559-5999
204 Associated Consultants engs 559-5511
205 Park Valley Agency Inc ins agcy 559-2221
206 United Homes Corp real est 559-1000
208 Woodbury-Evans Inc real est 559-5050
210 Diet Center Of Plymouth ladies home party fashion plan 559-3525
212 H B E Leasing Corp 559-3370
225 Hjelle Agency Inc ins 553-1146
227 Pennwalt Corp (Wallace-tieman Div) 553-4116
3135 Eckes Philip J @ 559-4384
3225 La Vigne James C photog @ 559-2536
3235 Herwig Steve W @ 553-1046
3315 Johnson Manford J @ 559-4383
3330 Lessard Wallace E @ 559-2122
3430 Turner Lowell R @ 559-2995
3435 No Return
3440 Johnston Jean G Mrs @ 559-2475
3450 Starr John E @ 559-0489
35TH AV N INTERSECTS
3535 Schulte S F @ 559-3160
3540 Krupp Glenn D @ 559-5293
3550 Munson Nardie L @ 559-5314
3800 Beck Virgil V @ 559-2780
3810 Schmidt Gerald L @ 559-4018
3816 Zbikowski Theo H @ 559-2507
3920 Arnts Steven 559-0216
40TH AV N BEGINS
3940 Manders John @ 559-0873
3950 Larson Donald G @ 559-1283
4000 Mills Albert D @ 559-9269
COUNTY RD 9 INTERSECTS
ZIP CODE 55442
4105 Huntington Donald D @ 559-1427
4115 Walters Keith D @ 559-4510
4120 Tel Co (Sub Sta)
4125 Stubbe Vernon G @ 559-5688
4150 Schlosser Raymond E @ 559-4554
4235 Holden Ronald E @ 559-0816
4265 Beyer Elmer P @ 559-5456
4300 Begin Lillian A Mrs @ 559-9563
4315 Schmidt Melvin A @ 559-3036
4625 Charley's Pony Express amusement devices 559-9216
Malenke Fredk @ 559-9216
4630 Kittelson Newell H pntg contr @ 559-5723
4640 Taylor Robt D @ 559-1861

425
FERNDALE AV NE (FRIDLEY) FROM 1 WEST OF BENJAMIN ST NE EAST 2 NORTH OF GARDENA AV NE

ZIP CODE 55432
1504 Gaupp Otto A @ 574-0454
1505 No Return
1508 Vinewood Builders remodeling contr 571-0311
Scholl Ronald J @ 571-0311
1511 Olsen Irving W @ 574-9335
1521 Arel Roger D @ 571-0978
1522 Richert Andrew B @ 574-1728
1540 Otto Leo C @ 571-9716
1541 Rice Charles E @ 571-4054
1550 Marcon Theo
1560 Duval Ellena L @
1561 Doty Gary M @ 571-3273
1567★Bjorklund Richd J @ 574-1974
1568 Hanson Jim G @ 574-0859
1573 Clasen Terry J @ 571-6920
1579 Nelson David @ 571-5323

594
FERNDALE DR (MINNETONKA) FROM EAST OF SHADY OAK RD 1 MI NORTH OF COUNTY RD 62

ZIP CODE 55343

450
FERNDALE RD N (PLYMOUTH) FROM SOUTH CITY LIMITS NORTH

ZIP CODE 55391
12TH AV N INTERSECTS
1120 Skrowaceski Stanislaw
1200 Bremer John @ 473-8062
1220 No Return
COUNTY 6 INTERSECTS

589
FERNLAND CT (MEDICINE LAKE) FROM SOUTH SHORE DR AND HIGHWAY 55 WEST

ZIP CODE 55441
25 No Return
27 Schmidt David A 545-4803
28 Osowski Joseph M 545-7350

567
FERRIS LA (MINNETONKA)—FROM EDEN PRAIRIE RD EAST

ZIP CODE 55343
14331 Seefeldt Harold R @ 934-9638
14333 Vacant
14400 Engstrom Walter H @ 934-9642
14401 Wombacher John D @ 934-9627
14409 Noll Richd J @ 934-1738
14414 Schoenberg Robt C @ 934-9629
14417 Swanson Dennis @ 934-9628

591
FETTERLY LA (MINNETONKA) FROM FETTERLY RD NORTHWEST 3 WEST OF COUNTY RD 73

ZIP CODE 55343
11551 Holland Jeffery @ 546-2592
11552 Hallin Thos R @ 544-9585
11559 Clark Stuart B @ 545-5195
11560 Goldman Richd S @ 544-6831
11701★Saliterman Mark A 544-5937

591
FETTERLY RD (MINNETONKA)—

ZIP CODE 55343
11209★Ullom John R 545-2552

591
FETTERLY RD W (MINNETONKA) FROM S HOPKINS CROSSROADS WEST

ZIP CODE 55343
11309 Burandt's Television Service 546-6848
11619★Heimerl K C
11320 Bechthold James L @ 546-3798
11324 Puffett Gary @ 546-8130
11413 Davidson Harold @ 546-0758
11512 Crider Lloyd A @ 545-0981
11519 Heimerl Richd C @ 544-6025
11527★Hardwick Leonard P 544-5636
11543 Griffith Raymond L @ 546-5013
11544 Mainen Eug L @ 544-4731
11557 Smith Rod @ 545-2382
11558★Guthart Richd L @ 546-1125
11568 Quale Paul E @ 544-0611
11612★Dahl Ronald D 546-5023
11656 Carp Howard @ 545-1634
11660 Rosenthal Eug @ 546-5722
11662 No Return

518
FIELD DR (GOLDEN VALLEY) FROM HANLEY RD WEST AND SOUTH 1 EAST OF BROOKVIEW COUNTRY CLUB

ZIP CODE 55426
420 Cook Marvin D @ 545-1653
505 Hanson James C @ 545-1154
615 Shirley Robt W @ 545-9521
675 No Return

463
FIELD WAY (EDINA)—FROM LONDONDERRY RD NORTH IN A CIR 3 NORTH OF NINE MILE CREEK

ZIP CODE 55436
6600★Ogurak Melvin @ 935-5068
6601 Locke Murray S @
6604 Goldstein Martha A @ 938-9399
6605 Dunn Leo R @ 935-5577
6608 Hofstad Ralph P @ 933-7865
6609 Azar Miguel M @ 938-5216
6612 Maeder Edw C Jr @ 938-4241
6613 Peterson Harold L @ 933-5236
6616★Geddis John E @ 933-0705
6617 Sheehan James C @ 933-0756
6620 Sciamanda John @ 938-0564
6621 Vacant
6700 Mellem Kenneth L @ 935-0874
6701 Wilson Robert E @ 933-5491
6704 Schwartzbauer Robert A @ 933-9610

421
FILLMORE ST NE (COLUMBIA HEIGHTS)—FROM 45TH AV NE NORTH AND WEST 4 EAST OF CENTRAL

ZIP CODE 55421
4506 Larson Lyle M @ 571-3295
4508 Boone R @ 571-0332
4509★Maynard M S 574-9953
Upper Vacant
4514 Johnson Warren R @ 571-6362
4515 Alcorn Khris N @ 571-4495
4516 Moore Florence E @ 574-8911
4517 Battig Dave H @ 574-0696
4518★Pramasc Joseph
4520 No Return
4524 Zimmerman Kenneth I @ 571-8450
4526 Hall Raymond 571-8873
45½ AV NE ENDS
4531★Axelson James
4532 Hamrin Christopher H @ 571-8449
4533 Boyce Doris J
4534★Mehrkens Douglas R 571-6577
4539★Moberly Mildred 574-1610
Klevin Eloise @
Taber Wm
4544 Rhodes Sharon A 571-7009
Richards Harold C 571-1783
4545★La Quier Cath A 571-8721
4547 Enlund Harry
4549★Mixon Michl
4550★Murphy L K 571-5624
4555 Emmert Clinton G 574-7399
4556 No Return
4557 De Moure Gary W 571-5412
4558★Connett G R 574-1909
46TH AV NE INTERSECTS
4600★Jablonski Diane 574-0133
4601 Bright Mary Jane @ 571-5832
4602 Vacant
4606 Knutson Herbert C @ 571-6459
4607 Williams Marilyn K 574-9503
4608 No Return
4609 Becker Linda L 571-9168
4610 No Return
4612 Erickson Dale E @ 574-9063
4613 Buhmann Judith A 572-0257
Koski James I 571-2556
4618 Porter Kenneth L @ 574-9092
4619★Riedeman Carlotta J 572-0293
Flesher Karen R 572-0386
4624 Braaten Curtis J @ 571-5679
4625 Brooks Charles N @
Ducher Jeanine R
4627 Judge Robt A 571-4406
4630 Shedlov Clifford M @ 571-7437
4631★Cardinal K
Blunt Grover 574-9641
4636 Warrick John S @ 571-8232
4637 No Return
4642 Gordier Kenneth L @ 571-6805
4643 Vacant
4645★Svoboda Laura
4648 De Coursey Wm L @ 574-9062
4649★Dahl Thos
4654 Stolcers Maris @ 571-8680
4655 Mc Kenna Sally
4657★Duffy Jack
47TH AV INTERSECTS

502
4905 Gaynor Philip J @ 574-0423
4910 Hart Robt W @ 571-7324
4916 Brunsvold Jon A @ 571-4190
4925 Holland Z H @ 574-0428
LINCOLN TER INTERSECTS
4945 Caskey Carl C Rev @ 571-1869
4950 No Return
4960 Pukite Janis @ 571-8705
NE BUCHANAN PL INTERSECTS
5000 Bizal Michl F @ 571-2894
5015 Yurista Steven G @
5020★Hawrysh Ludwina @ 571-1875

401
FILLMORE ST NE (FRIDLEY)—FROM 1 SOUTH OF 53D AV NE NORTH 4 WEST OF MATTERHORN DR

ZIP CODE 55421
5200 Boomer Geo H Jr @ 571-5544
5211 No Return
5212★Bliss Dean 571-8333
5221 Raines Theo C @ 572-0612
5222 Armentrout Norris L @ 571-1975
5231 Ward Donald C @ 571-8741
5234 Molinaro Peter S @ 571-6114
5241 Arth Thos R @ 571-7790
5246 Schenk Marvin W @ 571-3667
5251 Webster M Howard @ 571-7092
5258 Parizek Ronald G @ 571-4633
5261 Bungert Joseph M @ 571-5366
5271 Smith Allan J @ 571-2274
5298 O'Bannon Mike E @ 571-8865
53D AV NE INTERSECTS
5300 Petron James L @ 571-9426
5353 Berg Julie I Mrs @
SKYWOOD LA INTERSECTS
5355★Shields Wm L 572-0267

FAIRWAY DR (CH)—Contd
1910 Kinkle Richd @ 571-4825
1920 Berry Dixie @ 571-0682
1930 Fuchs Werner P @ 571-0779
2000 Boss Lee @ 574-1961
2020★Christen Steve L @ 570-0547
2036★Carlson Robt S @ 571-0576
2100 Wold Clifford A @ 571-0307
W UPLAND CREST BEGINS
2101 Vacant
2102 Muellerleile Len J @ 571-0264
2103 Mahlmann Charles W @ 571-0993
2104 Mundy Arth J @ 571-7441
2105 Lazarz Thad @ 574-9055
2106 Swan Fred P @ 571-2253
2108 Koss Helen D Mrs @ 571-0218
2109 Cleveland Darrell B @ 571-4308
CHATHAM RD ENDS
2113 Roach Donald F @ 571-2892
2119 Gapinski Gerald P @ 574-9052
2123 Hartel Robt J @ 571-6940
2127 Hartmann Annabelle M Mrs @ 574-0341
2133 Hince Le Roy G @ 574-0337
2139 Ruzin Danl E @ 571-8226
2201 King Virgil L @ 574-0918
2209 Fowler James E @ 574-1333
2215 Skalicky Alf J @ 574-0579
2221 Zaccardi E Mrs @ 571-0962
2227 Frolik Bernard A @ 571-0981
UPLAND CREST INTERSECTS
2344 Wright David E @ 571-0650
2345 Strand Gordon W @ 571-1831

FAIRWAY LA (ST LOUIS PARK) FROM 18TH NORTH 1 WEST OF FLAG AV 529

ZIP CODE 55426
1605 Kaufmann Henry H @ 545-7584
1611 Segelbaum Stanley B @ 545-2675
1621 Murphy Jeremiah J @ 545-7647
1631★Anderson Philip L 545-7206

FAIRWOOD CIR (MINNETONKA) FROM FAIRWOOD DR EAST 567

ZIP CODE 55343
6029 Lundgren Alston @ 938-0805
6031 Wong Donald R @ 935-3714
6037 Jorgensen Harlan H @ 935-6785
6043 Boley Michl R @ 935-2903

FAIRWOOD DR (MINNETONKA) FROM WILLOWWOOD DR SOUTH 567

ZIP CODE 55343
5908 Lynetta Frank @
5916 Sundin Gordon V Jr @ 938-8891
5919 Vacant
5924 Vathing Robt S @ 933-1376
5927 Olson Byron @ 938-2667
5932 Hoghaug Harold T @ 933-7641
5937 Noble Robt L @ 933-1017
5940 Ong Lincoln @ 935-1410
5951 Mc Clay Dennis E @ 935-6833
5957 Vatland Harlan J @ 938-3896
6001★Hillstrom Robt @ 933-1518
6007 Pouliot Vernon L @ 938-7135
6013★Durocher John H @ 935-7430
6019★Wierschem Jospeh G @ 933-1838
6020★Wilmot Carl D @ 935-9399
6025 Finnigan Howard R @ 938-7277
6100 Benjamin Richd D @ 938-2552
6114 Sebald Eug M @ 935-5479
6125 Larson Michl J @ 935-8362

FAIRWOOD LA (MINNETONKA) FROM FAIRWOOD DR WEST 567

ZIP CODE 55343
5900 Komanecky Geo @ 938-3020
5901 Applegate Alan C @ 938-8368
5909 Copeland Richd E @ 933-0732
5916★Morton David N @ 938-4887
5921 Hansen Dennis L @ 935-9490
5926 Ritzinger Geo B @ 935-9192
5934★Landgraf Fredk @ 933-0212
5941★Dushee Dona @ 935-3583
5942★Gillies Donald R @ 935-2745
5949★Kallio Richd @ 938-1725
5951 Thomas Robt L @ 935-9854
5952 Straining James A @ 933-5286
5956 Vacant
5957★Lewis David W @ 938-5227
15602★Selseth Thos @ 933-2875
15607 Klaus Richd B @ 938-2483
15618 Svikis Gunars @ 938-7324
15619 Ainsworth Michl C @ 933-3750
15701 Morris Wm M Jr @ 935-4296
15709★Ericksen Robt K @ 935-1503
15717 No Return

FALCON CT (EDINA)—FROM OLINGER BLVD NORTH 468

ZIP CODE 55436
6300★Ranck Wm E @ 922-1671
6301 Under Constn
6304★Caristie John A @ 922-8844
6305 Under Constn
6308★Bransford A @ 922-6458
6309 Under Constn
6312★Strathy Robt D @ 920-5809
6313 Under Constn
6317 Under Constn

FARM LA (MINNETONKA)—FROM COUNTY RD 73 WEST 1 NORTH OF ROYZELLE LA 492

ZIP CODE 55343
11210 Happ Kenneth K @ 938-6544
11211 Dock Peter L @ 935-8048
11218 Ralston Lowell @ 935-0609
11219 Holmquist Dale J @ 938-5276
11226 Ballard Jerry W @ 938-1304
11227 Peterson Neil R

FARMDALE RD (HOPKINS)—FROM WAYSIDE RD EAST AND NORTH 2 SOUTH OF HWY 7 459

ZIP CODE 55343
1 Soules Harold A @ 938-2864
100 Johnson Lawrence E @ 935-5838
102 Helgeson Richd @ 933-0744
103 Segal Stewart R @ 935-5407
104 Peterson Lester E Jr @ 938-5094
105 Lohmann Arth M @ 938-2114
108 Lujan Joseph C @ 938-5237
109 Gaskell Alf J @ 935-2925
112 Paris Dennis G @ 935-9893
116 Larson Wayne H @ 935-1168
118 Gartner Herbert @ 938-5083
204★Child R Thos @ 933-3950
208★May Ron 933-5537
209 Kraemer Paul W @ 938-2474
210 Otto K Maxfield @ 938-7202
CAMPBELL DR INTERSECTS
307 Cottrill Lester W @ 935-1425
313 Laurel Myron J @ 938-5979
SWEETBRIAR LA INTERSECTS
417 Niemann Richd O @ 938-5306

FARMINGTON RD (MINNETONKA) FROM INVERNESS RD SOUTH 492

ZIP CODE 55343
3607 Schmit Joseph L @ 935-1305
3611★Greenwood Barton L @ 933-1575
3614 Hlavacek Agnes L Mrs @ 938-9320
3617 Krake Harry C @ 938-7909
3622 Kosmoski Jeffrey S @ 933-3851
3623 Stidger Eug R @ 935-6388
3628★Van Asek D @ 933-5962
3629 Reier David 935-6406
3634 K And A Agency ins 935-2079
Axel Fredk C @ 935-2079
3635 Krantz Harold R @ 935-6656
3700 Hovdeeven Wesley @ 925-5965
3701 Rasmusson Darrell R @ 938-8458
3706 Heath Wm M @ 938-5568
3707 Karash Robt P @ 938-1438
3712 Wendt Carl H @ 935-2667
3715★Rankin Ronald S @ 935-6782
3723 Carlson Ralph E @ 938-7700
3726 Gray Robt A @ 938-8465
3727 Merrill Foster S @ 938-6874
3733 Norris Richd H @ 935-5461
3734 Johnson Edwin M @ 938-8002
3745 Hoff Geo A @ 938-1696
3840 Baer Larry G @ 935-8940

FAVORITE LA (MINNETONKA) FROM SUMMIT LA SOUTH 492

ZIP CODE 55343
13712 Treloar Kenneth J @ 933-4836
13728 Tosterud Arth @ 933-6515
13827 Larson Gordon J @ 938-8760
13833 Zesbaugh John H Jr @ 938-2046
13840 Under Constn

FELTL RD (MINNETONKA)—FROM SHADY OAK RD NORTHEAST 494

ZIP CODE 55343
5435 Feltl Stanley @ 938-8019
5509 Feltl Cyril M @ 938-7537
5625 Rell Delores Mrs @ 935-5737
5800 Saint Margaret's Cemetery

FERN DR (RICHFIELD)—FROM BLOOMINGTON AV SOUTHEAST 1 SOUTH OF E 70TH 871

ZIP CODE 55423
1521 Winkelman J Brian @ 869-5929
1524 Wilhelmsen Hans K @ 869-2038
1525★Raw Marvel Mrs @
1528 Waltz Richd C @ 869-1666
1529 Evers Neil E @ 869-2723
1535 Caspers Joseph L @ 869-4438
1538 Brinkman Earl H @ 869-3058
1539 Ostby Clayton T @ 861-3587
1544★Schmitt Beverly Mrs @ 861-3266
1545 Sturges Donald L @ 866-1903

FERNBROOK LA (PLYMOUTH) FROM 16TH AV N NORTH 1 WEST OF HWY 494 650

ZIP CODE 55441
1115 Olson Ronald D @ 473-0509
1125★Wood Larry S @ 475-3615
1135 Murphy Michl J @ 475-2180
1615 Oas Thos K @ 473-0618
1705 Bergren Anna Mrs @ 473-6760
Bergren Jack M
1711 Evenson Dennis S @ 473-0085
2160 Vacant
2315 State Dept Transportation
2440 Physicians & Hospitals Supply 559-3333
Phys & Surgeons (Whse)
2455 West Metro State Drivers Examining Ofc drivers training 473-1592
2525 Erikson Axel J @ 559-2686

698

2645 Herwig Marvin K @ 559-5898
2705 Anderson Floyd @ 559-1121
2715 Moen Mark A @ 559-5044
2720 M & Y Construction Co water treatment 559-2222
2722 Vacant
2724 Magney Construction Co bldg contr 559-5545
2730 Paul's Woodcraft Co millwork 559-2990
2805 Anderson Betty J Mrs @ 559-3713

448

HWY 55 INTERSECTS
3131 Office Buildings
Rooms
101 Vaughan D R & Associates cpa's 559-4422
102 United Homes Corp real est 559-1000
103 Vaughan D R & Assoc (Sub Ofc)
104 New Horizon Homes bldg contr 559-5770
105 Vaughan D R & Assoc (Sub Ofc)
106 Vacant
107 Vacant
108 M A S Steel Inc steel fabricators 559-0990
111 Vacant
112 Colonial Life And Accident Insurance Co 559-2050
114 Vacant
115 Whamco Inc food brokers 559-5752
117 Loken T Erick adv agcy 559-5030
119 Crofoot Grant mfg rep 559-4515
120 Vacant
121 Loken Erick T & Assocs (Sub Ofc)
123 Hamele & Associates playground equip mfr 553-1412
200 Lunchrm
201 Conference Rm
202 World Wide Church Of God (Ofc)
204 Associated Consultants engs 559-5511
206 Vacant
208 Hjelle Insurance Agency 553-1146
210 Queen's Way To Fashion ladies home party fashion plan 559-2070
212 Vacant
3135 Eckes Philip J @ 559-4384
3225 La Vigne James C photog @ 559-2536
3235 Herwig Steven @
3315 Johnson Manford J @ 559-4383
3330 Lessard Wallace E @ 559-2122
3430 Turner Lowell R @ 559-2995
3435 Belgarde Chris D Jr @ 559-5100
3440 Johnston Jean G Mrs @ 559-2475
3450★Starr John E @ 559-0489
35TH AV N INTERSECTS
3535 Schulte Sharrie Mrs @ 559-3160
3540 Krupp Glenn D @ 559-5293
3550 Munson Donald C cement contr @ 559-5314
3640 Kraskey Sam 559-5319
3800 Beck Virgil V @ 559-2780
3810 Schmidt Gerald L @ 559-4018
3816 Zbikowski Theo H @ 559-2507
3820 Olson James C @ 559-9662
3905★Beffa Larry @ 553-1583
3920 Morken Bradley
40TH AV N BEGINS
3940★Matters John
3950★Nelson David R @ 553-1334
4000 Mills Albert D @ 559-9269
COUNTY RD 9 INTERSECTS
ZIP CODE 55442
4115★Holden Ronald E @ 559-0816
4120 Tel Co (Sub Sta)
4125 Schmidt David M @ 559-5113
4150 Schlosser Raymond E @ 559-4554
4235 Olson Arnold C @ 559-4291
4265 Beyer Elmer P @ 559-5456
4300 Begin Lillian A Mrs @ 559-9563
4515 Schmidt Melvin A @ 559-3036
4625 Charley's Pony Express amusement devices 559-9216
Malenke Fredk @ 559-9216
4630★Kittelson Newell H pntg contr @ 559-5723
4640★Taylor Robt

FERNDALE AV NE (FRIDLEY) FROM NE HILLCREST DR EAST 1 WEST OF STINSON BLVD 435

ZIP CODE 55432
1504 Gaupp Otto A @ 574-0454
1505 Lembke Larry A @ 571-0966
1508 Vinewood Builders remodeling contr 571-0311
Scholl Ronald J @ 571-0311
1511 Bannochie Douglas W @ 571-2776
1521 Arel Roger D @ 571-0978
1522★Richert Andrew B @ 574-1728
1540 Otto Leo C @ 571-9716
1541 Rice Charles E @ 571-4064
1560 Duval Ellena L @ 571-4306
1561★Doty Gary @
1567 Pearson Duane B @ 571-7117
1568 Gunhus Darrell G @ 571-1074
1573 Clasen Terry J @ 571-6920

FERNDALE RD N (PLYMOUTH) FROM SOUTH CITY LIMITS NORTH 450

ZIP CODE 55391
645 Strand Richd E @ 473-6881
665★Steiner Bruce @ 473-3396
710 Elwell Laurance R Jr @ 473-7743
12TH AV N INTERSECTS
1120 Skrowaczewski Stanislau @
1200★Breamer John @
1220 Pedersen Paul E @ 473-4012

FERNLAND CT (MEDICINE LAKE) FROM SOUTH SHORE DR AND HIGHWAY 55 WEST 589

ZIP CODE 55441
25 No Return
26★Oluusen David R 546-9376
27★Kogl James 545-4803
28 Vacant

FERRIS LA (MINNETONKA)—FROM EDEN PRAIRIE RD EAST 567

ZIP CODE 55343
14331 Seefeldt Harold R @ 935-7889
14333 Erickson Dorothy J Mrs @ 935-4376
14400 Engstrom Walter H @ 935-2364
14401 Wombacher John D @ 938-1280
14409★Weitrick David @
14414★Schoenberg Robt C @ 933-5707
14417★Swanson Dennis @ 935-6493

FETTERLY LA (MINNETONKA) FROM FETTERLY RD NORTHWEST 2 WEST OF COUNTY RD 73 491

ZIP CODE 55343

FIELD DR (GOLDEN VALLEY) FROM HANLEY RD WEST AND SOUTH 1 EAST OF BROOKVIEW COUNTRY CLUB 518

ZIP CODE 55426
420 Cook Marvin D @ 545-1853

FAIRVIEW AV N (C)—Contd
6704 Strandberg Craig C @ 533-3843
6710 Lynch Grace M Mrs @ 533-6029
6716*Rimpy Roger A @ 533-6802
6722 Quast Wilbert N @ 537-6269
6728 Dahl Arlan L @ 537-4652
IDAHO AV N ENDS
6800 Rud Richd G @ 537-8227
6806 Jordan Grey S @ 537-4244
6812 Larson Donald L @ 533-7696
JERSEY AV N INTERSECTS
6916 Olson D Evelyn Mrs @ 533-2386
6922 Horberg Robt J @ 537-4630
6928 Scheidecker Frank E @ 537-4231
KENTUCKY AV N ENDS
7000 Ross Orville A @ 537-4343
7006 Brick John L @ 537-3084
7012 Kolflat Charles A @ 537-9401
7018 Staples Richd G @ 537-8308
7024 Miller Dale D @ 537-7262
LOUISIANA AV N INTERSECTS
MARYLAND AV INTERSECTS
NEVADA AV INTERSECTS

44
FAIRVIEW AV N (NEW HOPE)—FROM ZEALAND AV N WEST 1 NORTH OF 49TH AV N

ZIP CODE 55428
8500 Anderson James B @ 533-6468
8508 Sunvold Wesley D @ 533-1834
8509 Braun Robt A @ 533-2079
8516 Pierson Harold A @ 533-5545
8517 Halbur John J @ 537-6178
8524 Engebretson Wm E @ 537-9687
8525 Wold Frederick A @ 533-7966
8601 David Eug C @ 537-1944
8600 O'Brien Patk B @ 537-2529
8608 Colson Donald W @ 533-0747
8609 Palashewski Fred J @ 537-2806
8616 Mallison Edgar R @ 533-6485
8617 Kopp Wm J @ 537-1663
BOONE AV INTERSECTS

94
FAIRVIEW LA (MINNETONKA)—FROM FAIRVIEW AV EAST

ZIP CODE 55343
12017 Swenson Donald C @ 938-3295
12024 Bracher Richd N @ 935-5582
12025 Carlson Wm R @ 938-2345
12108 Johengen Eug W @ 935-2842
12115 Lausseng Gerald O @ 938-6678

102
FAIRWAY DR (COLUMBUS HEIGHTS) FROM WEST UPLAND CREST EAST

ZIP CODE 55421
1610 Johnson Woodrow P @ 788-7116
1620 Schaaf Gunthar A @ 788-2406
1630*Siegfried Ervin V @ 788-6714
1640 Winter Joseph B @ 788-0214
1650 Kishish Chris J @ 788-7562
1660 Kaczmarczyk Edw J @ 788-3627
1665 Hedblad Royhl C @ 788-4865
1670 Austin Stewart D @
1675 Ihlan Ellert M @ 788-2736
1700 Turnquist Philip D @ 788-7496
1710 Larson Clarence E @ 788-4200
1715*Fraser Geo R @ 789-7331
1720 Wimsett Jerome E @ 788-0453
1725 Dufault Don J @ 788-3066
1730 Ketz Geo Jr @ 788-2196
1735 La Houd D E Mrs 788-8257
1800*Renquist Donald E @ 781-2281
1805 Mathews Alvin G @ 788-2969
1820 Nordby David A @ 788-2800
1825 Knutson Thos G @ 788-3945
1840 Lucas Danl L @ 788-6384
1845 Kimber Robt A @ 788-8285
1850 Henry Paul R @ 788-3029
1860 Forsmark Alvin C @ 788-4108
1870 Hendrickson Mark P @ 788-5623
1900 Rethwill Clayton Jr @ 788-3891
1910 Kinkle Richd @ 788-4625
1920 No Return
1930 Fuchs Weiner P @ 788-1072
2000*Voss H @
2020 Studer John D @ 788-6968
2036 Johansen Wayne M @ 788-4662
2100 Wold Clifford A @ 788-1534
W UPLAND CREST BEGINS
2101 Schaefer David L @ 788-2178
2102 Muellerleile Len J @ 788-6030
2103 Mahlmann Charles W @ 788-8266
2104 Mundy Arth J @ 788-7441
2105 Veit John G @ 788-5409
2106 Swan Fred P @ 788-2253
2108 Koss Helen D Mrs @ 788-5104
2109 Cleveland Darrell B @ 788-4308
CHATHAM RD ENDS
2113 Roach Donald F @ 788-2892
2119 Gapinski Gerald P @ 788-1192
2123 Hartell Robt J @ 788-5940
2127 Hartmann Annabelle M Mrs @ 788-2190
2133 Hince Le Roy G @ 788-5445
2139 Cloutier Russell A @ 788-3353
2201 King Virgil L @ 788-0918
2209 Fowler James E @ 788-1333
2215 Skalicky Alf J @ 788-0579
2221 Zaccardi Ethel M Mrs @ 788-3626
2227 Skog Le Roy A @ 788-4201
UPLAND CREST INTERSECTS
2344*Schwaiinger E L
2345 Strand Gordon W @ 788-1831

129
FAIRWAY LA (ST LOUIS PARK)—FROM 16TH NORTH 1 WEST OF FLAG AV

ZIP CODE 55426
1605 Kaufmann Henry @ 545-7584
1611 Segelbaum Stanley B @ 545-2675
1621 Murphy Jerry J @ 545-7647
1631 Anderson Philip L @ 545-7206

167
FAIRWOOD CIR (MINNETONKA)—FROM FAIRWOOD DR EAST

ZIP CODE 55343
6029 Harman Bruce @ 938-6075
6031 Wong Donald R @ 935-3714
6037 Jorgensen Harlan @ 935-6785
6043 Ackerman Michl J @ 935-0533

167
FAIRWOOD DR (MINNETONKA)—FROM NORMANDY LA SOUTH

ZIP CODE 55343
5908 Smock Donald L @ 933-1296
5916*Sundin Gordon V Jr @ 938-8891
5919 Vacant
5924 Vathing Robt S acct @ 933-1376
5927 Reed John W @ 935-8727
5932 Furlan John M @ 933-1009
5937 Noble Robt L @ 933-1017
5940 Ong Lincoln P @
5951 Mc Clay Dennis E @ 935-6833
5957 Vatland Harlan J @ 938-3896
6001*Winter Mary Mrs @
6007 Pouliot Vernon L @ 938-7135
6013 Kaat James @
6019 Dearing John N @ 935-4225
6020 Yonehiro Earl G @
6025 Finnigan Howard R @ 938-7974
6100 Benjamin Richd D @ 938-2552
6114 Sebald Eug M @ 935-6479
6125 Larson L Michl J @ 935-8362

167
FAIRWOOD LA (MINNETONKA)—FROM FAIRWOOD DR WEST

ZIP CODE 55343
5900*Komanecky Geo @ 938-3020
5901 Applegate Allen @ 938-8366
5906 Under Constn
5916*Debol Ronald J @ 935-3678
5921 Hansen Denis L @ 935-9490
5926 Under Constn
5941 Ruthenbeck Richd K @ 933-1392
5949 Olson Byron K @ 938-2667
5951 Thomas Robt L @ 935-9854
5956 Do Vale Joao M @ 933-1366
5957 Leslie Robt W @ 935-0686
15602*Oberlin David W @ 935-0072
15607 Klaus Richd B @ 938-2483
15618 Svikis Gunars @ 938-7324
15619 Askerman Mauritz @ 935-9642
15701 Morris Wm Jr @ 935-4296
15709 Erichsen Robt K @ 935-1503
15717*Dancull Kenneth M @ 933-4972

92
FARM LA (MINNETONKA)—FROM COUNTY RD 73 WEST 1 NORTH OF ROYZELLE LA

ZIP CODE 55343
11210 Schilling Gerald W @ 933-1421
11218 Ralston Lowell @ 935-0609
11219 Holmquist Dale J @ 938-5276
11226 Lhotsky Karl @ 938-4334
11227 Petersen Neil R @

59
FARMDALE RD (HOPKINS)—FROM SWEETBRIAR LA EAST AND NORTH 7 NORTH OF EXCELSIOR AV

ZIP CODE 55343
1 Soules Harold A @ 938-2684
102 Olson Fred C @ 938-4708
103 Segal Stewart R @ 935-5407
105 Lohmann Arth M @ 938-2114
HOLLYHOCK LA BEGINS
108 Lujan Joseph C @ 938-5237
109 Gaskell Alf J @ 935-2925
112 Layton Thos L @ 935-8161
116 Meskin Lawrence H @ 935-7131
118 Gartner Herbert R @ 938-5083
ALTHEA LA INTERSECTS
204 Ballard Gerald W @ 938-1304
208*Hoskinson Reed L 935-9180
209 Kraemer Paul W @ 938-2474
210 Otto K Maxfield @ 938-7202
212 Honeywell Inc (Stge)
CAMPBELL DR INTERSECTS
313 Carney Dene A @ 935-1448
SWEETBRIAR LA INTERSECTS
417*Niemann Richd O @ 935-5306

59
FARMDALE RD E (HOPKINS)—FROM ALTHEA LA EAST 1 SOUTH OF WAYSIDE RD

ZIP CODE 55343
104 Peterson Lester E Jr @ 938-5094
212 Honeywell Inc (Whse)

92
FARMINGTON RD (MINNETONKA)—FROM INVERNESS RD SOUTH

ZIP CODE 55343
3607 Schmit Joseph L @ 935-1305
3611 Olson Richd E @ 935-8956
3614 Hlavacek Agnes L Mrs @ 938-9320
3617 Krake Harry C @ 938-7909
3622 Bing Wm D @ 935-2636
3623 Stidger Eug R @ 935-6388
3628 Lumley Bruce L @ 935-7688
3629 Reier David P @ 935-6406
3634 Axel Fredk C @ 935-2079
3635 Krantz Harold R @ 935-6656
3700 Erickson Roger L @ 935-7674
3701 Vacant
3706 Heath Wm M @ 938-5568
3707 Karash Robt P @ 938-1438
3712 Wendt Carl H @ 935-2667
3715*Paulson Robt @ 933-2342
3723 Carlson Ralph E @ 938-7700
3726 Gray Robt A @ 938-8465
3727 Merrill Foster S @ 938-6874
3733 Norris Richd H @ 935-5461
3734 Johnson Edwin M @ 938-8002
3740 Baer Larry G @ 935-8940
3745 Hoff Geo A @ 938-1696

92
FAVORITE LA (MINNETONKA)—FROM SUMMIT LA SOUTH

ZIP CODE 55343
13712*Treloar Kenneth J @ 933-4836
13827 Larson Gordon J @ 938-8760
13833 Zeshaugh John H Jr @ 938-2046

94
FELTL RD (MINNETONKA)—FROM SHADY OAK RD NORTHEAST

ZIP CODE 55343
5435 Feltl Stanley @ 938-8019
5509*Feltl Cyril M @ 938-7537
5625 Rell Delores Mrs @ 935-5737
5628 Dvorak Frank H @ 938-8080
5636 Dvorak Ralph B @ 935-1165
5706 Dvorak Delano D 935-7934
Roushar Margt Mrs 935-5848
5717*Dvorak Elwood @ 938-7865
5800 Saint Margaret's Cemetery

71
FERN DR (RICHFIELD)—FROM BLOOMINGTON AV SOUTHEAST 1 SOUTH OF E 70TH

ZIP CODE 55423
1521 Winkelman J Brian @ 869-5929
1524 Wilhelmsen Hans K @ 869-2038
1525 Raw Dale
1528 Waltz Richd C @ 869-1666
1529 Evers Neil E @ 869-2723
1535 Caspers Joseph L @ 869-4438
1538 Brinkman Earl H @ 869-3058
1539 Vacant
1544*Christensen Owen 869-6087
1545 Sturges Donald L @ 866-1903

50
FERNBROOK LA (PLYMOUTH VILLAGE) FROM 16TH AV N NORTH 1 WEST OF HWY 494

ZIP CODE 55441
1615 Loecken Gerald A @ 473-3859
1705 Bergren Anna Mrs @ 473-6760
1711 Hoppe Robt S Jr @ 473-1969
1940 Stoffels Veronica Mrs @ 544-1469
2060 Hearshman Ronald C 544-6954
2160*Raymond Robt J 546-5920
2409 Under Constn
2525 Erikson Axel @ 546-7424
2605 Vacant
2645*Herwig Marvin @ 545-1898
2705 Berthiaume Eug L @ 545-7405
2715 Moen Mark A @ 545-1044
2722 Food Engineering Corp food processing machy 544-5055
Burgess Engineering Co 545-2722
2724 Gale Bill Photography coml 544-5641
Magney Construction Co bldg contr 544-7747
2730 Paul's Woodcraft Co millwork 545-0216
2805 Anderson Betty J Mrs @ 545-0813
2825 Vacant

49
HWY 55 INTERSECTS
3131 Bel Mar Buieders 546-2511
Belcrete Masonry Co cement contr 546-2511
Belgarde Construction bldg contr 546-2511
Belgarde Enterprises Diversified Capital constn contrs 546-2511
Fraley Donald J lwyr 546-2516
Northern Lite Building Products cabt and fixture sls
3135 Eckes Philip J @ 545-6364
3225 La Vigne James C photog @ 546-1536
3235 Herwig Walter @ 545-5972
3315 Johnson Manford J @ 545-6383
3330 Lessard Wallace E real est appraiser @ 545-2122
3430 Turner Lowell R @ 545-1995
3435*Belgarde John P 544-1040
3440 Johnston Jean G Mrs @ 545-2475
3450 Sorensen Paul J @ 545-2611
36TH AV N INTERSECTS
3535 Schulte Sharrie Mrs @ 545-3160
3540*Lassen John K @ 546-3744
3550 Munson Donald C cement contr @ 544-5314
3640 Kraskey Sam 545-7319
3800 Beck Virgil V @ 544-1780
3810 Schmidt Gerald L @ 544-4018
3816 Zbikowski Theo H @ 544-3207
3820 Olson James C @ 544-9662
3905 No Return
3920 Northside Roofing contrs 545-8511
Berthiaume Robt M @ 545-8511
40TH AV N BEGINS
3940 Turner Wallace A @ 545-4369
3950 Smith Wilmuth T @ 544-0625
4000 Mills Albert D @ 544-9269
COUNTY RD 9 INTERSECTS
ZIP CODE 55442
4115 Hesse Jerome N @ 545-0304
4125 Bill Norman L @ 544-2063
4150 Schlosser Ray E @ 544-4554
4235 Olson Arnold C @ 545-3291
4255 Beyer Elmer P @ 545-7476
4300 Begin Lillian A Mrs @ 546-9563
4315 Schmidt Melvin A @ 545-7412
4625 Charley's Pony Express amusement devices 545-6600
Malenke Fredk @ 544-1216
4640 Kittleson Newell H painting contr @ 545-7723

25
FERNDALE AV NE (FRIDLEY)—FROM NE HILLCREST DR EAST 1 WEST OF STINSON BLVD

ZIP CODE 55432
1504 Gaupp Otto A @ 788-0454
1505*Lembke Larry @ 789-5628
1508 Scholl's Construction remodeling contr 788-7384
*Scholl Ronald J @ 788-7384
1511 Davis Stanley A @ 781-0991
1521 Philipson Alf B @ 788-8055
1522 Vasecka James @ 788-2602
1540 Redden Edw A @ 788-0116
1541 Kempf Al J @ 788-8460
1560 Helman David @
1561 Vacant
1566 Schneider Richd J @ 788-2768

50
FERNDALE RD N (PLYMOUTH VILLAGE) FROM RIDGEMOUNT AV W NORTH

ZIP CODE 55391
710 Elwell Laurance R Jr @ 473-7743
1220n Pedersen Paul E @ 473-4012

139
FERNLAND CT (MEDICINE LAKE)—FROM SOUTH SHORE DR AND HIGHWAY 55 WEST

ZIP CODE 55441
25 Vacant
26 Vacant
27 Vacant
28*Thorstenson Virgil 546-1781

167
FERRIS LA (MINNETONKA)—FROM EDEN PRAIRIE RD EAST

ZIP CODE 55343
14331 Seefeldt Harold R @ 935-3537
14333 Erickson Manley O @ 938-4376
*Kopp Allan T 933-1642
14400 Engstrom Walter H @ 935-2364
14401 Wombacher John D @ 938-1280
14409 Jacobs Hubert A @ 935-7423
14414 Gailis Woldemars @ 938-9692
14417 Tank Perry E @ 935-2359

91
FETTERLY LA (MINNETONKA)—FROM FETTERLY RD NORTHWEST 2 WEST OF COUNTY RD 73

ZIP CODE 55343

91
FETTERLY RD W (MINNETONKA)—FROM COUNTY RD 73 WEST 1 SOUTH OF HILLSIDE LA WEST

ZIP CODE 55343
11324*Puffett Gary F @ 546-1214
11413 Goll J A @ 545-6589
11512 Crider Lloyd A @ 545-0981
11513 Mitchell James L @ 545-8008
11557 Smith James R @ 545-2382
11558 Vacant
11612 Heimert Richd @ 544-6025

118
FIELD DR (GOLDEN VALLEY)—FROM HANLEY RD WEST AND SOUTH 1 EAST OF BROOKVIEW COUNTRY CLUB

ZIP CODE 55426
420 Cook Marvin D @ 545-1853
505 Quisberg Sherman F @ 545-8773
615 Shirley Robt W @ 545-9521
675 Vacant

21
FILLMORE ST NE (COLUMBIA HEIGHTS) FROM 45TH AV NE NORTH AND WEST 4 EAST OF CENTRAL

ZIP CODE 55421
4505 Larson Lyle M @ 788-3295
4508*Boik David L 789-3033
4509*Hoff Robt
Haag Robt A @ 781-1328
4514 Johnson Warren @ 788-6362
4515 Piss Richd L 788-2139
4516 Lero Edith L @ 788-2533
4517 Petersen Roger E 788-7405
4518 Kruse Lowell C 788-3968
4520 Lawrence Clifford E 789-4135
4524 Zimmerman Kenneth I @ 788-3762
4526 Smith Theo @ 788-0549
45½ AV NE ENDS
4531*Kautt Ronald J 781-3503
4532 Hamrin Christopher @ 788-8449
4533 Bjorge Alden J 788-1963
4534*Wright Doug K 781-0409
4539 Andreen Gary 788-8368
Westad Bruce M 788-1781
4544 Dykoski Wm W 780-1354
Condos Jerry P @ 788-7262
4545 Fuller Earl L 780-1274

FARMINGTON RD (MV)--CONTD
3727 MERRILL FOSTER S • 938-6874
3733 NORRIS RICHD H • 935-5461
3734 JOHNSON EDWIN M • 938-8002
3745 HOFF GEO A • 938-1696

92
FAVORITE LA (MINNETONKA VILLAGE)-FROM SUMMIT LA SOUTH

---ZIP CODE 55343
13827 LARSON GORDON J • 938-8760
13833 ZESBAUGH JOHN H JR • 938-2046

94
FELTL RD (MINNETONKA VILLAGE)-FROM SHADY OAK RD NORTHEAST

---ZIP CODE 55343
5625 RELL ROBER J • 935-5737
5628 DVORAK FRANK H • 938-8080
5636 DVORAK RALPH • 938-1165
ROUSHAR MARGT 935-5848
5708 DVORAK DELANO 935-7934
5717 DVORAK ELWOOD G • 938-7865

71
FERN DR (RICHFIELD)-FROM BLOOMINGTON AV SOUTHEAST 1 SOUTH OF E 70TH

---ZIP CODE 55423
1521 BARNES JERRY D • 869-1508
1524 WILHELMSEN HANS J • 869-2038
1525 WEISS JACK • 869-3006
1528 WALTZ RICHD C • 869-1666
1529 VACANT
1535 CASPERS JOSEPH L • 869-4438
1538 BRINKMAN EARL H • 869-3058
1539 JONES SAML G • 869-1292
1544 CHRISTENSEN OWEN E • 869-6087
1545 LARSEN NORMAN W • 869-5379

50
FERNBROOK LA (PLYMOUTH VILLAGE)-FROM 16TH AV N NORTH 1 WEST OF HWY 494

---ZIP CODE 55427
1615 LOECKEN GERALD A • 473-3859
1705 BERGREN ANNA MRS • 473-6760
1940 RYAN CORNELIUS • 545-7573
2060 STOFFELS VERONICA 544-7658
2160 HERMANN ROBT K • 545-5436
2520 REEDY ALLEN J • 544-7487
2525 ERIKSON AXEL • 545-7424
2605 VACANT
2623 BASS JAMES
2635 COLEMAN JOHN F 545-6369
REITZ RAYMOND C 544-6561
2645 SAINT MARTIN ROGER A • 545-1341
2705 BERTHIAUME EUG L • 545-7405
2715 MOEN MARK A • 545-1044
2720 MAGNEY CONSTN CO 544-7747
2725 MC QUILLAN PATK P • 545-6344
2730 PAUL'S WOODCRAFT CO MILLWORK 545-0216
2805 ANDERSON KENNETH B • 545-0813
2825 HERWIG MARVIN K • 545-1898
---HWY 55 INTERSECTS
3135 ECKES PHILIP J • 545-6384
3225 LA VIGNE JAMES C • 545-1536
3235 HERWIG WALTER • 545-5972
3315 JOHNSON MANFORD J • 545-6383
3330 LESSARD WALLACE E REAL EST APPR • 545-2122
3430 TURNER LOWELL R • 545-1995
3435 SCHULTE MICHL E 544-2231
3440 JOHNSTON JEAN MRS • 545-2475
3450 SORENSEN PAUL J • 545-2611
3535 SCHULTE EDW D • 545-3160
3540 ANDERSON JAMES E • 544-6390
3550 MUNSON DONALD C CEMENT CONTR • 544-5314
3640 KRASKEY SAM • 545-7319
3800 BECK VIRGIL V • 544-1780
3810 SCHMIDT GERALD L • 544-4018
3816 ZBIKOWSKI THEO H • 544-3207
3820 NELSON AXEL W • 545-6021
3905 FRANKLIN LOREN V • 544-6446
3911 VACANT
3920 REESE DEANE A 545-2976
3940 TURNER WALLACE A • 545-4369
3950 HARTH MERLE D 544-3980
4000 GILLETTE MARGT MRS • 544-7422

48
---COUNTY RD 9 INTERSECTS
4115 HESSE JEROME N • 545-0304
4125 BILL NORMAN L • 544-2063
4150 SCHLOSSER RAY E • 544-4554
4235 OLSON ARNOLD C • 545-3291
4265 BEYER ELMER P • 545-7476
4200 BEGIN LILLIAN MRS • 545-9563
4315 SCHMIDT MELVIN A • 545-7412
4625 CHARLEY'S PONY EXPRESS AMUSEMENT DEVICES 545-6600
MALENKE FREDK • 544-1216
4640 KITTLESON NEWELL H PNTR & DEC CONTR • 545-7723

25
FERNDALE AV NE (FRIDLEY)-FROM NE HILLCREST DR EAST 1 WEST OF STINSON BLVD

---ZIP CODE 55421
1504 GAUPP OTTO A • 788-0454
1505 NAGOVSKY LOWELL J • 788-8584
1508 BROWN LYNDA R MRS • 788-8384
1511 PEEBLES JOHN E • 788-1520
1521 LARSON WAYNE K • 788-3516
1522 VASECKA JAMES • 788-2602
1540 REDDEN EDW A • 788-1476
1541 KEMPF ALOYSIUS J • 788-8460
1560 EWY MAURICE G • 788-4382
1561 ZRUST FRANK D • 788-3745
1568 SCHNEIDER RICHD J • 788-2768

50
FERNDALE RD (PLYMOUTH VILLAGE)-FROM RIDGEMOUNT AV W NORTH

---ZIP CODE 55427
7 ELWELL LAURANCE R JR • 473-7743
NIELSEN NORMAN L • 473-5266
PEDERSEN PAUL E 473-4012

167
FERRIS LA (MINNETONKA VILLAGE)-FROM EDEN PRAIRIE RD EAST

---ZIP CODE 55343
14333 ERICKSON MANLEY • 938-4376
14400 FERRIS JOHN D REV • 935-2791
14401 WOMBACKER JOHN • 938-1280
14409 JACOBS HUBERT • 935-7423
14414 GAILIS WOLDEMARS • 938-9692
14417 TANK PERRY • 935-2359

91
FETTERLY RD W (MINNETONKA VILLAGE)-FROM COUNTY RD 73 WEST 1 SOUTH OF HILLSIDE LA WEST

---ZIP CODE 55343
11413 MANNING D J • 545-6589
11512 CRIDER LLOYD A • 545-0981
11513 MITCHELL JAMES • 545-8008
11612 HOSTETLER WINIFRED A MRS
11700 VACANT

118
FIELD DR (GOLDEN VALLEY)-FROM HANLEY RD WEST AND SOUTH 1 EAST OF BROOKVIEW COUNTRY CLUB

---ZIP CODE 55426
420 RAVENSCRAFT PHILOTHEA MRS • 545-3668
505 QUISBERG SHERMAN F • 545-8773
615 SHIRLEY ROBT W • 545-9521
675 SUBURBAN MAINTENANCE CO CLN CONTRS 545-0293
KAISER JAMES F • 545-3200

21
FILLMORE ST NE (COLUMBIA HEIGHTS)-FROM 45TH AV NE NORTH AND WEST 4 EAST OF CENTRAL

---ZIP CODE 55421
4506 YOUNG LANE G
4508 WHALEY DEAN C
4509 BLOOM KENNETH L
JERGENSON ALAN 788-7139
4514 LININGER WM T • 788-1239
4515 LATVALA DONALD 788-4183
4516 MACHULDA JOHN 788-8834
4517 LONKEY DALE V • 788-4172
4518 GOLDEN PAUL 788-2812
4520 BLEVINS DOROTHY MRS 788-1361
4524 HENDERSON JIM A 788-8046
4526 JOHNSON DAVID L
4531 PETERSON JOHN C
PETERSON ROGER E 788-7405
4532 CARLSON ANNA M MRS • 788-4365
FREEMAN DUANE 788-4365
4534 HICKS CHARLES W 788-6257
4539 SASS RICHD 788-2642
WESTAD BRUCE 788-1781
4544 VATTHAUER NORMAN E 788-4973
CONDOS JERRY P • 788-7262
4545 ANDERSON ROBT L 788-7655
4547 REA MILTON C 788-7378
4550 DAVIS CLAIRE D • 788-3758
LORLEBERG VICTOR 788-3581
4555 HANSON CHARLES A 788-2748
4556 LUTZ DANL P 788-4900
4557 RUSSELL ALF S 788-7973
4558 ENGELS DALE L 788-4280
---46TH AV NE INTERSECTS
4600 KRZYSKA ALICE 788-2221
4601 NICHOLSEN GENE R 788-4556
4602 WICK DALE 788-1790
4606 KNUTSON HERBERT C • 788-6459
4607 JOHNSTON MARLOWE V 788-8250
STEINHAUSE ARNIE
4608 PASCHE RICHD R 788-2723
4610 WEINMANN JOHN L 788-4655
4612 ERICKSON DALE E • 788-6955
4613 VACANT
VACANT
4618 JAY ERMA L MRS • 788-8413
4619 BAUER ED E 788-0514
BRISBOIS EUG P 788-8910
4624 BRAATEN CURTIS •
4625 MEYER EUG F 788-4675
BRACKENBURG WM C 788-0336
4630 SCHAAF FRED • 788-7560
4631 KAPPEL STANLEY 781-7835
4636 WARRICK JOHN S • 788-8232
4637 BAILEY JOHN 788-4041
4642 GORDIER KENNETH L • 788-6805
4653 MARPE WAYNE R 788-0100
4643 ODLE JOAN 788-6547
4648 DE COURSEY WM L • 788-0407
4649 THOMASON CLIFFORD E 788-1671
VACANT
4654 GADBAW LAWRENCE W • 788-7980
4655 TUNSKY RODNEY F 788-3771
VACANT
---49TH AV INTERSECTS
4905 SPRANG WENDELL G • 788-2530
4910 HART ROBT W • 788-7324
4915 HEDMAN E LLOYD • 788-2080
4925 HOLLAND RAYMOND F • 788-0418
4945 CASKEY CARL REV • 788-1869
4950 LEININGER LARRY • 788-5420
4960 PUKITE JANIS • 788-8705
5015 YURISTA STEVE • 788-1821
5020 HILL CHARLES D • 788-2829

25
FILLMORE ST NE (FRIDLEY)-FROM S 30 NORTH 4 EAST OF CENTRAL AV

---ZIP CODE 55421
5200 BOE PHILIP W • 788-1979
5211 WHITE DOUGLAS W • 788-8763
5221 NELSON HAROLD C • 788-0066
5222 ARMENTROUT NORRIS L •
5231 CHRISTENSON DONALD A • 788-2283
5234 MOLINARO PETER S • 788-6114
5246 SCHENK MARVIN W • 788-3667
5251 WEBSTER M HOWARD • 788-7092
5258 PARIZEK RONALD G • 788-4633
5261 BUNGERT JOSEPH M • 788-5366
5271 SMITH ALLAN J • 788-2274
5298 O'BANNON MIKE E • 788-3438
---53D AV NE INTERSECTS
5352 OTT GEO K 788-1173
5353 BERG EDMUND L • 788-2250
5355 O'CONNOR DAVID P 788-6673
---SKYWOOD LA INTERSECTS
5512 LIDBERG THOS R 788-8890

96
FILLMORE ST NE (SPRING LAKE PARK)-FROM 81ST AV NE AND STATE HWY 65 NORTH 3 NORTH OF OSBORNE RD

95
---ZIP CODE 55432
---83D AV NE INTERSECTS
8334 ESCH FRED 784-8285
8350 ERICKSON WAYNE W • 784-0335
8364 KUTSCHEID LESLIE W • 784-2693
8365 COOPER KENNETH E • 784-7590
8376 SMITH LOWELL T • 784-0978

26
FIR ST NE (FRIDLEY)-CHANGED TO NE FIR ST

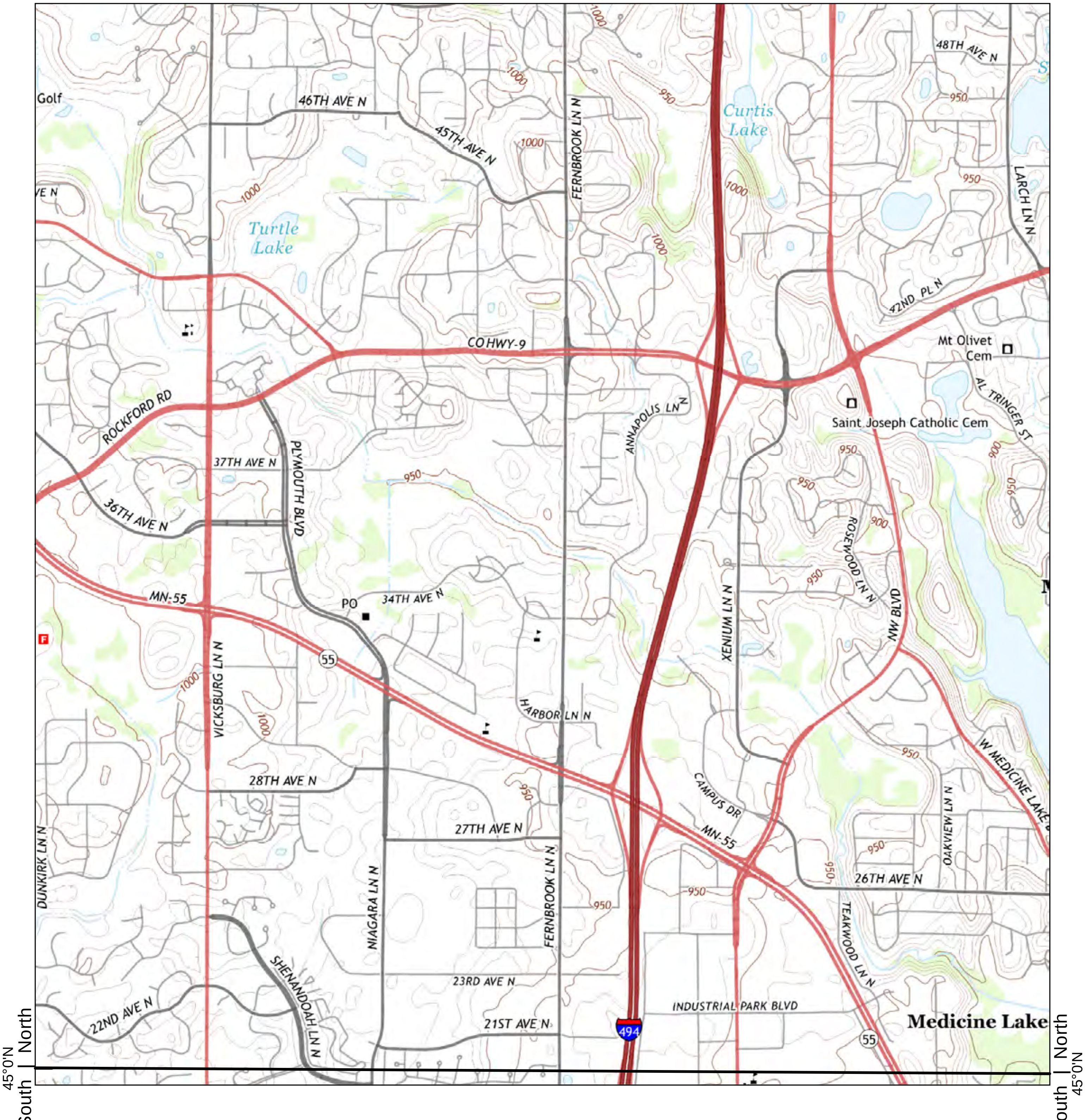
25
FIRSIDE DR NE (FRIDLEY)-FROM HWY 65 EAST 2 NORTH OF 73D AV

---ZIP CODE 55432
---CENTRAL AV INTERSECTS
1367 LARSON VERNON R 784-5831
---HAYES ST INTERSECTS
1400 FLOWERS ELMER H • 786-1794
1420 SOLI ROBT F • 784-6611
---STONSON BLVD INTERSECTS

26
FIRWOOD WAY NE (FRIDLEY)-FROM PEARSON WAY NORTHWEST 1 WEST OF EAST RIVER RD

---ZIP CODE 55432
7830 WILEY EDW L • 784-6528
7833 JOHNSON NORMAN E •
7837 LEGUN LA WAYNE MRS 784-6563
7838 STEWART RAYMOND L • 784-4234
7843 KEARNS JAMES E 784-5489
7844 MORREIM VERNON S 786-3193
7847 JAMES DAROLD L 786-1740
7851 BERNARD RONALD C 786-5297
7852 BERG ROBT H • 784-7342
7855 WANDER NICHOLAS G 786-4313
7857 BABCOCK LYLA J 784-1274
7858 HYATT NEIL W • 784-6553
7861 GOEDEL MARVIN • 786-4429
7865 ARNOLD VICTOR C 786-4093
7866 KALIHER DAVID J • 784-8343
7869 ENBERG GARY D 784-7174
7871 TATRO CLARENCE W 784-4192
7872 ACKLEY RANDALL C • 784-9461
7875 COUCH GEO L 784-8257
7879 THORSTENSON PAUL E 786-5635

Topographic Maps



2013

0 Distance in Miles 1

1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N

Site information:
Plymouth Creek Feaibility

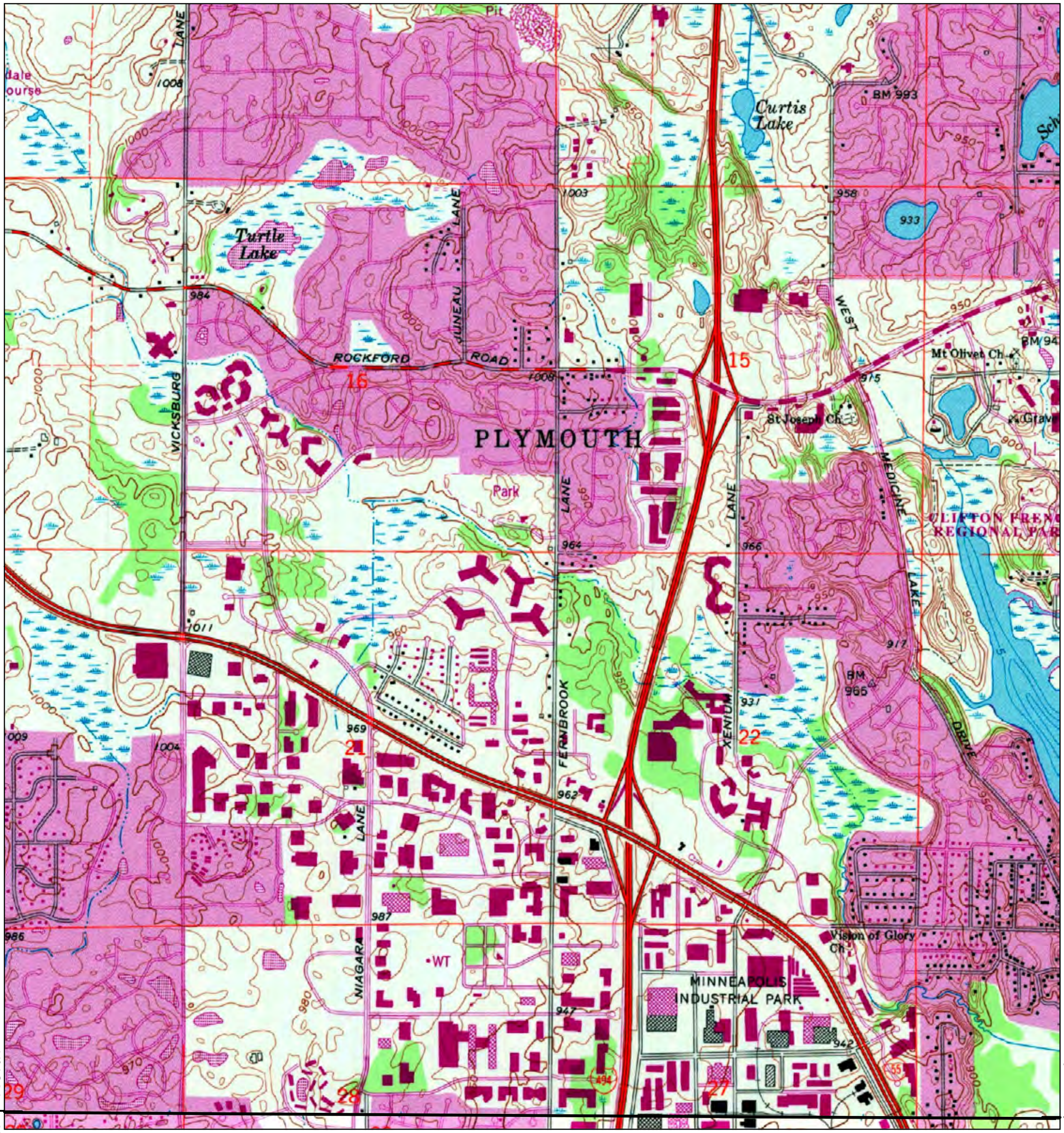
Plymouth, MN 55447

HIG

Unified maps show subdued modern topo features where corresponding maps of the same year were not published.

Barr Engineering project #23270051.36
HIG #1521115 completed: 09/14/2015

Zone	Topographic Map Name	Publisher	Map Size	Base Map	Aerial Photo Topo Updates Photo Year	Inspected	Revised
North	Osseo, MN	USGS	7½' x 7½'	2013	--	--	--
South	Hopkins, MN	USGS	7½' x 7½'	2013	--	--	--



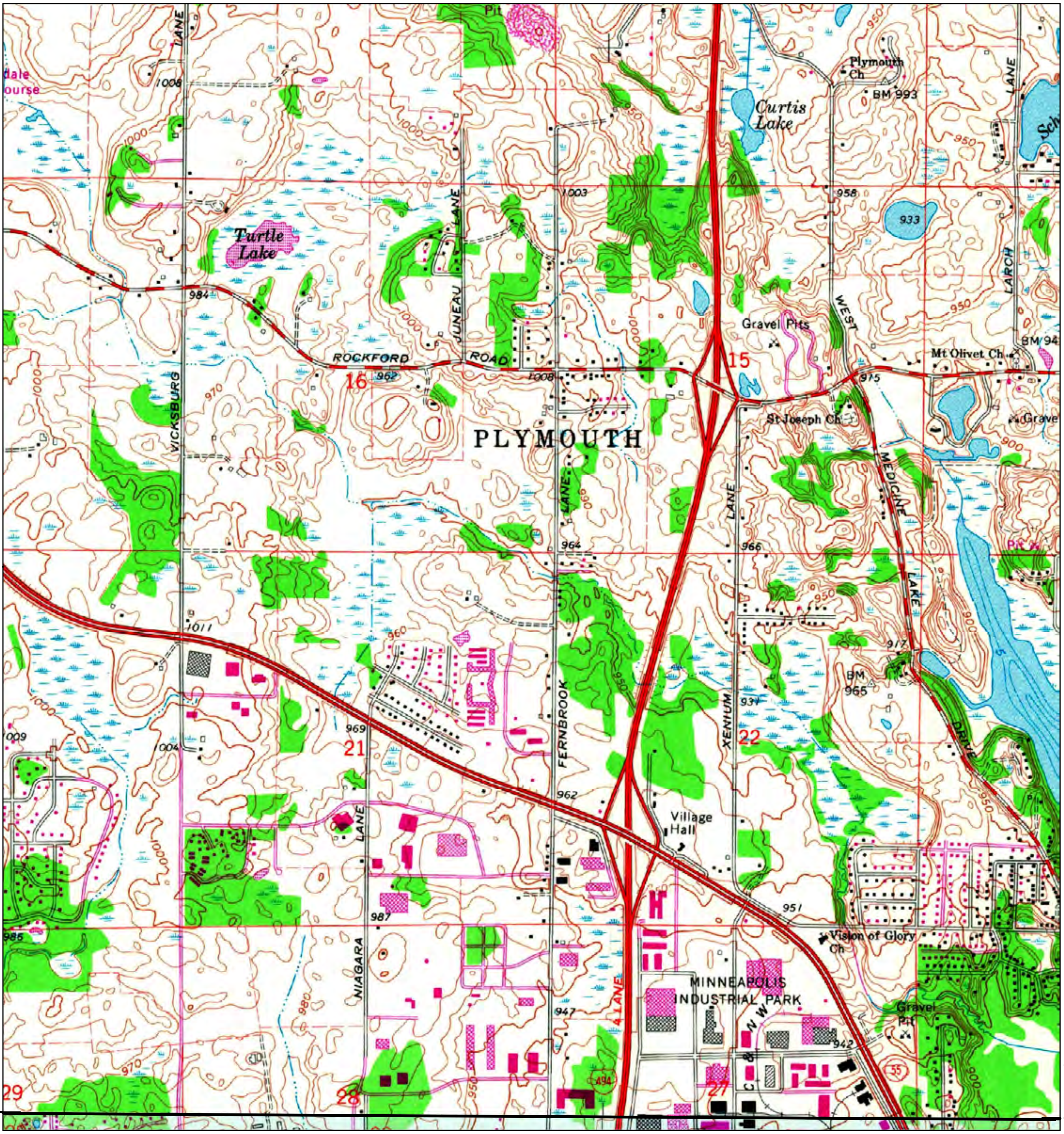
45°0'N
North | South

North | South
45°0'N

1993	0 Distance in Miles 1 1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N	Site information: Plymouth Creek Feaibility Plymouth, MN 55447
Unified maps show subdued modern topo features where corresponding maps of the same year were not published.	Barr Engineering project #23270051.36 HIG #1521115 completed: 09/14/2015	

HIG

Zone	Topographic Map Name	Publisher	Map Size	Base Map	Aerial Photo Topo Updates Photo Year	Inspected	Revised
North	Osseo, MN	USGS	7½' x 7½'	1967	1992	--	1993
South	Hopkins, MN	USGS	7½' x 7½'	1967	1992	--	1993

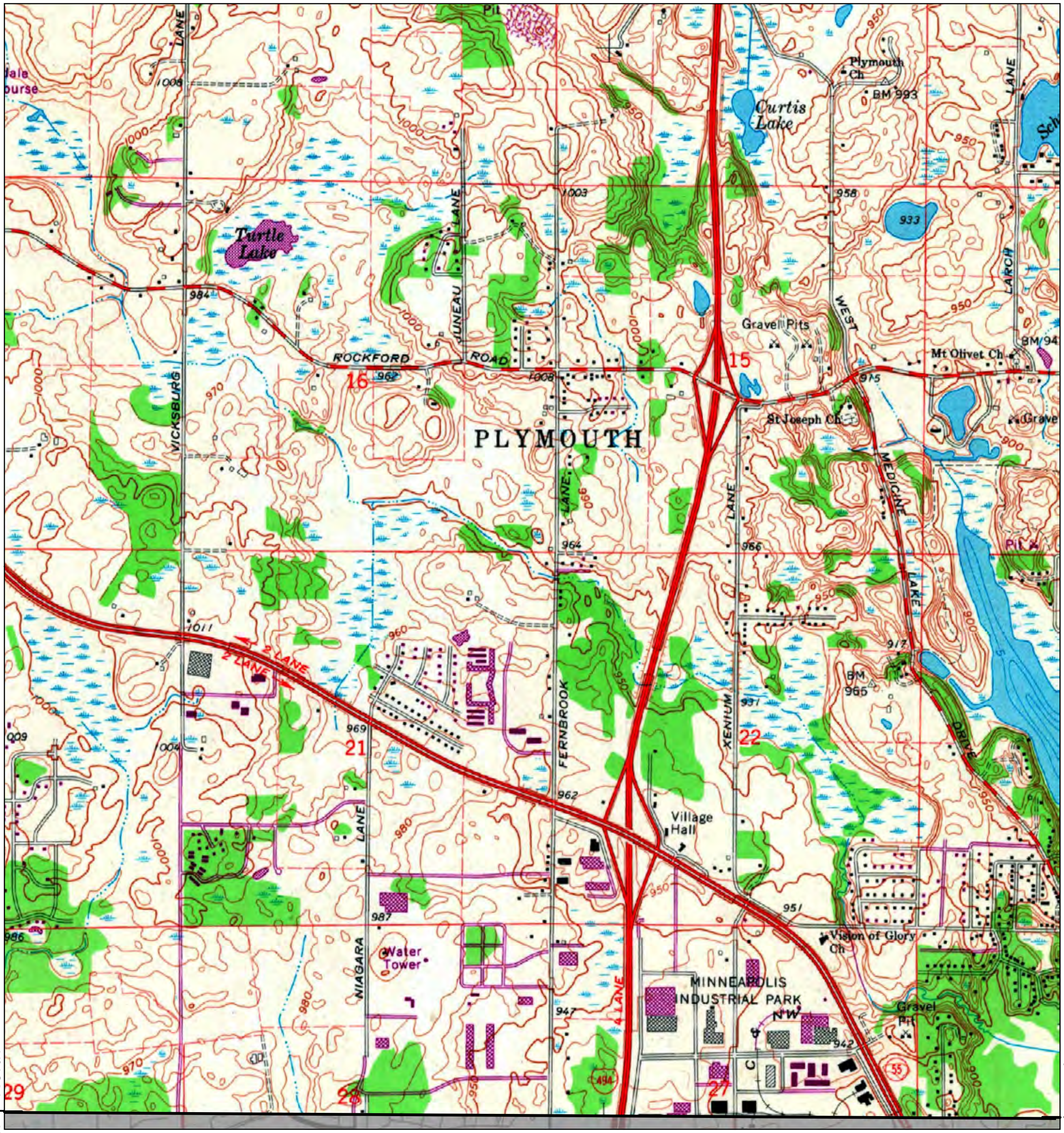


1980	0 Distance in Miles 1 1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N	Site information: Plymouth Creek Feaibility Plymouth, MN 55447

Unified maps show subdued modern topo features where corresponding maps of the same year were not published.

Barr Engineering project #23270051.36
HIG #1521115 completed: 09/14/2015

Zone	Topographic Map Name	Publisher	Map Size	Base Map	Aerial Photo Topo Updates: Photo Year	Inspected	Revised
North	Osseo, MN	USGS	7½' x 7½'	1967	1977	--	1980
South	Hopkins, MN	USGS	7½' x 7½'	1967	1977	--	1980



45°0'N South | North

45°0'N South | North

1972

0 Distance in Miles 1

1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N

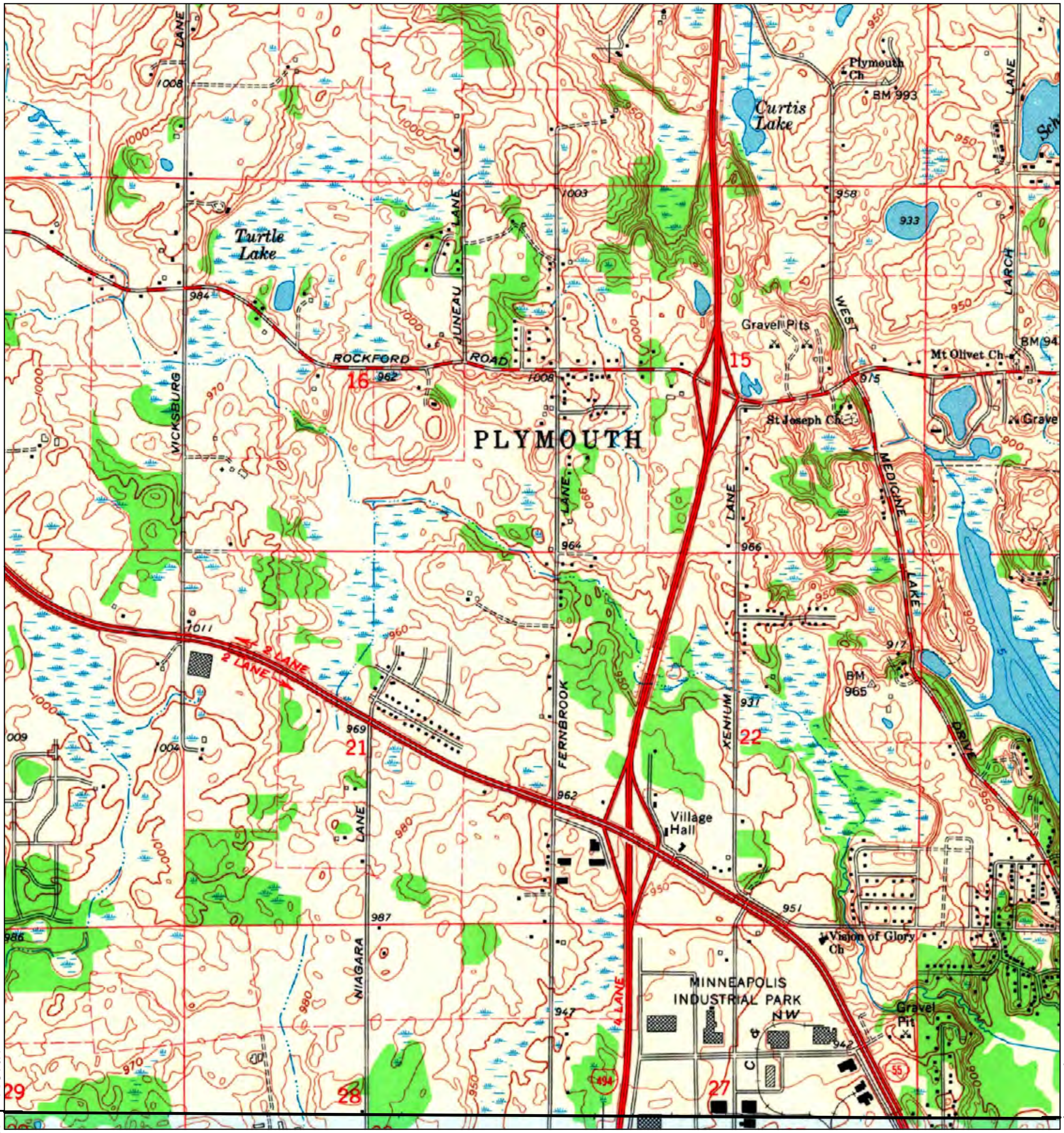
Site information:
Plymouth Creek Feaibility

Plymouth, MN 55447

Unified maps show subdued modern topo features where corresponding maps of the same year were not published.

Barr Engineering project #23270051.36
HIG #1521115 completed: 09/14/2015

Zone	Topographic Map Name	Publisher	Map Size	Base Map	Aerial Photo Topo Updates Photo Year	Inspected	Revised
North	Osseo, MN	USGS	7½' x 7½'	1967	1972	--	1972



45°0'N North | South

North | South 45°0'N

1967

0 Distance in Miles 1

1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N

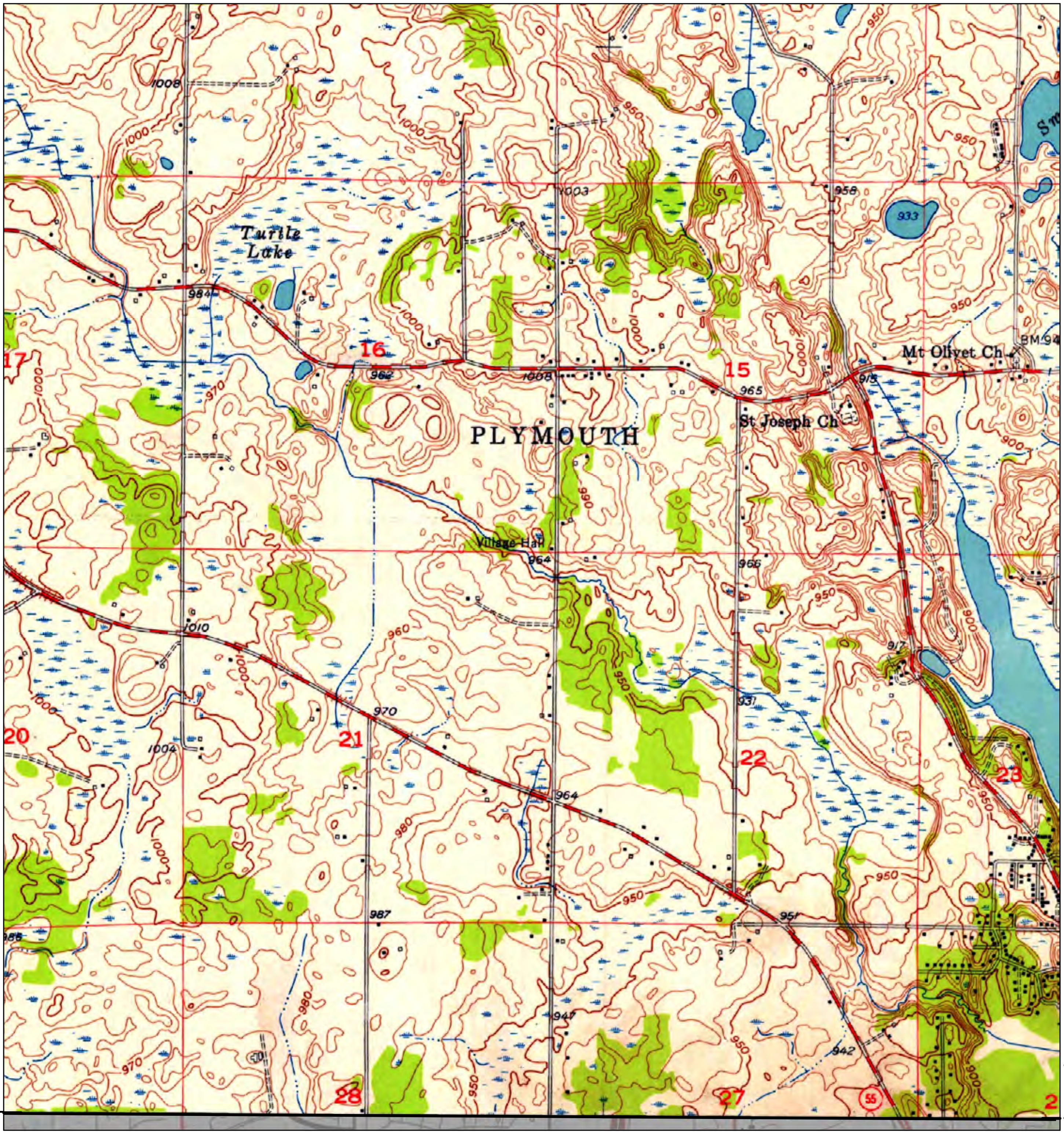
Site information:
Plymouth Creek Feaibility

Plymouth, MN 55447

Unified maps show subdued modern topo features where corresponding maps of the same year were not published.

Barr Engineering project #23270051.36
HIG #1521115 completed: 09/14/2015

Zone	Topographic Map Name	Publisher	Map Size	Base Map	Aerial Photo Topo Updates: Photo Year	Inspected	Revised
North	Osseo, MN	USGS	7½' x 7½'	1967	1947	--	--
South	Hopkins, MN	USGS	7½' x 7½'	1967	1947	--	--

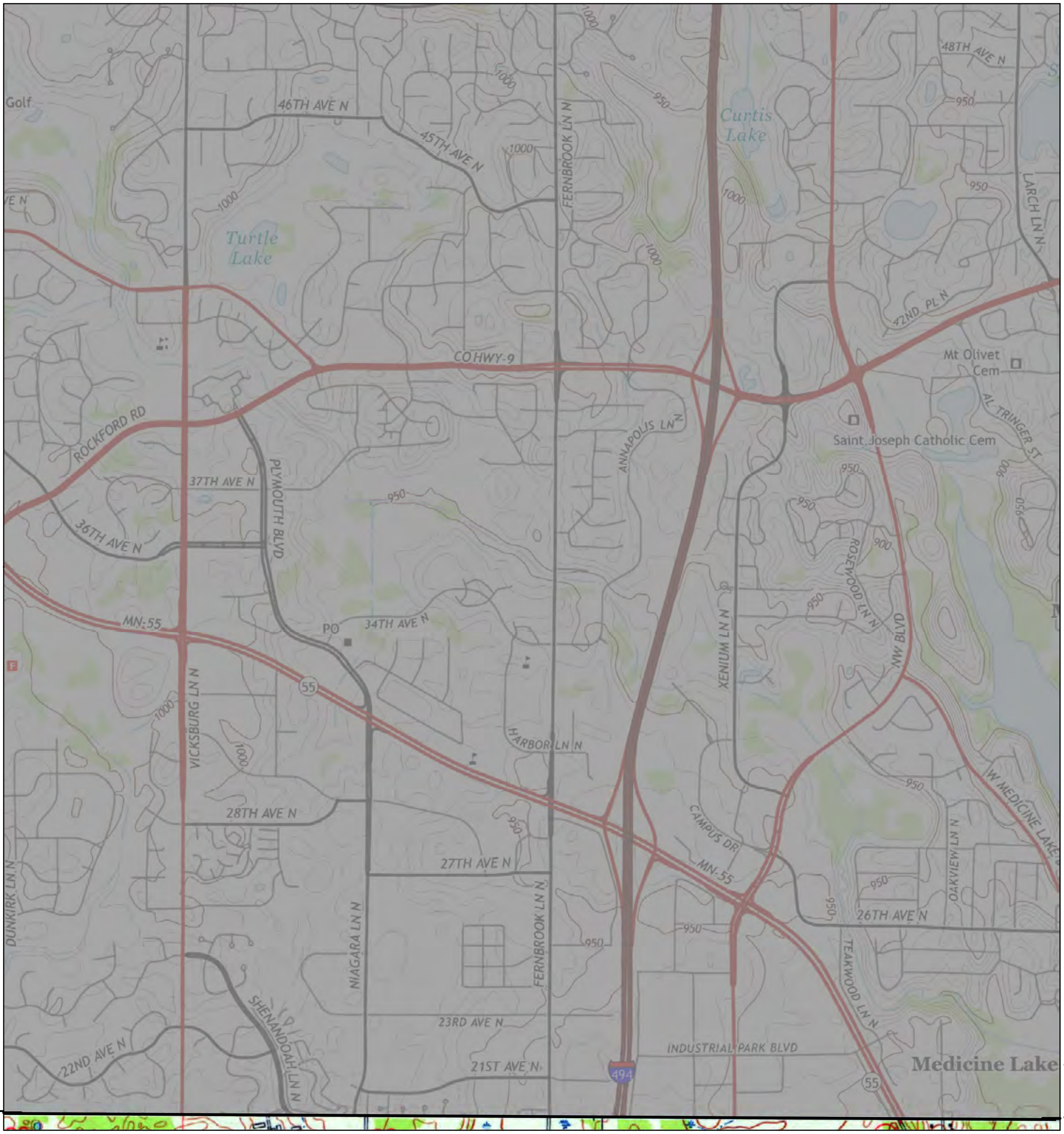


North | 45°0'N | South

North | 45°0'N | South

1955	0 Distance in Miles 1 1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N	Site information: Plymouth Creek Feaibility Plymouth, MN 55447	HIG
Unified maps show subdued modern topo features where corresponding maps of the same year were not published.	Barr Engineering project #23270051.36 HIG #1521115 completed: 09/14/2015		

Zone	Topographic Map Name	Publisher	Map Size	Base Map	Aerial Photo Topo Updates Photo Year	Inspected	Revised
North	Osseo, MN	USGS	7½' x 7½'	1955	1947	--	--



45°0'N

South | North

1954

0 Distance in Miles 1

1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N

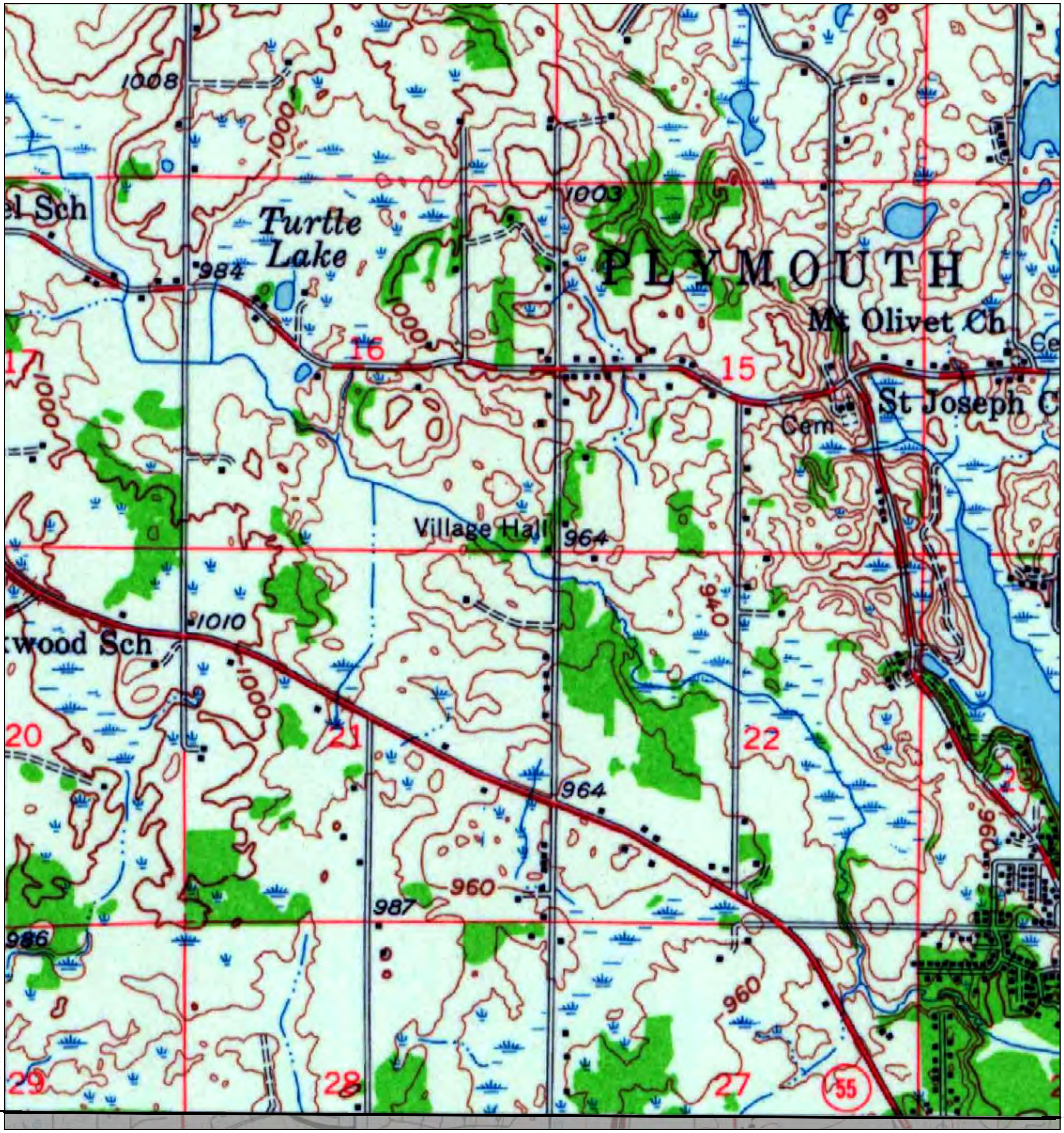
Site information:
Plymouth Creek Feaibility

Plymouth, MN 55447

Unified maps show subdued modern topo features where corresponding maps of the same year were not published.

Barr Engineering project #23270051.36
HIG #1521115 completed: 09/14/2015

Zone	Topographic Map Name	Publisher	Map Size	Base Map	Aerial Photo Year	Topo Updates Inspected	Topo Updates Revised
South	Hopkins, MN	USGS	7½' x 7½'	1954	1947	--	--



1955

0 Distance in Miles 1

1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N

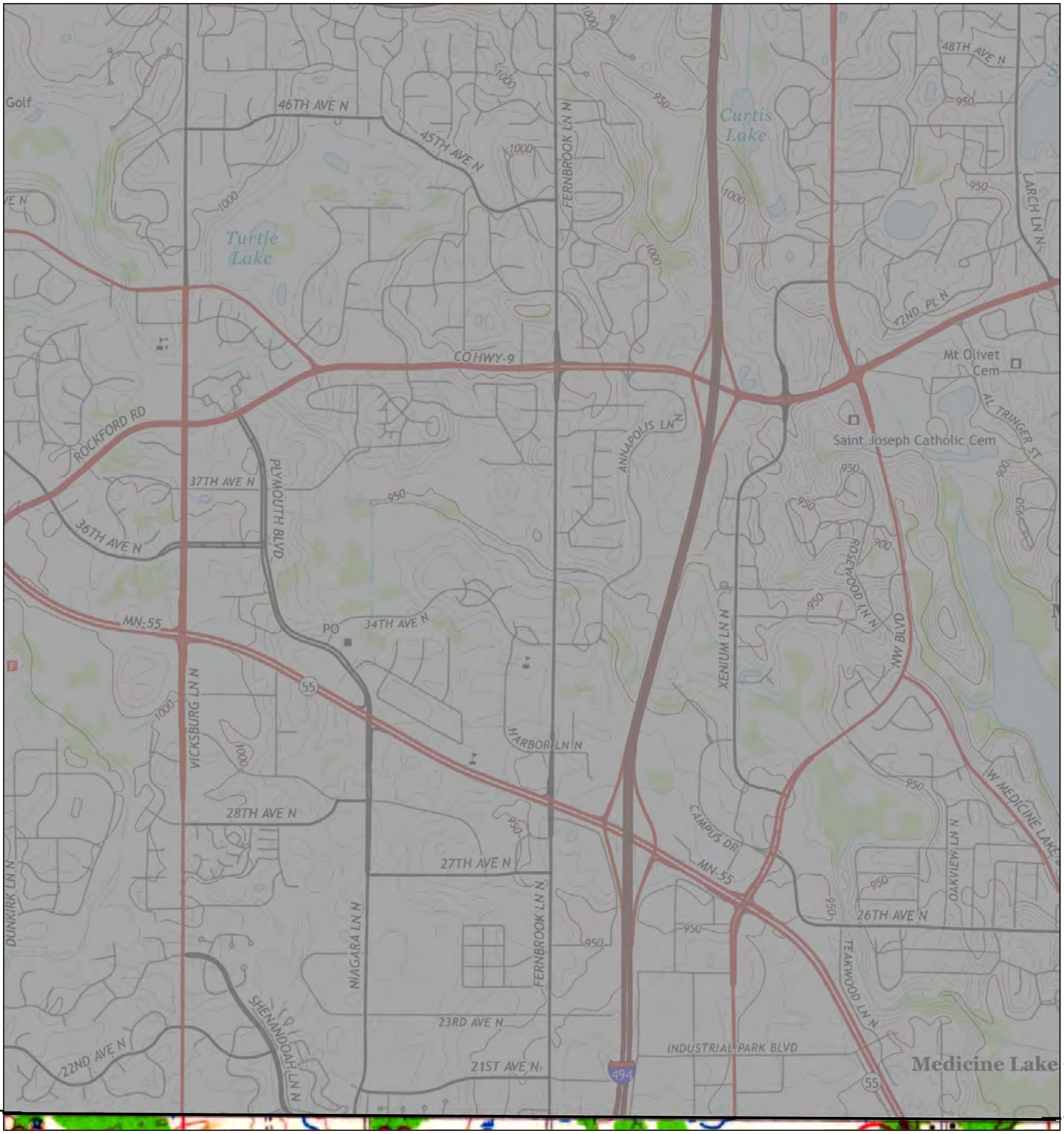
Site information:
Plymouth Creek Feaibility

Plymouth, MN 55447

Unified maps show subdued modern topo features where corresponding maps of the same year were not published.

Barr Engineering project #23270051.36
HIG #1521115 completed: 09/14/2015

Zone	Topographic Map Name	Publisher	Map Size	Base Map	Aerial Photo Topo Updates: Photo Year	Inspected	Revised
North	Anoka, MN	USGS	15' x 15'	1955	1947	--	--

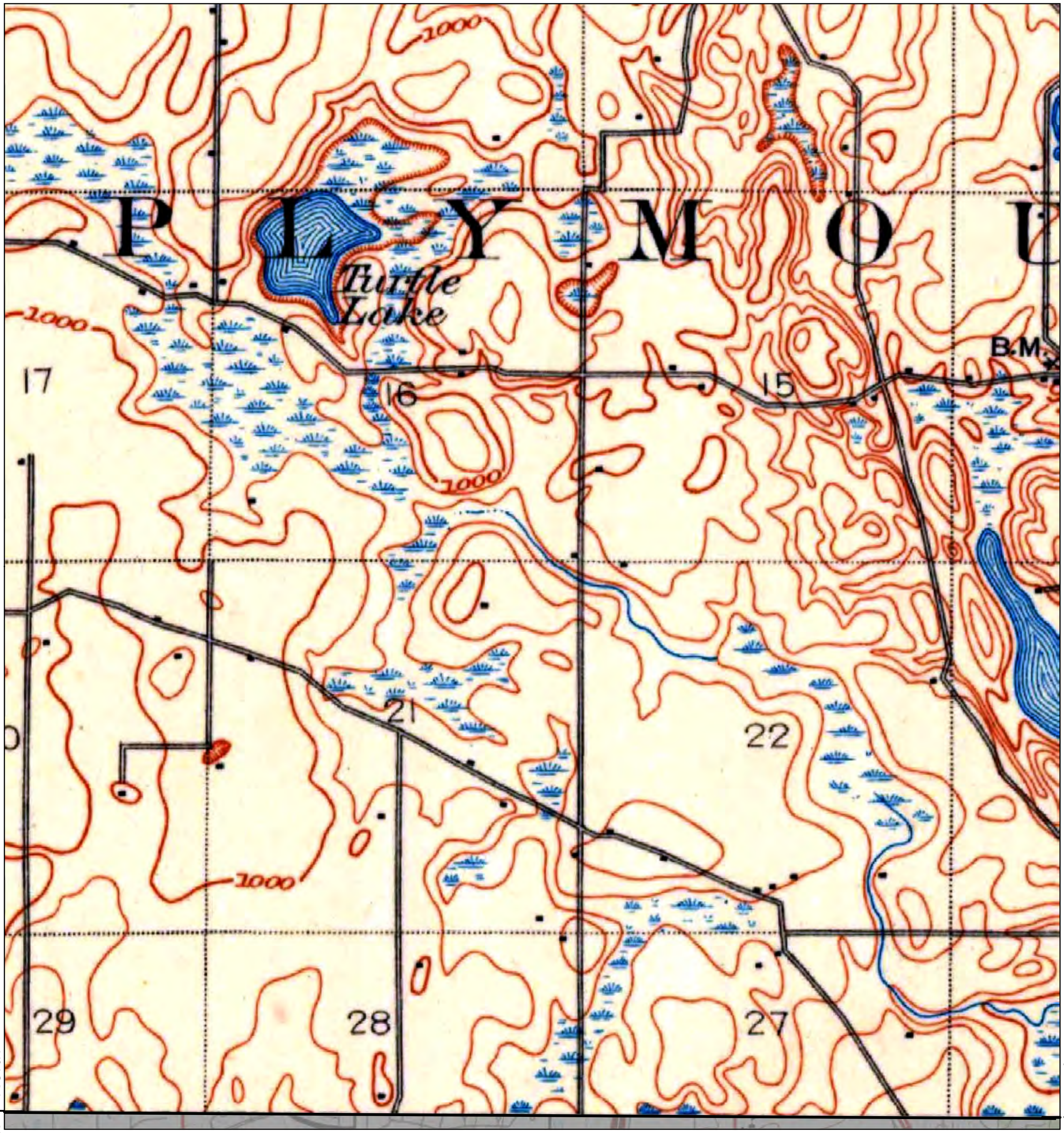


45°0'N South | North

South | North 45°0'N

1954	0 Distance in Miles 1 1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N	Site information: Plymouth Creek Feaibility Plymouth, MN 55447	HIG
Unified maps show subdued modern topo features where corresponding maps of the same year were not published.		Barr Engineering project #23270051.36 HIG #1521115 completed: 09/14/2015	

Zone	Topographic Map Name	Publisher	Map Size	Base Map	Aerial Photo Topo Updates: Photo Year	Inspected	Revised
South	Minneapolis, MN	USGS	15' x 15'	1954	1951	--	--



North | South 45°0'N

1902

0 Distance in Miles 1

1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N

Site information:
Plymouth Creek Feaibility

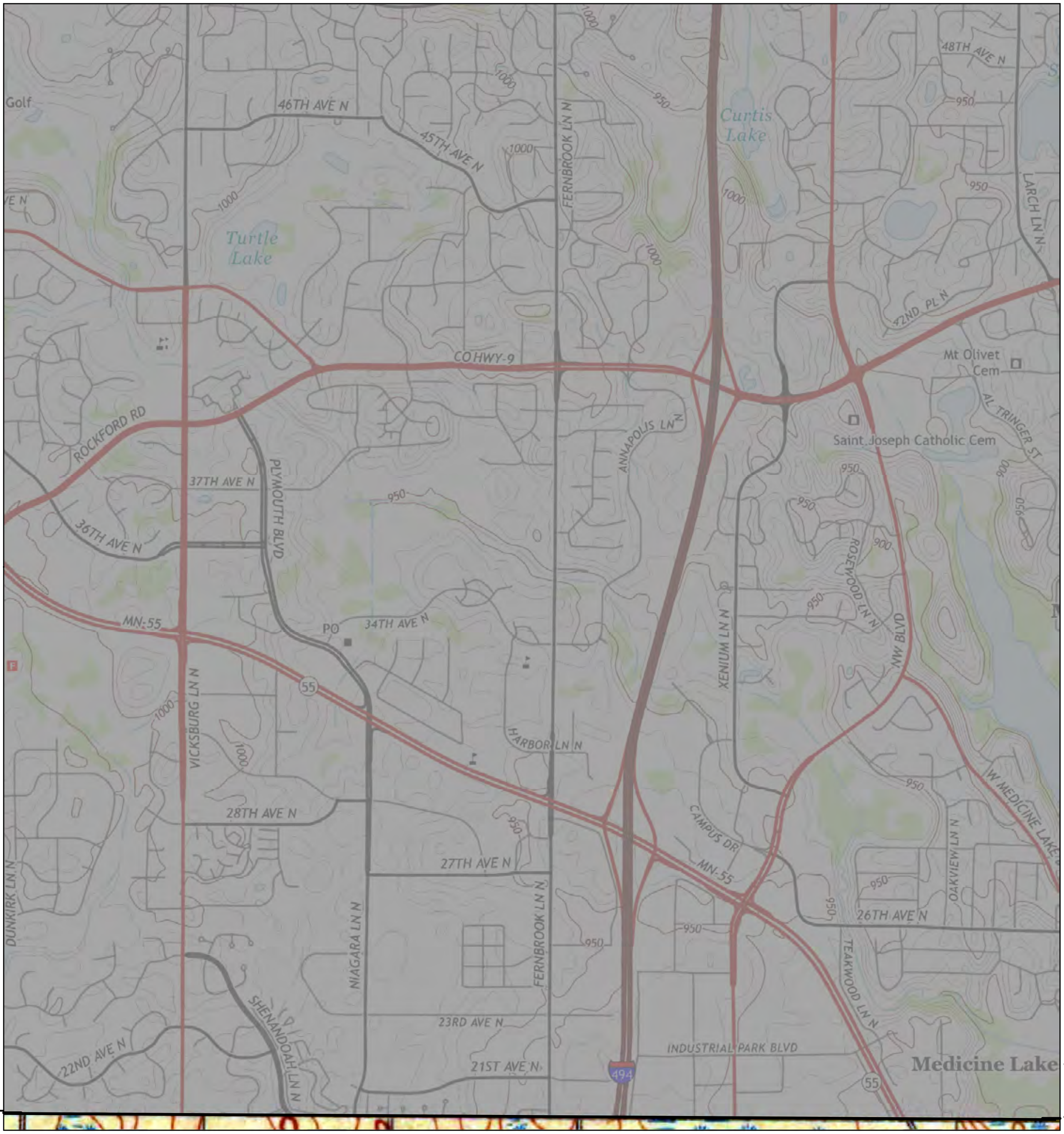
Plymouth, MN 55447

HIG

Unified maps show subdued modern topo features where corresponding maps of the same year were not published.

Barr Engineering project #23270051.36
HIG #1521115 completed: 09/14/2015

Zone	Topographic Map Name	Publisher	Map Size	Base Map	Aerial Photo Topo Updates: Photo Year	Inspected	Revised
North	Anoka, MN	USGS	15' x 15'	1902	--	--	--



1901

0 Distance in Miles 1

1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N

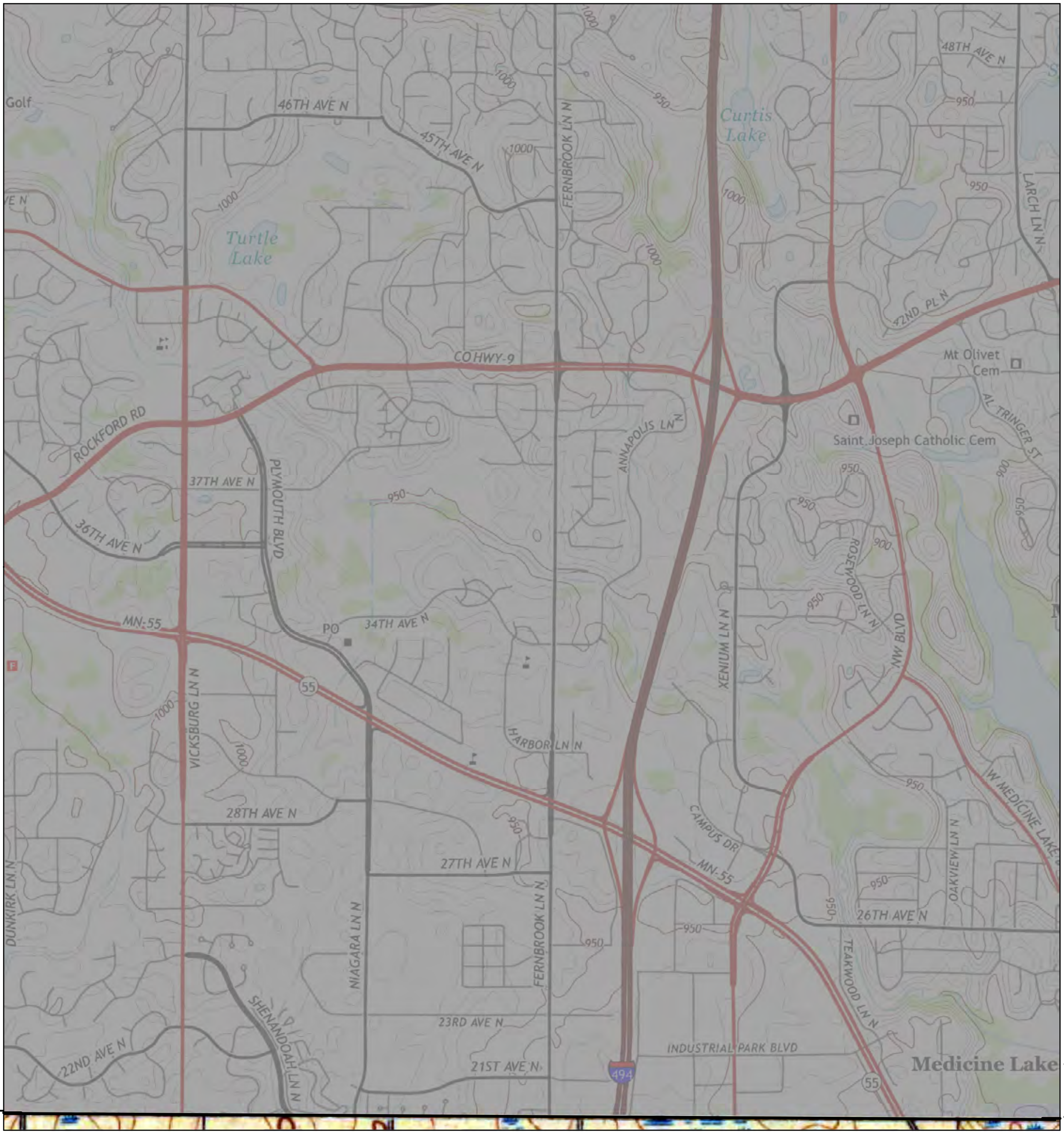
Site information:
Plymouth Creek Feaibility

Plymouth, MN 55447

Unified maps show subdued modern topo features where corresponding maps of the same year were not published.

Barr Engineering project #23270051.36
HIG #1521115 completed: 09/14/2015

Zone	Topographic Map Name	Publisher	Map Size	Base Map	Aerial Photo Topo Updates: Photo Year	Inspected	Revised
South	Minneapolis, MN	USGS	15' x 15'	1901	--	--	--



1896	0 Distance in Miles 1 1: 24,000 (1"=2,000') NAD 1983 UTM Zone 15N	Site information: Plymouth Creek Feaibility Plymouth, MN 55447
Unified maps show subdued modern topo features where corresponding maps of the same year were not published.		Barr Engineering project #23270051.36 HIG #1521115 completed: 09/14/2015

Zone	Topographic Map Name	Publisher	Map Size	Base Map	Aerial Photo Topo Updates Photo Year	Inspected	Revised
South	Minneapolis, MN	USGS	15' x 15'	1896	--	--	--

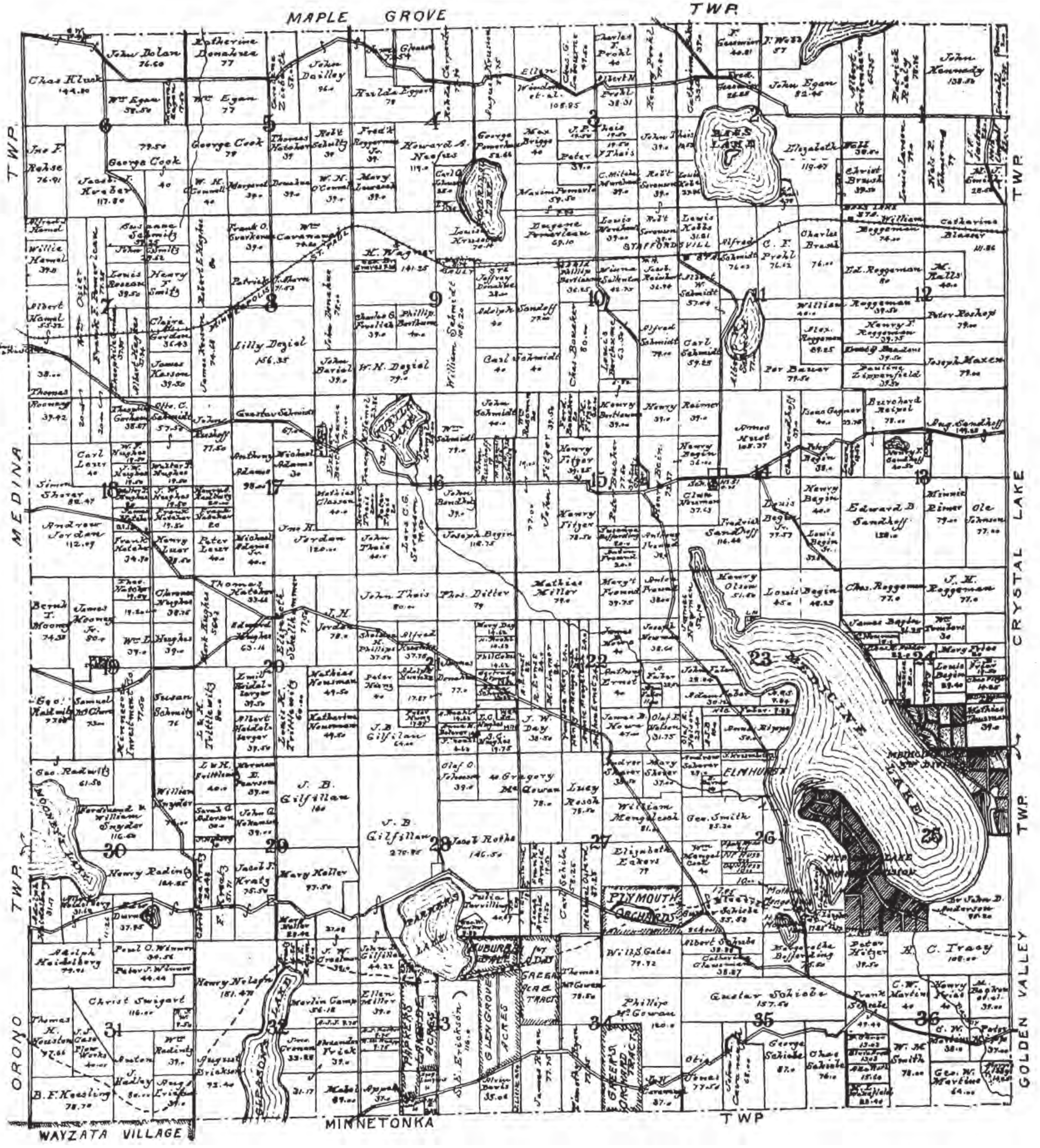
Historical Maps


MAP OF
PLYMOUTH
TOWNSHIP
Scale 2 inches to one Mile
Township 118 North
Range 22 West of the 5th P.M.
HENNEPIN COUNTY
MINNESOTA.
REFERENCES:
Rail Road
School
Wagon Road
Church
Farm Line
Houses
Creek
Cem.
School Districts
MAPLE GROVE TWP.
MEDINA TWP.
ORONO TWP.
MINNETONKA TWP.
LAKE TWP.
CRYSTAL
GOLDEN VALLEY TWP.
MEDICINE LAKE
MEDICINE LAKE PARK
ELMHURST
STAFFORDSVILLE
BASS LAKE
PARKERS LAKE
GLEASON LAKE
ROBBINSDALE
HAMEL
WAYZATA
HOPKINS
SUBURBAN DALE
GREEN ACRE TRACTS
GLEN GROVE ACRES
PARKE'S LAKESIDE ACRES
120
47
123
51
10
95
48
20
27
23

PLAT OF PLYMOUTH

TOWNSHIP 118 N. RANGE 22 W. 5TH P.M.

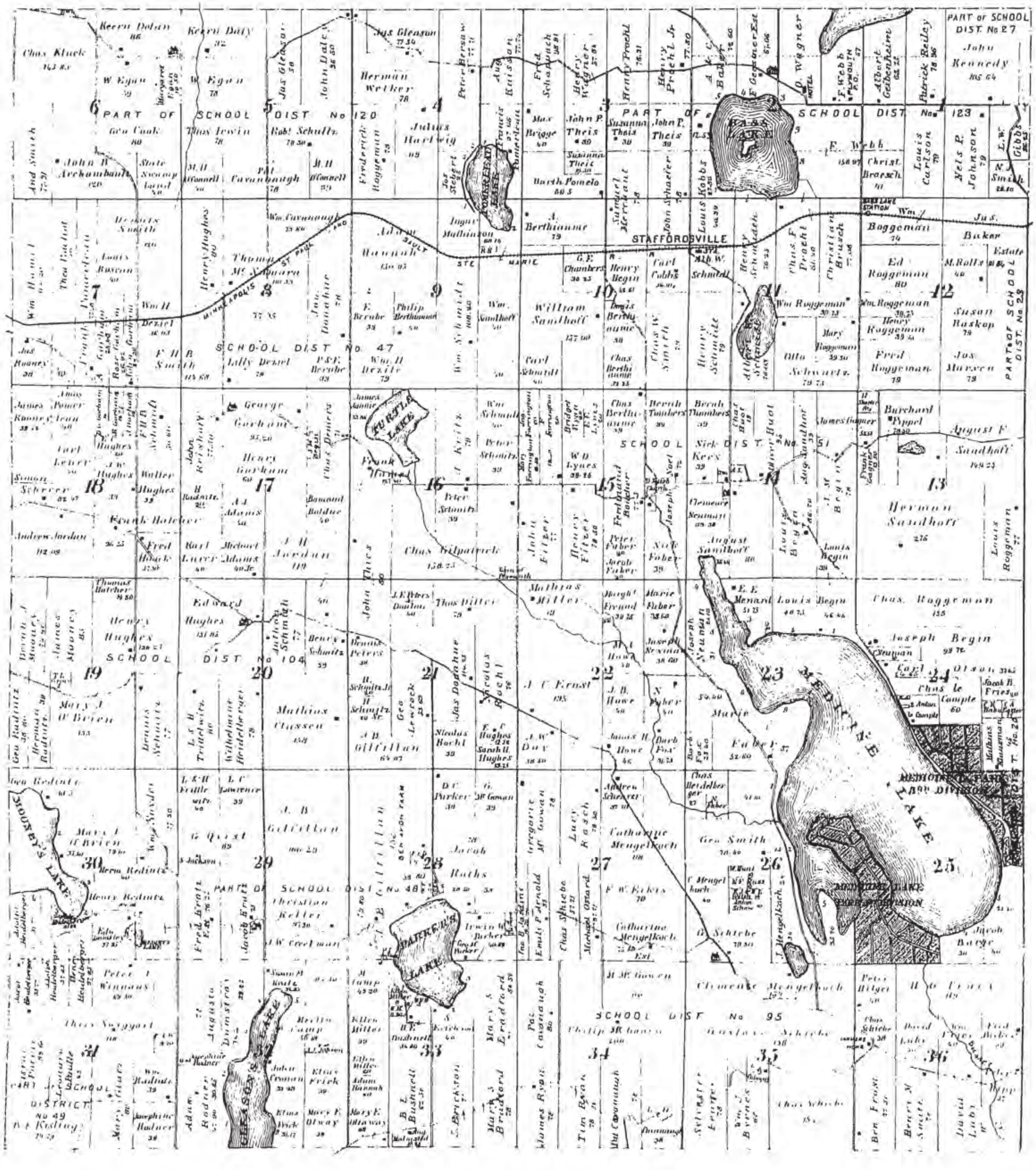
Scale



PLAT OF PLYMOUTH

TOWNSHIP 118 N RANGE 22 W. 5th P. M.

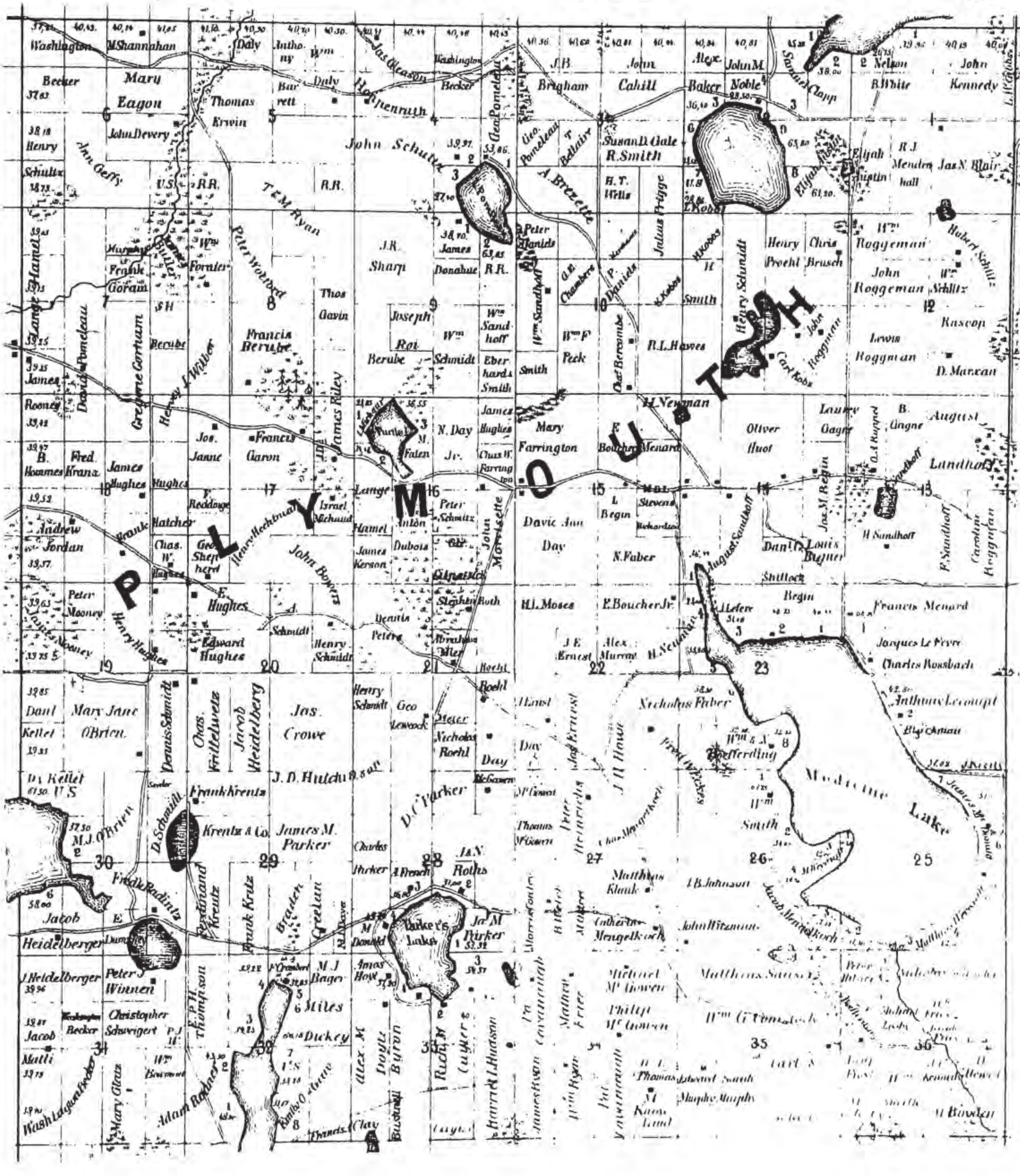
Scale 2 inches to the mile



Atlas of Hennepin County, GBW Wright & GJ Rice, Pubs, 1873

T. 118 R. 22

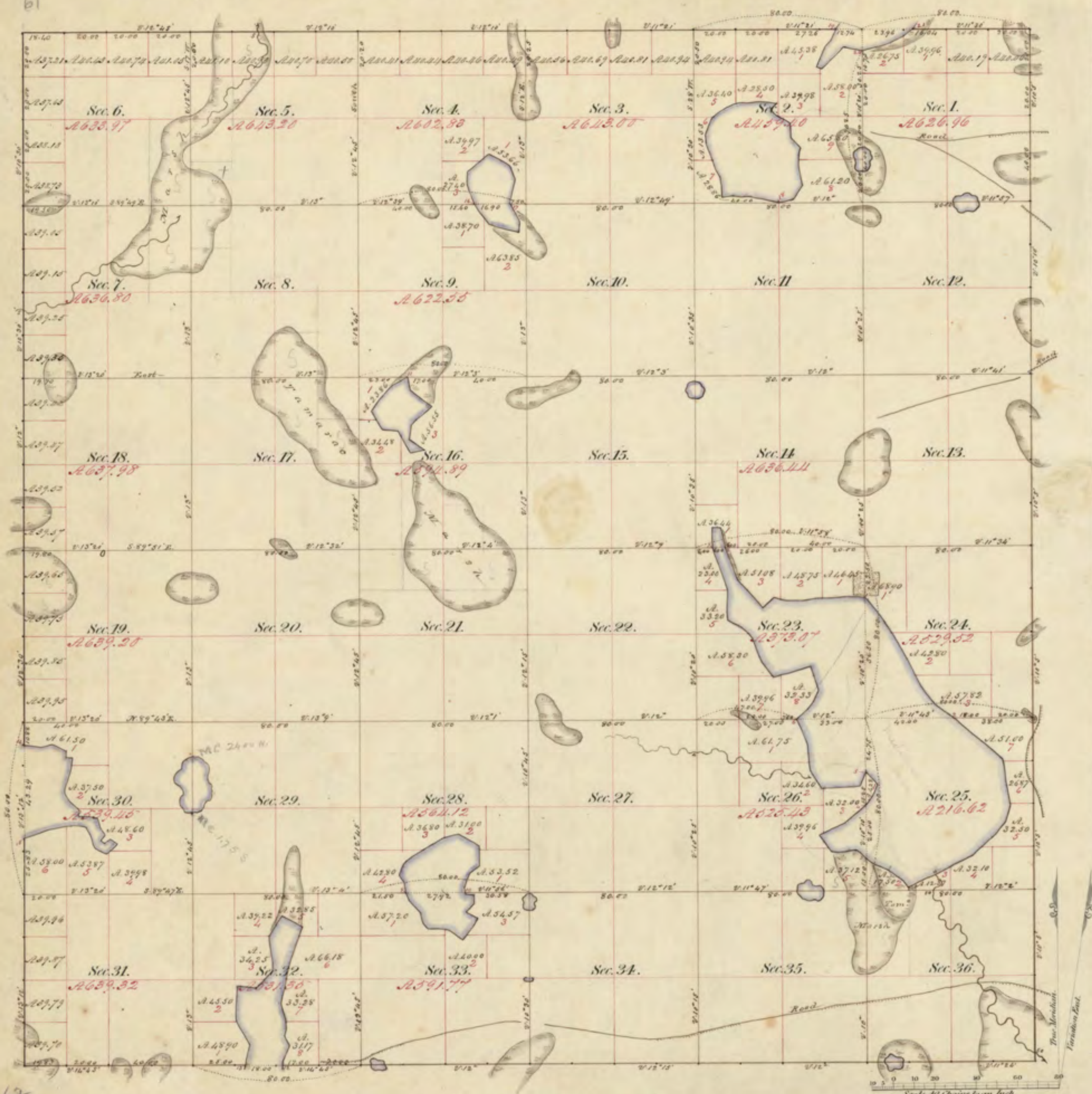
19.



1856

Township No. 118 N., Range No. 22 West of the 5th Mer.

61 63



62

Total number of Acres 21487.87

Meanders of Lakes

Posts	Courses	Ch. Lk.
Lake in Sections 14, 23, 24, 25 and 26		
1	S.39–E.	14.00
	S.31–E.	13.00
	S.26–E.	15.00
	S.37–E.	14.00
2	S.56–E.	9.44
	S.53–E.	18.00
	S.44–E.	12.00
	S.10–E.	22.00
	S.17–W.	7.00
	S.35–W.	8.00
	S.50–W.	16.00
	S.66–W.	13.00
	S.70–W.	5.00
	S.60–W.	10.00
	N.42–W.	5.00
	N.54–W.	7.00
	N.62–W.	11.00
3	N.51–W.	1.63
	N.33–W.	3.00
	N.52–W.	3.00
	S.84–W.	10.00
	N.86–W.	3.00
	N.35–W.	9.00
	N.64–E.	13.00
4	N.52–E.	14.00
	N.35–E.	6.00
	N.24–E.	5.00
5	N.42½–W.	7.20
	S.20–W.	7.00
	S.86–W.	18.00
	N.33–W.	10.00
	N.5–W.	9.00
	N.21–W.	14.00
6	N.30–W.	2.00
	N.44–E.	7.00
	N.37–E.	5.00
	N.26–E.	6.00
	N.17–W.	11.00
	S.75–W.	18.00
	N.47–W.	9.00
	N.21–W.	15.00
	N.42–W.	4.00
	S.63–W.	8.00
	North	14.00
7	N.19–W.	21.00
	North	9.00
	East	4.00
8	S.12½–E.	9.30
	S.20–E.	16.00
	S.42–E.	11.00
	N.47–E.	8.00
	S.73–E.	5.00
	East	11.00
	N.78–E.	4.00
	N.87–E.	14.00
1	S.86–E.	8.98

Posts	Courses	Ch. Lk.
Lake in Secs. 28 & 33		
9	N.18–W.	5.00
	N.32–W.	4.00
	N.21–E.	5.00
	N.47–E.	6.00
	N.61–E.	17.00
	N.77–E.	8.00
	S.61–E.	11.00
	South	9.00
	S.52–W.	7.00
	S.20–W.	7.00
10	S.10–E.	2.00
	S.21–E.	1.00
	S.82–E.	4.00
	South	4.00
	S.47–W.	5.00
	S.62–E.	6.00
	S.28–W.	5.00
	S.39–W.	8.00
	N.55–W.	8.00
	N.83–W.	5.00
	S.88–W.	4.00
	N.40–W.	5.00
	N.16–W.	5.00
	N.46–W.	8.00
9	N.19–W.	3.47
Lake in Section 16		
11	S.61½–W.	8.00
	S.37½–W.	16.00
	S.33–E.	10.00
	S.86½–E.	7.50
	S.30–E.	11.00
	N.78½–E.	7.00
	N.58–W.	8.50
	N.7½–E.	7.00
	N.43–E.	5.00
	N.49–E.	8.00
	N.53½–W.	12.00
11	N.13½–W.	6.40
Lake in Section 32		
12	North	2.00
	N.23–E.	7.50
	N.25–W.	5.00
	N.14–E.	2.50
	N.4–W.	4.50
	N.17–W.	7.00
	N.12–E.	19.00
	N.14–E.	19.00
	N.63–W.	9.00
	S.32–W.	12.00
	S.9–E.	12.00
	S.7–W.	4.00
	S.45–W.	10.00
	N.86–W.	10.00
	S.3–W.	16.00
	S.28–E.	14.00
13	S.12–W.	8.35
Lake in Section 30		
14	S.85–E.	8.00
	N.75–E.	5.00

Posts	Courses	Ch. Lk.
	S.65–E.	8.00
	South	3.00
	East	3.00
	S.8–W.	5.00
	S.18–W.	9.00
	S.11–W.	3.00
	S.31–E.	4.00
	S.49–E.	6.00
	South	3.50
	East	5.00
	S.79–E.	4.00
	S.16–E.	5.00
	S.34–E.	4.00
	S.36–W.	3.50
	S.55–E.	2.50
	N.53–E.	3.00
	S.60–E.	4.00
	S.46–W.	6.00
	N.73–W.	4.00
	N.65–W.	2.00
	N.32–W.	3.00
	N.14–W.	3.00
	N.27–W.	5.00
	N.72–W.	2.50
	N.88–E.	5.00
	S.80–W.	10.00
15	S.72–W.	13.00
Lake in Secs. 4 & 9.		
16	N.20–W.	9.00
	North	7.00
	N.34–E.	13.00
	S.62–E.	8.00
	S.22–E.	12.00
17	S.12–W.	8.28
	S.28–E.	9.00
	South	5.00
	N.75–W.	15.00
16	N.36–W.	11.29
Lake in Section 2		
18	N.81–W.	13.50
	West	4.00
	N.83–W.	4.00
	S.83½–W.	5.00
	N.4–W.	9.00
	N.28–W.	8.00
	N.20–W.	11.00
	N.½–W.	4.00
	N.26–E.	8.00
	N.50–E.	4.00
	N.64–E.	7.50
	N.77–E.	4.00
	S.83–E.	4.50
	N.70½–E.	5.00
	S.83–E.	8.00
	S.52–W.	3.30
	S.27–E.	3.00
	S.59½–E.	8.00
	S.24–E.	7.50
	S.43–E.	7.50
	S.18–W.	3.00
	S.8–W.	2.50
	S.2–W.	4.00
	S.10½–E.	6.00
	S.36–W.	8.00
18	S.83–W.	6.50
Lake in Secs. 1 & 2.		
19	S.26–W.	5.50
	S.43–W.	2.50
	S.24–W.	11.00
	S.73–E.	3.00
	N.49–E.	14.00
20	S.74–E.	9.00
	N.75–E.	15.00
	N.60½–E.	8.50
21	N.54–E.	2.30
Total	M. 18 Ch. 21	Lks. 47

Surveys Designated.	By Whom Surveyed.	Date of Contract.	Amount of Surveys M. Ch. Lk.	When Surveyed.	When Changed in the Sur. Gen.'s Acc.
Township lines.	John Ryan	July 10th 1854	23 . 78 . 23	May 1855	
Subdivisions.	Hardin Nowlin	June 9th 1855	75 - 20 - 20	August 1855	

The above Map of Township No. 118 N., of Range No. 22 West, 5th Principal Meridian, Minnesota, is strictly conformable to the field notes of the survey thereof on file in this Office, which have been examined and approved.

Surveyor General's Office
Dubuque, March 18th 1856

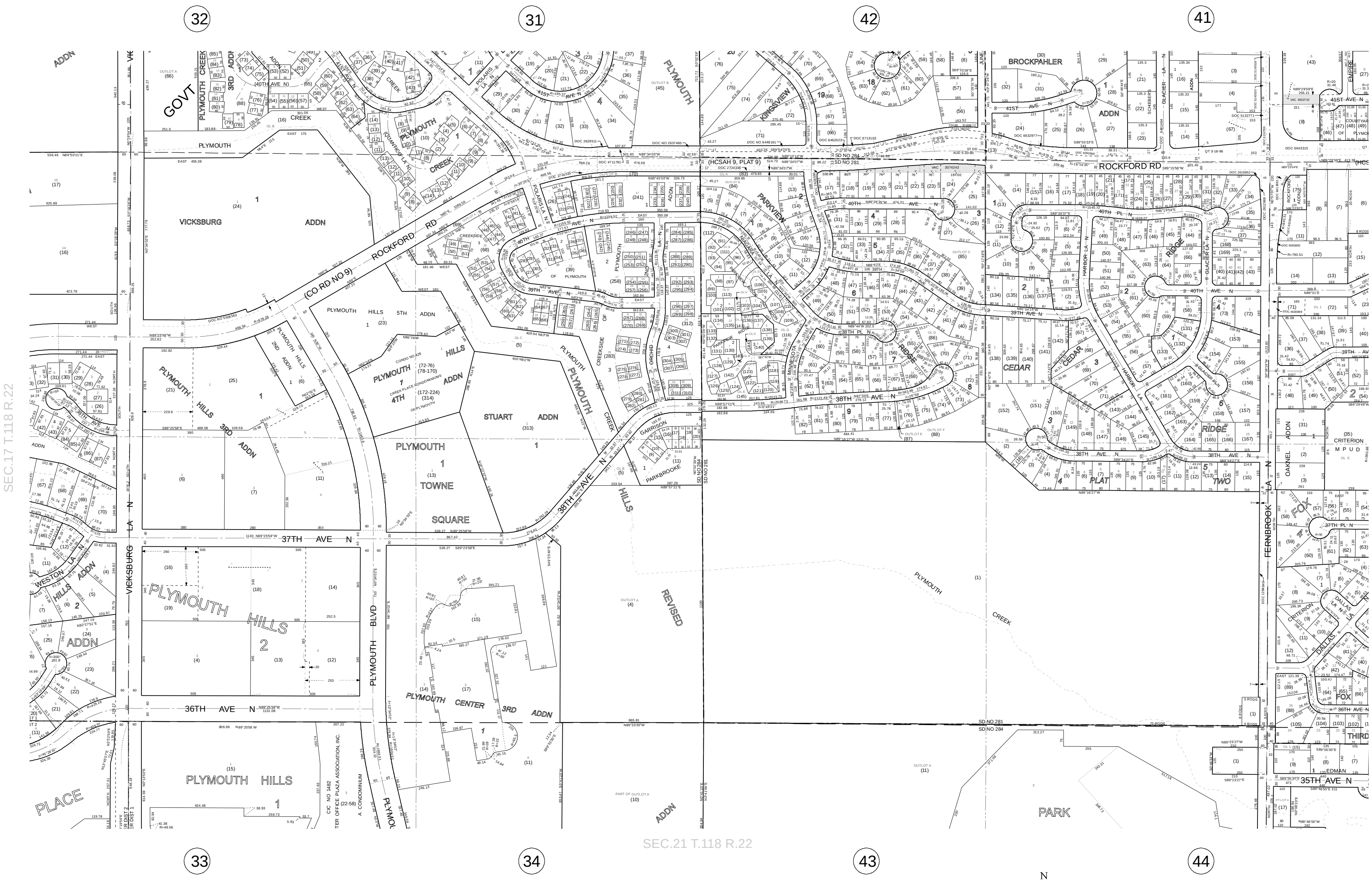
Warner Lewis
Sur. Genl.

63½

Plat Maps

Prepared by:
Hennepin County, Minnesota
Taxpayer Services Department
Survey Division

S1/2 SEC.16 T.118 R.22



0 200 400 600 Feet

LEGEND
STORM SEWER DISTRICT BOUNDARY
SCHOOL DISTRICT BOUNDARY
WATERSHED DISTRICT BOUNDARY
TAX INCREMENT DISTRICT BOUNDARY
MUNICIPAL BOUNDARY

N

This map is a compilation of data from various sources and is furnished "AS IS" with no representation or warranty express or implied, including fitness for any particular purpose, merchantability, or the accuracy and completeness of the information shown.

Last Updated: Oct 2, 2013

Prepared by:
Hennepin County, Minnesota
Taxpayer Services Department
Survey Division

N1/2 SEC.22 T.118 R.22

This map is a compilation of data from various sources and is furnished "AS IS" with no representation or warranty express or implied, including fitness for any particular purpose, merchantability, or the accuracy and completeness of the information shown.

0 200 400 600 Feet

N

LEGEND
- STORM SEWER DISTRICT BOUNDARY
- SCHOOL DISTRICT BOUNDARY
- WATERSHED DISTRICT BOUNDARY
- TAX INCREMENT DISTRICT BOUNDARY
- MUNICIPAL BOUNDARY

Last Updated: Apr 25, 2013

Appendix D

Regulatory Records Documentation

(on CD)

Radius Report

[Satellite view]

Target Property:

Plymouth Creek Feaibility
Plymouth, Hennepin County, Minnesota 55446

Prepared For:

Historical Information Gatherers

Order #: 55910
Job #: 121201
Project #: 1521115
Date: 09/15/2015

Table of Contents

Target Property Summary

Plymouth Creek Feaibility
Plymouth, Hennepin County, Minnesota 55446

USGS Quadrangle: ***Osseo, MN***
Target Property Geometry: ***Area***

Target Property Longitude(s)/Latitude(s):
(-93.466315, 45.023113), (-93.465886, 45.022765), (-93.466380, 45.023356), (-93.466208, 45.023432), (-93.465950, 45.023280), (-93.465178, 45.022704), (-93.463826, 45.022097), (-93.463333, 45.022188), (-93.462839, 45.022006), (-93.462582, 45.021384), (-93.462110, 45.021263), (-93.461208, 45.020899), (-93.460715, 45.021157), (-93.460157, 45.021142), (-93.460007, 45.020793), (-93.459878, 45.020914), (-93.459127, 45.021020), (-93.458419, 45.020444), (-93.458784, 45.020247), (-93.459384, 45.020641), (-93.459942, 45.020383), (-93.460350, 45.020459), (-93.460522, 45.020808), (-93.460672, 45.020641), (-93.461509, 45.020626), (-93.462217, 45.021005), (-93.462775, 45.021081), (-93.463097, 45.021839), (-93.463440, 45.021915), (-93.463805, 45.021824), (-93.464191, 45.021885), (-93.465071, 45.022340), (-93.466315, 45.023113), (-93.466315, 45.023113)

County/Parish Covered:
Hennepin (MN)

Zipcode(s) Covered:
Minneapolis MN: 55441, 55442, 55446, 55447

State(s) Covered:
MN

****Target property is located in Radon Zone 1.***
Zone 1 areas have a predicted average indoor radon screening level greater than 4 pCi/L (picocuries per liter).

This report may have unlocatable records. Please see the Unlocatables Report, attached to this file.

Database Findings Summary

FEDERAL LISTING

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY SUBSYSTEM	AIRSAFS	0	0	TP/AP
BIENNIAL REPORTING SYSTEM	BRS	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
EPA DOCKET DATA	DOCKETS	0	0	TP/AP
FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES	EC	0	0	TP/AP
EMERGENCY RESPONSE NOTIFICATION SYSTEM	ERNSMN	0	0	TP/AP
FACILITY REGISTRY SYSTEM	FRSMN	0	0	TP/AP
HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM	HMIRSR05	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY DOCKETS)	ICIS	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	ICISNPDES	0	0	TP/AP
LAND USE CONTROL INFORMATION SYSTEM	LUCIS	0	0	TP/AP
MATERIAL LICENSING TRACKING SYSTEM	MLTS	0	0	TP/AP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	NPDESR05	0	0	TP/AP
PCB ACTIVITY DATABASE SYSTEM	PADS	0	0	TP/AP
PERMIT COMPLIANCE SYSTEM	PCSR05	0	0	TP/AP
RCRA SITES WITH CONTROLS	RCRASC	0	0	TP/AP
CERCLIS LIENS	SFLIENS	0	0	TP/AP
SECTION SEVEN TRACKING SYSTEM	SSTS	0	0	TP/AP
TOXICS RELEASE INVENTORY	TRI	0	0	TP/AP
TOXIC SUBSTANCE CONTROL ACT INVENTORY	TSCA	0	0	TP/AP
NO LONGER REGULATED RCRA GENERATOR FACILITIES	NLRRCRAG	0	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR FACILITIES	RCRAGR05	2	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - NON-GENERATOR FACILITIES	RCRANGR05	1	0	0.1250
HISTORICAL GAS STATIONS	HISTPST	0	0	0.2500
BROWNFIELDS MANAGEMENT SYSTEM	BF	0	0	0.5000
COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION & LIABILITY INFORMATION SYSTEM	CERCLIS	0	0	0.5000
DELISTED NATIONAL PRIORITIES LIST	DNPL	0	0	0.5000
NO FURTHER REMEDIAL ACTION PLANNED SITES	NFRAP	0	0	0.5000
NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES	NLRRCRAT	0	0	0.5000
OPEN DUMP INVENTORY	ODI	0	0	0.5000
RESOURCE CONSERVATION & RECOVERY ACT - TREATMENT, STORAGE & DISPOSAL FACILITIES	RCRAT	0	0	0.5000
DEPARTMENT OF DEFENSE SITES	DOD	0	0	1.0000

Database Findings Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
FORMERLY USED DEFENSE SITES	FUDS	0	0	1.0000
NO LONGER REGULATED RCRA CORRECTIVE ACTION FACILITIES	NLRRCRAC	0	0	1.0000
NATIONAL PRIORITIES LIST	NPL	0	0	1.0000
PROPOSED NATIONAL PRIORITIES LIST	PNPL	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE ACTION FACILITIES	RCRAC	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - SUBJECT TO CORRECTIVE ACTION FACILITIES	RCRASUBC	0	0	1.0000
RECORD OF DECISION SYSTEM	RODS	0	0	1.0000
SUB-TOTAL		3	0	

Database Findings Summary

STATE (MN) LISTING

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
PERMITTED AIR FACILITIES	AIRS	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
SITES WITH INSTITUTIONAL CONTROLS	IC	0	0	TP/AP
SPILLS LISTING	PCASPILLS	0	0	TP/AP
SOLID WASTE UTILIZATION PROJECTS	SWUP	0	0	TP/AP
TIER TWO FACILITY LISTING	TIERII	0	0	TP/AP
FEEDLOTS	FEEDLOT	0	0	0.1250
HAZARDOUS WASTE GENERATOR SITES	HWGS	2	0	0.1250
WATER DISCHARGE PERMITS	WDP	3	0	0.1250
BULK STORAGE PERMITS	BULKSTORAGE	0	0	0.2500
REGISTERED DRYCLEANING FACILITIES	CLEANERS	0	0	0.2500
REGISTERED STORAGE TANKS	UAST	0	0	0.2500
AGRICULTURAL SPILLS LISTING	AGSPILLS	0	0	0.5000
CONCENTRATED ANIMAL FEEDING OPERATIONS	CAFO	0	0	0.5000
CERCLIS SITES	CERCLIS	0	0	0.5000
CLOSED LANDFILLS	CLF	0	0	0.5000
AGRICULTURAL CONTINGENCY SITES	CONTINGENCIES	0	0	0.5000
HAZARDOUS WASTE TREATMENT STORAGE DISPOSAL SITES	HWSTSD	0	0	0.5000
REGISTERED LEAKING STORAGE TANKS	LUAST	3	0	0.5000
PETROLEUM BROWNFIELDS PROGRAM SITES	PBF	0	0	0.5000
PERMITTED BY RULE LANDFILLS	PBRLF	0	0	0.5000
POTENTIAL VOLUNTARY INVESTIGATION AND CLEANUP PROGRAM SITES	PVICP	0	0	0.5000
RECYCLING MARKETS DIRECTORY	RECYCLERS	0	0	0.5000
SITE RESPONSE SECTION DATABASE	SRS	0	0	0.5000
OPEN SOLID WASTE FACILITIES	SWF	0	0	0.5000
UNPERMITTED DUMP SITES	UNPERMDUMPS	1	0	0.5000
VOLUNTARY INVESTIGATION AND CLEANUP PROGRAM SITES	VICP	0	0	0.5000
CONTAMINATED SOIL TREATMENT FACILITIES	CSTF	0	0	1.0000
HAZARDOUS WASTE CLEANUP SITES	HWCS	0	0	1.0000
STATE ASSESSMENT SITES	SAS	4	0	1.0000
SUPERFUND SITE INFORMATION LISTING	SF	0	0	1.0000
SUB-TOTAL		13	0	

Database Findings Summary

TRIBAL LISTING

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	USTR05	0	0	0.2500
LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	LUSTR05	0	0	0.5000
OPEN DUMP INVENTORY ON TRIBAL LANDS	ODINDIAN	0	0	0.5000
INDIAN RESERVATIONS	INDIANRES	0	0	1.0000
SUB-TOTAL		0	0	
TOTAL		16	0	

Locatable Database Findings

FEDERAL LISTING

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRSAFS	0.0200		NS	NS	NS	NS	NS	0
BRS	0.0200		NS	NS	NS	NS	NS	0
CDL	0.0200		NS	NS	NS	NS	NS	0
DOCKETS	0.0200		NS	NS	NS	NS	NS	0
EC	0.0200		NS	NS	NS	NS	NS	0
ERNSMN	0.0200		NS	NS	NS	NS	NS	0
FRSMN	0.0200		NS	NS	NS	NS	NS	0
HMIRSR05	0.0200		NS	NS	NS	NS	NS	0
ICIS	0.0200		NS	NS	NS	NS	NS	0
ICISNPDES	0.0200		NS	NS	NS	NS	NS	0
LUCIS	0.0200		NS	NS	NS	NS	NS	0
MLTS	0.0200		NS	NS	NS	NS	NS	0
NPDESR05	0.0200		NS	NS	NS	NS	NS	0
PADS	0.0200		NS	NS	NS	NS	NS	0
PCSR05	0.0200		NS	NS	NS	NS	NS	0
RCRASC	0.0200		NS	NS	NS	NS	NS	0
SFLIENS	0.0200		NS	NS	NS	NS	NS	0
SSTS	0.0200		NS	NS	NS	NS	NS	0
TRI	0.0200		NS	NS	NS	NS	NS	0
TSCA	0.0200		NS	NS	NS	NS	NS	0
NLRRCRAG	0.1250		0	NS	NS	NS	NS	0
RCRAGR05	0.1250		2	NS	NS	NS	NS	2
RCRANGR05	0.1250		1	NS	NS	NS	NS	1
HISTPST	0.2500		0	0	NS	NS	NS	0
BF	0.5000		0	0	0	NS	NS	0
CERCLIS	0.5000		0	0	0	NS	NS	0
DNPL	0.5000		0	0	0	NS	NS	0
NFRAP	0.5000		0	0	0	NS	NS	0
NLRRCRAT	0.5000		0	0	0	NS	NS	0
ODI	0.5000		0	0	0	NS	NS	0
RCRAT	0.5000		0	0	0	NS	NS	0
DOD	1.0000		0	0	0	0	NS	0
FUDS	1.0000		0	0	0	0	NS	0
NLRRCRAC	1.0000		0	0	0	0	NS	0
NPL	1.0000		0	0	0	0	NS	0
PNPL	1.0000		0	0	0	0	NS	0

Locatable Database Findings

Acronym	*Search Radius (miles)*	*TP/AP (0 - 0.02)*	*1/8 Mile (> TP/AP)*	*1/4 Mile (> 1/8)*	*1/2 Mile (> 1/4)*	*1 Mile (> 1/2)*	*> 1 Mile*	*Total*
RCRAC	*1.0000*		*0*	*0*	*0*	*0*	*NS*	*0*
RCRASUBC	*1.0000*		*0*	*0*	*0*	*0*	*NS*	*0*
RODS	*1.0000*		*0*	*0*	*0*	*0*	*NS*	*0*
SUB-TOTAL			*3*	*0*	*0*	*0*	*0*	*3*

STATE (MN) LISTING

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRS	0.0200		NS	NS	NS	NS	NS	0
CDL	0.0200		NS	NS	NS	NS	NS	0
IC	0.0200		NS	NS	NS	NS	NS	0
PCASPILLS	0.0200		NS	NS	NS	NS	NS	0
SWUP	0.0200		NS	NS	NS	NS	NS	0
TIERII	0.0200		NS	NS	NS	NS	NS	0
FEEDLOT	0.1250		0	NS	NS	NS	NS	0
HWGS	0.1250		2	NS	NS	NS	NS	2
WDP	0.1250		3	NS	NS	NS	NS	3
BULKSTORAGE	0.2500		0	0	NS	NS	NS	0
CLEANERS	0.2500		0	0	NS	NS	NS	0
UAST	0.2500		0	0	NS	NS	NS	0
AGSPILLS	0.5000		0	0	0	NS	NS	0
CAFO	0.5000		0	0	0	NS	NS	0
CERCLIS	0.5000		0	0	0	NS	NS	0
CLF	0.5000		0	0	0	NS	NS	0
CONTINGENCIES	0.5000		0	0	0	NS	NS	0
HWSTSD	0.5000		0	0	0	NS	NS	0
LUAST	0.5000		1	1	1	NS	NS	3
PBF	0.5000		0	0	0	NS	NS	0
PBRLF	0.5000		0	0	0	NS	NS	0
PVICP	0.5000		0	0	0	NS	NS	0
RECYCLERS	0.5000		0	0	0	NS	NS	0
SRS	0.5000		0	0	0	NS	NS	0
SWF	0.5000		0	0	0	NS	NS	0
UNPERMDUMPS	0.5000		0	0	1	NS	NS	1
VICP	0.5000		0	0	0	NS	NS	0
CSTF	1.0000		0	0	0	0	NS	0
HWCS	1.0000		0	0	0	0	NS	0
SAS	1.0000		0	0	1	3	NS	4
SF	1.0000		0	0	0	0	NS	0

SUB-TOTAL			6	1	3	3	0	13

Locatable Database Findings

TRIBAL LISTING

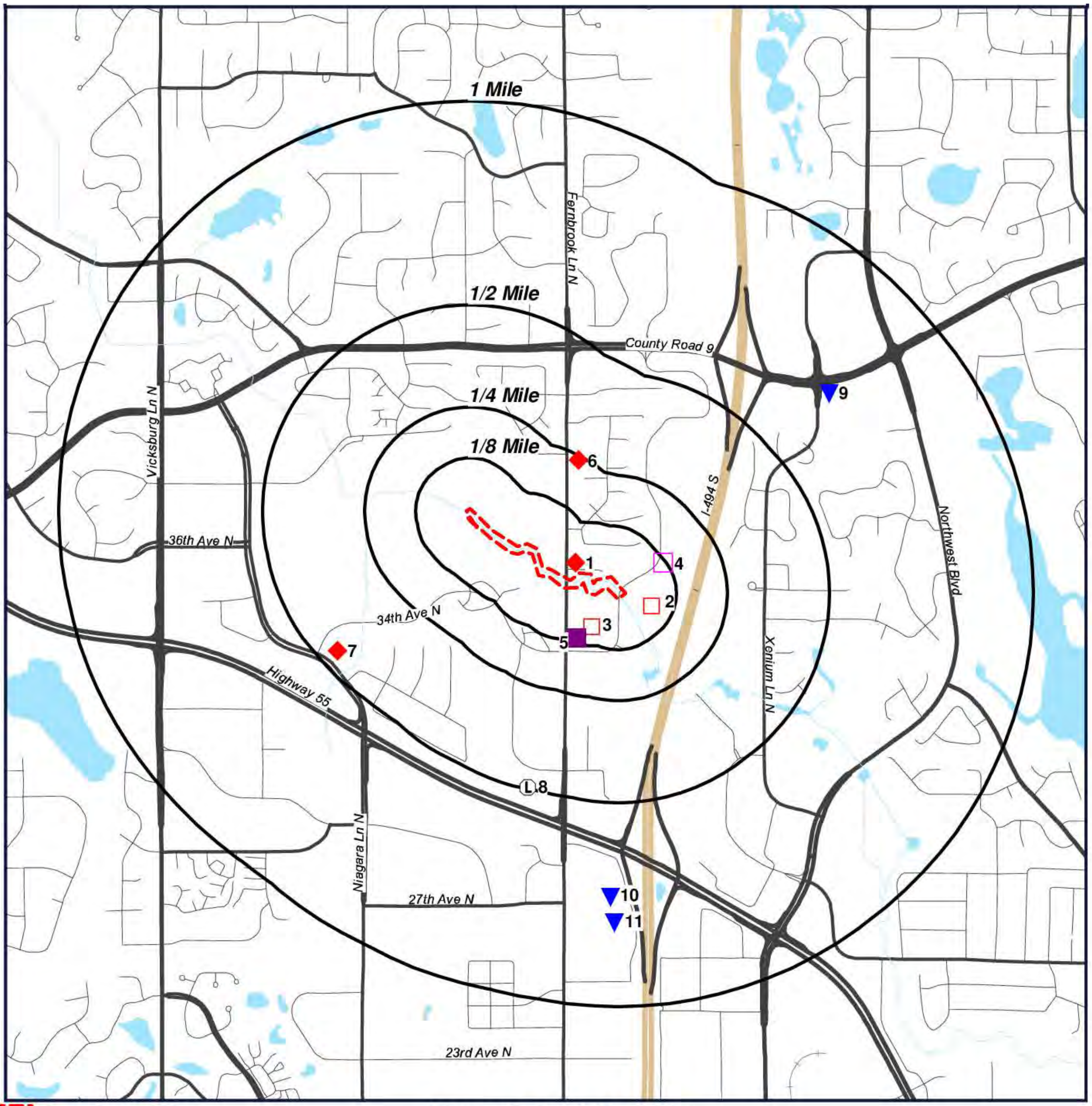
Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
USTR05	0.2500		0	0	NS	NS	NS	0
LUSTR05	0.5000		0	0	0	NS	NS	0
ODINDIAN	0.5000		0	0	0	NS	NS	0
INDIANRES	1.0000		0	0	0	0	NS	0

SUB-TOTAL			0	0	0	0	0	0

TOTAL		0	9	1	3	3	0	16

NOTES:
NS = NOT SEARCHED
TP/AP = TARGET PROPERTY/ADJACENT PROPERTY

Radius Map 1



Target Property (TP)
LUAST
RCRAGR05
RCRANGR05
WDP
UNPERMDUMPS
SAS

Plymouth Creek Feaibility
Plymouth, Minnesota
55446

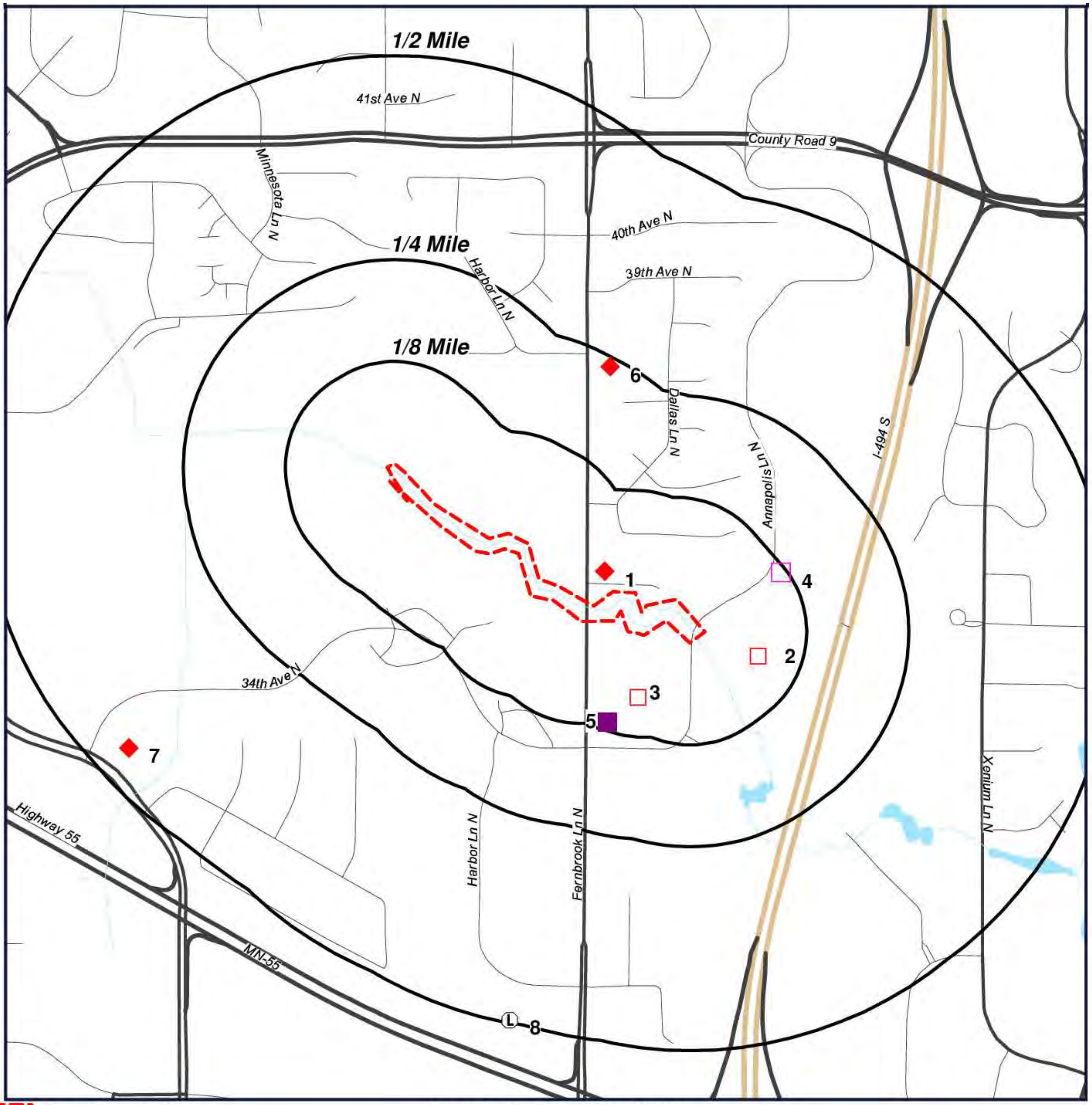
N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

[Click here to access Satellite view]

GeoSearch www.geo-search.com 888-396-0042

Radius Map 2



Target Property (TP)
LUAST
RCRAGR05
RCRANGR05
WDP
UNPERMDUMPS
SAS

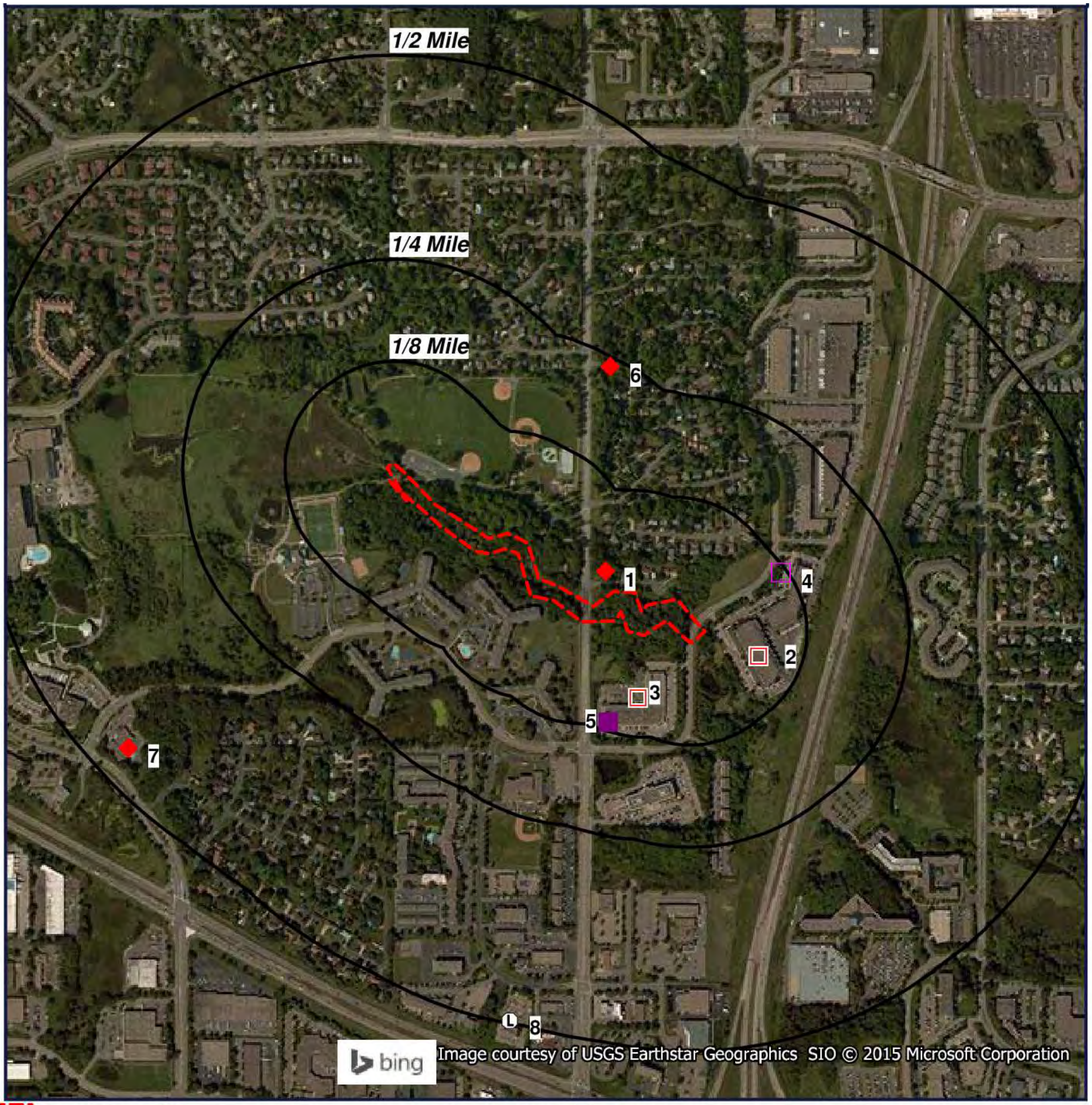
Plymouth Creek Feaibility
Plymouth, Minnesota
55446

N W E S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

[Click here to access Satellite view]

Ortho Map



Target Property (TP)
LUAST
RCRAGR05
RCRANGR05
WDP
UNPERMDUMPS
SAS

Quadrangle(s): Osseo
Plymouth Creek Feaibility
Plymouth, Minnesota
55446

N W E S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

[Click here to access Satellite view]

Topographic Map

Target Property (TP)

Quadrangle(s): Osseo
Source: USGS, 08/22/2013
Plymouth Creek Feaibility
Plymouth, Minnesota
55446

N W E S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Click here to access Satellite view

Report Summary of Locatable Sites

Map ID#	Database Name	Site ID#	Distance From Site	Site Name	Address	City, Zip Code	PAGE #
1	LUAST	5358LUAST	0.03 SE	DENNIS JOHNSON PROPERTY	3540 FERNBROOK AVE N	PLYMOUTH, 55441	15
2	WDP	273015	0.08 SE	SAUER-DANFOSS CO	3500 ANNAPOLIS LN N	PLYMOUTH, 55447	16
2	RCRAGR05	MNR000041293	0.08 SE	SAUER-DANFOSS CO	3500 ANNAPOLIS LN N	PLYMOUTH, 55447	17
2	HWGS	MNR000041293	0.08 SE	SAUER-DANFOSS CO	3500 ANNAPOLIS LN N	PLYMOUTH, 55447	19
3	RCRAGR05	MNS000150847	0.08 SE	KIPS BAY MEDICAL INC	3405 ANNAPOLIS LN STE 200	MINNEAPOLIS, 55447	20
3	HWGS	MNS000150847	0.08 SE	KIPS BAY MEDICAL INC	3405 ANNAPOLIS LN STE 200	MINNEAPOLIS, 55447	22
4	RCRANGR05	MND985667682	0.12 E	TRAMMELL CROW CO	3550 ANNAPOLIS LN	PLYMOUTH, 55441	23
4	WDP	69261661	0.12 E	FLUKE THERMOGRAPHY	3550 ANNAPOLIS LN N 70	PLYMOUTH, 55447	25
5	WDP	12977	0.12 SE	PLYMOUTH BUSINESS CENTER 5TH ADD	NE QUAD OF FERNBROOK LN & 34TH AVE	PLYMOUTH, 55447	26
6	LUAST	5859LUAST	0.25 NE	CHARLOTTE BECK RESIDENCE	3800 FERNBROOK LN	PLYMOUTH, 55447	27
7	LUAST	3973LUAST	0.47 SW	US POSTAL SERVICE/PLYMOUTH BRANCH	3300 PLYMOUTH BLVD	MINNEAPOLIS, 55447	28
8	UNPERMDUMPS	173449UDS	0.5 S	ST. LOUIS PARK MUNICIPAL DUMP	SEE LOCATION DESCRIPTION	ST. LOUIS PARK, 55426	29
8	SAS	173449SAS	0.5 S	ST. LOUIS PARK MUNICIPAL DUMP		ST. LOUIS PARK, 55426	30
9	SAS	67321189SAS	0.71 E	ANCHOR BANK - PLYMOUTH	3950 VINEWOOD LN N	PLYMOUTH, 55441	31
10	SAS	71778SAS	0.74 S	TEMROC METALS INC	2735 CHESHIRE LN N	PLYMOUTH, 55447	32
11	SAS	907SAS	0.8 S	AACRON INC	2705 CHESHIRE LN N	PLYMOUTH, 55447	33

Registered Leaking Storage Tanks (LUAST)

MAP ID# 1 **Distance from Property: 0.03 mi. SE**

SITE INFORMATION

GEOSEARCH ID: **5358LUAST**

LEAK ID: **5358**

NAME: **DENNIS JOHNSON PROPERTY**

ADDRESS: **3540 FERNBROOK AVE N**
PLYMOUTH, MN 55441

RELEASE DISCOVERED: **06/25/1992**

RELEASE REPORT: **06/25/1992**

CONDITIONAL CLOSURE DATE: **NOT REPORTED**

COMPLETE SITE CLOSURE DATE: **08/04/1992**

COMTAMINATED SOILS REMAINING: **NO**

OFFSITE COMTAMINATION: **UNKNOWN**

PRODUCT RELEASED: **FUEL OIL 1 & 2**

WEBSITE LINK:

http://cf.pca.state.mn.us/programs/lust_pResults2.cfm?leak=5358&pg=LS

GROUND WATER

DRINKING WATER CONTAMINATION: **NOT REPORTED**

FREE PRODUCT OBSERVED: **NO**

FREE PRODUCT THICKNESS: **NOT REPORTED**

GROUNDWATER CONTAMINATION: **NO**

CLEANUP ACTIONS

- NO CLEANUP ACTIONS REPORTED

INTEREST TYPE:	LAST UPDATE:
LEAK SITE	**11/10/2014**
DELETED LEAK SITE	**11/17/2006**

Back to Report Summary

Water Discharge Permits (WDP)

MAP ID# 2 **Distance from Property: 0.08 mi. SE**

FACILITY INFORMATION

SITE ID: **273015**

SITE NAME: **SAUER-DANFOSS CO**

ADDRESS: **3500 ANNAPOLIS LN N**
PLYMOUTH, MN 55447 HENNEPIN

PDF URL: **http://cf.pca.state.mn.us/wimn/siteInfo_print.cfm?siteid=273015**

FACILITY DETAILS

ID: **MNRNE33HP**

TYPE: **INDUSTRIAL STORMWATER PERMIT**

WATERSHED: **MISSISSIPPI RIVER - TWIN CITIES**

CURRENTLY ACTIVE: **YES**

INDUSTRY CLASSIFICATION: **NOT REPORTED**

Back to Report Summary

Resource Conservation & Recovery Act - Generator Facilities (RCRAGR05)

MAP ID# 2 **Distance from Property: 0.08 mi. SE**

FACILITY INFORMATION

EPA ID#: **MNR000041293**
NAME: **SAUER-DANFOSS CO**
ADDRESS: **3500 ANNAPOLIS LN N**
PLYMOUTH, MN 55447

OWNER TYPE: **NOT REPORTED**
OWNER NAME: **NOT REPORTED**
OPERATOR TYPE: **PRIVATE**
OPERATOR NAME: **SAUER-DANFOSS CO**

CONTACT NAME: **JOHN PACK**
CONTACT ADDRESS: **3500 ANNAPOLIS LN N**
PLYMOUTH MN 55447
CONTACT PHONE: **763-694-2144**
NON-NOTIFIER: **NOT A NON-NOTIFIER**
DATE RECEIVED BY AGENCY: **03/10/2008**

CERTIFICATION

CERTIFICATION NAME:	CERTIFICATION TITLE:	CERTIFICATION SIGNED DATE:
JOHN PACK	**EHS ADMINISTRATION**	**03/19/2008**
JOHN PACK	**EHS ADMINISTRATION**	**03/19/2007**
JOHN PACK	**EHS ADMINISTRATION**	**11/25/2002**
JOHN PACK	**EHS ADMINISTRATION**	**11/25/2002**
JOHN PACK	**EHS ADMINISTRATION**	**01/01/1985**
JOHN PACK	**EHS ADMINISTRATION**	**01/01/1985**

INDUSTRY CLASSIFICATION (NAICS)

335999 - ALL OTHER MISCELLANEOUS ELECTRICAL EQUIPMENT AND COMPONENT MANUFACTURING

SITE HISTORY (INCLUDES GENERATORS AND NON-GENERATORS)

DATE RECEIVED BY AGENCY: **03/10/2008**
NAME: **SAUER-DANFOSS CO**
GENERATOR CLASSIFICATION: **LARGE QUANTITY GENERATOR**

CURRENT ACTIVITY INFORMATION

GENERATOR STATUS: **CONDITIONALLY EXEMPT SMALL QUANTITY GENERATOR** LAST UPDATED DATE: **02/17/2010**
SUBJECT TO CORRECTIVE ACTION UNIVERSE: **NO**
TDSFs POTENTIALLY SUBJECT TO CORRECTIVE ACTION UNDER 3004 (u)/(v) UNIVERSE: **NO**
TDSFs ONLY SUBJECT TO CORRECTIVE ACTION UNDER DISCRETIONARY AUTHORITIES UNIVERSE: **NO**
NON TSDFs WHERE RCRA CORRECTIVE ACTION HAS BEEN IMPOSED UNIVERSE: **NO**
CORRECTIVE ACTION WORKLOAD UNIVERSE: **NO**

IMPORTER: **NO**
MIXED WASTE GENERATOR: **NO**
RECYCLER: **NO**
TRANSPORTER: **NO**
ONSITE BURNER EXEMPTION: **NO**
FURNACE EXEMPTION: **NO**
USED OIL REFINER: **NO**
USED OIL TRANSFER FACILITY: **NO**

UNDERGROUND INJECTION: **NO**
UNIVERSAL WASTE DESTINATION FACILITY: **NO**
TRANSFER FACILITY: **NO**
USED OIL FUEL BURNER: **NO**
USED OIL PROCESSOR: **NO**
USED OIL FUEL MARKETER TO BURNER: **NO**
SPECIFICATION USED OIL MARKETER: **NO**
USED OIL TRANSPORTER: **NO**

COMPLIANCE, MONITORING AND ENFORCEMENT INFORMATION

EVALUATIONS **- NO EVALUATIONS REPORTED -**

VIOLATIONS **- NO VIOLATIONS REPORTED -**

ENFORCEMENTS **- NO ENFORCEMENTS REPORTED -**

HAZARDOUS WASTE

D001	**IGNITABLE WASTE**
D008	**LEAD**
D009	**MERCURY**

UNIVERSAL WASTE **- NO UNIVERSAL WASTE REPORTED -**

CORRECTIVE ACTION AREA **- NO CORRECTIVE ACTION AREA INFORMATION REPORTED -**

CORRECTIVE ACTION EVENT **- NO CORRECTIVE ACTION EVENT REPORTED -**

Back to Report Summary

Hazardous Waste Generator Sites (HWGS)

MAP ID# 2 **Distance from Property: 0.08 mi. SE**

FACILITY INFORMATION

PREFERRED ID: **MNR000041293**

FACILITY NAME: **SAUER-DANFOSS CO**

ADDRESS: **3500 ANNAPOLIS LN N**
PLYMOUTH, MN 55447

CONTACT: **JOHN PACK**

PHONE: **763-694-2144**

MAILING INFORMATION

ADDRESS: **3500 ANNAPOLIS LN N**
PLYMOUTH, MN 55447

FACILITY DETAILS

WASTE ACTIVITY: **G8-GENERATION, VSQG**

Back to Report Summary

Resource Conservation & Recovery Act - Generator Facilities (RCRAGR05)

MAP ID# 3 **Distance from Property: 0.08 mi. SE**

FACILITY INFORMATION

EPA ID#: **MNS000150847**
NAME: **KIPS BAY MEDICAL INC**
ADDRESS: **3405 ANNAPOLIS LN STE 200**
MINNEAPOLIS, MN 55447

OWNER TYPE: **PRIVATE**
OWNER NAME: **KIPS BAY MEDICAL INC**
OPERATOR TYPE: **NOT REPORTED**
OPERATOR NAME: **NOT REPORTED**

CONTACT NAME: **SHARON ROSSI**
CONTACT ADDRESS: **3405 ANNAPOLIS LN STE 200**
MINNEAPOLIS MN 55447
CONTACT PHONE: **763-235-3540**
NON-NOTIFIER: **NOT A NON-NOTIFIER**
DATE RECEIVED BY AGENCY: **11/19/2009**

CERTIFICATION

CERTIFICATION NAME:	CERTIFICATION TITLE:	CERTIFICATION SIGNED DATE:
SHARON ROSSI	**AQ/RA MANAGER**	**11/19/2007**

INDUSTRY CLASSIFICATION (NAICS)

339112 - SURGICAL AND MEDICAL INSTRUMENT MANUFACTURING

SITE HISTORY (INCLUDES GENERATORS AND NON-GENERATORS)

DATE RECEIVED BY AGENCY: **11/19/2009**
NAME: **KIPS BAY MEDICAL INC**
GENERATOR CLASSIFICATION: **LARGE QUANTITY GENERATOR**

CURRENT ACTIVITY INFORMATION

GENERATOR STATUS: **CONDITIONALLY EXEMPT SMALL QUANTITY GENERATOR** LAST UPDATED DATE: **02/17/2010**
SUBJECT TO CORRECTIVE ACTION UNIVERSE: **NO**
TDSFs POTENTIALLY SUBJECT TO CORRECTIVE ACTION UNDER 3004 (u)/(v) UNIVERSE: **NO**
TDSFs ONLY SUBJECT TO CORRECTIVE ACTION UNDER DISCRETIONARY AUTHORITIES UNIVERSE: **NO**
NON TSDFs WHERE RCRA CORRECTIVE ACTION HAS BEEN IMPOSED UNIVERSE: **NO**
CORRECTIVE ACTION WORKLOAD UNIVERSE: **NO**

IMPORTER: **NO**
MIXED WASTE GENERATOR: **NO**
RECYCLER: **NO**
TRANSPORTER: **NO**
ONSITE BURNER EXEMPTION: **NO**
FURNACE EXEMPTION: **NO**
USED OIL REFINER: **NO**
USED OIL TRANSFER FACILITY: **NO**

UNDERGROUND INJECTION: **NO**
UNIVERSAL WASTE DESTINATION FACILITY: **NO**
TRANSFER FACILITY: **NO**
USED OIL FUEL BURNER: **NO**
USED OIL PROCESSOR: **NO**
USED OIL FUEL MARKETER TO BURNER: **NO**
SPECIFICATION USED OIL MARKETER: **NO**
USED OIL TRANSPORTER: **NO**

COMPLIANCE, MONITORING AND ENFORCEMENT INFORMATION

EVALUATIONS **- NO EVALUATIONS REPORTED -**

VIOLATIONS **- NO VIOLATIONS REPORTED -**

ENFORCEMENTS **- NO ENFORCEMENTS REPORTED -**

HAZARDOUS WASTE

- NO HAZARDOUS WASTE INFORMATION REPORTED -

UNIVERSAL WASTE **- NO UNIVERSAL WASTE REPORTED -**

CORRECTIVE ACTION AREA **- NO CORRECTIVE ACTION AREA INFORMATION REPORTED -**

CORRECTIVE ACTION EVENT **- NO CORRECTIVE ACTION EVENT REPORTED -**

Back to Report Summary

Hazardous Waste Generator Sites (HWGS)

MAP ID# 3 **Distance from Property: 0.08 mi. SE**

FACILITY INFORMATION

PREFERRED ID: **MNS000150847**

FACILITY NAME: **KIPS BAY MEDICAL INC**

ADDRESS: **3405 ANNAPOLIS LN STE 200**
MINNEAPOLIS, MN 55447

CONTACT: **SHARON ROSSI**

PHONE: **763-235-3540**

MAILING INFORMATION

ADDRESS: **3405 ANNAPOLIS LN STE 200**
MINNEAPOLIS, MN 55447

FACILITY DETAILS

WASTE ACTIVITY: **G8-GENERATION, VSQG**

Back to Report Summary

MAP ID# 4 **Distance from Property: 0.12 mi. E**

FACILITY INFORMATION

EPA ID#: **MND985667682**
NAME: **TRAMMELL CROW CO**
ADDRESS: **3550 ANNAPOLIS LN**
PLYMOUTH, MN 55441

OWNER TYPE: **PRIVATE**
OWNER NAME: **TRAMMELL CROW CO**
OPERATOR TYPE: **PRIVATE**
OPERATOR NAME: **NAME NOT REPORTED**

CONTACT NAME: **DAVID HARMONICK**
CONTACT ADDRESS: **8400 NORMANDALE LAKE BLVD 375**
BLOOMINGTON MN 55437
CONTACT PHONE: **612-921-2000**
NON-NOTIFIER: **NOT A NON-NOTIFIER**
DATE RECEIVED BY AGENCY: **09/14/2004**

CERTIFICATION **- NO CERTIFICATION REPORTED -**

INDUSTRY CLASSIFICATION (NAICS) **- NO NAICS INFORMATION REPORTED -**

SITE HISTORY (INCLUDES GENERATORS AND NON-GENERATORS)

DATE RECEIVED BY AGENCY: **09/14/2004**
NAME: **TRAMMELL CROW CO**
GENERATOR CLASSIFICATION: **NOT A GENERATOR**

DATE RECEIVED BY AGENCY: **10/24/1988**
NAME: **TRAMMELL CROW CO**
GENERATOR CLASSIFICATION: **NOT A GENERATOR**

CURRENT ACTIVITY INFORMATION

GENERATOR STATUS: **NOT A GENERATOR** LAST UPDATED DATE: **09/14/2004**
SUBJECT TO CORRECTIVE ACTION UNIVERSE: **NO**
TDSFs POTENTIALLY SUBJECT TO CORRECTIVE ACTION UNDER 3004 (u)/(v) UNIVERSE: **NO**
TDSFs ONLY SUBJECT TO CORRECTIVE ACTION UNDER DISCRETIONARY AUTHORITIES UNIVERSE: **NO**
NON TSDFs WHERE RCRA CORRECTIVE ACTION HAS BEEN IMPOSED UNIVERSE: **NO**
CORRECTIVE ACTION WORKLOAD UNIVERSE: **NO**

IMPORTER: **NO**
MIXED WASTE GENERATOR: **NO**
RECYCLER: **NO**
TRANSPORTER: **NO**
ONSITE BURNER EXEMPTION: **NO**
FURNACE EXEMPTION: **NO**
USED OIL REFINER: **NO**
USED OIL TRANSFER FACILITY: **NO**

UNDERGROUND INJECTION: **NO**
UNIVERSAL WASTE DESTINATION FACILITY: **NO**
TRANSFER FACILITY: **NO**
USED OIL FUEL BURNER: **NO**
USED OIL PROCESSOR: **NO**
USED OIL FUEL MARKETER TO BURNER: **NO**
SPECIFICATION USED OIL MARKETER: **NO**
USED OIL TRANSPORTER: **NO**

COMPLIANCE, MONITORING AND ENFORCEMENT INFORMATION

EVALUATIONS **- NO EVALUATIONS REPORTED -**

VIOLATIONS **- NO VIOLATIONS REPORTED -**

ENFORCEMENTS **- NO ENFORCEMENTS REPORTED -**

HAZARDOUS WASTE

D001 **IGNITABLE WASTE**

D001 **IGNITABLE WASTE**

UNIVERSAL WASTE **- NO UNIVERSAL WASTE REPORTED -**

CORRECTIVE ACTION AREA **- NO CORRECTIVE ACTION AREA INFORMATION REPORTED -**

CORRECTIVE ACTION EVENT **- NO CORRECTIVE ACTION EVENT REPORTED -**

Back to Report Summary

Water Discharge Permits (WDP)

MAP ID# 4 **Distance from Property: 0.12 mi. E**

FACILITY INFORMATION

SITE ID: **69261661**

SITE NAME: **FLUKE THERMOGRAPHY**

ADDRESS: **3550 ANNAPOLIS LN N 70**
PLYMOUTH, MN 55447 HENNEPIN

PDF URL: **http://cf.pca.state.mn.us/wimn/siteInfo_print.cfm?siteid=69261661**

FACILITY DETAILS

ID: **MNRNE389Y**

TYPE: **INDUSTRIAL STORMWATER PERMIT**

WATERSHED: **MISSISSIPPI RIVER - TWIN CITIES**

CURRENTLY ACTIVE: **YES**

INDUSTRY CLASSIFICATION: **NOT REPORTED**

Back to Report Summary

Water Discharge Permits (WDP)

MAP ID# 5 **Distance from Property: 0.12 mi. SE**

FACILITY INFORMATION

SITE ID: **12977**

SITE NAME: **PLYMOUTH BUSINESS CENTER 5TH ADD**

ADDRESS: **NE QUAD OF FERNBROOK LN & 34TH AVE**
PLYMOUTH, MN 55447 HENNEPIN

PDF URL: **http://cf.pca.state.mn.us/wimn/siteInfo_print.cfm?siteid=12977**

FACILITY DETAILS

ID: **C00005584**

TYPE: **CONSTRUCTION STORMWATER PERMIT**

WATERSHED: **MISSISSIPPI RIVER - TWIN CITIES**

CURRENTLY ACTIVE: **NO**

INDUSTRY CLASSIFICATION: **MOTOR VEHICLE PARTS, USED**

Back to Report Summary

MAP ID# 6 **Distance from Property: 0.25 mi. NE**

SITE INFORMATION

GEOSEARCH ID: **5859LUAST**

LEAK ID: **5859**

NAME: **CHARLOTTE BECK RESIDENCE**

ADDRESS: **3800 FERNBROOK LN**
PLYMOUTH, MN 55447

RELEASE DISCOVERED: **10/29/1992**

RELEASE REPORT: **10/29/1992**

CONDITIONAL CLOSURE DATE: **NOT REPORTED**

COMPLETE SITE CLOSURE DATE: **10/11/1993**

COMTAMINATED SOILS REMAINING: **YES**

OFFSITE COMTAMINATION: **UNKNOWN**

PRODUCT RELEASED: **FUEL OIL 1 & 2**

WEBSITE LINK:

http://cf.pca.state.mn.us/programs/lust_pResults2.cfm?leak=5859&pg=LS

GROUND WATER

DRINKING WATER CONTAMINATION: **NOT REPORTED**

FREE PRODUCT OBSERVED: **NO**

FREE PRODUCT THICKNESS: **NOT REPORTED**

GROUNDWATER CONTAMINATION: **NO**

CLEANUP ACTIONS

- NO CLEANUP ACTIONS REPORTED

INTEREST TYPE:	LAST UPDATE:
LEAK SITE	**11/10/2014**
DELETED LEAK SITE	**11/17/2006**

Back to Report Summary

Registered Leaking Storage Tanks (LUAST)

MAP ID# 7 **Distance from Property: 0.47 mi. SW**

SITE INFORMATION

GEOSEARCH ID: **3973LUAST**

LEAK ID: **3973**

NAME: **US POSTAL SERVICE/PLYMOUTH BRANCH**

ADDRESS: **3300 PLYMOUTH BLVD**

MINNEAPOLIS, MN 55447-9998

RELEASE DISCOVERED: **05/21/1992**

RELEASE REPORT: **06/15/1992**

CONDITIONAL CLOSURE DATE: **NOT REPORTED**

COMPLETE SITE CLOSURE DATE: **01/27/1995**

COMTAMINATED SOILS REMAINING: **NO**

OFFSITE COMTAMINATION: **NO**

PRODUCT RELEASED: **GASOLINE UNLEADED**

WEBSITE LINK:

http://cf.pca.state.mn.us/programs/lust_pResults2.cfm?leak=3973&pg=LS

GROUND WATER

DRINKING WATER CONTAMINATION: **NO**

FREE PRODUCT OBSERVED: **NO**

FREE PRODUCT THICKNESS: **NOT REPORTED**

GROUNDWATER CONTAMINATION: **YES**

CLEANUP ACTIONS

CODE:	LEAK ACTION DESCRIPTION:
21	**RI MONITORING**

APPROVAL DATE: **NOT REPORTED**

BEGIN DATE: **06/01/1993**

END DATE: **11/15/1993**

PRODUCT RECOVERED IN GALLONS: **NOT REPORTED**

PRODUCT REMOVED IN GALLONS: **NOT REPORTED**

TREATED WATER IN GALLONS: **NOT REPORTED**

INTEREST TYPE:	LAST UPDATE:
LEAK SITE	**11/10/2014**
DELETED LEAK SITE	**11/14/2006**

Back to Report Summary

Unpermitted Dump Sites (UNPERMDUMPS)

MAP ID# 8 **Distance from Property: 0.50 mi. S**

FACILITY INFORMATION

MPCA ID: **173449**

SITE NAME: **ST. LOUIS PARK MUNICIPAL DUMP**

ADDRESS: **SEE LOCATION DESCRIPTION**
ST. LOUIS PARK, MN 55426 HENNEPIN

FACILITY DETAILS

ID: **REM05075**

ACTIVITY: **UNPERMITTED DUMP SITE**

WATERSHED: **MISSISSIPPI RIVER - TWIN CITIES**

STATUS: **NO**

SITE URL: **http://cf.pca.state.mn.us/wimn/siteInfo_print.cfm?siteid=173449**

INDUSTRY CLASSIFICATION: **NOT REPORTED**

Back to Report Summary

State Assessment Sites (SAS)

MAP ID# 8 **Distance from Property: 0.50 mi. S**

FACILITY INFORMATION

SITE ID: **173449**

SITE NAME: **ST. LOUIS PARK MUNICIPAL DUMP**

ADDRESS: **NOT REPORTED**

ST. LOUIS PARK, MN 55426 HENNEPIN

FACILITY DETAILS

ID: **SA7653**

WATERSHED: **MISSISSIPPI RIVER - TWIN CITIES**

OWNER NAME: **UNKNOWN**

TYPE: **STATE ASSESSMENT SITE**

ACTIVE?: **NO**

SITE URL: **http://cf.pca.state.mn.us/wimn/siteInfo_print.cfm?siteid=173449**

INDUSTRY CLASSIFICATION: **NOT REPORTED**

Back to Report Summary

State Assessment Sites (SAS)

MAP ID# 9 **Distance from Property: 0.71 mi. E**

FACILITY INFORMATION

SITE ID: **67321189**

SITE NAME: **ANCHOR BANK - PLYMOUTH**

ADDRESS: **3950 VINEWOOD LN N**
PLYMOUTH, MN 55441 HENNEPIN

FACILITY DETAILS

ID: **SA109**

WATERSHED: **MISSISSIPPI RIVER - TWIN CITIES**

OWNER NAME: **ANCHOR BANK - PLYMOUTH**

TYPE: **STATE ASSESSMENT SITE**

ACTIVE?: **YES**

SITE URL: **http://cf.pca.state.mn.us/wimn/siteInfo_print.cfm?siteid=67321189**

INDUSTRY CLASSIFICATION: **NOT REPORTED**

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State Assessment Sites (SAS)

MAP ID# 10 **Distance from Property: 0.74 mi. S**

FACILITY INFORMATION

SITE ID: **71778**

SITE NAME: **TEMROC METALS INC**

ADDRESS: **2735 CHESHIRE LN N**
PLYMOUTH, MN 55447 HENNEPIN

FACILITY DETAILS

ID: **SA1243**

WATERSHED: **MISSISSIPPI RIVER - TWIN CITIES**

OWNER NAME: **TEMROC METALS INC**

TYPE: **STATE ASSESSMENT SITE**

ACTIVE?: **NO**

SITE URL: **http://cf.pca.state.mn.us/wimn/siteInfo_print.cfm?siteid=71778**

INDUSTRY CLASSIFICATION: **ALUMINUM EXTRUDED PRODUCTS**

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State Assessment Sites (SAS)

MAP ID# 11 **Distance from Property: 0.80 mi. S**

FACILITY INFORMATION

SITE ID: **907**

SITE NAME: **AACRON INC**

ADDRESS: **2705 CHESHIRE LN N**
PLYMOUTH, MN 55447 HENNEPIN

FACILITY DETAILS

ID: **SA1132**

WATERSHED: **MISSISSIPPI RIVER - TWIN CITIES**

OWNER NAME: **AACRON INC**

TYPE: **STATE ASSESSMENT SITE**

ACTIVE?: **NO**

SITE URL: **http://cf.pca.state.mn.us/wimn/siteInfo_print.cfm?siteid=907**

INDUSTRY CLASSIFICATION: **ELECTROPLATING, PLATING, POLISHING, ANODIZING, AND COLORING**

Back to Report Summary

Unlocatable Summary

This list contains sites that could not be mapped due to limited or incomplete address information.

No Records Found

AIRSAFS	Aerometric Information Retrieval System / Air Facility Subsystem
VERSION DATE: 10/20/14	

The United States Environmental Protection Agency (EPA) modified the Aerometric Information Retrieval System (AIRS) to a database that exclusively tracks the compliance of stationary sources of air pollution with EPA regulations: the Air Facility Subsystem (AFS). Since this change in 2001, the management of the AIRS/AFS database was assigned to EPA's Office of Enforcement and Compliance Assurance.

BRS	Biennial Reporting System
VERSION DATE: 12/31/11	

The United States Environmental Protection Agency (EPA), in cooperation with the States, biennially collects information regarding the generation, management, and final disposition of hazardous wastes regulated under the Resource Conservation and Recovery Act of 1976 (RCRA), as amended. The Biennial Report captures detailed data on the generation of hazardous waste from large quantity generators and data on waste management practices from treatment, storage and disposal facilities. Currently, the EPA states that data collected between 1991 and 1997 was originally a part of the defunct Biennial Reporting System and is now incorporated into the RCRAInfo data system.

CDL	Clandestine Drug Laboratory Locations
VERSION DATE: 07/02/15	

The U.S. Department of Justice ("the Department") provides this information as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments. The Department does not establish, implement, enforce, or certify compliance with clean-up or remediation standards for contaminated sites; the public should contact a state or local health department or environmental protection agency for that information.

DOCKETS	EPA Docket Data
VERSION DATE: 12/22/05	

The United States Environmental Protection Agency Docket data lists Civil Case Defendants, filing dates as far back as 1971, laws broken including section, violations that occurred, pollutants involved, penalties assessed and superfund awards by facility and location. Please refer to ICIS database as source of current data.

EC	Federal Engineering Institutional Control Sites
VERSION DATE: 01/14/15	

This database includes site locations where Engineering and/or Institutional Controls have been identified as part of a selected remedy for the site as defined by United States Environmental Protection Agency official remedy decision documents. A site listing does not indicate that the institutional and engineering controls are currently in place nor will be in place once the remedy is complete; it only indicates that the decision to include either of them in the remedy is documented as of the completed date of the document. Institutional controls are actions, such as legal controls, that help minimize the potential for human exposure to contamination by ensuring appropriate land or resource use. Engineering controls include caps, barriers, or other device engineering to prevent access, exposure, or continued migration of contamination.

ERNSMN Emergency Response Notification System

VERSION DATE: 05/10/15

This National Response Center database contains data on reported releases of oil, chemical, radiological, biological, and/or etiological discharges into the environment anywhere in the United States and its territories. The data comes from spill reports made to the U.S. Environmental Protection Agency, U.S. Coast Guard, the National Response Center and/or the U.S. Department of Transportation.

FRSMN Facility Registry System

VERSION DATE: 09/30/14

The United States Environmental Protection Agency's Office of Environmental Information (OEI) developed the Facility Registry System (FRS) as the centrally managed database that identifies facilities, sites or places subject to environmental regulations or of environmental interest. The Facility Registry System replaced the Facility Index System or FINDS database.

HMIRSR05 Hazardous Materials Incident Reporting System

VERSION DATE: 06/21/15

The HMIRS database contains unintentional hazardous materials release information reported to the U.S. Department of Transportation located in EPA Region 5. Region 5 includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

ICIS Integrated Compliance Information System (formerly DOCKETS)

VERSION DATE: 10/20/14

ICIS is a case activity tracking and management system for civil, judicial, and administrative federal Environmental Protection Agency enforcement cases. ICIS contains information on federal administrative and federal judicial cases under the following environmental statutes: the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, the Emergency Planning and Community Right-to-Know Act - Section 313, the Toxic Substances Control Act, the Federal Insecticide, Fungicide, and Rodenticide Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the Safe Drinking Water Act, and the Marine Protection, Research, and Sanctuaries Act.

ICISNPDES Integrated Compliance Information System National Pollutant Discharge Elimination System

VERSION DATE: 10/20/14

In 2006, the Integrated Compliance Information System (ICIS) - National Pollutant Discharge Elimination System (NPDES) became the NPDES national system of record for select states, tribes and territories. ICIS-NPDES is an information management system maintained by the United States Environmental Protection Agency's Office of Compliance to track permit compliance and enforcement status of facilities regulated by the NPDES under the Clean Water Act. ICIS-NPDES is designed to support the NPDES program at the state, regional, and national levels.

LUCIS Land Use Control Information System

VERSION DATE: 09/01/06

The LUCIS database is maintained by the U.S. Navy and contains information for former Base Realignment and Closure (BRAC) properties across the United States.

MLTS Material Licensing Tracking System

VERSION DATE: 04/14/14

MLTS is a list of approximately 8,100 sites which have or use radioactive materials subject to the United States Nuclear Regulatory Commission (NRC) licensing requirements.

NPDESR05 National Pollutant Discharge Elimination System

VERSION DATE: 04/01/07

Information in this database is extracted from the Water Permit Compliance System (PCS) database which is used by United States Environmental Protection Agency to track surface water permits issued under the Clean Water Act. This database includes permitted facilities located in EPA Region 5. This region includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. The NPDES database was collected from December 2002 until April 2007. Refer to the PCS and/or ICIS-NPDES database as source of current data.

PADS PCB Activity Database System

VERSION DATE: 07/01/14

The PCB Activity Database System (PADS) is used by the United States Environmental Protection Agency to monitor the activities of polychlorinated biphenyls (PCB) handlers.

PCSR05 Permit Compliance System

VERSION DATE: 08/01/12

The Permit Compliance System is used in tracking enforcement status and permit compliance of facilities controlled by the National Pollutant Discharge Elimination System (NPDES) under the Clean Water Act and is maintained by the United States Environmental Protection Agency's Office of Compliance. PCS is designed to support the NPDES program at the state, regional, and national levels. This database includes permitted facilities located in EPA Region 5. This region includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. PCS has been modernized, and no longer exists. National Pollutant Discharge Elimination System (ICIS-NPDES) data can now be found in Integrated Compliance Information System (ICIS).

RCRASC RCRA Sites with Controls

VERSION DATE: 05/19/15

This list of Resource Conservation and Recovery Act sites with institutional controls in place is provided by the U.S. Environmental Protection Agency.

SFLIENS CERCLIS Liens

VERSION DATE: 06/08/12

A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which United States Environmental Protection Agency has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties. This database contains those CERCLIS sites where the Lien on Property action is complete.

SSTS Section Seven Tracking System

VERSION DATE: 12/08/14

The United States Environmental Protection Agency tracks information on pesticide establishments through the Section Seven Tracking System (SSTS). SSTS records the registration of new establishments and records pesticide production at each establishment. The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) requires that production of pesticides or devices be conducted in a registered pesticide-producing or device-producing establishment. ("Production" includes formulation, packaging, repackaging, and relabeling.)

TRI Toxics Release Inventory

VERSION DATE: 12/31/13

The Toxics Release Inventory, provided by the United States Environmental Protection Agency, includes data on toxic chemical releases and waste management activities from certain industries as well as federal and tribal facilities. This inventory contains information about the types and amounts of toxic chemicals that are released each year to the air, water, and land as well as information on the quantities of toxic chemicals sent to other facilities for further waste management.

TSCA Toxic Substance Control Act Inventory

VERSION DATE: 12/31/06

The Toxic Substances Control Act (TSCA) was enacted in 1976 to ensure that chemicals manufactured, imported, processed, or distributed in commerce, or used or disposed of in the United States do not pose any unreasonable risks to human health or the environment. TSCA section 8(b) provides the United States Environmental Protection Agency authority to "compile, keep current, and publish a list of each chemical substance that is manufactured or processed in the United States." This TSCA Chemical Substance Inventory contains non-confidential information on the production amount of toxic chemicals from each manufacturer and importer site.

NLRRCRAG No Longer Regulated RCRA Generator Facilities

VERSION DATE: 06/09/15

This database includes RCRA Generator facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements. This listing includes facilities that formerly generated hazardous waste.
Large Quantity Generators: Generate 1,000 kg or more of hazardous waste during any calendar month; or Generate more than 1 kg of acutely hazardous waste during any calendar month; or Generate more than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste during any calendar month; or Generate 1 kg or less of acutely hazardous waste during any calendar month, and accumulate more than 1kg of acutely hazardous waste at any time; or Generate 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulated more than 100 kg of that material at any time.
Small Quantity Generators: Generate more than 100 and less than 1000 kilograms of hazardous waste during any calendar month and accumulate less than 6000 kg of hazardous waste at any time; or Generate 100 kg or less of hazardous waste during any calendar month, and accumulate more than 1000 kg of hazardous waste at any time.
Conditionally Exempt Small Quantity Generators: Generate 100 kilograms or less of hazardous waste per calendar month, and accumulate 1000 kg or less of hazardous waste at any time; or Generate one kilogram or less of acutely hazardous waste per calendar month, and accumulate at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste; or Generate 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste during any calendar month, and accumulate at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste.

RCRAGR05 Resource Conservation & Recovery Act - Generator Facilities

VERSION DATE: 06/09/15

This database includes sites listed as generators of hazardous waste (large, small, and exempt) in the RCRAInfo

system. The United States Environmental Protection Agency defines RCRAInfo as the comprehensive information system which provides access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). This database includes sites located in EPA Region 5. This region includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.
Large Quantity Generators: Generate 1,000 kg or more of hazardous waste during any calendar month; or Generate more than 1 kg of acutely hazardous waste during any calendar month; or Generate more than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste during any calendar month; or Generate 1 kg or less of acutely hazardous waste during any calendar month, and accumulate more than 1kg of acutely hazardous waste at any time; or Generate 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulated more than 100 kg of that material at any time.
Small Quantity Generators: Generate more than 100 and less than 1000 kilograms of hazardous waste during any calendar month and accumulate less than 6000 kg of hazardous waste at any time; or Generate 100 kg or less of hazardous waste during any calendar month, and accumulate more than 1000 kg of hazardous waste at any time.
Conditionally Exempt Small Quantity Generators: Generate 100 kilograms or less of hazardous waste per calendar month, and accumulate 1000 kg or less of hazardous waste at any time; or Generate one kilogram or less of acutely hazardous waste per calendar month, and accumulate at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste; or Generate 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste during any calendar month, and accumulate at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste.

RCRANGR05 Resource Conservation & Recovery Act - Non-Generator Facilities

VERSION DATE: 06/09/15

This database identifies RCRAInfo system sites that only handle hazardous waste, such as transporters, without generating any amount hazardous waste. The United States Environmental Protection Agency defines RCRAInfo as the comprehensive information system which provides access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). This database includes sites located in EPA Region 5. This region includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

HISTPST Historical Gas Stations

VERSION DATE: NR

This historic directory of service stations is provided by the Cities Service Company. The directory includes

Cities Service filling stations that were located throughout the United States in 1930.

BF Brownfields Management System

VERSION DATE: 07/13/15

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. The United States Environmental Protection Agency maintains this database to track activities in the various brown field grant programs including grantee assessment, site cleanup and site redevelopment. This database included tribal brownfield sites.

CERCLIS Comprehensive Environmental Response, Compensation & Liability Information System

VERSION DATE: 10/25/13

CERCLIS is the repository for site and non-site specific Superfund information in support of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). This United States Environmental Protection Agency database contains an extract of sites that have been investigated or are in the process of being investigated for potential environmental risk. In 2014, the Superfund Program implemented a new information system, the Superfund Enterprise Management System (SEMS). Efforts to migrate data to SEMS and to enhance data quality control are now in the final stages. The Program will continue to rely on the final CERCLIS data set (dated November 12, 2013, which reflects official end of Fiscal Year 2013 Program progress) for public reporting until a complete and accurate SEMS data set is available.

DNPL Delisted National Priorities List

VERSION DATE: 07/22/15

This database includes sites from the United States Environmental Protection Agency's Final National Priorities List (NPL) where remedies have proven to be satisfactory or sites where the original analyses were inaccurate, and the site is no longer appropriate for inclusion on the NPL, and final publication in the Federal Register has occurred.

NFRAP No Further Remedial Action Planned Sites

VERSION DATE: 10/25/13

This database includes sites which have been determined by the United States Environmental Protection Agency, following preliminary assessment, to no longer pose a significant risk or require further activity under CERCLA. After initial investigation, no contamination was found, contamination was quickly removed or contamination was not serious enough to require Federal Superfund action or NPL consideration.

NLRRCRAT No Longer Regulated RCRA Non-CORRACTS TSD Facilities

VERSION DATE: 06/09/15

This database includes RCRA Non-Corrective Action TSD facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements. This listing includes facilities that formerly treated, stored or disposed of hazardous waste.

ODI Open Dump Inventory

VERSION DATE: 06/01/85

The open dump inventory was published by the United States Environmental Protection Agency. An “open dump” is defined as a facility or site where solid waste is disposed of which is not a sanitary landfill which meets the criteria promulgated under section 4004 of the Solid Waste Disposal Act (42 U.S.C. 6944) and which is not a facility for disposal of hazardous waste. This inventory has not been updated since June 1985.

RCRAT Resource Conservation & Recovery Act - Treatment, Storage & Disposal Facilities

VERSION DATE: 06/09/15

This database includes Non-Corrective Action sites listed as treatment, storage and/or disposal facilities of hazardous waste in the RCRAInfo system. The United States Environmental Protection Agency defines RCRAInfo as the comprehensive information system which provides access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS).

DOD Department of Defense Sites

VERSION DATE: 06/21/10

This information originates from the National Atlas of the United States Federal Lands data, which includes lands owned or administered by the Federal government. Army DOD, Army Corps of Engineers DOD, Air Force DOD, Navy DOD and Marine DOD areas of 640 acres or more are included.

FUDS Formerly Used Defense Sites

VERSION DATE: 06/01/15

The 2012 Formerly Used Defense Sites (FUDS) inventory includes properties previously owned by or leased to the United States and under Secretary of Defense Jurisdiction, as well as Munitions Response Areas (MRAs). The remediation of these properties is the responsibility of the Department of Defense. This data is provided by the U.S. Army Corps of Engineers (USACE), the boundaries/polygon data are based on preliminary findings and not all properties currently have polygon data available. DISCLAIMER: This data represents the results of data collection/processing for a specific USACE activity and is in no way to be considered comprehensive or to be used in any legal or official capacity as presented on this site. While the USACE has made a reasonable effort to insure the accuracy of the maps and associated data, it should be explicitly noted that USACE makes no warranty, representation or guaranty, either expressed or implied, as to the content, sequence, accuracy, timeliness or completeness of any of the data provided herein. For additional information on Formerly Used

Defense Sites please contact the USACE Public Affairs Office at (202) 528-4285.

NLRRCRAC No Longer Regulated RCRA Corrective Action Facilities

VERSION DATE: 06/09/15

This database includes RCRA Corrective Action facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements.

NPL National Priorities List

VERSION DATE: 07/22/15

This database includes United States Environmental Protection Agency (EPA) National Priorities List sites that fall under the EPA's Superfund program, established to fund the cleanup of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action.

PNPL Proposed National Priorities List

VERSION DATE: 07/22/15

This database contains sites proposed to be included on the National Priorities List (NPL) in the Federal Register. The United States Environmental Protection Agency investigates these sites to determine if they may present long-term threats to public health or the environment.

RCRAC Resource Conservation & Recovery Act - Corrective Action Facilities

VERSION DATE: 06/09/15

This database includes all hazardous waste sites with ongoing corrective action activity and where corrective action is statutorily required to be address but have not had corrective action imposed in the RCRAInfo system. The Corrective Action Program requires owners or operators of RCRA facilities (or treatment, storage, and disposal facilities) to investigate and cleanup contamination in order to protect human health and the environment. The United States Environmental Protection Agency defines RCRAInfo as the comprehensive information system which provides access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS).

RCRASUBC Resource Conservation & Recovery Act - Subject to Corrective Action Facilities

VERSION DATE: 06/09/15

This database includes hazardous waste sites which are potentially subject to corrective action regardless of whether they have correction action underway, plus any sites showing a corrective action event of RFI or beyond in the RCRAInfo system. Sites conducting corrective action under analogous state authorities are also included. The United States Environmental Protection Agency defines RCRAInfo as the comprehensive information system which provides access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS).

RODS Record of Decision System

VERSION DATE: 07/01/13

These decision documents maintained by the United States Environmental Protection Agency describe the chosen remedy for NPL (Superfund) site remediation. They also include site history, site description, site characteristics, community participation, enforcement activities, past and present activities, contaminated media, the contaminants present, and scope and role of response action.

AIRS Permitted Air Facilities

VERSION DATE: 07/15/15

This database contains facilities with air permits issued by the by the Minnesota Pollution Control Agency. These permits identify the units at each facility that generate air pollutants and, where applicable, the limits on those emissions. In some cases a permit may also authorize construction or modification of a facility.

CDL Clandestine Drug Laboratory Locations

VERSION DATE: 07/21/15

This listing of clandestine methamphetamine laboratories is provided by the Minnesota Department of Health. Each meth lab, spill or dump is a potential hazardous waste site, requiring assessment and remediation by experienced and qualified personnel. Former meth lab sites are being cleaned (or remediated) in many Minnesota communities. In these communities, the cleanups are being guided by city and county ordinances, local housing laws, and Minnesota Statute 145A, the Public Health Nuisance Statute.

IC Sites with Institutional Controls

VERSION DATE: 05/13/15

Institutional controls are defined by Minnesota Statute, Section 115B.02, subdivision 9a, as legally enforceable restrictions, conditions, or controls on the use of real property, ground water, or surface water located at or adjacent to a facility where response actions are taken that are reasonably required to assure that the response actions are protective of public health or welfare or the environment. Institutional controls include restrictions, conditions, or controls enforceable by contract, easement, restrictive covenant, statute, ordinance, or rule, including official controls such as zoning, building codes, and official maps. An affidavit required under section 115B.16, subdivision 2, or similar notice of a release recorded with real property records is also an institutional control.

PCASPILLS Spills Listing

VERSION DATE: 07/01/15

The Minnesota Pollution Control Agency's Emergency Response Team maintains this listing of reported petroleum product, hazardous substance, and/or other spills.

SWUP Solid Waste Utilization Projects

VERSION DATE: 07/15/15

According to the Minnesota Pollution Control Agency, a solid waste utilization project uses certain wastes in a new way to recycle the material instead of putting it into a landfill. An example is using tires to create furniture. The beneficial use of waste products saves landfill capacity for materials that do not have alternative uses. By using solid waste, individuals and organizations can reduce disposal costs, or even generate profit through the sale of materials that have a beneficial use.

TIERII Tier Two Facility Listing

VERSION DATE: 04/07/15

The Minnesota Department of Public Safety's Emergency Planning and Community Right-to-Know Act Program (EPCRA) maintains this listing of Tier Two facilities which store hazardous chemicals on-site. These facilities subject to EPCRA reporting submit Tier II forms which provide information such as the Material Safety Data Sheet (MSDS) chemical or common name, emergency contact information, approximate amount of chemical stored, along with the location of the chemical at the facility.

FEEDLOT Feedlots

VERSION DATE: 07/15/15

Feedlots may be small farms or large-scale commercial livestock operations. They are places where animals are confined for feeding, breeding or holding. The Minnesota Pollution Control Agency (MPCA) and its county partners place requirements on how manure is managed at feedlots, so that it does not contaminate nearby surface water and groundwater.

HWGS Hazardous Waste Generator Sites

VERSION DATE: 12/22/14

The Minnesota Pollution Control Agency (MPCA) provides this list of active and inactive Hazardous Waste Generator Sites, including large quantity and small to minimal quantity generators. A large quantity generator (LQG) is a facility that generates at least 1,000 kilograms (2,200 pounds) of hazardous waste or 1 kilogram (2.2 pounds) of acutely hazardous waste per calendar month. An MPCA permit is not required for a large quantity generator, but the facility must have a current hazardous waste license. A small to minimal quantity generator is a facility that generates less than 1,000 kilograms (2,200 pounds) of hazardous waste or 1 kilogram (2.2 pounds) of acutely hazardous waste per calendar month. These facilities have less stringent rules than large quantity generators. This group includes Small Quantity Generators (SQGs), which produce 100 - 1000 kg of hazardous waste per month; Very Small Quantity Generators (VSQGs), which produce less than 100 kg of hazardous waste per month; and Conditionally Exempt Generators, which produce less than 100 kg or 10 gallons of hazardous waste per year. Like large quantity generators, SQGs and VSQGs must have current hazardous waste licenses.

WDP Water Discharge Permits

VERSION DATE: 07/15/15

This Minnesota Pollution Control Agency (MPCA) database includes the following types of water permits: Construction Stormwater Permits, Construction Stormwater Site Subdivisions, Industrial Stormwater Permits, MS4 Projects, and Wastewater Dischargers. A construction stormwater permit is designed to limit pollution during and after construction by controlling the erosion associated with construction activities. A construction stormwater site subdivision is a site where a construction project with an existing stormwater permit has been sub-divided into smaller parcels. Industrial stormwater permits are designed to limit the amount of harmful contaminants that reach surface water and groundwater, by requiring good practices for storing and handling materials. A Municipal Separate Storm Sewer System (MS4) is a system of conveyances - such as gutters, ditches, city streets and storm drains - which is used as a path for stormwater. Regulated MS4s cover large areas, and are owned or operated by a public entity such as a city, county, township, watershed district or university. A wastewater discharger is a facility that generates or treats wastewater for discharge onto land or into water.

BULKSTORAGE Bulk Storage Permits

VERSION DATE: 07/23/15

The Minnesota Department of Agriculture's Licensing Information System (LIS) lists individuals or companies who hold licenses, certificates and/or permits required by state law and regulated by the Department. This database only contains those LIS licenses related to anhydrous ammonia storage facilities and bulk pesticide/ fertilizer storage facilities. Please note the data is real time and therefore constantly changing.

CLEANERS Registered Drycleaning Facilities

VERSION DATE: 10/05/10

The Minnesota Pollution Control Agency maintains this listing of registered dry cleaning facilities.

UAST Registered Storage Tanks

VERSION DATE: 07/01/15

The Registered Storage Tanks Database provides information on aboveground and underground storage tanks registered with the Minnesota Pollution Control Agency. Owners of USTs and ASTs with a capacity of 500 gallons or more which contain petroleum or hazardous substances must notify the MPCA of the existence of these tanks. Tanks not subject to notification include farm and residential motor fuel tanks less than 1,100 gallons; heating oil tanks less than 1,100 gallons; flow-through process tanks; septic tanks; and agricultural chemical tanks.

AGSPILLS Agricultural Spills Listing

VERSION DATE: 04/24/15

This list of reported spill incidents is provided by the Minnesota Department of Agriculture (MDA). The MDA is the lead agency for response to, and cleanup of, agricultural chemical contamination (pesticides and fertilizers) in Minnesota. The MDA has grouped these spills into three categories: Old Emergencies, Small Spills and Investigations, and Investigations Boundaries. Old Emergencies represent emergencies which were closed prior to March 1, 2004. These files and the locations plotted have not been reviewed for accuracy and completeness. Smalls Spills and Investigations represent the location of small spills and investigations, which were closed after March 1, 2004. Investigation Boundaries represent the approximate extent of large spills and other types of facility investigations. Facility Investigations are further subdivided into the following program areas: Awaiting Prioritization Investigation files of known or potential agricultural chemical contamination that are waiting to be prioritized; Prioritized Investigation files of known or potential agricultural chemical contamination that have been prioritized and are awaiting activation; Comprehensive Facility Investigation / MERLA Investigation files of known or potential agricultural chemical contamination that have been activated in MDA's Comprehensive Facility Investigation Program or are active Superfund sites under MDA's oversite; AgVIC Investigation files of known or potential agricultural chemical contamination that have enrolled in the MDA's Agricultural Voluntary Investigation and Cleanup (AgVIC) Program; and Agricultural Chemical Emergency Response Investigation files that were reported as emergency spills of agricultural chemicals and are large enough in size to be represented by a polygon.

CAFO Concentrated Animal Feeding Operations

VERSION DATE: 06/30/15

A Concentrated Animal Feeding Operation (CAFO) is any feeding operation with a capacity of 1,000 or more animal units according to federal animal unit calculations. The Minnesota Pollution Control Agency can also define a facility with less than 1,000 animal units as a CAFO on a case-by-case basis, depending on site conditions, and if manure or process wastewater is directly discharged to waters of the state. Facilities that are CAFOs must comply with both federal regulations and state rules. Two or more feedlots under common ownership are considered a single facility if they adjoin each other or use the same manure storage or disposal system.

CERCLIS CERCLIS Sites

VERSION DATE: 07/15/15

CERCLIS sites are places that are listed in the federal Comprehensive Environmental Response, Compensation and Liability Information System. This means that they are or were suspected of being contaminated. The CERCLIS database contains information on preliminary assessments, site inspections, and cleanup activities for these sites. After CERCLIS sites are investigated, they may be elevated to state or federal Superfund lists, or it may be determined that no action is necessary. This database is provided by the Minnesota Pollution Control Agency.

CLF Closed Landfills

VERSION DATE: 07/15/15

The Minnesota Pollution Control Agency Closed Landfill Program (CLP) is a voluntary program established by the legislature in 1994 to properly close, monitor, and maintain Minnesota's closed municipal sanitary landfills. Any MPCA-permitted mixed-municipal solid waste landfill that stopped accepting mixed municipal solid waste (MMSW) by April 9, 1994, and demolition debris before May 1, 1995, can qualify for application to this program.

CONTINGENCIES Agricultural Contingency Sites

VERSION DATE: 04/24/15

The Minnesota Department of Agriculture (MDA) Incident Response Unit (IRU) is the state lead agency for the investigation and remediation of incidents involving agricultural
chemicals (pesticides and fertilizer). This MDA IRU database includes sites with a soil or ground water contingency, deed restriction, local ordinance, restrictive covenant or deed affidavit in place. The accuracy of

these sites can be variable. In most cases, the site boundaries should be considered as only representing the vicinity of the soil or ground water contingency area or plume.

HWSTSD Hazardous Waste Treatment Storage Disposal Sites

VERSION DATE: 12/22/14

A hazardous waste Treatment Storage and /or Disposal facility (TSD) is any business designed to treat, store and / or dispose of hazardous waste. These facilities typically collect hazardous wastes for other businesses and treat it or dispose of it properly. TSD facilities must have valid operating permits issued by the Minnesota Pollution Control Agency (MPCA). This means that they are required to develop detailed plans to train and protect their workers and the environment. This database contains active and inactive TSD facilities.

LUAST Registered Leaking Storage Tanks

VERSION DATE: 07/01/15

The Minnesota Pollution Control Agency maintains this listing of leaking aboveground and underground storage tanks. Tank owners are required to immediately report a leak or spill of more than five gallons of petroleum, or any amount of a hazardous substance, from any tank or piping. All leaks and spills from USTs and ASTs and associated piping must be cleaned up to protect the environment and public health.

PBF Petroleum Brownfields Program Sites

VERSION DATE: 07/15/15

This listing of Petroleum Brownfield sites, including those with Development Response Action Plans dated between 2008 and 2012, is provided by the Minnesota Pollution Control Agency (MPCA). The Petroleum Brownfields Program (formerly VPIC) provides the technical assistance and liability assurance needed to facilitate and expedite the development, transfer, investigation and/or cleanup of property that is contaminated with petroleum. Even after cleanup or MPCA file closure most properties will have contamination remaining. State law requires that persons properly manage contaminated soil and water they uncover or disturb - even if they are not the party responsible for the contamination. Property owners, purchasers or developers of property where contaminated soil or water might be encountered may include provisions - called "response actions" - in development plans describing how petroleum contaminated soil and water will be managed if encountered. For some properties, special construction might be needed to prevent the further spreading of the contamination and/or to prevent petroleum vapors from entering buildings or utility access shafts.

PBRLF Permitted By Rule Landfills

VERSION DATE: 07/15/15

According to the Minnesota Pollution Control Agency, a landfill that is permitted by rule is not required to obtain an individual solid waste permit if it meets certain eligibility criteria. However, it must comply with waste management rules and regulations. Landfills may be permitted by rule if they have a small capacity and/or operate for a short period of time.

PVICP Potential Voluntary Investigation and Cleanup Program Sites

VERSION DATE: 05/13/15

This listing of Potential Voluntary Investigation and Cleanup Program sites is provided by the Minnesota Pollution Control Agency. These potential sites have not yet entered into the VIC Program until an application has been received at the MPCA.

RECYCLERS Recycling Markets Directory

VERSION DATE: 02/14/13

The Recycling Markets Directory is provided by the Minnesota Pollution Control Agency. The markets in this database accept large (commercial) quantities of materials.

SRS Site Response Section Database

VERSION DATE: 05/13/15

The Minnesota Pollution Control Agency (MPCA) is involved in remediation activities through various programs. Remediation is the process of cleaning up pollution in the soil, water or air. The pollution can result from an accidental spill or from activities that occur over a long time. This MPCA database includes remediation sites from the Superfund, Voluntary Investigation and Cleanup, Brownfields, Resource Conservation and Recovery Act, Tanks, Landfills, and Emergency Response Programs.

SWF Open Solid Waste Facilities

VERSION DATE: 07/15/15

Open landfills are regulated by Minnesota Rules 7001 and 7035. They actively accept, under the terms and conditions of a Minnesota Pollution Control Agency permit, certain types of wastes for disposal. They are part of a larger and integrated collection of open solid waste management facilities that process, transfer and receive waste for disposal in Minnesota. Open landfills fall into several categories, which include: demolition, industrial, mixed municipal and municipal waste combustor ash.

UNPERMDUMPS Unpermitted Dump Sites

VERSION DATE: 07/15/15

Unpermitted dump sites are landfills that never held a valid permit from the Minnesota Pollution Control Agency (MPCA). Generally, these dumps existed prior to the permitting program established with the creation of the MPCA in 1967. These dumps are not restricted to any type of waste, but were often old farm or municipal disposal sites that accepted household waste. State assessment staff have investigated many of these dump sites.

VICP Voluntary Investigation and Cleanup Program Sites

VERSION DATE: 05/13/15

The Voluntary Investigation and Cleanup (VIC) Program site listing is provided by the Minnesota Pollution Control Agency. This program encourages timely property transactions by reducing potential health or environmental risks from contamination and promoting the redevelopment of these properties.

CSTF Contaminated Soil Treatment Facilities

VERSION DATE: 07/15/15

Contaminated soil treatment facilities are places that the Minnesota Pollution Control Agency (MPCA) has approved or permitted to take petroleum-contaminated soils from leak sites and provide treatment through a number of different processes. The processes include thermal treatment (usually by roasting soils at high temperatures), composting, or thin-spreading soils and allowing natural microorganisms to biodegrade the petroleum.

HWCS Hazardous Waste Cleanup Sites

VERSION DATE: 05/13/15

Soil and or groundwater cleanup under RCRA Corrective Action is conducted by the Site Remediation Division of the Minnesota Pollution Control Agency. The Hazardous Waste Treatment, Storage, or Disposal Facilities enter the RCRA corrective action program through the permitting process. Interim Status Facilities enter the RCRA Correction Action Program through a negotiated process initiated by the MPCA (these facilities at one time applied for a RCRA treatment, storage and or disposal permit, but did not complete the permitting process). Hazardous Waste Generators usually enter the RCRA remediation program through evidence of suspected releases to soil and or ground water from improper management of hazardous wastes or hazardous constituents uncovered during hazardous waste inspections conducted by state, county or city inspectors.

SAS State Assessment Sites

VERSION DATE: 07/15/15

State Assessment sites are places that Minnesota Pollution Control Agency (MPCA) Site Assessment staff have investigated because of suspected contamination. The sites investigated include abandoned industrial properties, small commercial businesses and publicly-owned land. (Note that petroleum-contaminated sites are investigated by MPCA Tanks and Leaks staff.) These sites may be referred to the Site Assessment program by the Voluntary Investigation and Cleanup (VIC) program, the Petroleum Remediation program, Minnesota Duty Officer reports or citizen complaints. Site Assessment staff do an initial assessment, and then determine if further action is needed. If a site poses a threat to human health or the environment, it is referred to CERCLIS, Superfund, RCRA Cleanup or VIC.

SF Superfund Site Information Listing

VERSION DATE: 05/13/15

The Minnesota Pollution Control Agency's Superfund Program identifies, investigates and determines appropriate cleanup plans for abandoned or uncontrolled hazardous waste sites where a release or potential release of a hazardous substance poses a risk to human health or the environment. Superfund does not deal with Resource Conservation and Recovery Act (RCRA) sites or petroleum storage tank releases.

USTR05 Underground Storage Tanks On Tribal Lands

VERSION DATE: 04/01/15

This database, provided by the United States Environmental Protection Agency (EPA), contains underground storage tanks on Tribal lands located in EPA Region 5. Region 5 includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

LUSTR05 Leaking Underground Storage Tanks On Tribal Lands

VERSION DATE: 04/01/15

This database, provided by the United States Environmental Protection Agency (EPA), contains leaking underground storage tanks on Tribal lands located in EPA Region 5. Region 5 includes the following states: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin.

ODINDIAN Open Dump Inventory on Tribal Lands

VERSION DATE: 11/08/06

This Indian Health Service database contains information about facilities and sites on tribal lands where solid waste is disposed of, which are not sanitary landfills or hazardous waste disposal facilities, and which meet the criteria promulgated under section 4004 of the Solid Waste Disposal Act (42 U.S.C. 6944).

INDIANRES Indian Reservations

VERSION DATE: 01/01/00

The Department of Interior and Bureau of Indian Affairs maintains this database that includes American Indian Reservations, off-reservation trust lands, public domain allotments, Alaska Native Regional Corporations and Recognized State Reservations.

Appendix E

City of Plymouth Records

(on CD)

City of Plymouth

Illicit Discharge Detection and Elimination Report

Illicit Discharge Details

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1. Plymouth Ice Center - Xcel Energy Transformer

Latitude:	
Longitude:	
Discovery Date:	5/28/2015
Discovered By:	Police / Fire Responding to accident
Type:	Re-active
	Wetland 21111-NB01 EAP 04658
Description:	5/28/15: There was a single car crash about 4:45pm on 5/28/15 between a vehicle and the Xcel Energy transformer behind the Plymouth Ice Center. The traffic accident in the back parking lot of the Plymouth Ice Center caused the Xcel Energy transformer to leak all of its mineral oil into the storm system (approx. 329 gallons) First responders (Plymouth Fire) installed absorbent booms downstream of the spill site (EAP 04568) to contain any of the mineral oil that was washed during the fire fighting. Absorbent material was also thrown down on the parking lot to minimize the amount of spilled material that got into the storm system. Absorbent booms were installed inside of the 2 catch basins downstream from the spill site to soak up spilled oil before it reached the outfall. 5/29/15:

Plymouth Fire (Dave Dreelan) notified Scott Newberger about the spill at 7:00am.

Xcel Energy initiated the clean up efforts during the morning. City of Plymouth staff were on site to supervise the clean up efforts.

Xcel staff contracted with Clean Harbors to install additional absorbent and non absorbent booms and to vactor our the storm system as it was flushed.

City of Plymouth staff opened a fire hydrant to flush out the storm system pipes as Clean Harbors was downstream (directly upstream of the outfall) vactoring out any material. The thought behind this was to flush the mineral oil material and anything it was bound to downstream to be sucked up by the vactor truck. A total of Approximately 1000 gallons of water was used to "clean" the pipes of any oily material.

Clean Harbors and Xcel Energy will remove and dispose of properly the booms, soils and material swept off the parking lot.

A permanent boom will be left at the EAP 04658 for a week or so to collect any residual oils that still remain in the storm system. This material will be cleaned up accordingly before the permanent boom is removed.

Name of Responsible Party:	
Address:	Plymouth, MN 55447
Is Illicit Discharge associated with an outfall?:	Yes -
Staff Responsible for Follow Up:	Ben Scharenbroich

Attachment
Clean Up Response
PIC - Xcel Energy Report

Attachment

Attachment

Attachment

Attachment

Attachment

Attachment

Attachment

Appendix F

User Interview

(on CD)

PHASE I ENVIRONMENTAL SITE ASSESSMENT
USER QUESTIONNAIRE FORM

Property : Plymouth Creek: Hennepin county parcels 16-118-22-43-0001; 21-118-22-12-0011; 22-118-22-22-0017; and 22-118-22-22-0030

Interviewer (if applicable):

Project No.: 2327051

Date: 11-4-15

User Information:

Name: Laura Jester

Tel. No.: 952-270-1990

Position Title & Co. BCWMC Administrator

Connection to Property: Representing project proposer, watershed manager for this area

Introduction

In order to qualify for one of the Landowner Liability Protections (LLPs) offered by the Small Business Liability Relief and Brownfields Revitalization Act of 2001 (the "Brownfields Amendments"), the user must provide the following information (if available) to the environmental professional that will conduct the Environmental Site Assessment (ESA). Failure to provide this information could result in a determination that "all appropriate inquiry" is not complete. If your goals include protections afforded by the Act, you should consult with legal counsel as to your responses.

1. Why is the Phase I required and who will rely on the Phase I report (please list lending institutions if they wish to rely on the Phase I ESA)? *Phase I will help determine if possible contamination issues are present and need to be addressed as the BCWMC restoration project is designed and constructed.*

2. Are you aware of any environmental cleanup liens against the Property that are filed or recorded under federal, tribal, state, or local law? If, yes, please describe. *No.*

3. Are you aware of any activity and use limitations*, such as engineering controls, land use restrictions or institutional controls that are in place at the Property or have been filed or recorded in a registry under federal, tribal, state or local law? If yes, please describe. *No.*

*activity and use limitations —legal or physical restrictions or limitations on the use of, or access to, a property: (1) to reduce or eliminate potential exposure to hazardous substances or petroleum products in the soil or ground water on the property, or (2) to prevent activities that could interfere with the effectiveness of a response action, in order to ensure maintenance of a condition of no significant risk to public health or the environment. These legal or physical restrictions, which may include institutional and/or engineering controls, are intended to prevent adverse impacts to individuals or populations that may be exposed to hazardous substances and petroleum products in the soil or ground water on the property.

4. As the user of this ESA, do you have any knowledge or experience related to the Property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the Property or an adjoining property so that you would have knowledge of the chemicals and processes used by this type of business? If yes, please describe. *No.*

5. Does the purchase price being paid for this Property reasonably reflect the fair market value of an uncontaminated property? If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the Property? *NA – not purchasing property.*

6. Are you aware of information about the Property that would help the environmental professional to identify conditions indicative of releases or threatened releases or hazardous substances or petroleum products? For example, as user:

   a. Do you know the past uses of the Property? If yes, please explain. *No.*

   b. Do you know of specific chemicals that are present or once were present at the Property? If yes, please explain. *No.*

   c. Do you know of spills or other chemical releases that have taken place the Property? If yes, please explain. *No.*

   d. Do you know of any environmental cleanups that have taken place at the Property? If yes, please explain. *No.*

7. As the user of this ESA, based on your knowledge and experience related to the Property, are there any indicators that point to the presence or likely presence of contamination at the Property? *I am not aware of any indicators.*

8. Do any of the following documents exist for the Property? If so, please provide a copy to Barr either prior to, or at the time of, the site reconnaissance.

Document type	*Exists – yes or no*	*Comments*
Environmental site assessment reports	*NA*	*I am not aware of any*
Environmental compliance audit reports	*NA*	*I am not aware of any*
Environmental permits (for example, solid waste disposal permits, hazardous waste disposal permits, wastewater permits, NPDES permits, underground injection permits)	*NA*	*I am not aware of any*

Document type	*Exists – yes or no*	*Comments*
Registrations for underground and above-ground storage tanks	*NA*	*I am not aware of any*
Registrations for underground injection systems	*NA*	*I am not aware of any*
Material safety data sheets for chemicals used onsite	*NA*	*I am not aware of any*
Community right-to-know plan	*NA*	*I am not aware of any*
Safety plans; preparedness and prevention plans; spill prevention, countermeasure, and control plans; etc.	*NA*	*I am not aware of any*
Reports regarding hydrogeologic conditions on the Property or surrounding area	*NA*	*I am not aware of any*
Notices or other correspondence from any government agency relating to past or current violations of environmental laws with respect to the Property or relating to environmental liens encumbering the Property	*NA*	*I am not aware of any*
Hazardous waste generator notices or reports	*NA*	*I am not aware of any*
Geotechnical studies for building foundations, etc.	*NA*	*I am not aware of any*
Risk assessments	*NA*	*I am not aware of any*
Title search	*NA*	*I am not aware of any*
Boundary survey of the Property	*NA*	*I am not aware of any*

9. Do you know of:

i. Any pending, threatened, or past litigation relevant to hazardous substances or petroleum products in, on, or from the Property? If yes, please explain. *No.*

ii. Any pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on or from the Property? If yes, please explain. *No.*

iii. Any notices from any governmental entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products associated with the Property? If yes, please explain. *No.*

Appendix G

Qualifications

(on CD)

Appendix G
Qualifications

Company Information

Barr provides a wide range of engineering and scientific consulting services. Barr traces its origins to the early 1900s, and was incorporated as an employee-owned firm in 1966. Our company, which is based in Minneapolis, has gained the confidence of clients throughout the upper Midwest and the nation, including industries, utilities, law firms, and all levels of government.

Barr has branch offices in Duluth and Hibbing, Minnesota; Jefferson City, Missouri; Ann Arbor, Michigan, and Bismarck, North Dakota. Drawing upon skills in more than two dozen technical areas, our staff is able to form multidisciplinary teams to meet those needs in the areas of:

- Solid and hazardous waste management and site remediation
- Water resources management
- Environmental management
- Air quality
- Process and materials handling
- Facilities and infrastructure engineering
- Information technology

Barr employs approximately 450 engineers, scientists, and support staff in the following disciplines:

Engineering/Design	**Science**	**Support Services**
Agricultural	Atmospheric Science	Accounting
Architectural	Biology	Computer Science
Chemical	Biochemistry	Drafting/Graphics
Civil	Chemistry	Field Operations
Electrical	Data QA/QC	Laboratory Operations
Environmental	Epidemiology	Library Science
Geologic	Forestry	Information Management
Geotechnical	Geochemistry	Public Relations
Hydraulic	Geology	Surveying
Hydrologic	Geophysics	Technical Writing
Mechanical	Hydrogeology	Word Processing
Structural	Industrial Hygiene	
Water Resources	Public Health	
	Soil Science	
	Toxicology	

Barr uses a project team approach that matches our expertise with the unique requirements of each project. Overall responsibility for each project is maintained by an officer of the company. Barr uses computer and data processing systems to manage and monitor budgets, staff workloads, and billings for all projects.

Quality control on each project is the responsibility of every member of the project team. Reports, designs, and specifications are prepared to meet the client's requirements. Barr's quality assurance program includes:

- Obtaining clear and complete understanding of the client's needs
- Communication among team members and with the client as work progresses
- Peer review as the work progresses
- Evaluation of completed documents for technical accuracy and cost-effectiveness

Qualifications and Experience – Environmental Site Assessments

Barr conducts environmental site assessments for a wide variety of clients involved in property and business transactions. Clients include cities, attorneys, developers, and private and public parties interested in selling, purchasing, or redeveloping property.

Barr has specialized in the investigation and design of remedial actions for contaminated sites since the early 1970s. Our company has completed hundreds of site investigations, feasibility studies, and remedial action designs. This experience includes work on most of the larger contaminated sites in Minnesota as well as numerous smaller sites. Barr has been a primary consultant on about two-thirds of the EPA National Priority List sites in Minnesota and has been involved in either a primary or secondary role on about half of the sites listed by the state of Minnesota. Barr's work on virtually all of these sites has been on behalf of potentially responsible parties. We have worked on contaminated sites in many other states as well.

Many projects are initiated by clients who are buying or selling property or who are required to conduct an environmental site assessment for financing purposes. Other projects are initiated by clients who suspect that contamination may be present on a site. Still other projects are in response to orders from regulatory agencies. Many of these projects involve a state voluntary cleanup program. Barr works for clients in both the public and private sectors, and clients range from major industries to state and federal agencies.

Barr has worked on a variety of properties, including:

- Steel and coke manufacturing
- Wood treating
- Petroleum refining
- Manufacturing (paint waste/spent solvents)
- Coal gasification
- Mining and mineral processing
- Petroleum product storage (above and below ground)
- Metal plating
- Scrapyards
- Landfills
- Fly and bottom ash
- Permitted and nonpermitted waste disposal facilities

Barr staff is familiar with a wide range of industrial practices and we provide environmental and waste management consulting to many industries. The resumes of the specific Barr staff who worked on this Assessment are included in the following pages.

BARR

Experience Dan Fetter has 24 years of experience in the areas of regulatory analysis, site investigation, remedial design, brownfields redevelopment, cost estimating, hazardous waste management, and remedial action coordination. He specializes in addressing legacy environmental issues at contaminated sites and industrial facilities and developing practical, cost-effective environmental solutions for redeveloping contaminated land. His experience includes:

Brownfields redevelopment

- Directing investigation and cleanup planning for the City of St. Paul on three brownfield redevelopment sites along the Central Corridor, a development area around St. Paul's first light-rail transit (LRT) route. Work was funded under the city's U.S. Environmental Protection Agency (EPA) brownfield redevelopment grant, and it included Phase I and Phase II assessments, preparation of response action plans, assistance with U.S. EPA grant administration procedures, and coordination with the City's development partners.
- Assisting the city of New Brighton with one of the largest and most complex brownfield redevelopments in the state. The work includes conducting Phase Is, Phase IIs, and preparation of response action plans in support of the city's planned acquisition and redevelopment of the 100-acre Northwest Quadrant redevelopment area adjoining I-694 and I-35W. The redevelopment involves 15 properties that include nine petroleum release sites, a former refinery and Superfund site, two former dumps with landfill gas concerns, and other concerns related to past solvent and chemical use. The work includes assessing the soil, groundwater, and vapor impacts and developing and implementing response action plans in support of a mixed-use redevelopment and new public infrastructure (e.g., roads, piped utilities, storm water ponds, and foundations). The majority of the cleanup was completed by 2009 and the city and its developers have begun the initial phases of redevelopment, which will involve a new urban mixed-use village.
- Assisting the City of St. Louis Park with investigation and management of old dump materials that were encountered during a park redevelopment. The project involved improving park features and expansion of a dry retention basin to address neighborhood flooding concerns. The project included partial removal of dump materials, establishment of an appropriate soil cover over the remaining areas of the dump, and coordination with the Minnesota Pollution Control Agency (MPCA).
- Directing the investigation and cleanup planning for the proposed Surly Brewing Co. development located on the border of Minneapolis and St. Paul. The redevelopment site has a long history of industrial use, including a variety of environmental legacy concerns. Work has included assisting with applications for environmental grant funding; conducting preliminary assessments; and cost estimating for environmental cleanup, regulatory coordination, site demolition, geotechnical requirements, and stormwater management in support of the new brewery development. The cleanup and redevelopment is planned for 2013-2014.

- Assisting the city of New Brighton with cleanup and redevelopment of two petroleum-release sites into new commercial businesses. Reviewed the past investigation results and prepared development response action plans (DRAPs) to address the residual contamination in support of the planned commercial redevelopments. All work is being coordinated with the MPCA's petroleum brownfield program.
- Assisting the city of New Brighton with several demolition efforts to clear land of aging commercial and industrial facilities in preparation for redevelopment. The work included planning and coordination of hazardous substance abatement (including asbestos, lead paint, and mercury switches), assistance with public bidding, and oversight and testing during demolition work.
- Assisting several of Barr's clients in successfully obtaining more than $9 million dollars in grant and reimbursement funding for numerous environmental projects. The funding sources have included brownfield grants from the U.S EPA, Minnesota Department of Employment and Economic Development (DEED), Metropolitan Council, Hennepin County, Ramsey County, Minnesota Petrofund tank program, Wisconsin PECFA tank program, and special bonding requests to state and federal legislatures.
- Planning and coordinating a unique U.S. EPA Superfund cleanup at 35 residential properties located adjacent to a former wood-treating facility. Previous cleanups had addressed the majority of the contamination from the historical wood-treating operations, but recent data identified low-level dioxins in residential yards and interior house dust. A remedial action for residential dust reduction was negotiated and implemented at the request of the U.S. EPA. The work involved coordinating access to homes, temporarily relocating residents to motels, carpet removal and replacement, duct cleaning, and extensive cleaning of nearly every interior surface of the homes. To control potential future sources of contaminated dust, the residential yards were covered with three inches of clean topsoil and re-vegetated, and the residential driveways were covered with three inches of clean gravel. Ongoing efforts include arrangements for periodic supplemental cleaning of homes to remove accumulated dust and application of dust suppressant to unpaved roads in the neighborhood. A permanent remedy is being negotiated with U.S. EPA.
- Assisting Xcel Energy with planning and managing historical impacts to soil and groundwater as part of a $700-million project involving demolition and reconstruction of two electric-generation plants that were upgraded and switched from coal to natural gas-the Riverside power plant in Minneapolis and the High Bridge power plant in St. Paul. Developed a soil-management plan to address historical concerns from the past 100 years of power-plant operations including petroleum releases, asbestos-containing materials, and buried ash, slag, and coal. The soil management was also coordinated with development of updated plans for stormwater management and closure of the handling facilities for coal, ash, and slag.
- Designing and negotiating regulatory acceptance for a risk-based redevelopment plan to convert a former demolition dump with PAH and lead contamination into a new park and recreation area. The innovative design work involved coordination of the in-

place dump closure with the park redevelopment (including ball fields, retaining walls, landscaping, geotechnical design, parking lots, and utilities). The project also involved protection and enhancement of an adjoining wetland and creek in coordination with the watershed district and regulatory authorities.

- Directing environmental planning and negotiated regulatory liability assurances on a series of projects for the city of Golden Valley which led to redevelopment of several adjoining contaminated properties into a new office and warehouse business park, along with the associated streets and utilities. The work involved investigating the properties, identifying environmental concerns, preparing a comprehensive corrective action plan, and assisting with implementation of institutional controls. All efforts were coordinated with the redevelopment plans to focus the environmental cleanup on the actual future land use. The design work included developing a soil management plan to address the poor geotechnical site conditions and the soil and groundwater contamination (petroleum, chlorinated VOCs, and PAHs).
- Directing a remedial investigation, focused feasibility study, and prepared a response action plan for a site in Minneapolis that had formerly been an automotive battery recycling operation. Worked with the Minnesota Department of Transportation (MnDOT) to implement the remedial action, which involved excavation and on-site stabilization of the lead-contaminated soil. The City of Minneapolis plans to redevelop the site.
- Designing a series of response action plans associated with redevelopment of a former railyard with petroleum and solvent contamination into a business park with new roads, office buildings, and parking. The environmental response plan includes safe, onsite management for most of the contaminated soil combined with a geotechnical soil correction for the proposed buildings.
- Assisting the city of Inver Grove Heights to address historical petroleum releases and farm dumps that were encountered as part of their construction of new frontage roads, stormwater ponds, and related utilities along the Highway 52 corridor.
- Assisting the cities of New Brighton and Burnsville with new stormwater ponds that were constructed near historical petroleum release sites. The work included review of previous environmental investigations and development of remedial plans to address residual groundwater impacts that could impact the new pond's water quality.
- Conducting numerous Phase I environmental site-assessment projects involving property transfers.

Environmental assessment and investigations

- Directing Barr staff working with MnDOT on a variety of environmental projects under an emergency contract that was funded by federal stimulus funds. The sites involved environmental investigations (Phase I/IIs), response action plans, and oversight of contamination cleanup for new highway construction projects throughout northern Minnesota involving petroleum releases and old dumps.

- Assisting the City of Oslo, Minnesota to address environmental legacy concerns as part of a fast-track flood control project to control flooding on the Red River of the North. The project work included a hazardous, toxic, and radioactive waste (HTRW) assessment; coordination of pre-demolition surveys to identify hazardous substances in more than 20 buildings and structures; Phase II field investigations to delineate a petroleum release in an area where the city's water supply tank was to be relocated for a new flood wall; and coordination with environmental regulatory agencies. The petroleum release was remediated in conjunction construction of a new water-supply tank for the city.
- Assisting the City of Hopkins and the Nine Mile Creek Watershed district to address environmental legacy concerns as part of a streambank stabilization project on a 1.4-mile long corridor of the city with numerous contaminated sites including petroleum releases, old dumps, manufactured gas plant sites, solvent sites, and demolition fill. The project work included performing Phase I and II investigations, preparing a response action plan, and successfully obtaining $364,000 in grants from the Hennepin County Environmental Response Fund to reimburse investigation and cleanup costs. The environmental cleanup approach was designed in conjunction with the elements of the creek restoration project that addressed stabilization of eroding banks; creation of new channel segments; maintenance dredging of stormwater ponds; and construction of new stormwater outfalls as well as park paths, bridges, and bike trails.
- Assisting Hennepin County on a series of projects under Barr's master services agreement, including Phase I and Phase II environmental site assessments and development of response action plans. The work has spanned a wide variety of projects including Brownfield redevelopment, stormwater projects that encountered legacy contamination, and litigation support to the county as an environmental expert to help resolve a dispute between the county and their highway construction contractor over the cost of unexpected contamination.
- Directing a Phase I corridor study and targeted Phase II environmental investigations in support of MnDOT's reconstruction of the I-35W and Highway 62 interchange (Crosstown Highway). The Phase I/II work was conducted to assess for subsurface environmental concerns that may affect the reconstruction of this critical 5 mile urban transportation corridor for the Twin Cities. The reconstruction of the 5-mile-long project corridor will involve 24 bridges, new ramps/retaining walls/sound walls, stormwater management ponds, and some reconfiguration of adjacent local streets and utilities.
- Directing environmental investigations and related property cleanup for the first light rail transit project in the Twin Cities metropolitan area. The project involved a 12-mile rail transit corridor through an urban setting. Preliminary planning and cost estimating was conducted with MnDOT. Following that, Dan directed targeted environmental investigations, developed a response action plan, and implemented the necessary response actions during rail line construction. The project was successfully completed by a design-build project team involving an innovative, multi-party public/private partnership.

- Assisting with a RCRA facility investigation and implemented a RCRA closure plan for an Oregon site with a release of petroleum distillates to soil and groundwater.
- Directing screening site inspections (SSIs) under CERCLA at three former municipal dumps in Minnesota. The SSIs were conducted with the Minnesota Pollution Control Agency and the U.S. EPA to develop a hazard ranking score that was used to evaluate sites for the EPA Superfund National Priority List and MPCA Permanent List of Priorities.

Remediation

- Assisting Capitol Region Watershed District and MnDOT with a fast-track project to realign a 100-year-old storm-sewer interceptor to make way for new highway interchange bridges near downtown St. Paul. The project area involved petroleum contaminated soil and groundwater that had to be managed during the complex interceptor replacement. BNSF Railway agreed to a rare 30-hour shutdown of two mainline railroad tracks to allow removal and replacement of railroad track, installation a new box culvert, open-cut excavation, and backfilling. Months of planning preceded the effort and involved government agencies, consultants, and investigative contractors. The excavation needed to be completely dewatered prior to construction, requiring permits for disposing of contaminated groundwater and impacted soils and the design of a sophisticated track-monitoring system to verify that dewatering did not affect the surrounding railway. Construction was completed successfully and rail service restored on time, minimizing disruptions and enabling the MnDOT's highway project to move forward.
- Assisting International Paper Company with several efforts to address concerns from a former wood-treating facility located in Cass Lake, Minnesota. The work has included investigations and a feasibility study to evaluate many alternatives for addressing widespread areas of dioxin in soil at the site and in nearby residential areas. The potentially impacted areas under study involve hundreds of acres of land, including more than 100 residences in surrounding neighborhoods. Also directed interim remedial actions to remove areas of soil at the site with high concentrations of dioxin, cover residential yards near the site with clean soil, and arrange for periodic cleanings of residences and dust suppression on unpaved roads. The site is located within the Leech Lake Band of Ojibwe Reservation, and investigation and cleanup efforts are subject to complex negotiations between the International Paper, U.S. EPA, state agencies, local government, and the tribe.
- Helping a large iron mine in northern Michigan respond to regulatory concerns about historical tailings releases to wetlands and streams. Work involved evaluating the extent of the releases, evaluating options for dredging tailings from streams, and assisting with permitting work in wetlands and surface water.
- Directing the cleanup, decommissioning, and demolition of a large bulk-petroleum-storage facility at a former mine in northern Michigan. The work included recovery and recycling of the tank contents, demolition and recycling of the metal tanks, and evaluation and management of petroleum-impacted soil.

- Directing a remedial design and remedial action under CERCLA (Superfund) at a former waste-oil disposal facility at Douglassville, Pennsylvania. The work included negotiating, planning, designing, and providing project management for a $15 million cleanup effort that involved excavation, on-site stabilization, and on-site landfilling of 46,000 cubic yards of used-oil filter-cake sludge. Detailed procedures were developed for monitoring waste treatment, controlling and monitoring air emissions, and collecting and treating wastewater generated from runoff.
- Conducting a feasibility study for the former Reserve Mining scrapyard and landfill located at the current North Shore Mining facility near Silver Bay, Minnesota. The work involved evaluation of a range of on-site and off-site alternatives for managing buried scrap, debris, and drummed waste (including some RCRA hazardous wastes) associated with a nearby taconite plant. The remedial alternatives were developed to address direct contact and groundwater pathway risks that were identified by Barr's remedial investigation at the site. The work was conducted for the Minnesota Pollution Control Agency.
- Directing long-term operations and improvements for a groundwater remediation system at a Superfund site that addresses a large solvent release from an old chemical dump in Oakdale, Minnesota. The work has involved regulatory negotiations and evaluating various enhancements to the system to ensure that remedial objectives are met while economically maintaining the groundwater remediation system.
- Conducting a focused feasibility study to evaluate remedial options and potential environmental response costs for a former wood tar site located in Kipling, Michigan. The study considered a range of both onsite and offsite remedial options that could support site redevelopment.
- Conducting an evaluation of potential remedial costs for the Cliffs-Dow wood tar site in Marquette, Michigan. The study considered a range of both onsite and off-site remedial options that could support site redevelopment.
- Designing and coordinating a remedial action under CERCLA (Superfund) at a former coal gasification facility in Dubuque, Iowa, that had extensive coal tar contamination in the soil and groundwater. The design, which was coordinated with the city, the Iowa DOT, and MidAmerican Energy, included redeveloping a portion of the site into a new highway corridor. The remedial action included excavation, processing, and offsite thermal treatment of coal tar and heavily contaminated soil at a coal-fired power plant. Soil with residual contamination was managed onsite under a clean cover and a groundwater extraction and treatment system with sanitary sewer discharge was installed to address the groundwater risks.
- Directing the cleanup, decommissioning, and demolition of a large bulk-petroleum-storage facility at a former mine in northern Michigan. The work included recovery and recycling of the tank contents, demolition and recycling of the metal tanks, and evaluation and management of petroleum-impacted soil.

- Assisting with preparation of RI/FS work plans and supporting documents for several contaminated sites, including former coal gasification facilities in Chicago and Iowa and a former lead-battery recycling facility in Minneapolis.
- Assisting with feasibility studies for evaluating remedial options for contaminated soil, groundwater, and wastes at numerous sites, including a former railroad switchyard with an extensive petroleum release, a former uncontrolled municipal dump that contained lead contamination, and a Chicago railyard with lead and PCB soil contamination. The Chicago railyard study included development of a probabilistic cost evaluation for possible remedial alternatives.
- Conducting an underground-storage-tank management project for the U.S. Postal Service that involved more than 125 tanks at 90 locations in Minnesota and North Dakota. The project included site visits and reports summarizing recommendations to comply with new tank regulations and to minimize environmental liabilities associated with tank operation. Subsequent work involved design and construction observation during replacement of tanks at several post offices and management of contaminated soil and groundwater at sites where petroleum had been released.
- Planning and coordinating a soil remediation at a former automotive battery-cracking operation at a railyard in La Crosse, Wisconsin. Lead-contaminated soil was stabilized in situ prior to excavation and off-site disposal. The work was coordinated with the city of Lacrosse and the Wisconsin Department of Natural Resources in accordance with NR 700 rules.
- Developing probabilistic remedial cost estimates for two contaminated rail yards and a waste oil disposal site. Responsibilities included developing potential remedial strategies, evaluating key technical/regulatory uncertainties, assigning probabilities, and developing an estimated range for remedial costs.
- Providing technical expertise and negotiating with the Wisconsin Department of Natural Resources for two former manufactured gas plant (MGP) sites that were located adjacent to rivers in urban settings. The work included assessing impacts to soil, groundwater, and surface water in accordance with Wisconsin NR 700 rules and evaluating MPG-related structures still on the sites. The work at one of the sites included coordination of an Interim Removal Action to address potential impacts to the surface water and preparation of a site investigation work plan. The work at the second site included preparation of detailed plan and cost estimate for implementing a remedial action to stabilize and cap MGP waste along a river bank as part of a planned redevelopment of the site into a city park.
- Assisting with remedial investigations/remedial alternative evaluations at numerous Holiday gas stations in Wisconsin. All work was conducted in accordance with NR 700 and Department of Commerce rules and guidance regarding petroleum release sites and PECFA-reimbursement requirements.
- Assisting with the remedial design to address solvent-contaminated soil near a former drum burial area at a site in Monroe, Wisconsin. Developed site-specific, performance-based soil cleanup goals for land treatment in accordance with NR 718 and 720.

- Providing technical review and recommendations the City of New Brighton in support of their response to citizen complaints for sites involving noise and odor concerns.

While with another consulting firm, Dan focused on the investigation and remediation of soil and groundwater at contaminated sites. His work included:

- Conducting feasibility studies for material handling and thermal treatment of contaminated soil at a large petrochemical facility on the EPA s National Priority List.
- Observing tank removals and performing remedial investigations at numerous underground-storage-tank sites in accordance with MPCA guidance documents.
- Assisting with the design and implementation of various remedial actions at sites with contaminated soil and groundwater.
- Conducting numerous environmental property assessments prior to land purchase or development.
- Assisting with the development of equipment for soil-gas testing and thermal treatment of contaminated soil.

Education BS, Civil Engineering, University of Minnesota, 1988

Registration Professional Engineer: Minnesota, Iowa, Michigan, Wisconsin

MICHELLE WATERS
Geoscientist

BARR

Experience

Michelle has more than eight years of experience in environmental consulting. She has experience with Phase I and Phase II environmental site assessments; soil, groundwater, and vapor sampling; underground storage tank investigations; monitoring well and soil boring installation; soils management; response action plans (RAPs); GIS analysis and figure creating; and report writing. Her work experience includes:

- Performing fieldwork in the investigation phase of several projects including:
  - Conducting fieldwork for drilling, installation, development, and sampling of groundwater monitoring wells at railyards in Iowa.
  - Conducting field oversight for installation of storm-water utility line at a dump site near a railyard in Minnesota.
  - Conducting fieldwork for drilling, installation, development, and sampling of groundwater monitoring wells at an airport in Tennessee.
  - Conducting fieldwork for aquifer pumping tests in Minnesota and Wisconsin.
- Performing soil sampling using various drilling techniques, such as Geoprobe, hollow-steam auger, mud-rotary, rotosonic, dual-rotary, and documenting subsurface soils in boring logs.
- Completing field screening and collection of laboratory samples of contaminated soils from surface and subsurface samples.
- Serving as imagery and GIS specialist and as journeyman GIS cartographer for a cartographic firm in Minnetonka, Minnesota.
- Serving as environmental scientist for an environmental firm in Maple Plain, Minnesota. Her work included Phase I and Phase II environmental site assessment (ESA) reports; assisting with Environmental Assessment Worksheet and Environment Impact Statement reports; well and soil-boring installation; and soil management at land development sites.
- Serving as environmental scientist for a consulting firm in Plymouth, Minnesota. Her work included assisting on Phase I and Phase II ESA reports, including field reconnaissance and reporting; Phase II subsurface soil and groundwater investigation; soil, groundwater, and vapor sampling; underground storage tank investigation; monitoring-well and soil-boring installation; soils management at land-development sites; RAPs and RAP implementation reports; GIS analysis; figure creating for reports and presentations; and general compliance and remediation.
- Serving as office and field intern for three seasons for an engineering firm in Bloomington, Minnesota. Collected and recorded global positioning system (GSP) field location and soil-boring location readings; assisted on Phase I ESA reports and completed bedrock resistivity-depth analysis.

Education

Graduate Certificate, GIS, St. Mary's University, 2010

BA, Geology, University of St. Thomas, 2006

Certification	E-RailSafe Certified
	40-Hour OSHA HAZWOPER training
	24-Hour MSHA training

Appendix D

Cultural and Historical Resources

APPENDIX D.

ARCHAEOLOGICAL INVESTIGATION CONDUCTED FOR THE

PLYMOUTH CREEK STREAM CHANNEL RESTORATION FEASIBILITY STUDY,

CITY OF PLYMOUTH,

HENNEPIN COUNTY, MINNESOTA

Prepared for:

Bassett Creek Watershed Management Commission

and

Barr Engineering
4300 MarketPointe Dr
Minneapolis, MN 55435

By:

Christina Harrison, Principal Investigator
Archaeological Research Services
1812 15th Avenue South
Minneapolis, MN 55404
(612) 770-1721

January 2016

SHPO File Number: 2014-....

Minnesota Archaeological License Number: 15-057

CONTENTS

MANAGEMENT SUMMARY

During the fall of 2015, Archaeological Research Services (ARS) conducted an archaeological Phase I survey along a segment of Plymouth Creek in the City of Plymouth, Hennepin County, Minnesota. The investigation is part of a feasibility study that is being completed by Barr Engineering (Barr) for the Bassett Creek Watershed Management Commission (BCWMC) Watershed Management Plan.

The study examines the feasibility of restoring damaged areas along the channel of Plymouth Creek within the Plymouth Creek Park and between Fernbrook Lane North and Annapolis Lane North. It aims to identify sites that need some form of stabilization to address damage caused by erosion, scouring and other reasons for bank failure.

The feasibility study follows the protocols developed by the U.S. Army Corps of Engineers (USACE) and the BCWMC for projects within the BCWMC Resource Management Plan (RMP). As the implementation of these efforts would involve public land and funding as well as federal permitting of wetland impacts, the project proposers anticipate that the State Historic Preservation Office (SHPO) and the Office of the State Archaeologist (OSA) both will request an archaeological review of the project route. Consequently, a records and literature search and preliminary field assessment were incorporated into the feasibility study.

Retained to conduct the review, ARS completed a field inspection during late October, mid November and early December 2015 following records and literature searches at SHPO and OSA. Methodology and results are described below in Sections 2.0 and 3.0 and the conclusions provided in Section 4.0.

The study area measures approximately 2800 feet as it extends from from Annapolis Lane on the downstream end to a control structure in Plymouth Creek Playfields Park on the upstream end. Fernbrook Lane crosses the creek roughly half way through the study reach. The site is located just northwest of the intersection of I-494 and Hwy 55 in Plymouth, in SWSW 1/4 Section 15, SESE 1/4 Section 16, NENE 1/4 Section 21 and NWNW 1/4 Section 22, T118N, R22W.

Visual inspection of existing erosion exposure, in some areas supplemented by shovel testing, provided enough survey coverage to conclude that neither the banks of the creek nor the areas close enough to be affected by proposed stabilization measures feature any archaeological evidence. However, should final design of needed stabilization measures change the now proposed areas of project impact, this initial inspection will need to be supplemented with further survey conducted in a manner that meets previously referenced federal and state guidelines.

1.0 INTRODUCTION AND PROJECT DESCRIPTION

During the fall of 2015, Archaeological Research Services (ARS) conducted an archaeological Phase I survey along a segment of Plymouth Creek in the City of Plymouth, Hennepin County, Minnesota. The investigation is part of a feasibility study that is being completed by Barr Engineering (Barr) for the Bassett Creek Watershed Management Commission (BCWMC) Watershed Management Plan.

This study examines the feasibility of restoring damaged areas along the channel of Plymouth Creek within the Plymouth Creek Park and between Fernbrook Lane North and Annapolis Lane North. It aims to identify sites that need some form of stabilization to address damage caused by erosion, scouring and other reasons for bank failure.

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Retained to conduct these reviews, ARS completed a field inspection during late October, mid November and early December 2015 following records and literature searches at SHPO and OSA.

The project area is located just northwest of the intersection of I-494 and Hwy 55 in Plymouth, in SWSW 1/4 Section 15, SESE 1/4 Section 16, NENE 1/4 Section 21 and NWNW 1/4 Section 22, T118N, R22W.

The study reach of the creek measures approximately 2800 feet as it extends from from Annapolis Lane on the downstream end to a control structure in Plymouth Creek Playfields Park on the upstream end. Fernbrook Lane crosses the creek roughly half way.

The project is divided into three sub-reaches as shown below in Figure D:1. Land use immediately adjacent to Reaches 1 and 2 is predominantly a disc golf course. Reach 1 has heavy tree cover and sparse vegetation below the canopy, in part due to traffic from the disc golf course. Reach 2 is a mix of tree cover and a grassy riparian area. The land use adjacent to Reach 3 is primarily a wooded valley on both sides of the creek, which is located adjacent to a residential neighborhood.

Barr staff walked the entire study reach in September 2015 and identified sites that require stabilization to address bank erosion, scour, and/or bank failure. Additional site visits were conducted through October and November to meet with stakeholders on site, check conceptual stabilization alternatives, and observe the creek during different flow conditions. Resulting recommendations are shown below.

Stabilization techniques used to prevent additional bank erosion and improve in-stream and riparian habitat may include riprap, j-vanes, cross vanes, biolog, live stakes, vegetated reinforced soil stabilization (VRSS), live fascines, selective tree removal, re-establishment of riparian vegetation, and planting native trees and shrubs.

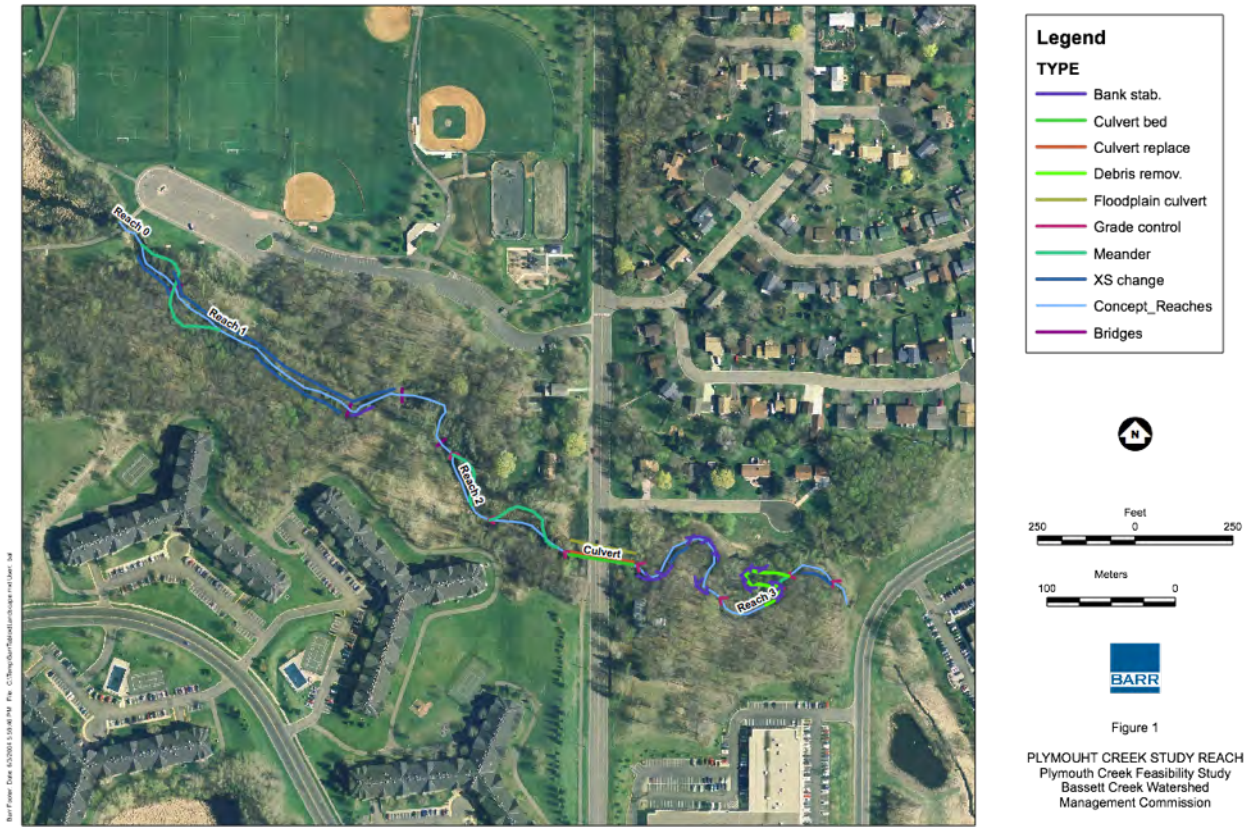

Figure D:1 Plymouth Creek Study Area

2.0 ENVIRONMENTAL AND HISTORIC SETTING

The survey area is located within the Emmons-Faribault Moraine -- a geomorphic region dominated by glacial features left by the advancing and receeding of the Des Moines Lobe during the Late Wisconsin glaciation approximately 18,000 to 13,000 B.P.: irregular loam mantled moraines and numerous ice disintegration features which have created deep, often isolated, now water- or peat-filled depressions (UMAES 1973:18).

At the time of the original land survey, i.e. prior to more extensive impact by Euroamerican settlement, the survey area supported primarily oak openings and barrens, with small pockets of either deciduous hardwoods (“big woods”) or open prairie (Marschner 1974). A few miles to the northeast/east/southeast, the Mississippi River valley supported river bottom forest (primarily elm, ash, cottonwood, boxelder, basswood, maple, willow and hackberry) alternating with wet prairie, marshes and slough grasslands.

Easy access to a range of habitats would have provided early inhabitants of the area with a rich variety of plant and animal resources. At the time of Euroamerican settlement, the forest areas supported species such as white-tailed deer, cottontail rabbit, woodchuck, raccoon and bear.

The prairie and prairie/woodland border would have sustained large mammals such as bison and elk, as well as numerous small species. The rivers, lakes, sloughs, and marshes contained muskrat and beaver, numerous types of waterfowl, and many species of fish and turtle (Anfinson 1990).

Reaching farther back in time, pollen cores and macrobotanic evidence attest to quite dramatic changes in the regional environment throughout the postglacial period. A periglacial parkland of spruce and larch followed the retreat of the Wisconsin glaciers and the tundra vegetation associated with their margins. By 11,500 B.P., rapid climatic change had caused the spruce to be succeeded by pine forest (by approximately 10,000 B.P.) and then by a deciduous forest composed primarily of oak and elm. A warming and drying trend, which characterized the early to middle Holocene, peaked at 7,000 to 6,000 B.P., causing the prairie and its transitional prairie-woodland margin to expand some 75 miles north and east of their normal limits. Linked with these climatic warming trends were an increase in the frequency of prairie fires and a marked decline of the water table which caused many small lakes to dry up completely (Wright 1972, 1974; Anfinson and Wright 1990).

Pollen cores from Hennepin County have provided quite specific environmental data for the more immediate study area, charting changes from the middle Holocene to the present (Grimm 1983). They suggest that woodlands prevailed throughout the Holocene in the northeastern Big Woods area which includes much of what is now Hennepin County. This is perhaps best explained by local infrequency of fire due to a rolling topography with numerous deep lakes which would have retained water even during the middle Holocene. Just as significant was probably the protection provided by major firebreaks such as the main rivers and large bodies of water like Lake Minnetonka. Local vegetation consisted of a fairly balanced mixture of woodland and prairie from 6,330 to 3,810 B.P., followed by oak- dominated woodlands from 3,810 to 280 B.P. The onset of cooler and wetter climatic conditions encouraged the development of the Big Woods (dominated by elm, maple and basswood) from 280 B.P to the mid-1800s and the beginning of Euroamerican clearing and settlement (ibid. 1983).

Until the late 1800s, the area around Plymouth and upper Bassett Creeks remained quite rural: all woodlands and farmed fields with a smattering of farms and the western edge of Minneapolis still well to the east (Andreas 1874). As the city expanded west and north, a segment of Bassett Creek was protected as part of Theodore Wirth Park and the historic Grand Rounds Scenic Byway system (Harrison 2002). Beyond that, urban and suburban growth has changed most of the area and although other segments of the creek since have been protected as designated parkland, long stretches of the stream have been confined to channels which have been narrowed and straightened to accommodate residential and industrial developent. Old photographs and topographic maps, along with less urbanized segments of the drainage, indicate that the historic appearance was that of a naturally meandering stream which at times was flanked by quite pronounced glacial knolls but elsewhere traversed quite wide and often marshy stretches of floodplain.

As the Twin Cities metropolitan area was one of the first to be cleared for farming or developed for residential and commercial use, much archaeological evidence can be presumed to have been destroyed before it could be recorded and studied but some of it has survived in parks and otherwise protected areas around the metropolitan lakes and rivers especially in the lake country of the southwestern metro region and also on the uplands along the Mississippi River valley and its confluence with the Minnesota River -- all of which, along with the current project area, are part of the so-called “Central Deciduous Lakes South” archaeological region (Anfinson 1990).

Easy access to a wide range of habitats would have provided a rich variety of plant and animal resources throughout this region. In the the forested areas were species such as white-tailed deer, cottontail rabbit, woodchuck, raccoon and bear, and on the prairie -- or along the prairie/ woodland border -- larger game such as bison and elk as well as numerous smaller species. The rivers, lakes, sloughs, and marshes harbored muskrat and beaver, numerous types of waterfowl, clams and many species of fish and turtle (Anfinson 1990).

Archaeological evidence indicates that this rich environment attracted Native Americans to the area throughout the postglacial period. While no archaeological sites have been recorded in close proximity to the survey segment of Plymouth Creek, such evidence is known to exist elsewhere in the Plymouth-Bassett Creek watershed. In May of 2011, ARS completed a cultural resource Phase IA review for the Bassett Creek Watershed Management Commission Resource Management Plan. The results were intended to provide a preliminary understanding of the archaeological and historic potential of six Plymouth and Bassett Creek segments that were considered to warrant channel restoration, sediment removal and/or other water quality improvement measures. OSA site files were reviewed by ARS for information about archaeological sites identified within a mile of these project areas. Information from the history/ architecture data base that is maintained by SHPO was provided by that office directly to Barr. Both sets of data are presented in the 2011 report. In addition, ARS reviewed SHPO report files for cultural resource surveys previously conducted within and near the project area. ARS staff also examined historical maps and aerial photographs at the Minnesota Historical Society and the University of Minnesota-Borchert Map Library.

Although the results of the records search indicated that a number of archaeological surveys had been conducted within the watershed, many of them had proven negative. Archaeological sites had primarily been identified on larger bodies of water that drain into Bassett Creek: on the shores of Medicine Lake and, a few miles downstream, the Sweeney and Twin Lakes as well as Birch Pond by Wirth Lake. Most of these sites are quite distant from the current project area but a few are close enough to indicate a possible relationship to the latter:

> 21-HE-0068 (Medicine Lake Mounds) -- seven mounds recorded in 1887 on a hogback ridge on the west side of Medicine Lake (Winchell 1911:255). No longer visible, they may have been destroyed by house and road construction as burial authentication efforts proved negative (Mather et al. 1997). Located in T118N, R22W, Section 26 (SW-NE and W-SW-NE).
>
> 21-HE-0261 -- a corner-notched point reported as found on a cultivated terrace that overlooks the marshy Plymouth Creek floodplain in T118N, R22W, Section 22 (W-SW-SE-NE).

The fact that relatively few cultural resources have been recorded in the vicinity of Plymouth and Bassett Creeks more than likely reflects a lack of systematic inventory survey rather than an actual lack of archaeological and historic potential, considering that most of the areas that have been inventoried proved positive. Existing data for the few areas that have been investigated suggest that most uplands that overlook these streams and associated lakes/wetlands would have attracted Native Americans as well as early Euro-American settlers.

Drawing on our understanding of the sites that do exist here as well as in neighboring parts of the “Central Deciduous Lakes South” archaeological region, we know that the following main cultural manifestations are known or likely to be represented in the archaeological record of the general study area: the **Paleoindian and Early Archaic periods** (ca. 10,000 to 3000 B.C.); the **Middle to Late Archaic periods** (ca. 3000 to 800 B.C.); the **Woodland period** (ca. 800 B.C. to the time of the time of early Euro-American contact); the **Oneota and Plains Village traditions**, which emerged around A.D. 950-1000; the **period of initial contact between Native Americans** (the Eastern Dakota) **and 18th/19th century Euro-Americans** (French, British and American explorers, military men, traders and missionaries); the **period of Euro-American settlement and home-steading**. As this investigation did not produce any archaeological evidence that needs to be evaluated within a larger cultural framework, more detailed discussion of the regional cultural sequence seems redundant in this report. More detailed discussions of the characteristics of each context can be found in Minnesota History in Sites and Structures: Pre-Contact and Contact Period Contexts, compiled and updated as needed by the State Historic Preservation Office (SHPO). A somewhat more comprehensive description is appended to the 2011 report.

3.0 SURVEY METHODOLOGY AND RESULTS

As the project will need a Section 404 U.S. Army Corps of Engineers permit to fill jurisdictional wetlands, it will require compliance with Section 106 of the National Historic Preservation Act of 1966 and consultation with SHPO. As an undertaking that involves non-federal public land and funding, the project will also come under the purview of OSA and Minnesota Statutes 138.31-.42. More encompassing, the Minnesota Private Cemeteries Act (MnST 307.07) protects all human remains and burials that are older than 50 years and located on private or public lands outside of platted, recorded or identified cemeteries.

In view of the above, the archaeological research done for this project has been conducted in a manner that meets the requirements of the Secretary of the Interior's Standards for Identification and Evaluation of cultural resources as well as the standards specified in the State Archaeologist's Manual for Archaeological Projects in Minnesota.

3.1 Records/Literature Search

Prior to the field review, ARS updated information they had already compiled for the Plymouth Creek study area as part of the above-mentioned 2011 Phase IA review. According to OSA staff, no new archaeological site information has been received by that office, nor do their records show that any studies have been or are being conducted in that area since 2011.

3.2 Plymouth Creek west of Fernbrook Lane

As shown in Figure D:1 and described above on page 2, the project route parallels the southern edge of a disc golf course. The medium blue line in the figure shows the existing stream centerline while the darker blue lines indicate the extent of the stream valley and the areas where its banks may be somewhat modified. The green lines show places where minor re-routing of the stream are being considered. Those concepts do not show the exact route, but rather the vicinity and rough extent of a re-route/remeander.

Although the field survey primarily focused on the areas that seemed likely to be affected by the undertaking, the entire length of this creek segment was visually reviewed including all areas adjacent to the stream banks up to a distance of 75 feet from the stream. The field review was conducted following the flow of the creek downstream.

From the bottom of the stream valley, ARS staff checked erosion exposure along the banks as well as erosion residue deposited at their base and in the creek. Following the top of the creek bank and covering all adjacent ground, the team then inspected the surface for evidence of any signs of past cultural activity as well as any existing subsoil exposure in the form of animal burrows, wind falls and erosion around tree roots. Because of good lateral visibility even in wooded areas as well as the ubiquitous presence of good erosion exposure all along the disc golf course and the creek banks, ARS could rely on visual inspection to provide sufficient survey coverage without supplementary shovel testing. Figures D:3 to D:5 illustrate the type of good ground exposure encountered all along this stretch. The last approximately 200 feet long segment west of Fernbrook Lane flows through low, quite marshy terrain without any archaeological potential. The area that then would be disturbed by the proposed culvert replacement under Ferndale Avenue has been completely disturbed by road construction and is also completely lacking in archaeological potential.

3.3 Plymouth Creek east of Fernbrook Lane

This eastern segment of the project -- Reach 3 on Figure D:1 -- is primarily a wooded valley which, along its northern side, abuts a residential neighborhood with newer homes on landscaped lots north of east-trending 35th Avenue. South of the avenue, wooded terrain slopes quite rapidly down to Plymouth Creek. South of the creek, however, there are several fairly level terraces that overlook the creek and could have invited enough historic use to have considerable archaeological potential (Figures D:8 and D:9). Considering that many of these terraces by now have been quite badly impacted by erosion, slumping and undercutting as shown in Figures D:6 and D:7, they are likely to be in need of bank stabilization, debris removal and some rerouting of the channel.

Consequently, ARS staff decided to supplement thorough visual inspection along the creek with systematic shovel testing of areas that lacked subsoil exposure. An initial series of tests was approximately one meter in from the south side of the creek and at approximate ten meter intervals. A second series was placed six-seven meters south of the creek, again at ten meter intervals but now staggered for more complete coverage with tests placed approximately between the ones to the north.

All tests measured approximately 40 centimeters in diameter. Each unit was taken down to sterile mineral soil, removing the soil contents by 10-centimeter levels and screening them through quarter-inch hardware cloth. It was then backfilled once soil profiles had been noted. Individual test records will be kept on file by ARS. GPS readings were used to record all test locations. All test profiles were very similar, with 40 t0 50 centimeters of dark grayish brown sandy silt loam over a substratum of coarser, more sandy and gravely, lighter colored grayish brown silt loam.

Like the preceding visual inspection of all areas affected by erosion, all test results proved negative.

4.0 CONCLUSION AND RECOMMENDATIONS

Visual inspection of existing erosion exposure, in some areas supplemented by shovel testing, has provided enough survey coverage to conclude that none of the bank segments that are prioritized for stabilizing feature any archaeological evidence.

However, should final design of needed stabilization measures change the now proposed areas of project impact, this initial inspection will need to be supplemented with further survey conducted in a manner that meets previously referenced federal and state guidelines.

5.0 REFERENCES

Anfinson, S. F.
1990 Archaeological Regions in Minnesota and the Woodland Period. In *The Woodland Tradition in the Western Great Lakes: Papers presented to Elden Johnson,* edited by G. Gibbon, pp. 135-166. University of Minnesota Publications in Anthropology Number 4. Minneapolis.

Anfinson, S. F. and H. E. Wright, Jr.
1990 Climatic Changes and Culture in Prehistoric Minnesota. In *The Woodland Tradition in the Western Great Lakes: Papers presented to Elden Johnson*,edited by G. Gibbon, pp.213-232. University of Minnesota Publications in Anthropology Number 4, Minneapolis.

Andreas, A.T.
1874 *An Illustrated Atlas of the State of Minnesota*. A.T. Andreas, Chicago.

Grimm, E.
1983 Chronology and Dynamics of Vegetation Change in the Prairie-Woodland Region of Southern Minnesota, U.S.A. *New Phytologist* 93:311-350.

Harrison, Christina
2002 Report on Archaeological Reconnaissance Survey Conducted Along Theodore Wirth Park Bike Trail, Minneapolis, Hennepin County, Minnesota. Prepared for the Minneapolis Park and Recreation Board with Hess, Roise and Company, Minneapolis.

Mather, D., D. Johnson and E.J. Abel
1997 *Burial Authentication Investigations of the Medicine Lake Mounds (21 HE 0068) for the Proposed West Medicine Lake Park Improvements - Phase II, City of Plymouth, Hennepin County.* Loucks & Associates, Inc., Maple Grove, Minnesota.

Marschner, F.
1974 *The Original Vegetation of Minnesota: Compiled from U.S. General Land Office Survey Notes*. North Central Forest Experiment Station. St. Paul. (Map reprinted from original published in 1930.)

University of Minnesota Agricultural Experiment Station (UMAES)
1973 *Minnesota Soil Atlas: St. Paul Sheet*. (Miscellaneous Report 120).

Winchell, N.H.
1911 *The Aborigines of Minnesota*. Minnesota Historical Society, St. Paul.

Wright, H.E. Jr.
1972 Quaternary History of Minnesota. In *Geology of Minnesota: A Centennial Volume*, edited by P.K. Sims and G.B.Morey, 515-547. Minnesota Geological Survey, St. Paul.

Wright, H.E. Jr, cont'd

1974 The Environment of Early Man in the Great Lakes Region. In *Aspects of Upper Great Lakes Anthropology: Papers in Honor of Lloyd A. Wilford*, edited by E. Johnson, pp. 8-14. Minnesota Prehistoric Archaeology Series Number 11. Minnesota Historical Society, St. Paul.

Appendix E

Wetland Delineation

Wetland Delineation Report - DRAFT

Plymouth Creek Feasibility Study

Prepared for
Bassett Creek Watershed Management Commission

January 2016

Wetland Delineation Report

Plymouth Creek Feasibility Study

Prepared for
Bassett Creek Watershed Management Commission

January 2016

Wetland Delineation Report

Plymouth Creek Feasibility Study

Prepared for
Basset Creek Watershed Management Commission

January 2016

4300 MarketPoint Drive, Suite 200
Minneapolis, MN 55435
Phone: 952.832.2600
Fax: 952.832.2601

Wetland Delineation Report

January 2016

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1.0 Introduction

Basset Creek Watershed Management Commission (BCWMC) is submitting a Wetland Delineation Report as part of a study that examines the feasibility of restoring sites along Plymouth Creek reaches damaged by erosion or affected by sedimentation. The project area is located along several reaches of Plymouth Creek beginning at Plymouth Creek Park and continues between Fernbrook Lane North and Annapolis Lane North, Plymouth, Hennepin County, Minnesota. The project area is within Sections 16, 21 and 22 of Township 118 North, Range 21 West (**Figure 1**).

A field wetland delineation was conducted along the fringes of these stream reaches to include delineation of creek edges. Two wetland boundaries were delineated along the creek fringes and are depicted in **Figure 6**.

This Wetland Delineation Report has been prepared in accordance with the U.S. Army Corps of Engineers 1987 Wetland Delineation Manual (“1987 Manual”, USACE, 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (USACE, 2010) and the requirements of the Minnesota Wetland Conservation Act (WCA) of 1991. Barr delineated the wetland boundaries and determined wetland types within the project area on September 22, 2015.

This report includes a project overview (Section 2.0), general environmental information (Section 3.0), descriptions of the delineated wetlands (Section 4.0), and a discussion of regulations and the administering authorities (Section 5.0). The Tables section includes the precipitation data. The Figures section includes the Site Location Map, Topography Map, National Wetland Inventory (NWI), Public Waters Inventory (PWI), Hydric Soils Map and the Wetland Boundary Map. **Appendix A** includes Wetland Data Forms, and site photographs are included in **Appendix B**.

2.0 Project Description

The entire Plymouth Creek project area (Error! Reference source not found.) extends approximately 2,800 feet from Annapolis Lane North on the downstream end to approximately 1,700 feet upstream of Fernbrook Lane North on the upstream end. The upstream boundary of the project area is a water-level-control structure (**Photo 1**). Originally known as the Central Park Pond Outlet, this structure runs under an access road that connects the Plymouth Creek Park parking lot on the north and the Plymouth Creek Center on the south.

The BCWMC Engineer walked the entire project area in September 2015 and identified sites with bank erosion, scour, and/or bank failure. Additional site visits were conducted in October and November 2015 to meet with stakeholders, check conceptual stabilization alternatives, and observe the creek during different flow conditions. Restoration/stabilization of the sites were considered critically important to meeting BCWMC goals and objectives cost effectively.

Stream bank erosion is a natural process that occurs at some rate on all alluvial channels, and the natural erosion rate can be accelerated by local and regional changes in land use and hydrology. The bank erosion and bank failures throughout the project area appear to be caused by a combination of natural stream erosion processes, problems associated with changing watershed hydrology, and effects of riparian land use. Of the 5,600 feet of stream bank in the project area, approximately 2,850 feet (more than half) showed some degree of erosion.

Stable stream channels are often said to be in a state of “dynamic equilibrium” with their watersheds, adjusting to changes in the watershed hydrology. It may take many years or decades for a stream to fully adjust to a rapid change in watershed hydrology. The use of best management practices (BMPs) helps reduce the impact of development projects on streams. Nonetheless, development and land use changes fundamentally change the hydrology of the watershed. These changes to hydrology often include increased magnitude and frequency of high-flow events, which subsequently increases erosion rates. In addition, the heavy use of golf course in the riparian area of Reaches 1 and 2 has decreased groundcover on the stream banks and adjacent wooded areas, increasing the potential for erosion.

3.0 General Environmental Setting

3.1 Site Description

The proposed project area is located within City of Plymouth property. The project area west of Fernbrook Lane North is bordered by medium density apartment property to the south and Plymouth Creek Park to the north and west. The project area located east of Fernbrook Lane North has medium density housing to the North and office building space to the south. Lands surrounding the project area are forested with deciduous trees (**Figure 1**).

3.2 Topography

The project area has moderately undulating to flat topography throughout and in most areas along Plymouth creek there is an abrupt topographic break leading into the creek due to erosion. Topography surrounding the project area further away is relatively flat (**Figure 2**).

3.3 Precipitation

Recent precipitation data were compared to historic data for evaluating annual and monthly deviations from normal conditions. Simulated precipitation data were obtained from the Minnesota Climatology Working Group, Wetland Delineation Precipitation Data Retrieval from a Gridded Database (http://climate.umn.edu/gridded_data/precip/wetland/wetland.asp) for wetlands in Hennepin County, Township 118 North, Range 22 West, Section 21.

In 2015, antecedent moisture conditions were within the normal range based on precipitation for the three months prior to the September 22, 2015 site visit. These data were obtained from NRCS climate station 215838, New Hope Weather Station (**Table 1**). The water year has varied between normal and wet for the past six years but fell mostly into the wet range from 2010 through 2015 (**Table 2**).

3.4 National Wetland Inventory

The National Wetland Inventory (NWI) Map has identified a portion of the Plymouth Creek Study Reach as riverine wetland located west of Fernbrook Lane North. It was identified as a riverine (R) wetland, lower perennial (2), with an unconsolidated bottom (UB) that has an intermittently exposed hydrologic regime (G) or an R2UBG riverine wetland. No other NWI wetlands were mapped within the Plymouth Creek Study Reach (**Figure 3**).

3.5 Water Resources

The Minnesota Department of Natural Resources (MnDNR) Public Waters Inventory (PWI) has identified Plymouth Creek as a public water inventory watercourse (**Figure 4**). Reaches of Plymouth Creek located within the project area were delineated along with two wetland fringe areas. Plymouth Creek is not identified by the Minnesota Pollution Control Agency (MPCA) as an impaired water.

3.6 Soil Resources

Soil information for the wetland evaluation area was obtained from the Soil Survey of Hennepin County, Minnesota (USDA, 1974). Three soil map units were identified within the project area along the Plymouth Creek reaches: Hamel overwash-Hamel complex, 1 to 4 percent slopes (L36A), Lester loam, 6 to 10 percent slopes, moderately eroded (L22C2) and Hamel-Glencoe depressional, complex, 0 to 3 percent slopes (L132A). The Hamel overwash-Hamel complex and Lester loam are mapped as predominately Non-Hydric. The Hamel-Glencoe depressional is mapped as predominately hydric (**Figure 5**).

4.0 Wetland Delineation

4.1 Wetland Delineation and Classification Methods

Wetlands within the site were delineated and classified during a site visit on September 22, 2015. The wetland delineation was established according to the Routine On-Site Determination Method specified in the U.S. Army Corps of Engineers Wetlands Delineation Manual (1987 Edition) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (USACE, 2010).

The delineated wetland boundaries and sample points were surveyed using a Global Positioning System (GPS) with sub-meter accuracy (**Figure 6**).

Wetlands were classified using the U.S. Fish and Wildlife Service (USFWS) Cowardin System (Cowardin et al., 1979), the USFWS Circular 39 system (Shaw and Fredine, 1956), and the Eggers and Reed Wetland Classification System (Eggers and Reed, 1977).

Soil borings were placed in and around the wetland, to a depth of at least 20 inches below the ground surface where possible. Representative soil samples from each boring were examined for the presence of hydric soil indicators using the Natural Resources Conservation Service (NRCS) hydric soil indicators (Version 6.0). Soil colors (e.g., 7.5YR 4/2, etc.) were determined using a Munsell® soil color chart and noted on the Wetland Data Forms **Appendix A**.

Hydrologic conditions were evaluated at each soil boring, and this information was also noted on the Wetland Data Forms. The dominant plant species were identified, and the corresponding wetland indicator status of each plant species was determined and noted on the Wetland Data Forms (**Appendix A**). Photographs taken at the time of the site visit are provided in **Appendix B**.

4.2 Wetland Descriptions

Two wetlands were delineated within the project site. Descriptions and assessments of the wetland areas are provided below, with representative photographs in **Appendix B**.

4.2.1 Wetland 1

Wetland 1 is a Type 1 (PEMA), seasonally flooded basin within floodplain located on the right bank of Plymouth Creek within Plymouth Creek Park (**Figure 6**). The surrounding area has steep and abrupt slopes leading into Wetland 1. There is an upland island between Wetland 1 and Plymouth creek approximately 8 feet higher in elevation than the surface of the wetland. Flood waters may periodically enter the north end of Wetland 1 between the upland island and the adjacent forested uplands to the south, which flow through and back to Plymouth Creek further downstream.

Dominant plants within wetland 1 and at Wetland Sample Point 1-1 (SP 1-1 WET) was reed canary grass (*Phalaris arundinacea*, FACW). Sub-dominant species included green bulrush (*Scirpus atrovirens*, OBL), stinging nettle (*Urtica dioica*, FACW) and a species of sedge (*Carex sp*.) that could not be identified. Tree and shrub species were present within 30 feet of SP 1-1 WET but were not directly within the basin.

Primary indicators of hydrology that were observed were high water table (A2), and saturation (A3). Secondary indicators of hydrology present included geomorphic position (D2) and a positive FAC-Neutral test (D5).

Soils mapped at SP 1-1 WET and throughout Wetland 1 were identified as Lester loam, 6-10% slopes. Sampled soils were black at the surface with 2 percent redoximorphic concentrations down to 9 inches with sandy loam textures. Soils from 9 inches to 18 inches were dark grayish brown with 5 percent redoximorhic features and had fine sandy loam textures. At 18 inches soils transitioned to black and sandy mucky mineral textures down to 25 inches. The hydric soil indicator at SP 1-1 WET is sandy redox (S5).

The transition to upland was defined by the lack of vegetation, hydrology and hydric soil indicators. Dominant vegetation in upland areas consisted of sugar maple (*Acer saccharum*, FACU), common dandelion (*Taraxacum offcinale*, FACU) and a species of sedge.

4.2.2 Wetland 2

Wetland 2 is a Type 2 (PEMB), fresh meadow located on the left bank of Plymouth Creek approximately 300 feet downstream from Wetland 1 (**Figure 6**). Wetland 2 may occasionally flood during the growing season but in most year's water likely remains within 12 inches of the soil surface. Two sample points were taken within Wetland 1 along the same transect. Data from SP 2-1 WET-A was collected close to the wetland boundary and data from SP 2-1 WET-B was collected closer to the creek channel.

Reed canary grass and eastern cottonwood (*Populus deltoides*, FAC) is dominant at both SP 2-1 WET-A and SP 2-1 WET-B with a sub-dominance of water smartweed (*Persicaria amphibia*, OBL).

There were no primary indicators of hydrology observed within Wetland 2. Secondary indicators of hydrology present included geomorphic position (D2) and a positive FAC-Neutral test (D5).

Soils mapped at both sample locations and throughout Wetland 2 were identified as Lester loam, 6-10% slopes. Soils at SP 2-1 WET-A were very dark gray clay loams down to 8 inches and transitioned to dark grayish brown with 20 percent redoximorphic features down to 14 inches. From 14 to 20 inches soils transitioned to more yellow hues that were dark gray. Textures were clay loam throughout the soil profile. The hydric soil indicator at SP 2-1 WET-A is redox dark surface (F6).

Soils at SP 2-1 WET-B were sandy clay and gleyed down to 15 inches with 2 percent redoximorphic concentrations. Soils transitioned to sand and dark gray colors with yellower hues from 15 to 25 inches. The hydric soil indicators at SP 2-1 WET-B are sandy gleyed matrix (S4) and sandy redox (S5).

The transition to upland was defined by the lack of vegetation, hydrology and hydric soil indicators. Dominant vegetation in upland areas consisted of sugar maple and European buckthorn (*Rhamnus cathartica*, FAC).

5.0 Regulatory Overview

The USACE regulates the placement of dredge or fill materials into wetlands that are located adjacent to or are hydrologically connected to interstate or navigable waters under the authority of Section 404 of the Clean Water Act. If the USACE has jurisdiction over any portion of a project, they may also review impacts to wetlands under the authority of the National Environmental Policy Act.

Filling, excavating, and draining wetlands are also regulated by the Minnesota Wetland Conservation Act (WCA), and the Minnesota Public Waters Inventory Program, which are administered by the City of Plymouth and the Minnesota Department of Natural Resources (DNR) respectively. The USACE, the City of Plymouth and the DNR should be contacted before altering any wetlands on the site. In addition, delineated wetland boundaries may be reviewed, if needed, by a Technical Evaluation Panel (TEP) consisting of representatives from the Minnesota Board of Water and Soil Resources, and Hennepin County, along with the City of Plymouth, DNR and USACE.

6.0 References

Cowardin, L.M., V. Carter, F.C. Golet, and R.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States.* U.S. Fish and Wildlife Service, FWS/OBS079/31, 103 pp.

Eggers, S.D. and Reed, D.M. 1997. *Wetland Plants and Plant Communities of Minnesota and Wisconsin.* U.S. Army Corps of Engineers, St. Paul District. St. Paul, Minnesota.

Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. *The National Wetland Plant List*: 2014 Update of Wetland Ratings. Phytoneuron 2014-41: 1-42.

Shaw, S.P., and C.G. Fredine. 1956. Wetlands of the United States. U.S. Fish and Wildlife Service, Circular 39. 67pp.

U.S. Department of Agriculture, Natural Resources Conservation Service. 1974. *Soil Survey of Hennepin County, Minnesota*. Washington, D.C.

U. S. Department of Agriculture, Natural Resources Conservation Service. 2010. *Field Indicators of Hydric Soils in the United States, Version 7.0*. G.W. Hurt and L.M. Vasilas (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

U.S. Army Corps of Engineers. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region*. August 2010. Wetlands Regulatory Assistance Program.

U.S. Army Corps of Engineers. 1987. *1987 U.S. Army Corps of Engineers Wetland Delineation Manual*. Wetlands Research Program Technical Report Y-87-1 (on-line edition). Waterways Experiment Station, Vicksburg, Mississippi.

U.S. Fish and Wildlife Service. 1956. *Wetlands of the United States Circular 39*. U.S. Government Printing Office, Washington, D.C.

Tables

Table 1
Antecedent Moisture Conditions Prior to September 22, 2015 Site Visit
Plymouth Creek Feasibility Study Wetland Delineation
Plymouth, MN

Precipitation Worksheet Using Gridded Database

Precipitation data for target wetland location:

County: Hennepin
Township Name: Plymouth
Nearest Community: Plymouth
Township Number: 118N
Range Number: 22W
Section Number: 21

Aerial photograph or site visit date:
Tuesday September 22, 2015

Score using 1971-2000 normal period

(value are in inches)	first prior month: **August 2015**	second prior month: **July 2015**	third prior month: **June 2015**
estimated precipitation total for this location:	**3.6**	**7.02**	**3.56**
there is a 30% chance this location will have less than:	3.18	3.04	2.92
there is a 30% chance this location will have more than:	4.72	5.28	5.28
type of month: **dry** **normal** **wet**	**normal**	**wet**	**normal**
monthly score	**3 * 2 = 6**	**2 * 3 = 6**	**1 * 2 = 2**
multi-month score: 6 to 9 (**dry**) 10 to 14 (**normal**) 15 to 18 (**wet**)	14 (**normal**)		

Score using 1981-2010 normal period

(value are in inches)	first prior month: **August 2015**	second prior month: **July 2015**	third prior month: **June 2015**
estimated precipitation total for this location:	**3.6**	**7.02**	**3.56**
there is a 30% chance this location will have less than:	2.94	2.7	2.93
there is a 30% chance this location will have more than:	4.93	4.98	5.33
type of month: **dry** **normal** **wet**	**normal**	**wet**	**normal**
monthly score	**3 * 2 = 6**	**2 * 3 = 6**	**1 * 2 = 2**
multi-month score: 6 to 9 (**dry**) 10 to 14 (**normal**) 15 to 18 (**wet**)	14 (**normal**)		

Table 2
Precipitation in Comparison to WETS Data
Plymouth Creek Feasibility Study Wetland Delineation
Plymouth, MN

Precipitation data for target wetland location:

County: Hennepin
Township Name: Plymouth
Nearest Community: Plymouth
Township Number: 118N
Range Number: 22W
Section Number: 21

Precipitation Totals are in Inches	
Color Key	**Multi-month Totals**:
total is in lowest 30th percentile of the period-of-record distribution	**WARM** = warm season (May thru September)
total is => 30th and <= 70th percentile	**ANN** = calendar year (January thru December)
total is in highest 30th percentile of the period-of-record distribution	**WAT** = water year (Oct. previous year thru Sep. present year)

Period-of-Record Summary Statistics

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
30%	0.53	0.53	1.13	1.50	2.62	3.25	2.41	2.94	1.92	1.16	0.75	0.59	16.18	26.29	25.98
70%	1.07	1.24	1.95	2.76	4.28	5.66	4.50	4.44	3.75	2.65	1.92	1.31	20.94	32.47	32.04
mean	0.90	0.92	1.65	2.40	3.70	4.50	3.82	3.62	3.04	2.18	1.50	1.03	18.67	29.24	29.30

1971-2000 Summary Statistics

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
30%	0.63	0.35	1.25	1.33	2.70	3.24	2.83	3.34	1.98	0.98	1.12	0.60	17.43	28.26	27.09
70%	1.13	0.98	1.96	2.62	4.03	5.53	4.89	4.84	3.28	2.80	2.24	1.28	20.78	32.84	33.70
mean	1.00	0.82	1.82	2.31	3.47	4.41	4.43	4.08	2.94	2.18	1.90	0.96	19.33	30.33	30.47

1981-2010 Summary Statistics

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
30%	0.53	0.40	1.27	2.03	2.70	3.32	2.50	3.16	2.27	1.29	1.05	0.69	17.17	28.50	27.09
70%	1.06	0.91	1.96	2.84	4.08	5.44	4.41	4.91	3.73	3.35	2.02	1.45	21.56	34.09	34.04
mean	0.83	0.80	1.81	2.66	3.56	4.44	4.14	4.16	3.39	2.45	1.72	1.17	19.70	31.14	30.95

Year-to-Year Data

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
2015	0.38	0.34	0.67	1.84	4.44	3.56	7.02	3.60	3.76	2.84	-	-	22.38	-	28.86
2014	1.33	1.46	0.75	7.49	4.63	11.07	3.27	2.99	2.01	1.10	1.16	0.99	23.97	38.25	41.53
2013	0.65	1.17	1.89	4.05	5.17	7.78	4.72	1.53	1.45	4.37	0.58	1.58	20.65	34.94	32.40
2012	0.46	2.13	1.20	2.95	9.96	4.25	4.35	1.38	0.54	1.62	0.83	1.54	20.48	31.21	29.04
2011	0.92	0.96	1.57	3.00	6.50	4.13	6.45	3.64	0.60	0.94	0.16	0.72	21.32	29.59	34.81
2010	0.57	0.80	0.95	1.85	3.00	5.77	3.46	5.61	6.08	2.02	1.98	3.04	23.92	35.13	36.51
2009	0.43	0.91	1.92	1.18	0.49	3.80	0.89	6.62	0.87	5.62	0.60	2.20	12.67	25.53	21.26
2008	0.16	0.52	2.00	3.71	2.51	4.46	2.21	3.05	2.66	1.49	1.21	1.45	14.89	25.43	28.32
2007	0.71	1.29	3.31	2.37	3.22	1.30	2.02	6.86	4.96	5.24	0.09	1.71	18.36	33.08	30.45
2006	0.57	0.41	1.54	3.18	3.27	4.05	1.57	4.42	3.27	0.68	1.13	2.60	16.58	26.69	29.85
2005	1.31	0.88	1.23	2.47	3.50	6.25	2.47	3.08	6.59	4.60	1.61	1.36	21.89	35.35	32.81
2004	0.45	1.33	2.18	2.54	6.36	5.73	4.35	1.45	5.17	3.55	1.05	0.43	23.06	34.59	32.41
2003	0.22	0.92	1.62	2.77	4.66	6.73	2.36	0.47	2.52	0.92	1.13	0.80	16.74	25.12	26.26
2002	0.55	0.55	1.81	3.86	3.95	8.13	6.51	7.09	4.24	3.66	0.07	0.26	29.92	40.68	41.01
2001	1.25	1.25	0.89	7.93	5.27	5.07	2.51	3.17	3.46	0.87	2.86	0.59	19.48	35.12	36.01
2000	0.88	1.12	0.99	1.33	3.43	3.32	6.17	3.07	2.06	0.86	3.23	1.12	18.05	27.58	24.16
1999	1.19	0.32	1.54	3.12	6.57	5.31	4.49	4.06	2.33	0.66	0.81	0.32	22.76	30.72	33.69
1998	1.07	0.78	3.54	1.66	3.77	4.53	2.86	4.94	1.25	2.52	1.63	0.61	17.35	29.16	27.14
1997	1.60	0.26	1.39	1.04	1.73	2.62	9.74	4.54	2.86	1.95	0.57	0.22	21.49	28.52	36.05
1996	2.26	0.34	1.95	0.64	4.26	3.89	1.66	1.57	1.60	3.96	4.74	1.57	12.98	28.44	25.72

Figures

Legend

- Study Reach
- Streams

N

Feet

250 0 250 500

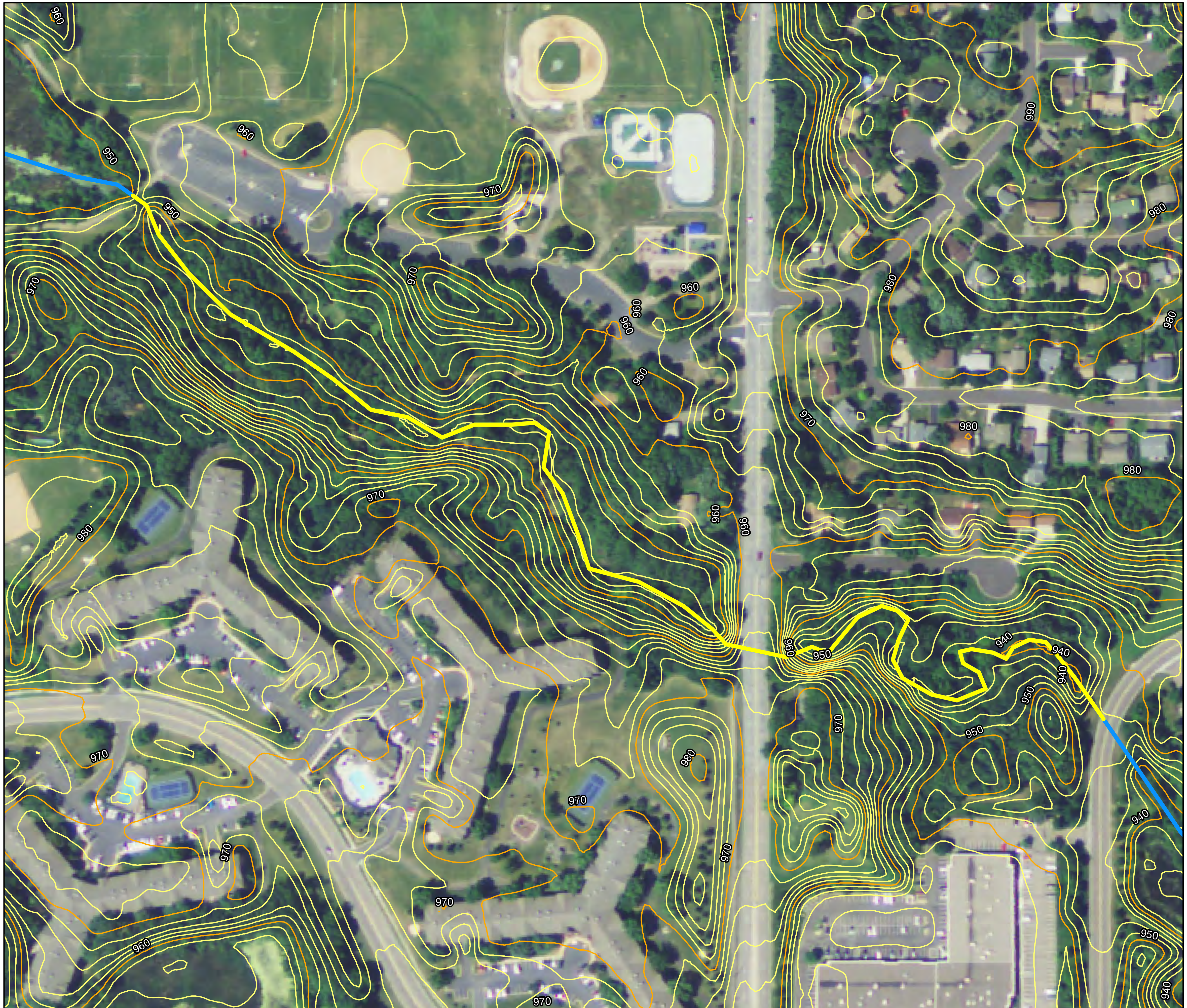
Meters

100 0 100

BARR

Figure 1

PROJECT LOCATION MAP
Plymouth Creek Feasibility Study
Wetland Delineation
Bassett Creek Watershed
Management Commission



Legend

- Plymouth Creek
- Plymouth Creek Study Reach

Contours

- 10-Foot Contour
- 2-Foot Contour

N

Feet
400 0

Meters
100 0

BARR

Figure 2

TOPOGRAPHY MAP
Plymouth Creek Feasibility Study
Wetland Delineation
Bassett Creek Watershed
Management Commission

Legend

- Plymouth Creek
- Plymouth Creek Study Reach
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine

N

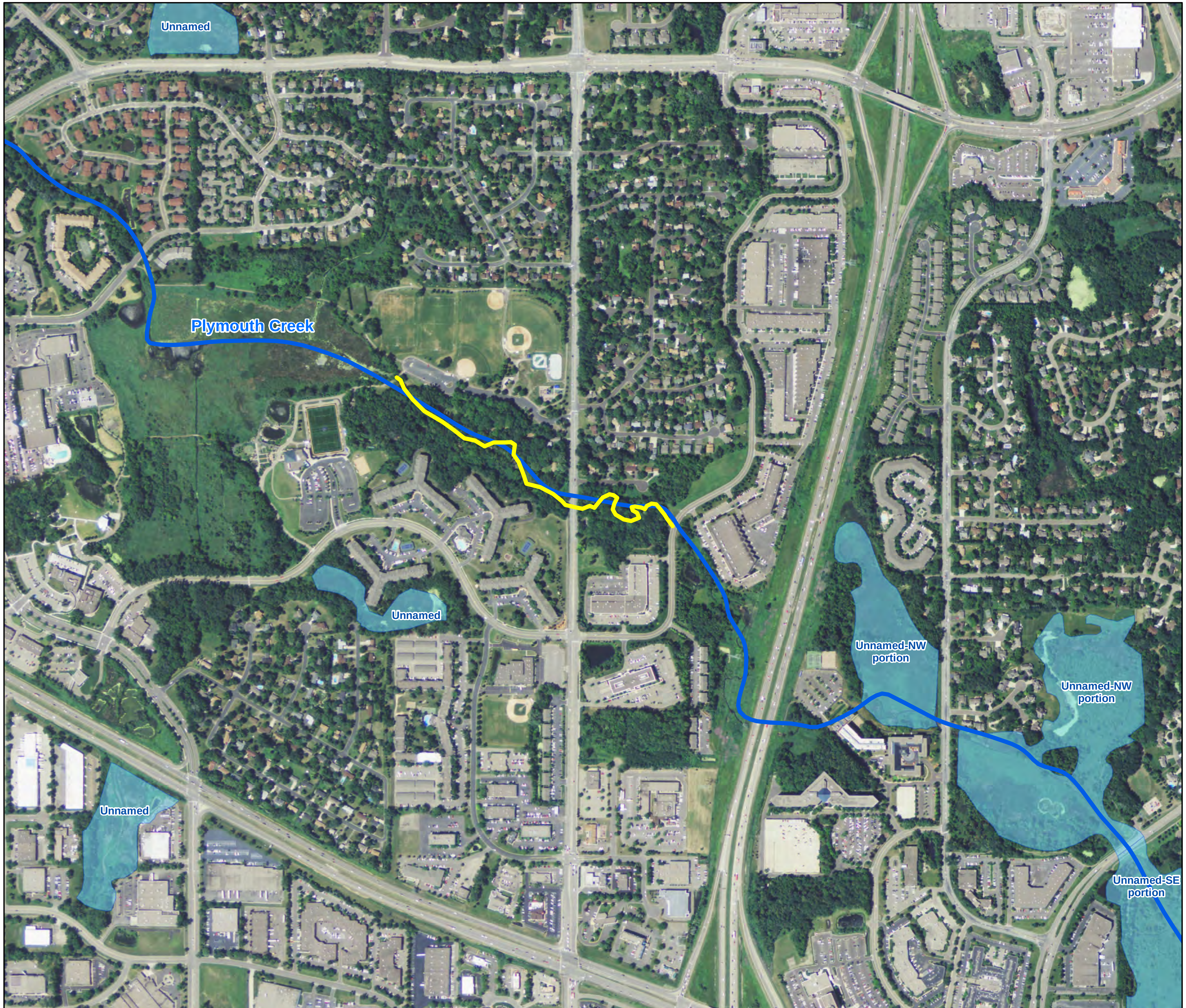
Feet
400 0

Meters
100 0

BARR

Figure 3

NATIONAL WETLAND INVENTORY
Plymouth Creek Feasibility Study
Wetland Delineation
Bassett Creek Watershed
Management Commission



Legend

- Plymouth Creek Study Reach
- Public Water Inventory Watercourses
- Public Water Inventory Basins

N

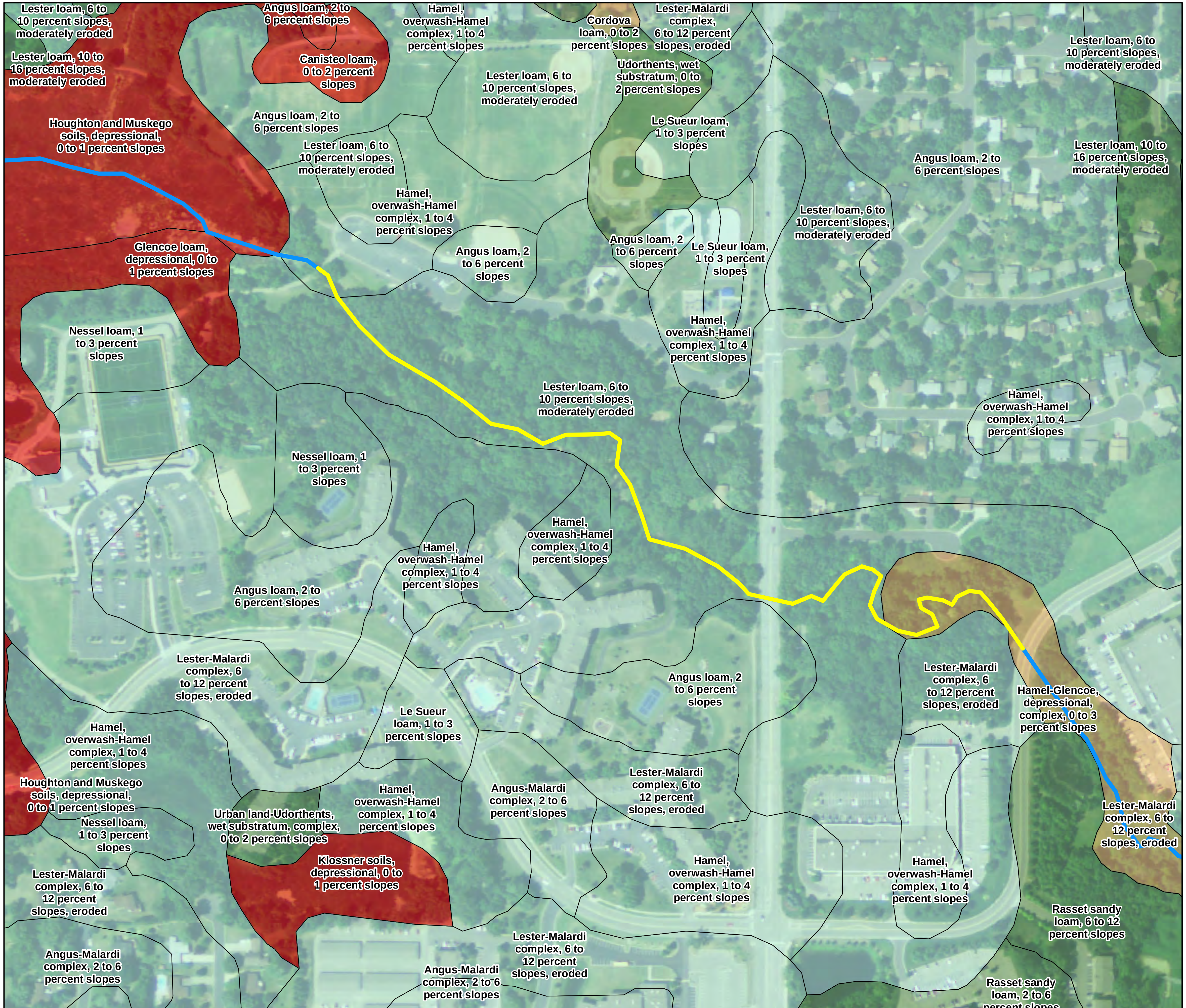
Feet
400 0 400 800

Meters
100 0 100 200

BARR

Figure 4

PUBLIC WATER INVENTORY
Plymouth Creek Feasibility Study
Wetland Delineation
Bassett Creek Watershed
Management Commission



Legend

- Plymouth Creek Study Reach
- Plymouth Creek

Soils Hydric Rating

- Hydric
- Predominately Hydric
- Predominately Non-Hydric
- Non-Hydric

N

Feet
500 0

Meters
100 0

BARR

Figure 5

SOIL SURVEY
Plymouth Creek Feasibility Study
Wetland Delineation
Bassett Creek Watershed
Management Commission

Legend

Sample Points

Feature Type

Creek

Upland Island

Wetland

Feet
100 0 100 200

Meters
50 0 50

BARR

Figure 6

WETLAND & CREEK DELINEATION
Plymouth Creek Feasibility Study
Wetland Delineation
Bassett Creek Watershed
Management Commission

Appendix A

Wetland Data Forms

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Plymouth Creek   Applicant/Owner: BCWMC   City/County: Plymouth/Hennepin   State: MN   Sampling Date: 10/16/15

Investigator(s): BKB   Section: 16   Township: 118   Range: 22   Sampling Point: 1-1 UPL

Land Form: Footslope   Local Relief: None   Slope %: 2   Soil Map Unit Name: Lester loam, 1 to 3 percent slopes

Subregion (LRR): M   Latitude: 4985548   Longitude: 463337   Datum: UTM Nad 83 Zone 15N Meters

Cowardin Classification: Upland   Circular 39 Classification: Upland   Mapped NWI Classification: Upland

Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in remarks)   Eggers & Reed (primary): Upland

Are vegetation No   Soil No   Hydrology No   significantly disturbed?   Are "normal circumstances" present? Yes   Eggers & Reed (secondary):

Eggers & Reed (tertiary):

Are vegetation No   Soil No   Hydrology No   naturally problematic?   Eggers & Reed (quaternary):

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	No
Hydric soil present?	No
Indicators of wetland hydrology present?	No
Is the sampled area within a wetland?	No

General Remarks (explain any answers if needed):

If yes, optional Wetland Site ID: Upland

VEGETATION

Tree Stratum (Plot Size: 30 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.	Acer saccharum	25	Yes	FACU
2.		0		
3.		0		
4.		0		
	Total Cover:	25		

Sapling/Shrub Stratum (Plot Size: 15 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.	Acer saccharum	10	Yes	FACU
2.		0		
3.		0		
4.		0		
5.		0		
	Total Cover:	10		

Herb Stratum (Plot Size: 5 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.	Taraxacum officinale	15	Yes	FACU
2.	Carex sp.	10	Yes	
3.	Plantago major	5	No	FAC
4.	Trifolium pratense	5	No	FACU
5.	Cirsium arvense	2	No	FACU
6.	Arctium minus	2	No	FACU
7.	Solanum dulcamara	2	No	FAC
8.	Verbascum thapsus	1	No	UPL
	Total Cover:	42		

Woody Vine Stratum (Plot Size: 30 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
	Total Cover:	0		

% Bare Ground in Herb Stratum: ____   % Sphagnum Moss Cover: ____

Vegetation Remarks: (include photo numbers here or on a separate sheet)

50/20 Thresholds:

	20%	50%
Tree Stratum	5	12.5
Sapling/Shrub Stratum	2	5
Herb Stratum	8.4	21
Woody Vine Stratum	0	0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW or FAC:	0.00%	(A/B)

Prevalence Index Worksheet:

	Total % Cover of:	Multiply by:	
OBL Species	0	X 1	0
FACW Species	0	X 2	0
FAC Species	7	X 3	21
FACU Species	59	X 4	236
UPL Species	1	X 5	5
Column Totals:	67	(A)	262 (B)

Prevalence Index = B/A = 3.91

Hydrophytic Vegetation Indicators:

No	Rapid Test for Hydrophytic Vegetation
No	Dominance Test is >50%
No	Prevalence Index ≤ 3.0 [1]
No	Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
No	Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? No

WETLAND DETERMINATION DATA FORM - Midwest Region

SOIL

Sampling Point: 1-1 UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the abscence of indicators).

	Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
1.	0 - 11	10YR 2/1						Silt Loam	
2.	11 - 17	10YR 2/1	99	10YR 5/1	1	D	M	Sandy Loam	1% coarse depletions
3.	17 - 20	10YR 3/1	98	10YR 4/2	2	D	M	Sandy Loam	
4.	20 - 24	10YR 2/2	98	7.5 YR 3/4	2	C	M	Sandy Clay Loam	
5.	-								
6.	-								

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): Type: Depth (inches):

Hydric soil present? No

Soil Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (explain in remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

- Surface water present? ☐ Surface Water Depth (inches):
- Water table present? ☐ Water Table Depth (inches):
- Saturation present? (includes capillary fringe) ☐ Saturation Depth (inches):

Indicators of wetland hydrology present? No

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site:	Plymouth Creek	Applicant/Owner:	BCWMC	City/County:	Plymouth/Hennepin	State:	MN	Sampling Date:	10/16/15
Investigator(s):	BKB	Section:	16	Township:	118	Range:	22	Sampling Point:	1-1 WET
Land Form:	Flat	Local Relief:	None	Slope %:	0	Soil Map Unit Name:	Lester loam, 1 to 3 percent slopes		
Subregion (LRR):	M	Latitude:	4985553	Longitude:	463342	Datum:	UTM Nad 83 Zone 15N Meters		
Cowardin Classification:	PEMA	Circular 39 Classification:	Type 1	Mapped NWI Classification:	Upland				

Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in remarks)

Eggers & Reed (primary): Seasonally Flooded Basin

Eggers & Reed (secondary):

Eggers & Reed (tertiary):

Eggers & Reed (quaternary):

Are vegetation No Soil No Hydrology No significantly disturbed?

Are vegetation No Soil No Hydrology No naturally problematic?

Are "normal circumstances" present? Yes

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	Yes
Hydric soil present?	Yes
Indicators of wetland hydrology present?	Yes
Is the sampled area within a wetland?	Yes

General Remarks (explain any answers if needed):

If yes, optional Wetland Site ID: Wetland 1

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot Size: 30 ft)			
1. Ulmus americana	20	Yes	FACW
2. Acer saccharum	5	Yes	FACU
3.	0		
4.	0		
Total Cover:	25		
Sapling/Shrub Stratum (Plot Size: 15 ft)			
1. Rhamnus cathartica	1	No	FAC
2.	0		
3.	0		
4.	0		
5.	0		
Total Cover:	1		
Herb Stratum (Plot Size: 5 ft)			
1. Phalaris arundinacea	60	Yes	FACW
2. Scirpus atrovirens	15	No	OBL
3. Urtica dioica	10	No	FACW
4. Carex sp.	5	No	
5.	0		
6.	0		
7.	0		
8.	0		
Total Cover:	90		
Woody Vine Stratum (Plot Size: 30 ft)			
1.	0		
2.	0		
Total Cover:	0		

% Bare Ground in Herb Stratum: ______ % Sphagnum Moss Cover: ______

Vegetation Remarks: (include photo numbers here or on a separate sheet)

50/20 Thresholds:	20%	50%
Tree Stratum	5	12.5
Sapling/Shrub Stratum	0.2	0.5
Herb Stratum	18	45
Woody Vine Stratum	0	0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW or FAC:	66.67%	(A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species	15	X 1	15
FACW Species	90	X 2	180
FAC Species	1	X 3	3
FACU Species	5	X 4	20
UPL Species	0	X 5	0
Column Totals:	111 (A)		218 (B)

Prevalence Index = B/A = 1.96

Hydrophytic Vegetation Indicators:

No	Rapid Test for Hydrophytic Vegetation
Yes	Dominance Test is >50%
Yes	Prevalence Index ≤ 3.0 [1]
No	Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
No	Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes

WETLAND DETERMINATION DATA FORM - Midwest Region

SOIL

Sampling Point: 1-1 WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the abscence of indicators).

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks
1.	0 - 9	10YR 2/1	98	7.5YR 3/4	2	C	M	Sandy Loam	
2.	9 - 18	10YR 4/2	95	7.5YR 3/4	5	C	M	Fine Sandy Loam	
3.	18 - 25	N 2.5/0	100					Sandy Mucky Mineral	
4.	-								
5.	-								
6.	-								

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☑ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): Type: Depth (inches):

Hydric soil present? Yes

Soil Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (explain in remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☑ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	☐	Surface Water Depth (inches):	
Water table present?	☑	Water Table Depth (inches):	8
Saturation present? (includes capillary fringe)	☑	Saturation Depth (inches):	0

Indicators of wetland hydrology present? Yes

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks:

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WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Plymouth Creek | Applicant/Owner: BCWMC | City/County: Plymouth/Hennepin | State: MN | Sampling Date: 10/16/15

Investigator(s): BKB | Section: 21 | Township: 118 | Range: 22 | Sampling Point: 2-1 UPL

Land Form: Hillslope | Local Relief: Concave | Slope %: 3 | Soil Map Unit Name: Lester loam, 1 to 3 percent slopes

Subregion (LRR): M | Latitude: 4985472 | Longitude: 463549 | Datum: UTM Nad 83 Zone 15N Meters

Cowardin Classification: Upland | Circular 39 Classification: Upland | Mapped NWI Classification: Upland

Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in remarks)

Eggers & Reed (primary): Upland

Are vegetation No Soil No Hydrology No significantly disturbed?

Are "normal circumstances" present? Yes

Eggers & Reed (secondary):

Eggers & Reed (tertiary):

Are vegetation No Soil No Hydrology No naturally problematic?

Eggers & Reed (quaternary):

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	No
Hydric soil present?	No
Indicators of wetland hydrology present?	No
Is the sampled area within a wetland?	No

General Remarks (explain any answers if needed):

If yes, optional Wetland Site ID: Upland

VEGETATION

Tree Stratum (Plot Size: 30 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.	Acer saccharum	90	Yes	FACU
2.		0		
3.		0		
4.		0		
	Total Cover:	90		

Sapling/Shrub Stratum (Plot Size: 15 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.	Rhamnus cathartica	20	Yes	FAC
2.		0		
3.		0		
4.		0		
5.		0		
	Total Cover:	20		

Herb Stratum (Plot Size: 5 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.	Acer saccharum	40	Yes	FACU
2.	Rhamnus cathartica	10	Yes	FAC
3.		0		
4.		0		
5.		0		
6.		0		
7.		0		
8.		0		
	Total Cover:	50		

Woody Vine Stratum (Plot Size: 30 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
	Total Cover:	0		

% Bare Ground in Herb Stratum: | % Sphagnum Moss Cover:

Vegetation Remarks: (include photo numbers here or on a separate sheet)

50/20 Thresholds:

	20%	50%
Tree Stratum	18	45
Sapling/Shrub Stratum	4	10
Herb Stratum	10	25
Woody Vine Stratum	0	0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW or FAC:	50.00%	(A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:		
OBL Species	0	X 1	0	
FACW Species	0	X 2	0	
FAC Species	30	X 3	90	
FACU Species	130	X 4	520	
UPL Species	0	X 5	0	
Column Totals:	160	(A)	610	(B)

Prevalence Index = B/A = 3.81

Hydrophytic Vegetation Indicators:

No	Rapid Test for Hydrophytic Vegetation
No	Dominance Test is >50%
No	Prevalence Index ≤ 3.0 [1]
No	Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
No	Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? No

WETLAND DETERMINATION DATA FORM - Midwest Region

SOIL

Sampling Point: 2-1 UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the abscence of indicators).

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks
1.	0 - 8	10YR 2/1						Clay Loam	
2.	8 - 15	10YR 3/2						Clay	
3.	15 - 20	10YR 5/4	98	10YR 5/8	2	C	M	Sandy Clay Loam	
4.	-								
5.	-								
6.	-								

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains   [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): Type: ______ Depth (inches): ______

Hydric soil present? No

Soil Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (explain in remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

- Surface water present? ☐ Surface Water Depth (inches): ______
- Water table present? ☐ Water Table Depth (inches): ______
- Saturation present? (includes capillary fringe) ☐ Saturation Depth (inches): ______

Indicators of wetland hydrology present? No

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks:

1/25/2016 12:21:16 PM

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Plymouth Creek | Applicant/Owner: BCWMC | City/County: Plymouth/Hennepin | State: MN | Sampling Date: 10/16/15

Investigator(s): BKB | Section: 21 | Township: 118 | Range: 22 | Sampling Point: 2-1 WET-A

Land Form: Flat | Local Relief: None | Slope %: 0 | Soil Map Unit Name: Lester loam, 1 to 3 percent slopes

Subregion (LRR): M | Latitude: 4985467 | Longitude: 463541 | Datum: UTM Nad 83 Zone 15N Meters

Cowardin Classification: PEMB | Circular 39 Classification: Type 2 | Mapped NWI Classification: Upland

Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in remarks)

Eggers & Reed (primary): Fresh (Wet) Meadow

Eggers & Reed (secondary):

Eggers & Reed (tertiary):

Eggers & Reed (quaternary):

Are vegetation No Soil No Hydrology No significantly disturbed?

Are vegetation No Soil No Hydrology No naturally problematic?

Are "normal circumstances" present? Yes

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	Yes
Hydric soil present?	Yes
Indicators of wetland hydrology present?	Yes
Is the sampled area within a wetland?	Yes

General Remarks (explain any answers if needed):

If yes, optional Wetland Site ID: Wetland 2

VEGETATION

Tree Stratum (Plot Size: 30 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.	Populus deltoides	15	Yes	FAC
2.		0		
3.		0		
4.		0		
	Total Cover:	15		

Sapling/Shrub Stratum (Plot Size: 15 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
3.		0		
4.		0		
5.		0		
	Total Cover:	0		

Herb Stratum (Plot Size: 5 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.	Phalaris arundinacea	100	Yes	FACW
2.		0		
3.		0		
4.		0		
5.		0		
6.		0		
7.		0		
8.		0		
	Total Cover:	100		

Woody Vine Stratum (Plot Size: 30 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
	Total Cover:	0		

% Bare Ground in Herb Stratum: | % Sphagnum Moss Cover:

Vegetation Remarks: (include photo numbers here or on a separate sheet)

50/20 Thresholds:

	20%	50%
Tree Stratum	3	7.5
Sapling/Shrub Stratum	0	0
Herb Stratum	20	50
Woody Vine Stratum	0	0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW or FAC:	100.00%	(A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:		
OBL Species	0	X 1	0	
FACW Species	100	X 2	200	
FAC Species	15	X 3	45	
FACU Species	0	X 4	0	
UPL Species	0	X 5	0	
Column Totals:	115	(A)	245	(B)

Prevalence Index = B/A = 2.13

Hydrophytic Vegetation Indicators:

No	Rapid Test for Hydrophytic Vegetation
Yes	Dominance Test is >50%
Yes	Prevalence Index ≤ 3.0 [1]
No	Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
No	Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes

WETLAND DETERMINATION DATA FORM - Midwest Region

SOIL

Sampling Point: 2-1 WET-A

Profile Description: (Describe to the depth needed to document the indicator or confirm the abscence of indicators).

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks
1.	0 - 8	10YR 3/1						Clay Loam	
2.	8 - 14	10YR 4/2	80	7.5YR 3/4	20	C	M	Clay Loam	
3.	14 - 20	5Y 4/1						Clay Loam	Gravelly
4.	-								
5.	-								
6.	-								

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5)
- [ ] 2 cm Muck (A10)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] 5 cm Mucky Peat or Peat (S3)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [x] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- [ ] Coast Prairie Redox (A16)
- [ ] Dark Surface (S7)
- [ ] Iron-Manganese Masses (F12)
- [ ] Very Shallow Dark Surface (TF12)
- [ ] Other (explain in soil remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): Type: Depth (inches):

Hydric soil present? Yes

Soil Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] True Aquatic Plants (B14)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres on Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Gauge or Well Data (D9)
- [ ] Other (explain in remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Stunted or Stressed Plants (D1)
- [x] Geomorphic Position (D2)
- [x] FAC-Neutral Test (D5)

Field Observations:

- Surface water present? [ ] Surface Water Depth (inches):
- Water table present? [ ] Water Table Depth (inches):
- Saturation present? (includes capillary fringe) [ ] Saturation Depth (inches):

Indicators of wetland hydrology present? Yes

Describe Recorded Data:

Soils were moist at 5 inches below ground surface

Recorded Data: [ ] Aerial Photo [ ] Monitoring Well [ ] Stream Gauge [ ] Previous Inspections

Hydrology Remarks:

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WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Plymouth Creek | Applicant/Owner: BCWMC | City/County: Plymouth/Hennepin | State: MN | Sampling Date: 10/16/15

Investigator(s): BKB | Section: 21 | Township: 118 | Range: 22 | Sampling Point: 2-1 WET-B

Land Form: Flat | Local Relief: None | Slope %: 0 | Soil Map Unit Name: Lester loam, 1 to 3 percent slopes

Subregion (LRR): M | Latitude: 4985463 | Longitude: 463535 | Datum: UTM Nad 83 Zone 15N Meters

Cowardin Classification: PEMB | Circular 39 Classification: Type 2 | Mapped NWI Classification: R2UBG

Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in remarks)

Eggers & Reed (primary): Fresh (Wet) Meadow
Eggers & Reed (secondary):
Eggers & Reed (tertiary):
Eggers & Reed (quaternary):

Are vegetation No Soil No Hydrology No significantly disturbed?

Are vegetation No Soil No Hydrology No naturally problematic?

Are "normal circumstances" present? Yes

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	0
Hydric soil present?	Yes
Indicators of wetland hydrology present?	Yes
Is the sampled area within a wetland?	Yes

General Remarks (explain any answers if needed):

If yes, optional Wetland Site ID: Wetland 2

VEGETATION

Tree Stratum (Plot Size: 30 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.	Populus deltoides	10	Yes	FAC
2.		0		
3.		0		
4.		0		
	Total Cover:	10		

Sapling/Shrub Stratum (Plot Size: 15 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
3.		0		
4.		0		
5.		0		
	Total Cover:	0		

Herb Stratum (Plot Size: 5 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.	Phalaris arundinacea	100	Yes	FACW
2.	Persicaria amphibia	1	No	OBL
3.		0		
4.		0		
5.		0		
6.		0		
7.		0		
8.		0		
	Total Cover:	101		

Woody Vine Stratum (Plot Size: 30 ft)

	Species	Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
	Total Cover:	0		

% Bare Ground in Herb Stratum: | % Sphagnum Moss Cover:

Vegetation Remarks: (include photo numbers here or on a separate sheet)

50/20 Thresholds:

	20%	50%
Tree Stratum	2	5
Sapling/Shrub Stratum	0	0
Herb Stratum	20.2	50.5
Woody Vine Stratum	0	0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW or FAC:	100.00%	(A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species	1	X 1	1
FACW Species	100	X 2	200
FAC Species	10	X 3	30
FACU Species	0	X 4	0
UPL Species	0	X 5	0
Column Totals:	111 (A)		231 (B)

Prevalence Index = B/A = 2.08

Hydrophytic Vegetation Indicators:

No	Rapid Test for Hydrophytic Vegetation
Yes	Dominance Test is >50%
Yes	Prevalence Index ≤ 3.0 [1]
No	Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
No	Problematic Hydrophytic Vegetation [1] (Explain)

[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? 0

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WETLAND DETERMINATION DATA FORM - Midwest Region

SOIL

Sampling Point: 2-1 WET-B

Profile Description: (Describe to the depth needed to document the indicator or confirm the abscence of indicators).

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks
1.	0 - 15	5GY 4/1 Gley	40	7.5 YR 3/4	2	C	M	Sandy Clay	
2.	0 - 15	10Y 3/1 Gley	60						
3.	15 - 25	5Y 4/1						Sand	
4.	-								
5.	-								
6.	-								

[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)

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- [ ] Stratified Layers (A5)
- [ ] 2 cm Muck (A10)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] 5 cm Mucky Peat or Peat (S3)
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- [x] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)

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- [ ] Very Shallow Dark Surface (TF12)
- [ ] Other (explain in soil remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present): Type: Depth (inches):

Hydric soil present? Yes

Soil Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Water-Stained Leaves (B9)
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- [ ] True Aquatic Plants (B14)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres on Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Gauge or Well Data (D9)
- [ ] Other (explain in remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Stunted or Stressed Plants (D1)
- [x] Geomorphic Position (D2)
- [x] FAC-Neutral Test (D5)

Field Observations:

- Surface water present? [ ] Surface Water Depth (inches):
- Water table present? [ ] Water Table Depth (inches):
- Saturation present? (includes capillary fringe) [x] Saturation Depth (inches): 20

Indicators of wetland hydrology present? Yes

Describe Recorded Data:

Recorded Data: [ ] Aerial Photo [ ] Monitoring Well [ ] Stream Gauge [ ] Previous Inspections

Hydrology Remarks:

Appendix B

Site Photographs

Appendix B – Plymouth Creek Feasibility Study Wetland Delineation Site Photos

Photo 1 – September 22, 2015 Study Reach (West of Fernbrook Ln. N) Water-level-control structure at start of the survey within Plymouth Creek Park.	
Photo 2 – September 22, 2015 Study Reach (West of Fernbrook Ln. N) Bridge crossing and typical view of Plymouth Creek in this area.	
Photo 3 – September 22, 2015 Wetland 1 Facing southeast. This photo shows the eroded edge of Wetland 1 and saturated soils.	

Appendix B – Plymouth Creek Feasibility Study Wetland Delineation Site Photos

Photo 4 – September 22, 2015 Wetland 2 Facing northwest. The upland island is located on the right side of the photo.	
Photo 5 – September 22, 2015 Study Reach (West of Fernbrook Ln. N) Typical view of the stream reach between Wetlands 1 and 2	
Photo 6 – September 22, 2015 Wetland 2 Facing south at the north edge of Wetland 2. Wetland 2 is located on the left side of this photo.	

Photo 7 – September 22, 2015

Wetland 2

Another view of wetland 2 facing southeast. Wetland 2 is dominated by reed canary grass.

Photo 8 – September 22, 2015

Study Reach
(East of Fernbrook Ln. N)

This photo shows an undercut portion of stream channel, which is typical along many areas of Plymouth Creek.

Photo 9 – September 22, 2015

Study Reach
(East of Fernbrook Ln. N)

Many areas within the stream reach east of Fernbrook Lane have snags that obstruct water flow

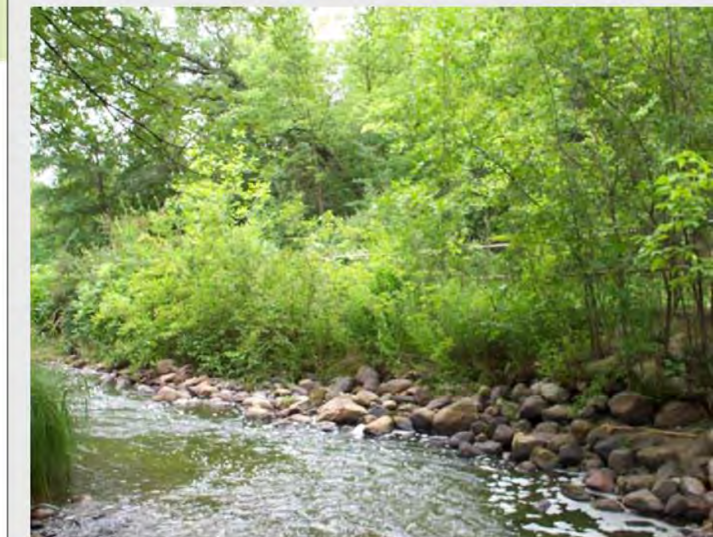
Appendix F

Stream Stabilization Technique Examples

Stream Stabilization Plan

Stone Toe Protection is constructed from cobble-sized rock on the creek edges. It extends to approximately the bankfull level, which will protect the channel banks for flow events that occur every 1 to 2 years or less. The material will extend into the ground to resist scour. Coarse gravel is used to separate the larger rock material from underlying soil. Stone toe protection is typically used in conjunction with revegetation of the upper banks.

SIMILAR PROJECTS

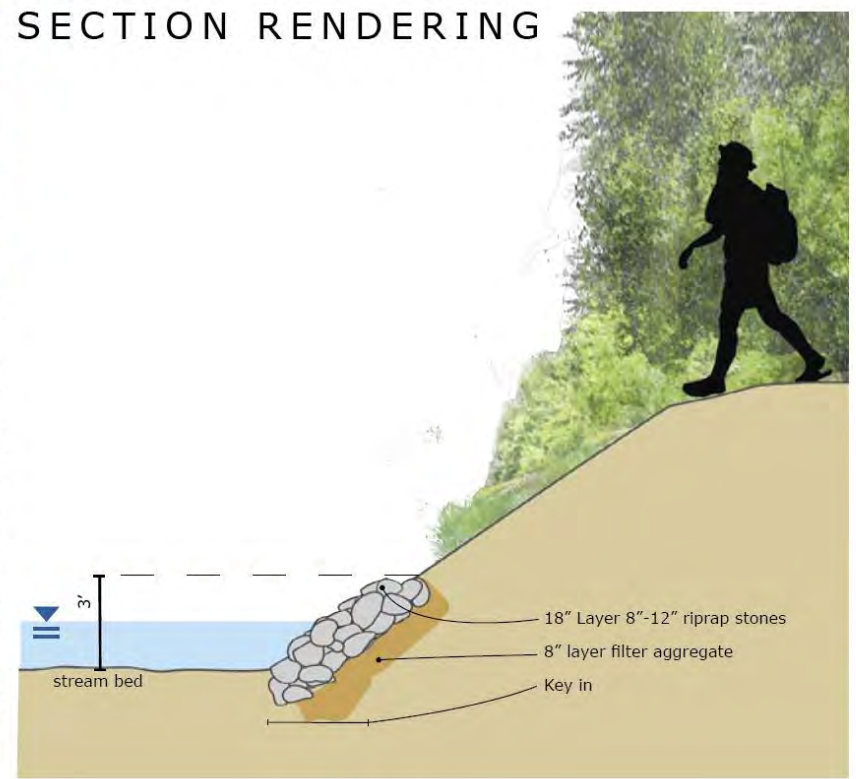


Stone toe protection has been used extensively in Nine Mile Creek's Lower Valley, in conjunction with deflector dikes, grade control measures and stabilization of large bank failures. Following the 1987 "super storm," the proposed design allowed the stream to continue its course while taking measures to protect areas where water flow was eroding valley walls. The resulting measures have stabilized the stream channel and valley walls while blending seamlessly with the natural environment.

EXISTING CONDITIONS

Fluvial bank erosion is caused by water in the stream moving past the streambanks. The shear stress caused by the flow entrains soil particles into the flow, causing the stream bank to erode away. This is the most common type of erosion that occurs in streams. Virtually all streams experience this type of erosion as their flow path evolves over time. However, the rate of fluvial bank erosion can increase when the stream is out of equilibrium with its watershed. Increased flow from a watershed will increase the rate of fluvial bank erosion. In many cases, it appears to be a part of the natural process of stream evolution. In places where the channel is confined by the valley walls, however, fluvial bank erosion can lead to failure of the high banks. It can also undermine storm sewer inlets.

SECTION RENDERING



MATERIALS

Materials will consist of cobble-sized material with coarse gravel filter layer to provide separation from the underlying soil. Natural fieldstone material will be used.

Stone Toe Protection

Bank Protection

Stream Stabilization Plan

Grade control measures are used where channel downcutting has occurred. Various types of weirs are commonly used to provide grade control on streams, particularly in steeper systems. Weirs can be constructed of sheetpile, concrete, or natural materials such as rock. In most cases, natural rock is used to emulate natural riffles. Large boulders would comprise the core of the structure, with smaller rock material placed on the upstream and downstream sides of the boulders to provide a gradual transition to the channel.

The riffles will serve to raise the surface of the water profile, and will reconnect the stream to its floodplain areas. Following the installation of the riffles, pools will be created upstream of the riffles. However, these pools will fill with sediment over time, which will in effect raise the channel bottom to the desired elevation.

SIMILAR PROJECTS

Following the 1987 "super storm," a rapids was constructed on Nine Mile Creek downstream of the 106th Street Bridge. The rapids was one of several grade-control structures that were installed on a three-mile stretch of creek in the lower valley. The proposal allowed the stream to continue its course while taking measures to protect areas where water flow was eroding valley walls. Protection measures included applying porous deflector dikes, burying sheetpile walls parallel to the creek to prevent undercutting of slopes, installing weirs (rock or capped sheetpile) to limit stream-bed degradation, and improving storm-sewer outlets.

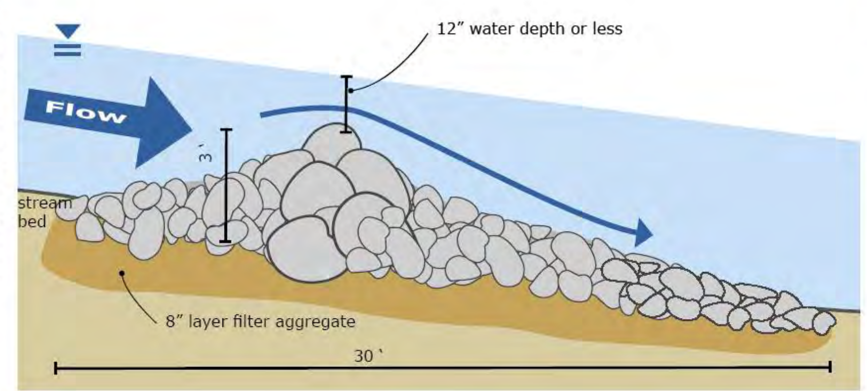
MATERIALS

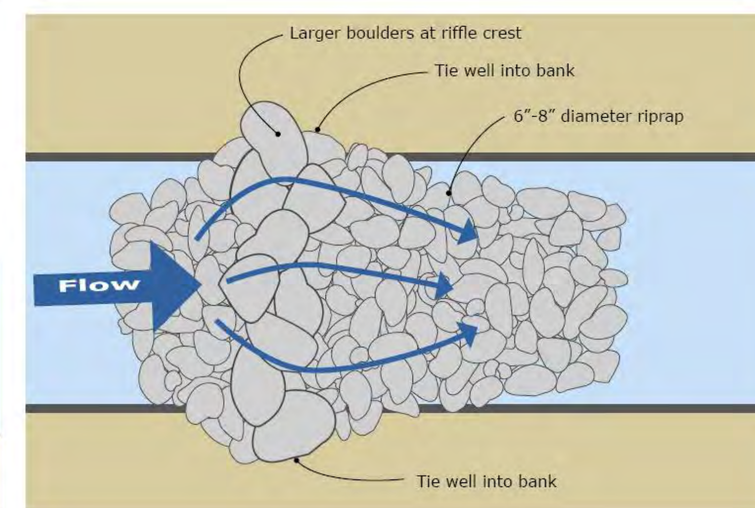
Materials will consist of various gradations of rock, ranging from large, 3-foot boulders to coarse gravel.

EXISTING CONDITIONS

Channel incision occurs when there is an imbalance between the sediment supply and the sediment carrying capacity of the stream. Erosion will occur when the sediment carrying capacity of a stream exceeds the sediment supply. In streams with cohesive banks and steep channel slope, the erosion will first occur primarily on the channel bottom because that is where the erosive forces are the strongest. As the channel deepens, the stream will gradually become wider as the banks eventually fail. The stream will gradually return to equilibrium; however, the process can take many years and significant amounts of erosion will occur during the process.

SECTION/PLAN RENDERING





Constructed Riffle

Grade Control

BARR

Stream Stabilization Plan

Rock vanes are constructed from boulders on the creek bottom. They function by diverting channel flow toward the center and away from the bank. They are typically oriented in the upstream direction and occupy no more than one third of the channel width. Vanes are largely submerged and inconspicuous. The rocks are chosen such that they will be large enough to resist movement during flood flows or by vandalism, with additional smaller rock material to add stability. Rock vanes function in much the same way as root wads in that they push the stream thalweg (zone of highest velocity) away from the outside bend. They also promote sedimentation behind the vane, which adds to the toe protection.

Vanes can also be constructed from both banks, forming an upstream-pointing “V.” In this configuration, the vane protects both banks and also provides grade control.

SIMILAR PROJECTS

Here is an example of a stabilization project designed for a 1,000-foot long, 20-foot high streambank that was severely eroded. The channel was directed away from the bank toe by installing six rock vanes. The bank was planted with native vegetation and protected with erosion control blanket, while the terrace above the bank was graded to redirect surface runoff to a less vulnerable area. The restored streambank withstood significant flooding during 2001, and has become nicely vegetated (see picture above).

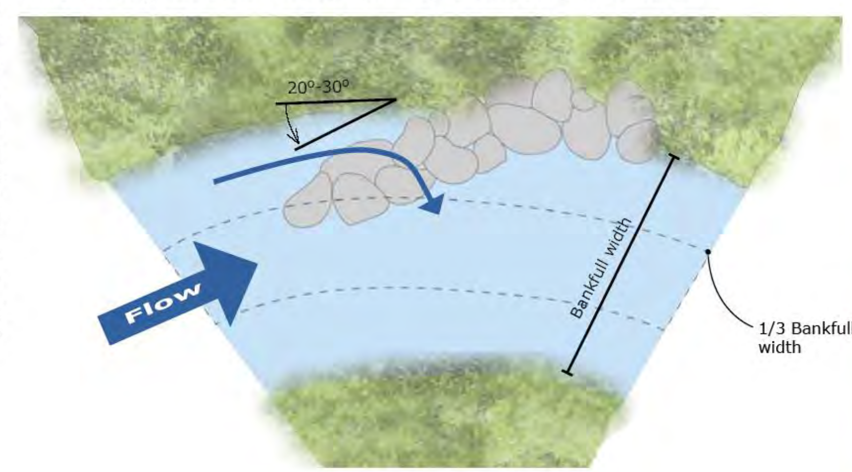
MATERIALS

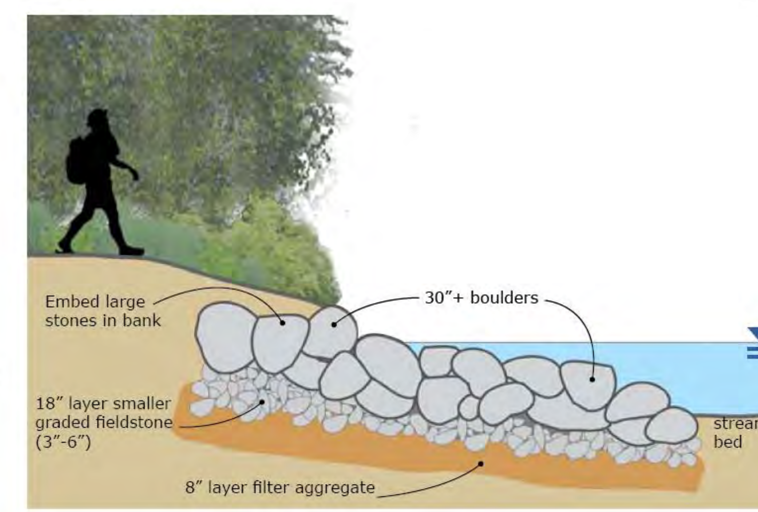
Materials will consist of various gradations of rock, ranging from large, 3-foot boulders to coarse gravel.

EXISTING CONDITIONS

Fluvial bank erosion is caused by water in the stream moving past the streambanks. The shear stress caused by the flow entrains soil particles into the flow, causing the stream bank to erode away. This is the most common type of erosion that occurs in streams. Virtually all streams experience this type of erosion as their flow path evolves over time. However, the rate of fluvial bank erosion can increase when the stream is out of equilibrium with its watershed. Increased flow from a watershed will increase the rate of fluvial bank erosion. In places where the channel is confined by the valley walls, however, fluvial bank erosion can lead to failure of the high banks. It can also undermine storm sewer inlets.

PLAN/SECTION RENDERING





Rock Vanes

Bank Protection

BARR

Stream Stabilization Plan

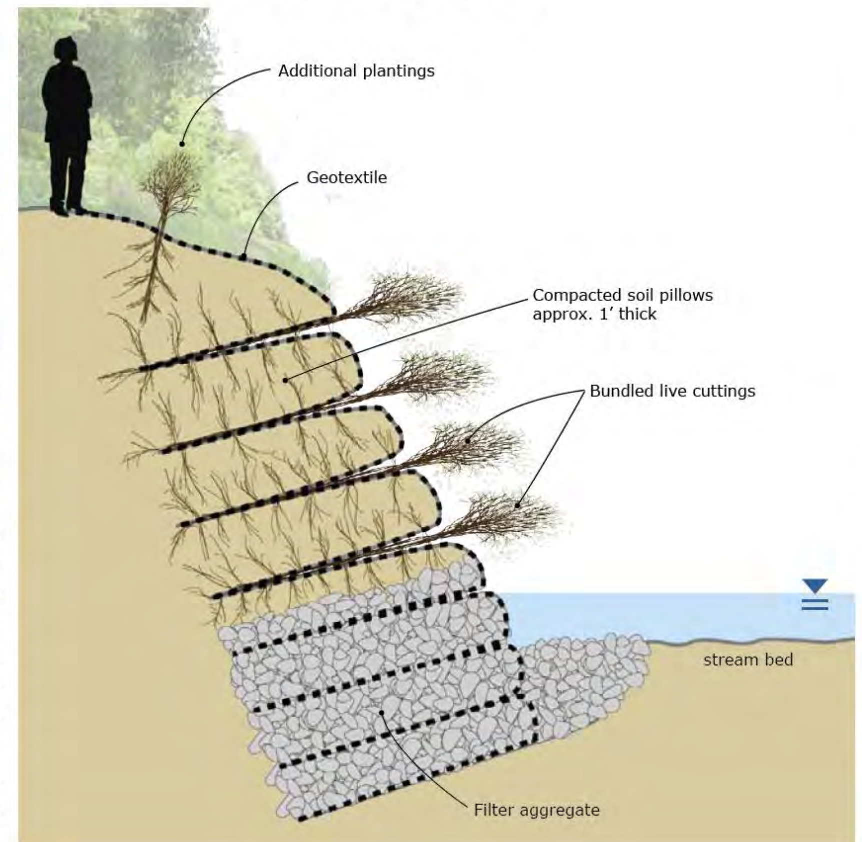
Soil Pillows are utilized in a bioengineering method known as Vegetated Reinforced Slope Stabilization (VRSS). The method combines rock, geosynthetics, soil and plants to stabilize steep, eroding slopes in a structurally sound manner. VRSS typically involves protecting layers of soils with a blanket or geotextile material (e.g. erosion control blanket) and vegetating the slope by either planting selected species (often willow or dogwood species) between the soil layers or by seeding the soil with desired species before it is covered by the protective material. In either case, with adequate light and moisture, the vegetation grows quickly and provides significant root structure to strengthen the bank. This method tends to be labor intensive and, therefore, relatively expensive.

EXISTING CONDITIONS

Fluvial bank erosion is caused by water in the stream moving past the streambanks. The shear stress caused by the flow entrains soil particles into the flow, causing the stream bank to erode away. This is the most common type of erosion that occurs in streams.

Virtually all streams experience this type of erosion as their flow path evolves over time. However, the rate of fluvial bank erosion can increase when the stream is out of equilibrium with its watershed. Increased flow from a watershed will increase the rate of fluvial bank erosion.

SECTION RENDERING



In places where the channel is confined by the steep valley walls, however, fluvial bank erosion can lead to failure of the high banks. It can also undermine storm sewer inlets.

For sites where groundwater seepage is a problem and where it is desirable to maintain steep banks, soil pillows are a feasible solution.

SIMILAR PROJECTS

The Mill Creek Restoration Project utilized soil bioengineering design to stabilize 175 linear feet of severely eroding streambanks within the Caldwell Recreation Park in southeastern Ohio. The work included two 25-foot vegetated reinforced soil slope (VRSS) sections, two 50-foot fill bank sections protected with woven coir and direct woody plantings, and a 12.5-foot tie-in on the upstream and downstream end of streambank work area.

MATERIALS

Materials consist of graded rock for the lower layers of the structure and for internal drainage, if necessary. Geotextile fabric is used to wrap the soil. Plants, such as willow or dogwood, or seed mixture is used for planting in and between the soil pillows.

Soil Pillows

Bank Protection

BARR

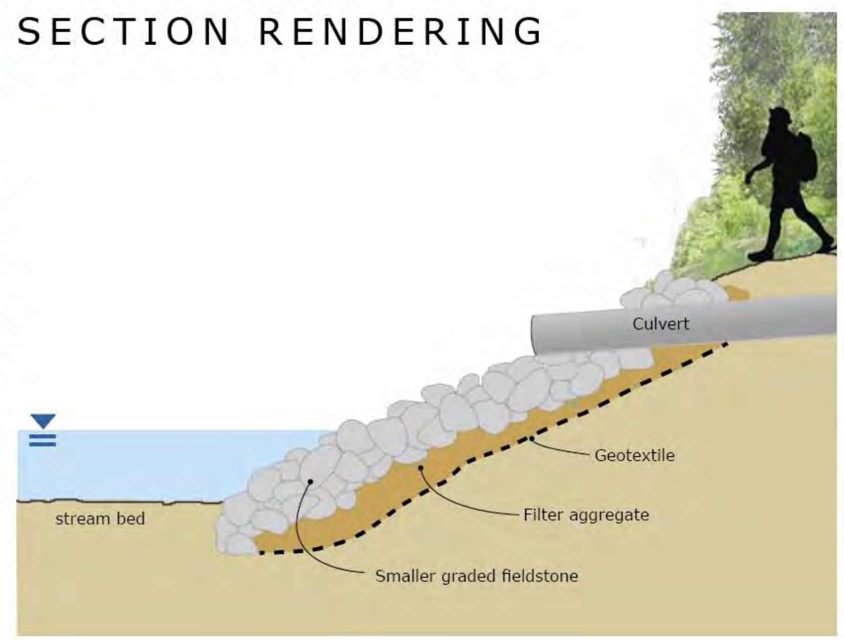
Stream Stabilization Plan

Culvert Stabilization is somewhat unique to each situation, depending on the site circumstances. Most sites require additional rock placement with a granular filter layer (rather than filter fabric). Some cases may require re-alignment and/or lowering of the outlet to better align with the stream channel. Typically, outlets should be aligned in the downstream channel direction so that flow doesn't impinge on the opposite bank. It is usually desireable for the culvert to enter the stream at or just above the normal water level in order to minimze the potential for undercutting.

SIMILAR PROJECTS

There are many culvert stabilization designs used on various streams and rivers. Because they are often small projects, the work is often performed by local municipalities or completed as part of a larger project.

SECTION RENDERING



EXISTING CONDITIONS

Erosion is frequently observed at culvert outlets for a variety of reasons, including insufficient erosion protection at the culvert outlet, streambank erosion, and channel downcutting, which leaves the culvert perched above the channel. Filter fabric is often used at culvert outlets to separate riprap protection from underlying soils, however the fabric provides a slippery surface for the riprap, which commonly slides into the channel.

MATERIALS

Materials consist of rock materials ranging from graded riprap (either fieldstone, or, for steep slopes, angular) and granular filter material (typically coarse gravel). If necessary, additional pipe, manholes and end sections may be necessary.



Culvert Stabilization

Bank Protection

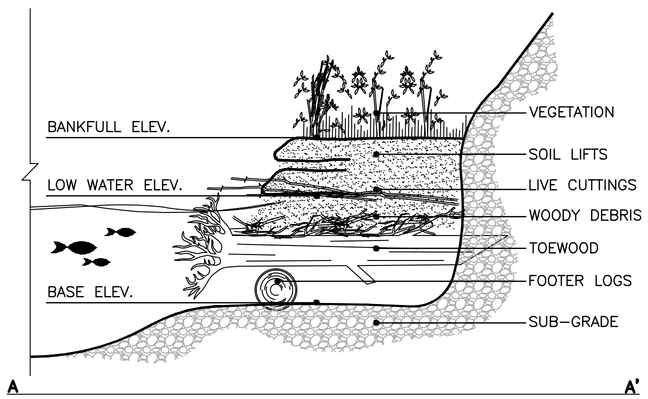
BARR

1. INSTALLATION SUMMARY

TOEWOOD BENCH CONSTRUCTION WILL BE DONE IN DRY WEATHER CONDITIONS AFTER STREAM HAS BEEN DIVERTED AND SITE DEWATERED.

ENGINEER OR OWNER'S REPRESENTATIVE MUST BE PRESENT FOR INSTALLATION
OF TOEWOOD BENCH.

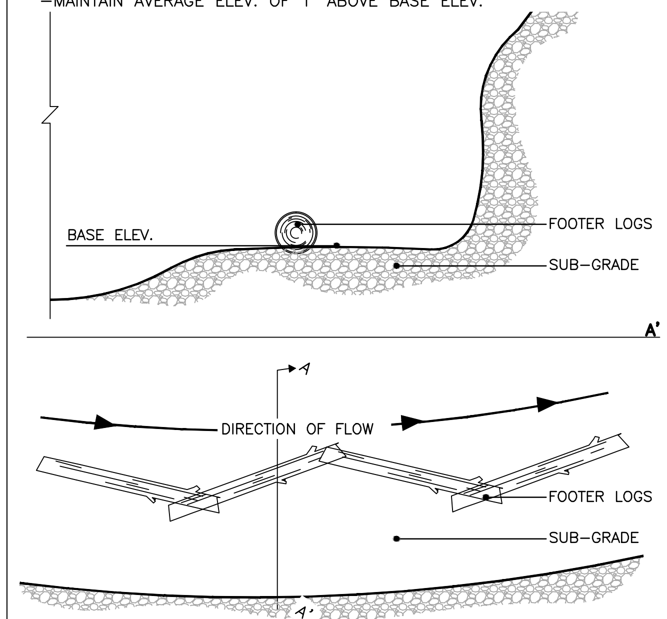
THE DRAWINGS ON THIS PAGE ARE NOT TO SCALE.



2. SUBGRADE AND FOOTER LOGS

SPECIFICATION:
- 8" TO 1' DIAMETER
- LIMBS REMOVED
- APPROX 10' LENGTH

PLACEMENT:
- EXCAVATE TO BASE ELEVATION – CONTRACTOR SHALL MAKE EFFORT TO SEPARATE GRANULAR AND FINE FILL NATIVE MATERIAL FOR USE IN STEPS 4 AND 6.
- PLACE FOOTER LOGS 30 DEGREES FROM PARALLEL TO STREAM FLOW WITH ENDS STACKED CREATING A ZIG ZAG PATTERN (PLAN VIEW BELOW)
- MAINTAIN AVERAGE ELEV. OF 1' ABOVE BASE ELEV.

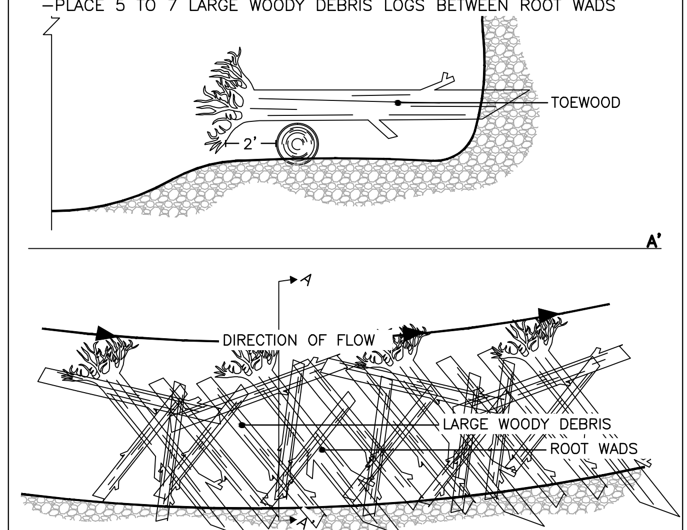


3. ROOT WADS & LRG WOODY DEBRIS

ROOT WAD SPECIFICATION:
- 10" MIN DIAMETER
- LENGTH INDICATED IN DESIGN CROSS SECTION OR 10' MIN.
- LIMBS REMOVED
- ROOT WADS LEFT INTACT
- ENDS SHARPENED TO A POINT

LARGE WOODY DEBRIS SPECIFICATION:
- 8" MIN DIAMETER

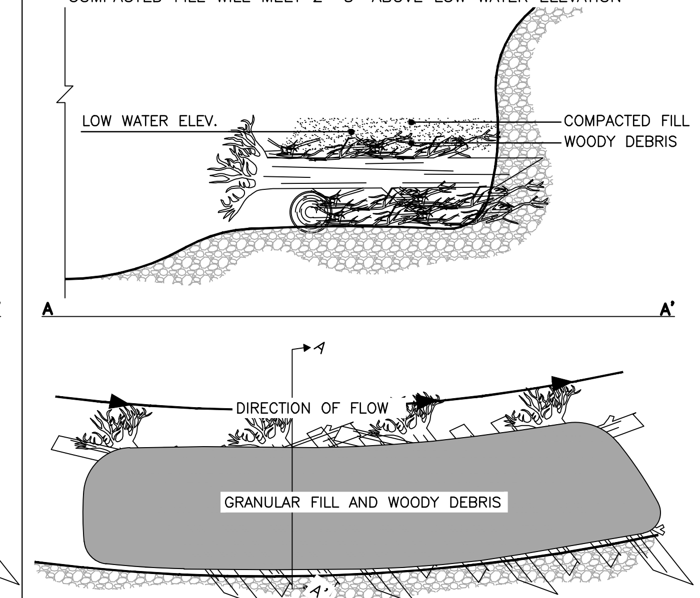
PLACEMENT:
- PLACE ROOT WADS HORIZONTALLY ON TOP OF FOOTER LOGS, OVERHANG ROOT WAD LOGS 2'
- ANGLE ROOTWADS UPSTREAM
- DRIVE SHARPENED TRUNKS MIN. 3' INTO BANK OR DIG IN .
- PLACE 1 ROOT WAD PER FOOTER LOG
- PLACE 5 TO 7 LARGE WOODY DEBRIS LOGS BETWEEN ROOT WADS



4. WOODY DEBRIS & GRANULAR FILL

SPECIFICATION:
- WOODY MATERIAL (COMPOSED OF SMALL LIMBS AND BRANCHES, APPROX. 4" MAX DIAMETER AND SMALLER)
- DO NOT USE ROTTEN WOODY MATERIAL
- NATIVE GRANULAR FILL

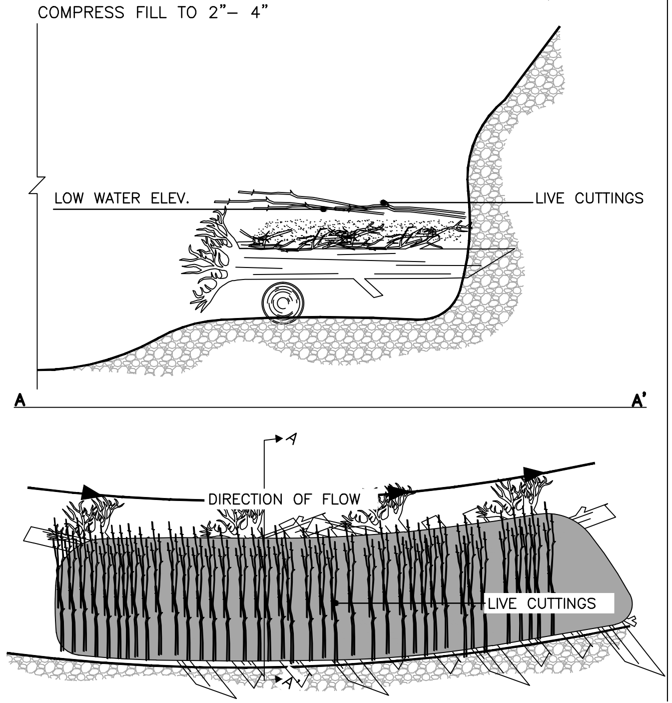
PLACEMENT:
- FILL BETWEEN FOOTER LOGS AND TOEWOOD WITH WOODY DEBRIS
- STACK WOODY DEBRIS TO LOW WATER ELEVATION
- LAYER NATIVE GRANULAR FILL ON TOP OF WOODY DEBRIS
- COMPACT SO THAT SETTLING OF FILL IS MINIMIZED BUT DEBRIS IS NOT DISPLACED
- COMPACTED FILL WILL MEET 2"-5" ABOVE LOW WATER ELEVATION



5. LIVE CUTTINGS

SPECIFICATION:
- SEE LIVE CUTTING DETAIL

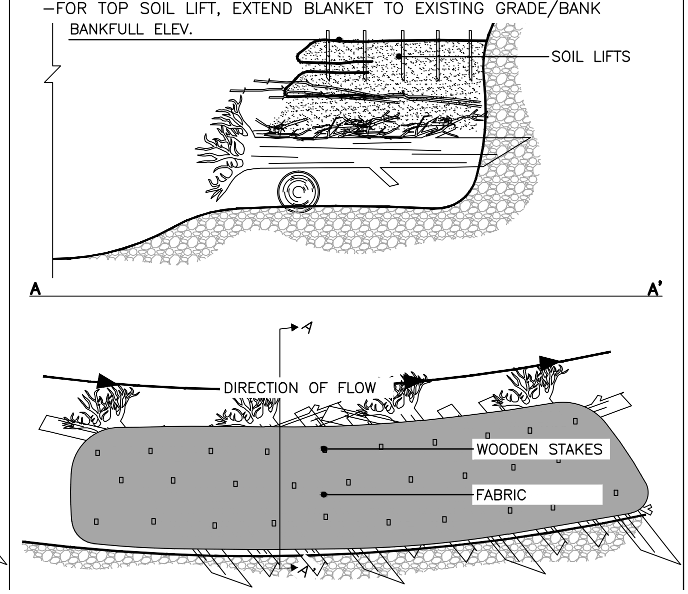
PLACEMENT:
- LAY CUTTINGS WITH A DENSITY OF 10 CUTTINGS PER LINEAL FOOT
- TOPS OF CUTTING WILL POINT TOWARD CHANNEL
- TRIM EXPOSED ENDS OF CUTTINGS, LEAVE NO MORE THAN 6" EXPOSED
- DEPOSIT NATIVE FILL OVER CUTTINGS AND WATER LIBERALLY, COMPRESS FILL TO 2"- 4"



6. SOIL LIFTS

SPECIFICATION:
- NATIVE FILL (FINE)
- 1' FORMS
- MIN 6.5' WIDE ROLANKA BIOD-MAT 70, GEOCOIR 700, OR EQUAL LINED WITH MNDOT CAT II EROSION CONTROL BLANKET WITH NATURAL NETTING
- 18" WOODEN STAKES (2X4 CUT AT ANGLE), PLACED AT 3' SPACING

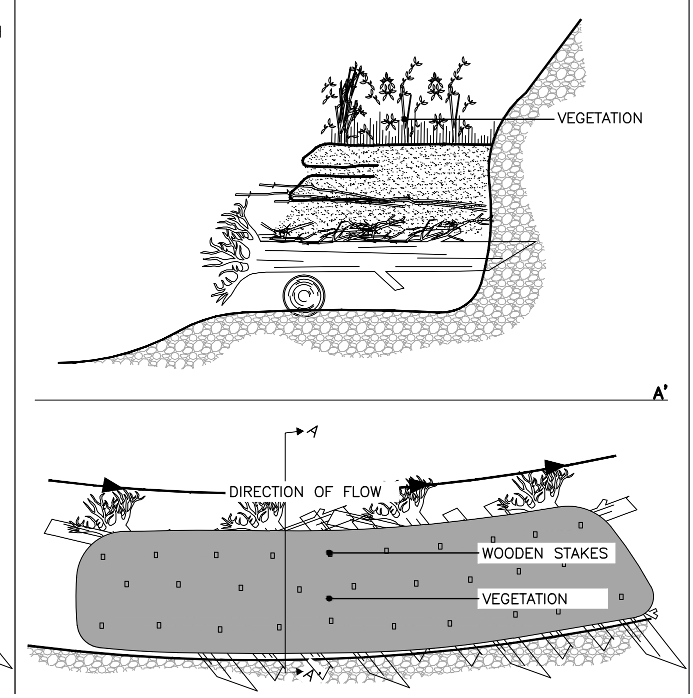
PLACEMENT:
- PLACE FORM
- LAY MIN 2.5' OF FABRIC (COCONUT BLANKET AND LINER) ALONG BENCH
- PLACE 1' OF FILL ON TOP OF MAT AND COMPACT
- WRAP FILL WITH REMAINING BLANKET AND SECURE WITH STAKES
- REPEAT UNTIL BANKFUL ELEVATION IS MET, STEP EACH LIFT BACK 1'
- FOR TOP SOIL LIFT, EXTEND BLANKET TO EXISTING GRADE/BANK



7. VEGETATION

SEE VEGETATION PLAN FOR DETAIL

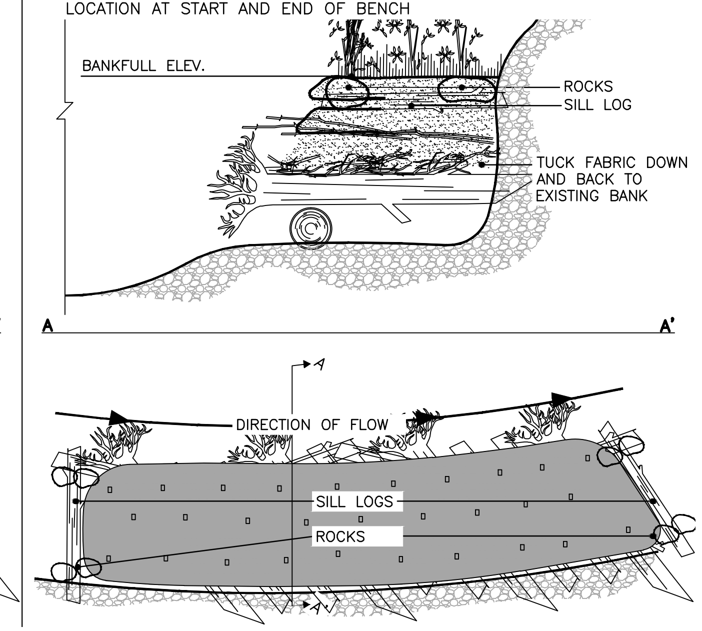
IF SEED IS CALLED FOR:
- PLANT SEED INSIDE OF SOIL LIFT PRIOR TO COVERING IN FABRIC
- PLANT SEED ON THE FACE OF EACH SOIL LIFT AS WELL AS ACROSS THE TOP SOIL LIFT



8. SILL LOGS & TERMINATION

SPECIFICATION:
- 10" MIN DIAMETER
- LIMBS REMOVED
- LENGTH DETERMINED BY WIDTH OF TOEWOOD BENCH

PLACEMENT:
- PLACE ONE SILL LOG AT THE START AND END OF THE TOEWOOD BENCH PERPENDICULAR TO THE DIRECTION OF FLOW.
- PLACE LARGE ROCKS ON TOP OF SILL LOG, TOP OF ROCK WILL MEET BANKFULL ELEVATION
- TUCK SOIL LIFT BLANKET DOWN AND BACK TOWARDS EXISTING BANK
- TRANSITION BANKFULL ELEVATION TO EXISTING GRADE AT DETERMINED LOCATION AT START AND END OF BENCH



CADD USER: Adam K. Howard FILE: P:\MPLS\23 MN\27\2327051\WORKFILES\CIP\CAPITAL PROJECTS\2017 PLYMOUTH CREEK ANNAPOLIS THRU PLYMOUTH CR PK 2017CR-P\FEASIBILITY STUDY\REPORT\APPENDICES\APPENDIX E\TOEWOOD.DWG PLOT SCALE: 1:2 PLOT DATE: 12/17/2015 12:31 PM

Images in Drawing – .\JDW.tif
ggn M:\Design\23270140.00\2327014000_C9.dwg Plot at 1 07/06/2015 16:12:46

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SIGNATURE ____________

PRINTED NAME ____________

DATE ____________ REG. NO. ____________

	A	B	C	0	1	2	3
CLIENT							
BID							
CONSTRUCTION							
RELEASED TO/FOR	DATE RELEASED						

BARR

Corporate Headquarters: Minneapolis, Minnesota
Ph: 1-800-632-2277

Project Office:
BARR ENGINEERING CO.
4700 WEST 77TH STREET
MINNEAPOLIS, MN. 55435-4803
Ph: 1-800-632-2277
Fax: (952) 832-2601
www.barr.com

Scale	AS SHOWN
Date	2/10/2015
Drawn	GGN
Checked	JDW
Designed	GGN
Approved	JDW

TOE WOOD

EXAMPLE DETAIL

BARR PROJECT No.

CLIENT PROJECT No.

DWG. No. C1.0

REV. No. 0

Appendix G

Detailed Alternative Assessments

G. Detailed alternatives for stabilization

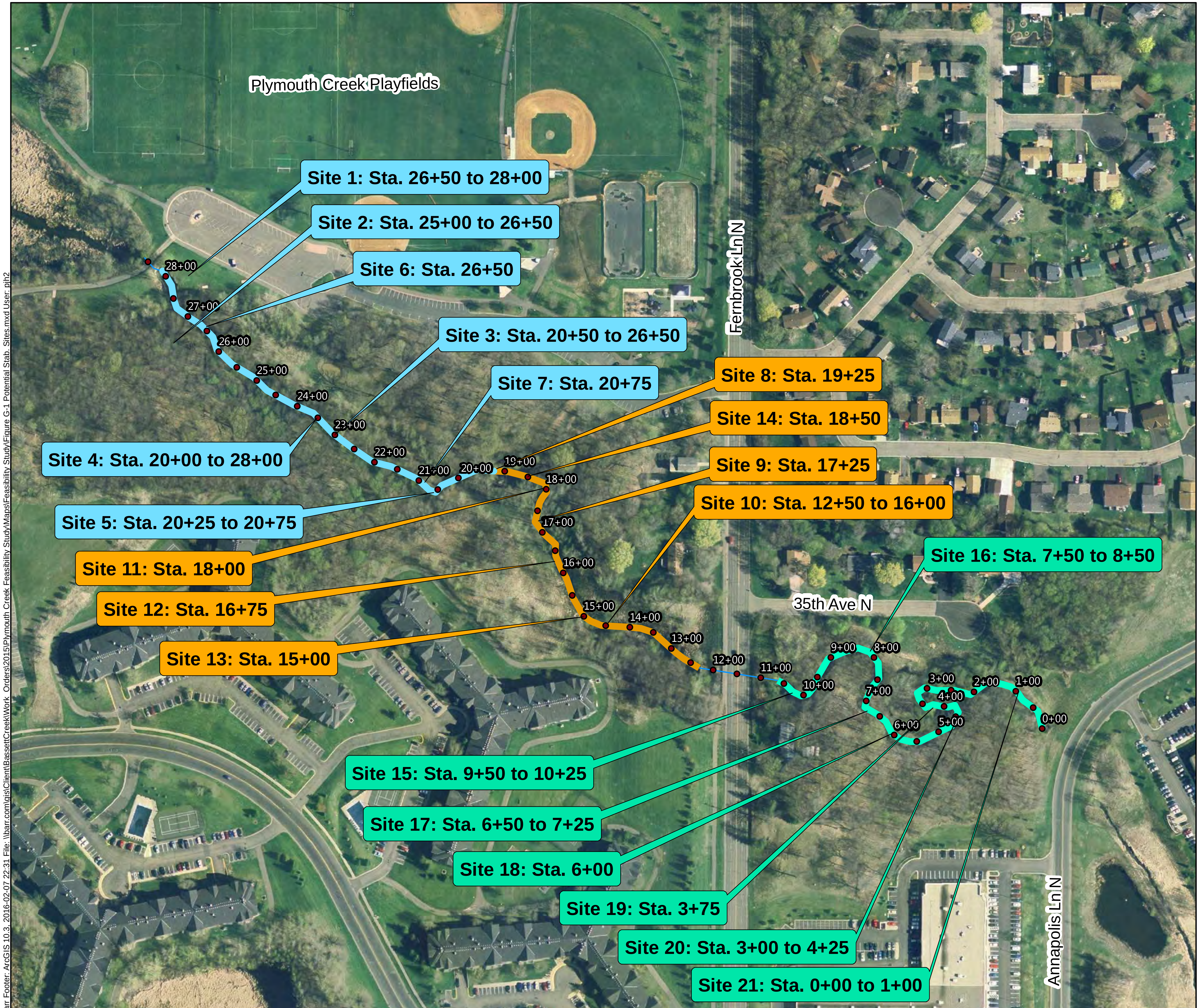
The following discussion is organized by location within each reach, referred to as "stabilization sites." The stabilization sites for the entire project area are shown in Figure G-1. Potential stabilization alternatives for each reach are summarized in Figure G-2 through Figure G-4 and in Table G-1. Stabilization sites within each reach with similar characteristics and stabilization alternatives are discussed together.

For each stabilization site (or group of sites), the following discussion includes:

- A brief description of the site characteristics.
- The issues to be addressed.
- Potential feasible alternatives for stabilization, with the advantages and disadvantages of each.
- A brief description of alternatives deemed infeasible after consideration.

A variety of factors or combinations of factors may make a "do-nothing" option viable for an individual site; however, it may not be cost-effective—particularly if the intent is to stabilize the site in the near future. If a "do-nothing" approach is ultimately chosen for a particular site, the potential need for future site stabilization should be evaluated. This evaluation should consider whether likely access routes could damage the measures already installed.

Although the sites for stabilization are discussed here individually, final design for the project will likely result in a nearly continuous implementation of stabilization techniques through all three stream reaches. The stabilization sites identified in Figure G-1 generally abut and overlap one another, although not all stream banks within each reach need stabilization and the recommended stabilization techniques may differ between adjacent sites.



Legend

- Non-Reach Creek
- Reach 3
- Reach 2
- Reach 1

N

Feet

100 0 100 200

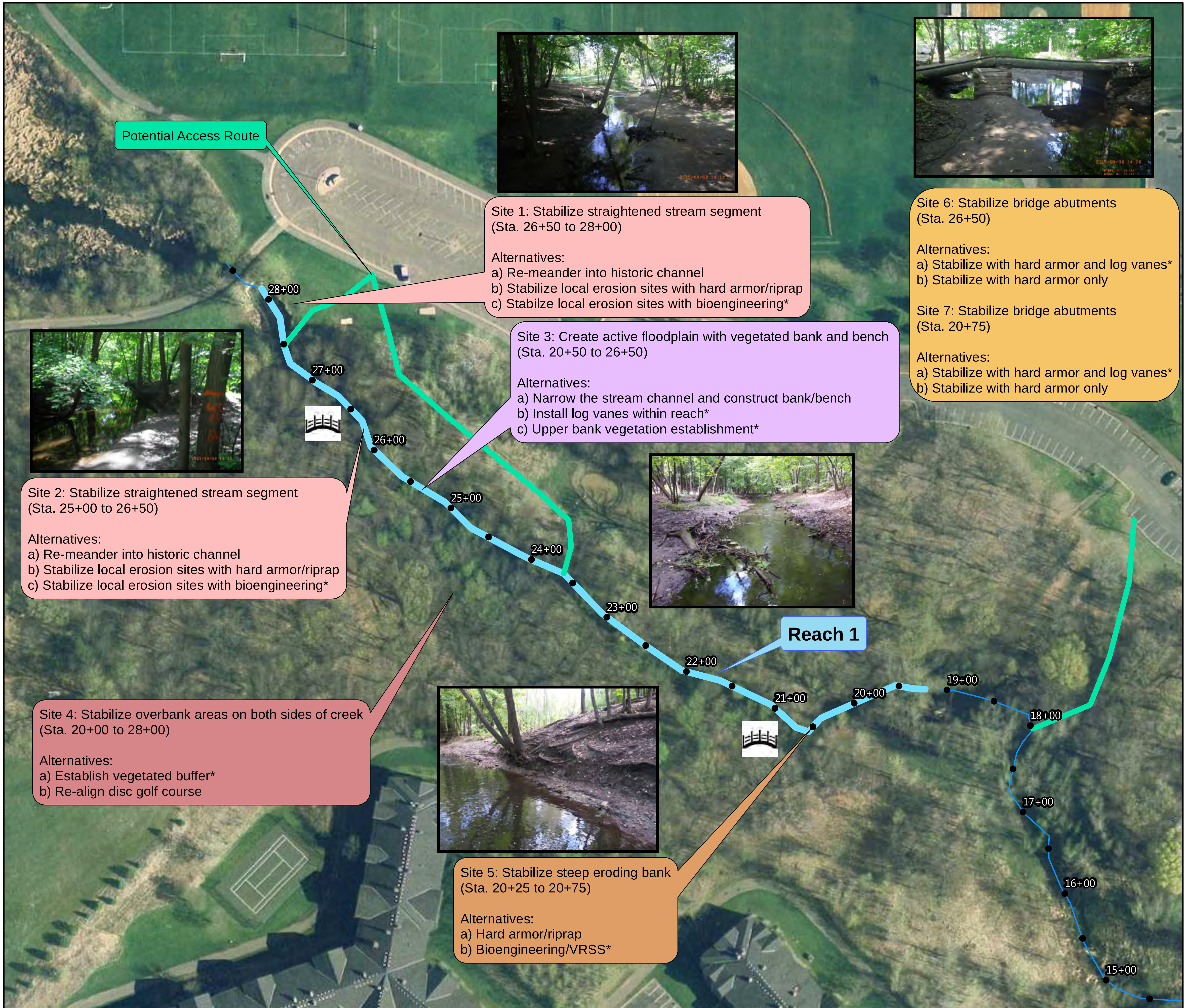
Meters

30 0 30 60

Bassett Creek Watershed Management Commission

Figure G-1

PLYMOUTH CREEK POTENTIAL STABILIZATION SITES
Plymouth Creek Feasibility Study
Bassett Creek Watershed Management Commission



Reach 1

Issues: Appears to be historically straightened; channel is overwide with bare banks. Significant bare overbank areas due to disc golf usage. High clay content of soils helps reduce bank movement.

Constraints: Restoration must be compatible with disc golf course; need for bridge crossings. Narrow valley and low slope limit meandering potential. Deep shade limits vegetation options.

Legend

Pedestrian Bridge

Culvert Outfall

Note: Individual alternatives are defined as a, b, or c for many of the sites. One or more alternatives will be chosen for each site.

*Indicates recommended alternative

N

Feet

100 0 100 200

Meters

30 0 30 60

Figure G-2

PLYMOUTH CREEK REACH 1 ALTERNATIVES
Plymouth Creek Feasibility Study
Bassett Creek Watershed
Management Commission

G.1 Sites 1 and 2

Sites 1 and 2 (shown in Photo 1 and 2 in Appendix A) consist of a relatively straight reach that appears to have straightened over time as evidenced by the low sinuosity and the presence of abandoned meanders from Station 26+50 to 28+00 (Site 1) and 25+00 to 26+50 (Site 2), shown on Figure G-2. The abandoned channels have vegetated banks and are situated at an elevation above typical flow levels in Plymouth Creek. The abandoned stream section in Site 1 no longer conveys flow during most flow events; however, the section in Site 2 is active during flood events. The existing stream between the historical channels has some bare lower stream banks; a footbridge for the disc golf course crosses the stream. The erosion on the banks of the existing channel is relatively minor. Immediately upstream of Site 1, the existing water level control structure impedes sediment flow through Plymouth Creek and may represent a "clear water" discharge that could potentially increase scour through the downstream reaches.

Alternatives 1A and 2A—Re-meander into historical channel

Alternative summary: Re-meander the stream into the historical channels.

Advantages: Re-meandering will improve habitat by adding stream length, improve stream aesthetics, reduce erosion by slowing water flow, and improve water quality through stream bank stabilization.

Disadvantages: Lengthening the stream will decrease the already mild slope and may reduce stream conveyance and sediment transport capacity. Tree removals will be necessary at both Site 1 and Site 2. Hydraulic modeling will be required during final design to ensure the flood profile is not impacted. The foot bridge between the sites will likely need to be replaced or realigned to avoid adverse impacts from an altered flow pattern.

Feasibility: This alternative is feasible given the existence of the historical channels and the ability for the existing footbridge between these sites to be realigned, if necessary; however, it may be more cost effective to consider this option when the footbridge needs to be replaced.

Alternatives 1B and 2B—Stabilize local erosion sites with hard armor/riprap

Alternative summary: Install riprap along the outer banks to reduce the sediment loading and loss of bank.

Advantages: Riprap is relatively inexpensive, effective in reducing bank erosion, and can be resilient to large flood events if properly designed.

Disadvantages: Stabilizing the stream channel in-place does not take advantage of the existing historical meander channels and may be less aesthetically pleasing, especially for Site 2 where a disc golf tee box is adjacent to the historical channel. Hard armoring does not encourage vegetative growth and does not appear natural or provide quality in-stream habitat. If erosion occurs around or behind the riprap, maintenance costs tend to be higher than for bioengineering techniques.

Feasibility: This alternative is feasible if detailed modeling indicates there are high velocities at these sites and bioengineering options are determined to be infeasible.

Alternatives 1C and 2C—Stabilize local erosion sites with bioengineering

Alternative summary: Install root wads and log vanes to stabilize eroding areas. Use log vanes to reshape the channel bottom and narrow the low-flow channel while maintaining the overall channel cross section. Establish vegetation on bare banks.

Advantages: Bank stabilization with bioengineering techniques will improve aesthetics of the stream, reduce erosion by directing flow away from stream banks, and improve water quality through stream bank stabilization. One or more log vanes can extend across the entire channel to provide grade control and prevent downcutting due to the clear water discharge from the upstream control structure. The cost of bioengineering within these reaches is comparable to hard armoring and significantly lower than re-meandering.

Disadvantages: Stabilizing the stream channel in-place does not take advantage of the existing historical meander channels and may be less aesthetically pleasing, especially for Site 2 where a disc golf tee box is adjacent to the historical channel. Due to the shady conditions, vegetation will be limited to shade-tolerant species. The combination of extreme shade and disc golf traffic may hinder establishment of vegetation.

Feasibility: Shade-tolerant species are available and the stream banks can be feasibly vegetated.

Sites 1 and 2 infeasible alternatives

The creation of additional stream channels outside of the historical meanders is not considered feasible due to impacts to the disc golf course and significant grading/tree removal.

Sites 1 and 2 recommendations

Although re-meandering is feasible for Sites 1 and 2, Alternatives 1A and 2A have a high estimated cost, compared to the alternatives for stabilizing the stream in its current location. In addition, the tree removals and foot bridge realignment that would be necessary for the re-meandering alternatives are significant disadvantages. Given the expressed preference of the BCWMC and permitting agencies for bioengineering solutions, Alternatives 1C and 2C are recommended.

G.2 Site 3

Site 3 consists of an over-widened stream channel with a small active floodplain. It extends from Station 20+50 to 26+50, as shown on Figure G-2. There are many areas where sediment is being deposited near the banks and the channel is beginning to narrow. Due to the wide channel bottom, water depth is very low during low-flow conditions, resulting in poor aquatic habitat. The channel banks are bare and the dense tree canopy overhead creates consistent shade along the stream channel. Photo 3 in Appendix A illustrates a typical portion of this site.

Alternative 3A—Narrow stream channel and construct floodplain bench

Alternative summary: Narrow the stream channel by grading to establish a vegetated floodplain bench within the existing channel alignment; offset decreased channel cross section by cutting back the existing high banks. This alternative would include upper-bank vegetation as described in Alternative 3C.

Advantages: Narrowing the channel will deepen it during low flow, providing improved habitat. It will also create a larger floodplain and vegetated stream buffer soon after construction.

Disadvantages: Narrowing the channel will require significant grading—excavating from the upper banks to create a floodplain while maintaining the overall channel conveyance. To achieve the desired channel shape tree removals will likely be required in some locations. Hydraulic modeling will be required during final design to ensure the flood profile is not impacted.

Feasibility: If the design of the narrowed channel can maintain existing flood elevations, this alternative is technically feasible, although it will require significant and costly grading. The overall feasibility of this alternative depends on whether the work can be completed without removing a significant number of trees.

Alternative 3B—Install log vanes

Alternative summary: Install log vanes and reshape the channel bottom to narrow the low-flow channel while maintaining the overall channel cross section. The logs for this alternative would be obtained by removing trees leaning over and at high risk of falling into the creek. Pre-emptively removing the trunks but leaving the stumps and roots will prevent localized erosion—both on the bare bank where the tree might fall and on other banks which would, subsequently, receive redirected flows. This alternative will also include upper-bank vegetation as described in Alternative 3C.

Advantages: Narrowing the low-flow channel with log vanes will provide improved habitat by deepening the channel during low flows and reduce the stress on the upper banks during high flows. Natural materials available onsite will be used for much of the log vane construction and prevent future erosion. One or more log cross vanes can extend across the entire channel to provide grade control and prevent downcutting due to the clear water discharge from the upstream control structure.

Disadvantages: The bench created by the log vanes will remain below the bankfull flow elevation. Depending on the available light at a given location and the frequency of inundation, vegetation on the low benches may be thin. Exposed soil may be less aesthetically pleasing than a vegetated floodplain.

Feasibility: Providing the design of the narrowed channel can maintain existing flood elevations, this alternative is feasible.

Alternative 3C—Upper-bank vegetation establishment

Alternative summary: Vegetate existing bare upper banks above the bankfull flow elevation with shade-tolerant trees, shrubs, and seed mixes. This alternative would be implemented in conjunction with Alternative 3A or 3B.

Advantages: Establishing perennial vegetation will improve aesthetics of the stream and reduce erosion from flood flows or overland flow entering the stream.

Disadvantages: Due to the shady conditions, suitable species will need to be selected carefully; site preparation, seeding, and establishment maintenance will need to be tailored to the site.

Feasibility: Shade-tolerant species are available and the upper banks can be vegetated; relatively frequent maintenance may be required due to the impacts of disc golf activity. This alternative also requires the cooperation of disc golfers to stay off newly established vegetation.

Infeasible alternatives

Re-meandering Plymouth Creek throughout Site 3 is not considered feasible due to the impact on the adjacent disc golf course. In addition, considering the existing topography and high overbank areas, establishing a meandering stream channel and floodplain would require significant and prohibitively costly excavation and tree removal.

Narrowing the stream channel by importing soil or rock and without excavating the existing high banks is not considered feasible due to the inevitable increase in the flood profile, not permitted by BCWMC policies. In addition, shifting the stream type to a narrow step-pool channel with limited floodplain is not considered feasible due to the low stream slope that will not facilitate creation of step-pool features.

Given the City's desire to maintain a natural stream channel through the Plymouth Creek Park and BCWMC policies preferring bioengineering techniques, lining Plymouth Creek with riprap to decrease bank erosion is also infeasible.

Site 3 recommendations

Alternative 3B is recommended for stabilizing the stream bed and lower banks of Site 3 because it will require minimal tree removals/grading and will use natural materials available onsite. Removing trees leaning over and at high risk of falling into the channel will also prevent localized erosion. Alternative 3C is recommended for stabilizing the upper banks and providing long-term natural aesthetics to the stream corridor. These two alternatives, implemented together, will stabilize and establish natural vegetation along approximately one-quarter of the entire project area.

G.3 Site 4

Site 4 includes overbank areas on both sides of the creek, but primarily on the south (Figure G-2), outside of the stream channel areas described above for Site 3. Due to the heavy use of the disc golf course, this area is largely unvegetated, resulting in significant sediment transfer from the bare ground to the stream (see Photo 4 in Appendix A).

Alternative 4A—Establish vegetated buffer

Alternative summary: Install low fencing or other markers and shade-tolerant vegetation to establish a vegetative buffer on the creek banks, while allowing for controlled or stabilized stream access points so as to not inhibit the use of the disc golf course.

Advantages: A vegetated buffer will improve water quality in the stream by separating disc golf foot traffic from the stream, thereby reducing bank erosion and removing sediment from overland runoff entering the stream. The buffer will also result in improved aesthetics near the stream and provide an opportunity to educate park users on natural buffers and stream bank stability.

Disadvantages: Suitable, shade-tolerant species will need to be carefully selected; site preparation, seeding, and maintenance will need to be tailored to the location. The vegetated buffer and any fencing will inconvenience disc golf course users and may require user education and cooperation as well as frequent maintenance.

Feasibility: Shade-tolerant species are available and a vegetated buffer can be feasibly established; relatively frequent maintenance may be required due to the impact of disc golf course users.

Alternative 4B—Realign disc golf course

Alternative summary: Realign portions of the Plymouth Creek Park disc golf course to reduce the potential for golfers to enter the creek by placing pins away from the stream and eliminating holes that cross the stream. This alternative could be implemented alone or in conjunction with Alternative 4A. This alternative would also include upper-bank vegetation, as described for Alternative 4C.

Advantages: Placing pins away from the stream will cause golfers to throw away rather than toward the stream and reduce foot traffic on the stream banks. Some degree of hole realignment may be possible without tree removal or additional grading.

Disadvantages: Separating play from the stream channel by realigning holes may decrease some users' enjoyment of the natural amenities of the course. Any major adjustments to hole placement (for example, to decrease the overall density of the course) will require clearing and/or tree removal and may be relatively costly.

Feasibility: This alternative is feasible only if it can be done with minimal tree removal and provides an opportunity for public involvement in the stabilization of Plymouth Creek.

Site 4 recommendations

Establishing vegetated buffers on the overbank areas along Site 4 will maintain continuity with the upper-bank vegetation recommended for Site 3 (Alternative 3C), while allowing continued disc golf course usage. Alternative 4A is recommended.

G.4 Site 5

Site 5 is near the downstream end of Reach 1 (see Figure G-2 and Photo 5 in Appendix A). A steep eroding outer bank is present near this site. The high clay content of the soils limits the rate of bank migration, but stabilizing the bank would remove a source of sediment to the stream and improve its aesthetics near a footbridge crossing.

Alternative 5A—Stabilize with hard armor/riprap

Alternative summary: Install riprap or boulders along the lower slope of the outer bank to reduce the sediment loading and loss of bank.

Advantages: Riprap is relatively inexpensive and effective in reducing bank erosion; if properly designed it can be resilient to large flood events.

Disadvantages: Hard armoring does not encourage vegetative growth and does not appear natural or provide quality in-stream habitat. If erosion occurs around or behind the riprap, maintenance costs tend to be higher than for bioengineering techniques.

Feasibility: This alternative is feasible if bioengineering alternatives cannot be used.

Alternative 5B—Stabilize with VRSS

Alternative summary: Install bioengineering in the form of VRSS to encourage vegetative growth along the outer bank. Install VRSS in front of the existing bank to minimize grading into the bank.

Advantages: VRSS is aesthetically pleasing after the vegetated banks begin to thrive and uses renewable materials. If properly designed and installed, VRSS can be resilient to large flood events.

Disadvantages: Suitable, shade-tolerant species will need to be selected; site preparation, seeding, and maintenance will need to be tailored to the location. VRSS is more costly to install than hard armoring alone.

Feasibility: Shade-tolerant species are available and the VRSS area can be feasibly vegetated, though relatively frequent maintenance may be required during the vegetation-establishment period.

Infeasible alternatives

Re-grading of the stream bank to reduce the steep slope is not considered feasible. The regrading would remove several trees and reduce the areas available for the disc golf course.

Site 5 recommendations

Given the expressed preference of the BCWMC and permitting agencies for bioengineering solutions, Alternative 5B is recommended.

G.5 Sites 6, 7, 8, and 9

Four pedestrian bridges used by disc golfers are located within Reach 1 (Sites 6 and 7, Figure G-2) and Reach 2 (Sites 8 and 9, Figure G-3). Erosion around the bridge abutments is present at all four bridges (see Photos 6 through Photo 8 in Appendix A).

Alternatives 6A through 9A—Stabilize with hard armor and log vanes

Alternative summary: Install hard armor (riprap) around each abutment and log vanes upstream of each abutment to direct flow to the center of the river and encourage sedimentation around the bridge abutments.

Advantages: Riprap around each abutment will reduce erosion during high flows, while log vanes will reduce the erosive pressure on the abutments.

Disadvantages: Hard armor around bridge abutments does not appear natural or provide quality in-stream habitat. Adding log vanes to the bridge locations will add complexity and require more detailed design and construction oversight to achieve the desired flow patterns.

Feasibility: This alternative is feasible.

Alternative 6B through 9B—Stabilize with hard armor only

Alternative summary: Install hard armor (riprap) around each abutment.

Advantages: Riprap around each abutment will reduce erosion during high flows and will not require any in-stream work. Installing only riprap will cost less than combining riprap with log vanes.

Disadvantages: Armoring only the bridge abutments without reducing the erosive pressure by redirecting the flow may result in failure of the riprap or additional maintenance after large flood events. In addition, hard armor around bridge abutments does not appear natural or provide quality in-stream habitat.

Feasibility: This alternative is feasible.

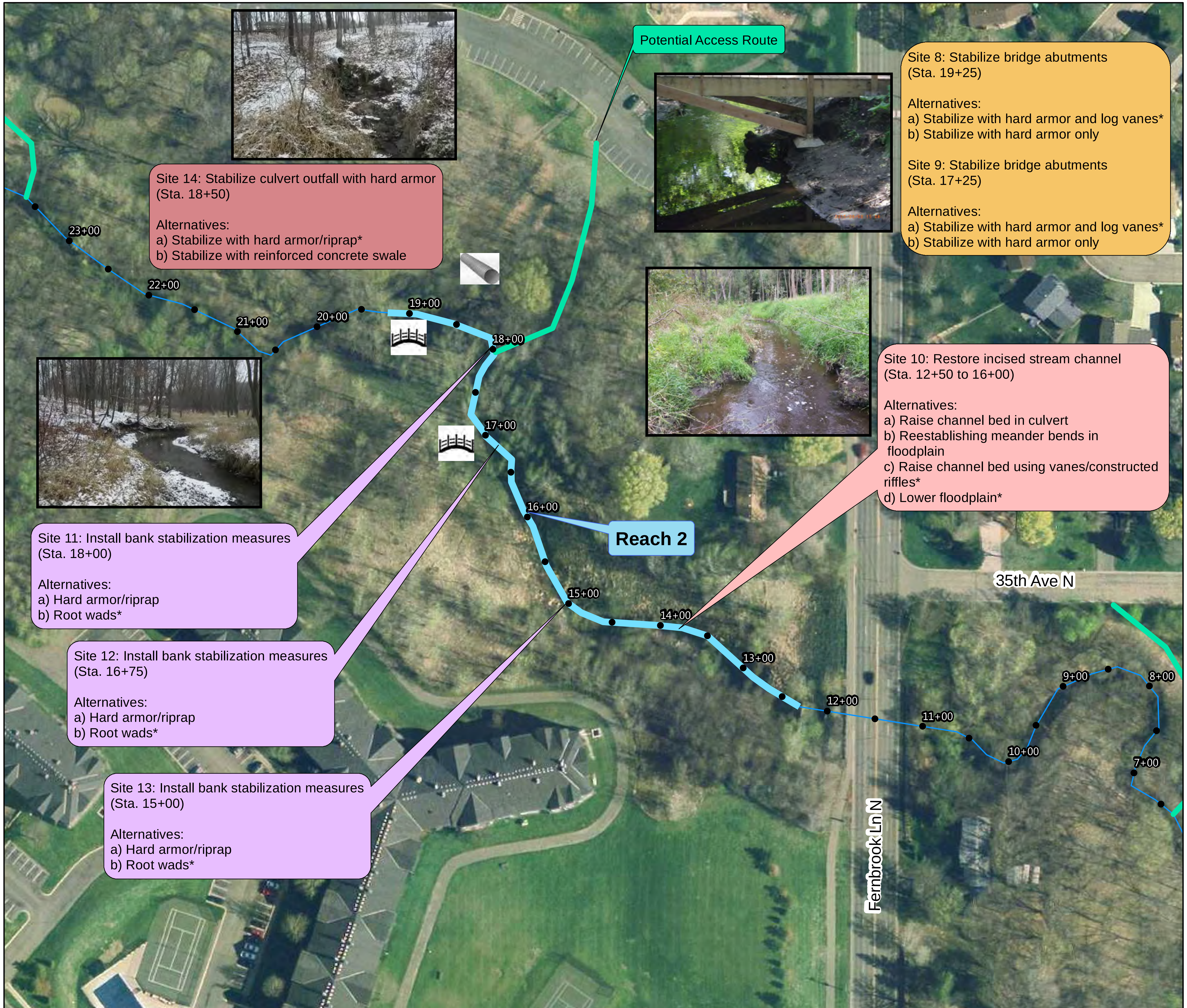
Infeasible alternatives

The cost of new footbridges—relative to the low consequences of erosion-related failure—is high. This makes widening the footbridges to put the abutments away from the channel on the floodplain infeasible.

Installing log vanes upstream of the abutment without riprap is not considered feasible. This would not provide the abutments with the required level of protection, especially during larger flow events.

Sites 6 through 9 recommendations

Alternatives 6A through 9A are recommended for stabilizing the pedestrian bridge abutments; both will improve resistance of the abutments to high flows and reduce the erosive pressure by redirecting flows toward the center of the stream.



Reach 2

Issues: Erosion of the stream bed (incision) has resulted in limited access to floodplain. Incision perhaps due to culvert grade on downstream end of reach. Pockets of granular soils prone to bank erosion.

Constraints: Culvert limits flow in floods. Nearby home impacted if flood levels increase. Low slope. Sanitary sewer manholes should be avoided and access to these manholes should be maintained.

Legend

Pedestrian Bridge

Culvert Outfall

Note: Individual alternatives are defined as a, b, c, or d for many of the sites. One or more alternatives will be chosen for each site.

*Indicates recommended alternative

N

Feet

100 0 100 200

Meters

30 0 30 60

Figure G-3

PLYMOUTH CREEK REACH 2 ALTERNATIVES
Plymouth Creek Feasibility Study
Bassett Creek Watershed
Management Commission

G.6 Site 10

Site 10 includes much of the stream channel located in the downstream half of Reach 2 (see Figure G-3). The stream bed in this section appears to be mildly incised (see Photo 8 in Appendix A), resulting in limited access to the floodplain. In addition, pockets of granular soils have facilitated bank erosion in some areas. Incised streams often have greater-than-average erosion; unlike streams that are well-connected to the floodplain, they do not effectively transfer flood energy. The excess energy causes bank erosion, suggesting the erosion at this site may continue to worsen. If the channel incision migrates upstream, additional banks and lengths of stream may be more prone to erosion.

Residential property exists on the downstream portion of the reach and cannot be further impacted by floodwaters. A portion of the overbank in this reach is defined as wetland (see Appendix E), which will necessitate additional permitting to ensure any impacts are mitigated.

Alternative 10A—Raise culvert bed elevation

Alternative summary: Add riprap and gravel to the bed of the culvert (grout select cobbles into place if necessary) under Fernbrook Lane North to act as a grade control and increase the bed elevation in the stream through Site 10. At the request of the MDNR, the culvert was installed 1 foot lower than the previous culvert, with the intent that it would fill with sediment and have a natural bottom. While a portion of the culvert has accumulated sediment, a natural bottom has not been fully established.

Advantages: Raising the stream bed in the Fernbrook Lane North culvert will decrease the slope of the creek and allow for improved access to the floodplain. This alternative will be relatively low-cost and may increase the ability of aquatic organisms to move through the culvert during low-flow conditions. It is assumed that a natural substrate will gradually accumulate in the culvert; this alternative would speed up the process.

Disadvantages: If too much material is added to the culvert bottom, its conveyance would be altered and the upstream flood profile could be affected.

Feasibility: Providing the design of the culvert can maintain existing flood elevations, this alternative is feasible.

Alternative 10B—Re-meander on floodplain

Alternative summary: Construct a meandering stream channel through the existing floodplain to improve connectivity of flood flows with the floodplain.

Advantages: The additional meander bends in the floodplain would allow for increased habitat by adding stream length and improve the aesthetics within this reach. The new channel will be constructed with a geomorphically appropriate cross section, which will help ensure ongoing channel stability.

Disadvantages: Adding stream length and raising the bed elevation of the stream will decrease the stream slope, reduce conveyance, and could affect the upstream flood profile. Hydraulic modeling will be required during final design to ensure the flood profile is not impacted. Impacts to the flood elevation could be offset by lowering the floodplain as described in Alternative 10D. In addition, construction of a new channel through the existing wetland floodplain may require mitigation for wetland impacts. Two sanitary manholes exist within this site. The re-meander must not impede vehicle access to the manholes or increase the potential for fluvial erosion around the manholes.

Feasibility: This alternative is feasible; however, there are multiple obstacles. It will be difficult to find a reasonable way to re-meander the stream while maintaining necessary vehicle access to the sewer manholes. This option will also be relatively costly compared to the other alternatives.

Alternative 10C—Raise channel bed with vanes/riffles

Alternative summary: Raise the channel bed elevation with boulder cross vanes or constructed riffles to act as localized grade control and improve connectivity of flood flows with the floodplain.

Advantages: The installation of cross vanes would facilitate sedimentation upstream of the cross vanes and naturally raise the stream bed without construction of an entirely new channel. If properly designed and constructed, cross vanes could also help direct flow away from existing eroding banks. This alternative will have reduced wetland impacts compared to Alternative 10B.

Disadvantages: Similar to Alternative 10B, raising the bed elevation could affect the upstream flood profile. Hydraulic modeling will be required during final design, and impacts could be offset by lowering the floodplain as described in Alternative 10D. In addition, this alternative will not alter the stream cross section if it is found to be overly wide in areas away from the installed vanes or riffles.

Feasibility: Providing that the design of the vanes or riffles can maintain existing flood elevations, this alternative is feasible.

Alternative 10D—Lower floodplain

Alternative summary: Lower portions of the floodplain adjacent to the stream channel to improve connectivity of flood flows with the floodplain and maintain the existing flood profile. This alternative may be used alone or in combination with Alternative 10B or 10C.

Advantages: Improved access to the floodplain creates fertile overbank areas for vegetation associated with the stream buffer and improves habitat in the buffer. Additionally, a lowered floodplain will produce increased flood storage and could lower the design flood profile.

Disadvantages: Lowering the floodplain within this reach will impact a delineated wetland. Additional permitting may be required to ensure the wetland impacts are mitigated or are determined to be self-mitigating. Due to the volume of soil to be removed, this alternative may be more costly than alternatives addressing the stream channel alone. Any grading work within the floodplain must not disturb the existing sanitary manholes and should provide vehicle access to the manholes.

Feasibility: This alternative is feasible and may allow for feasible construction of Alternative 10B or 10C. Based on feedback from the technical stakeholder meeting, permitting of the wetland impacts is not anticipated to be a significant obstacle.

Infeasible alternatives

Due to the relatively recent replacement of the culvert under Fernbrook Lane North by the City, any further replacement of the culvert or addition of culverts on the floodplain are considered infeasible.

Site 10 recommendations

Re-meandering the stream channel through Site 10 would require significant excavation, both for the new channel and to maintain flood flow capacity by lowering the floodplain. It may also conflict with the existing sanitary manhole in the area. Alternative 10C is recommended for this site because it provides many of the same benefits at a lower cost; in addition, fewer boulder vanes may be needed if the design is coordinated with stabilization of Sites 11 through 13. Alternative 10D is also recommended because some degree of increased flood flow capacity will likely be needed to offset the raised channel bed elevation.

G.7 Sites 11 through 13

Eroding banks are present in several locations in Reach 2. Sites 11 through 13 are located within the section of Plymouth Creek addressed in Site 10 (see Figure G-3). Stabilization of these sites could be performed instead of or in conjunction with one of the alternatives described for Site 10. The eroding banks at these sites are shown in Photo 10 through Photo 12 of Appendix A.

Alternatives 11A through 13A—Stabilize with hard armor/riprap

Alternative summary: Install riprap along the outer banks to reduce the sediment loading and loss of bank.

Advantages: Riprap is relatively inexpensive, effective in reducing bank erosion, and if properly designed can be resilient to large flood events.

Disadvantages: Hard armoring does not encourage vegetative growth and does not appear natural or provide quality in-stream habitat. If erosion occurs around or behind the riprap, maintenance costs tend to be higher than for bioengineering techniques.

Feasibility: This alternative is feasible if bioengineering techniques are not possible.

Alternatives 11B through 13B—Stabilize with root wads

Alternative summary: Install root wads around eroding bends to direct flow to the center of the stream.

Advantages: Root wads will reduce the erosive stress on the outer banks, reduce bank erosion, and allow vegetation to become established. Root wads also create scour pools and cover that can increase habitat diversity within the stream. Trees will likely need to be removed to gain access to these banks, providing a source for the root wads.

Disadvantages: Root wads will require removing trees; however, bank access is likely to require tree removal regardless of the technique. Adding root wads to the outer banks will add complexity and require more detailed design and construction oversight to achieve the desired flow patterns.

Feasibility: This alternative is feasible provided root wads would not require unnecessary tree removal.

Sites 11 through 13 recommendations

Given the expressed preference of the BCWMC and permitting agencies for bioengineering solutions, Alternatives 11B through 13B are recommended. As discussed in Section G.6 for Site 10, the required number of root wad may be reduced during final design if selected vane locations for Alternative 10C can meet the objectives of both raising the channel bed elevation and stabilizing meander bends.

G.8 Site 14

Site 14 includes the outfall from a 12-inch-diameter PVC pipe draining from the Plymouth Creek Park parking area to Plymouth Creek (see Figure G-3). The outfall of this pipe has limited stabilization and is causing sediment to erode into the creek (see Photo 13 in Appendix A).

Alternative 14A—Stabilize with hard armor/riprap

Alternative summary: Install riprap from the pipe outlet to the stream.

Advantages: Riprap is relatively inexpensive, effective in reducing erosion, and if properly designed can be resilient to large flood events. Riprap is the primary stabilization technique for pipe outlets due to its effectiveness at protecting against the high anticipated velocities and associated shear stresses from the outlet.

Disadvantages: Hard armoring does not encourage vegetative growth and does not appear natural or provide quality in-stream habitat. If erosion occurs around or behind the riprap, maintenance costs tend to be higher than for bioengineering techniques.

Feasibility: This alternative is feasible.

Alternative 14B—Stabilize with reinforced concrete swale

Alternative summary: Install a reinforced concrete swale from the pipe outlet to the stream.

Advantages: A concrete swale is highly effective in eliminating erosion at pipe outlets. If designed correctly, the swale can have a long life expectancy.

Disadvantages: A concrete swale does not encourage vegetative growth and does not appear natural or provide quality in-stream habitat. If erosion occurs around or behind the swale, maintenance costs tend to be higher than for bioengineering techniques.

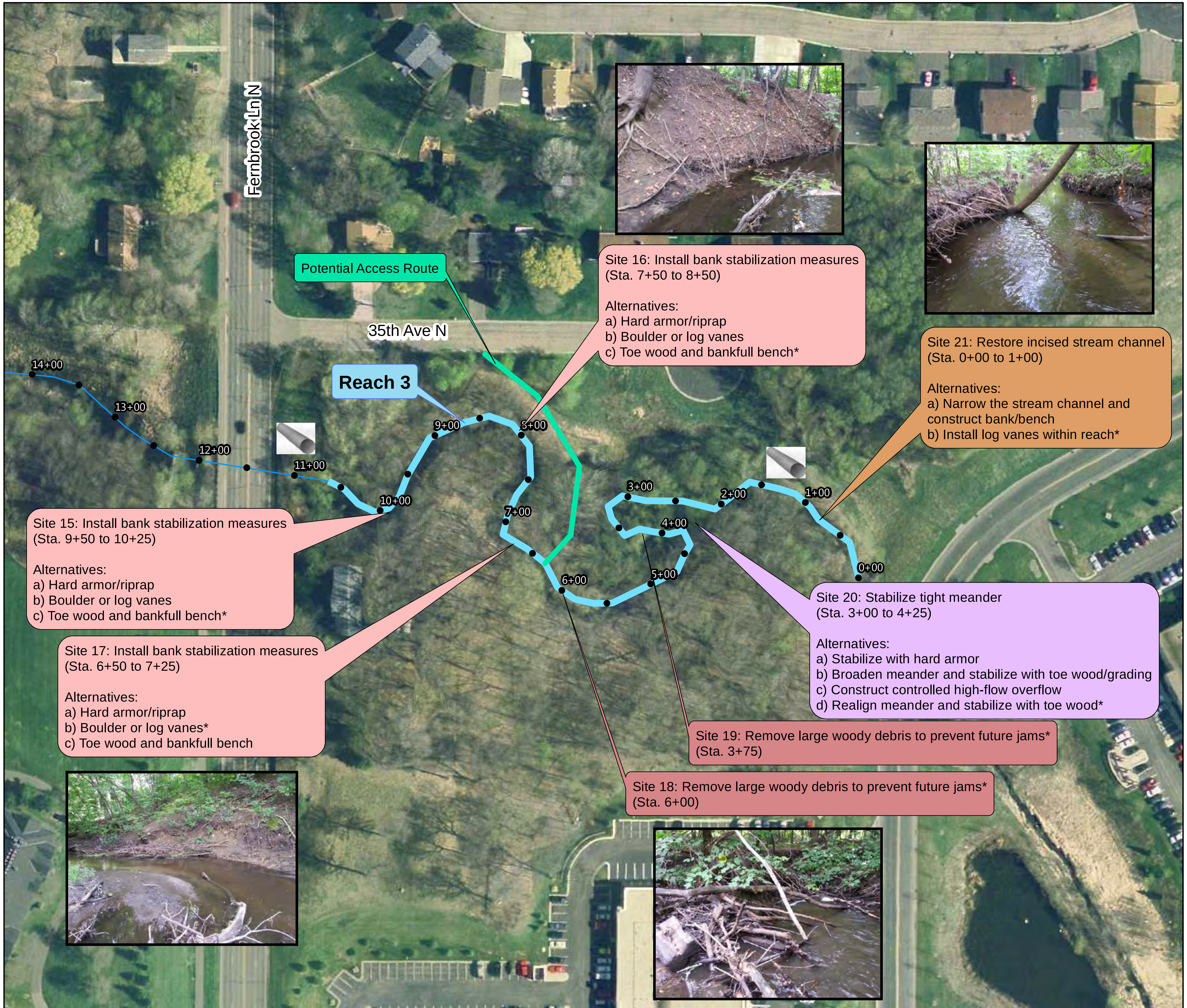
Feasibility: This alternative is feasible.

Infeasible alternatives

Due to the high anticipated velocities associated with the pipe outfall and the expense of replacing a failed pipe, bioengineering techniques are not typically used at sites like this.

Site 14 recommendations

Alternative 14A is recommended to maintain consistency with techniques used elsewhere within the project area (riprap rather than concrete armoring).



Reach 3

Issues: Several large eroding outer banks. Significant woody debris causing jams that redirect flow at banks. Unstable tight meander in downstream third in the process of being cut off.

Constraints: Narrow valley and low slope limit meandering potential, Deep shade limits vegetation options. Meander cutoff and loss of stream length could be permitting issue. Some existing trees may need preservation, inhibiting work access in their vicinity.

Legend

Pedestrian Bridge

Culvert Outfall

Note: Individual alternatives are defined as a, b, or c for many of the sites. One or more alternatives will be chosen for each site.

***Indicates recommended alternative**

N

Feet

100 0 100 200

Meters

30 0 30 60

Figure G-4

PLYMOUTH CREEK REACH 3 ALTERNATIVES
Plymouth Creek Feasibility Study
Bassett Creek Watershed
Management Commission

G.9 Sites 15, 16, and 17

Steep eroding banks are present in three locations within Reach 3, as shown on Figure G-4. In these locations, the bend radius is not overly tight, but the stream channel is cutting into high valley walls, causing bank failures, and undercutting trees (see Photo 14 through Photo 16 in Appendix A).

Alternatives 15A through 17A—Stabilize with hard armor

Alternative summary: Install riprap along the outer banks to reduce the sediment loading and loss of bank.

Advantages: Riprap is relatively inexpensive, effective in reducing bank erosion, and if properly designed can be resilient to large flood events.

Disadvantages: Hard armoring does not encourage vegetative growth and does not appear natural or provide quality in-stream habitat. If erosion occurs around or behind the riprap, maintenance costs tend to be higher than for bioengineering techniques. High erosive stress will continue to act at the toe of the steep banks, especially in high flows.

Feasibility: This alternative is feasible if suitable bioengineering alternatives are not identified.

Alternatives 15B through 17B—Stabilize with boulder or log vanes

Alternative summary: Install boulder or log vanes around eroding bends to direct flow to the center of the stream.

Advantages: Boulder or log vanes will reduce the erosive stress on the outer banks, reduce bank erosion, and allow for establishment of vegetation. Vanes also create mid-channel scour pools that can increase habitat diversity within the stream.

Disadvantages: Depending on their design, vanes can increase the upstream flood profile; hydraulic modeling will be required during final design to ensure that flood impacts are acceptable. Adding vanes to the outer banks will add complexity and require more detailed design and construction oversight to achieve the desired flow patterns. High erosive stress will continue to act at the toe of the steep banks during high flows.

Feasibility: This alternative is feasible.

Alternatives 15C through 17C—Stabilize with toe wood

Alternative summary: Install toe wood (root wads and large woody debris) around eroding bends to increase roughness of the lower banks and establish a vegetated bench at the toe of the high, eroding banks.

Advantages: Toe wood, constructed from natural materials at the project site, is effective in reducing stream bank erosion. Select trees can be removed within this reach to thin the cover and facilitate understory growth and provide material for the toe wood. The in-stream root wads create habitat complexity, while the vegetated bench separates the area of high erosive stress from the steep outer banks.

Disadvantages: Toe wood installation is more challenging than hard armoring and will require additional construction oversight to achieve the desired flow patterns. The longevity of toe wood depends on the woody material being consistently submerged (less potential for rotting) and successful establishment of vegetation along the bench. Toe wood becomes less cost effective if sufficient material is not available onsite.

Feasibility: This alternative is feasible, provided that sufficient woody material can be harvested from within the reach without excessive tree removal.

Infeasible alternatives

Stabilizing the high eroding banks with grading or VRSS is considered infeasible due to the number of trees that would need to be removed to grade the banks to a stable slope. Due to the shady conditions, establishing stabilizing vegetation for VRSS would be difficult.

Sites 15 through 17 recommendations

Although Sites 15 through 17 share many characteristics, the meander bends do not need to be stabilized using identical techniques. Hard armoring methods are not preferred, but there may not be sufficient woody material available to stabilize all three bends with toe wood; the optimal solution may require a combination of toe wood and vane techniques. Accordingly, Alternatives 15C, 16C, and 17B are recommended. Site 17 has the largest meander radius, making it the best candidate for stabilization with boulder or log vanes.

G.10 Sites 18 and 19

Large woody debris is present in two primary locations within the stream (see Figure G-4 and Photos 18 and 19 in Appendix A). The debris causes jams within the stream—redirecting flow towards the banks, which causes bank erosion.

Alternatives 18A and 19A—Remove large woody debris

Alternative summary: Remove existing large woody debris from the stream.

Advantages: Removal of the debris will allow the stream to flow naturally and reduce the stream bank erosion. It will also reduce flooding potential by removing the flow blockages.

Disadvantages: Woody debris removal will decrease the effective roughness of the stream channel and may cause increased flow velocities. Increased flow velocities in the absence of other restoration or stabilization measures could increase bank erosion.

Feasibility: This alternative is feasible and may provide a source of woody material for Alternatives 15C through 17C (toe wood), but it should not be pursued apart from other stabilization measures within Reach 3.

Sites 18 and 19 recommendations

Alternatives 18A and 19A are recommended.

G.11 Site 20

A tight meander is present within the downstream half of Reach 3 (Station 3+00 to 3+50 on Figure G-4). The meander radius is overly small, making the bend unstable and contributing to significant erosion of the outer bank. In addition, the meander is being cut off at the upstream bend (Station 4+25). Photo 19 in Appendix A shows the developing cutoff.

Alternative 20A—Stabilize with hard armor

Alternative summary: Install riprap along the outer banks of both the tight meander (Station 3+00 to 3+50) and the upstream meander (Station 4+00 to 4+50) to reduce sediment loading and loss of bank and prevent meander cutoff.

Advantages: Riprap is relatively inexpensive, effective in reducing bank erosion, and if properly designed can be resilient to large flood events.

Disadvantages: Hard armoring does not encourage vegetative growth and does not appear natural or provide quality in-stream habitat. If erosion occurs around or behind the riprap, maintenance costs tend to be higher than for bioengineering techniques. High erosive stress will continue to act at the toe of the steep bank, especially in high flows, and the tendency for the stream to cutoff the meander will remain.

Feasibility: This alternative is feasible if bioengineering methods are not possible.

Alternative 20B—Stabilize with toe wood and grading to broaden meander

Alternative summary: Install toe wood (root wads and large woody debris) around the eroding bends (Station 3+00 to 3+50 and 4+00 to 4+50) to increase roughness of the lower banks and establish a vegetated bench at the toe of the high, eroding banks. Use the toe wood bench to increase the meander radius by excavating a new channel, as necessary. Depending on the final channel alignment, boulder or log vanes may be used to decrease the length of toe wood required.

Advantages: This alternative retains the general meander pattern of the stream and can be designed to have minimal impact on the overall stream length. Toe wood is effective in reducing stream bank erosion, using natural sources of materials at the project site. Select trees can be removed within this reach to thin the cover, facilitate understory growth, and provide material for the toe wood. The in-stream root wads create habitat complexity, while the vegetated bench separates the area of high erosive stress from the steep outer banks.

Disadvantages: Due to the tight project limits in this area, the stream will still have relatively tight bends. This may, eventually, result in a cutoff loop regardless of stabilization efforts. Hydraulic modeling will be required during final design to ensure that flood impacts are acceptable. Toe wood installation is more challenging than hard armoring and will require additional construction oversight to achieve the desired flow patterns. The longevity of toe wood depends on the woody material being consistently submerged (less potential for rotting) and successful establishment of vegetation along the bench. A significant number of trees would need to be removed for grading and to ensure that enough material is available for toe wood.

Feasibility: This alternative is feasible, provided that sufficient woody material is available and that design of the adjusted meander pattern can maintain existing flood elevations.

Alternative 20C—Create controlled high-flow overflow

Alternative summary: Stabilize the area forming a natural cutoff (from approximately Station 2+25 to 4+25) with an armored overflow channel that could be used during flood events to prevent the stream from completing the meander cutoff. A grade-control structure made of fieldstone could direct flow through the area during flood events. This alternative could be combined with Alternative 20A or 20B to stabilize the remaining tight meander, which would continue to convey flow during low- to average-flow conditions.

Advantages: Stabilizing the natural overflow while retaining the existing low-flow channel will maintain the existing stream length and habitat while preventing uncontrolled stream migration and corresponding erosion. Installation of riprap or logs in this area would be relatively inexpensive and could be designed for stability during high flows.

Disadvantages: Hydraulic modeling will be required during final design to ensure that flood impacts are acceptable. If stabilization measures are not taken on the surrounding meander bends (Alternative 20A or 20B), the high-flow overflow could be flanked by erosion and the stream could experience an abrupt avulsion or change of course. This option will need to be approved by the MDNR. Monitoring information may need to be provided to address their concern that the design might result in the loss of habitat.

Feasibility: This alternative is feasible, provided that design of the high-flow overflow and any additional meander stabilization measures can maintain existing flood elevations.

Alternative 20D—Realign channel to stabilize and broaden meander

Alternative summary: Change the stream channel alignment upstream of the cutoff and the tight meanders (from approximately Station 3+00 to 6+25) to create meanders with stable curvature. Install toe wood and boulder or log vanes around both meander bends to stabilize the outer banks and create a bankfull bench.

Advantages: Creating a stable channel pattern will ensure long-term stability and reduce the risk of meander cutoff or avulsion. Toe wood and vanes are effective in reducing stream bank erosion, using natural sources of materials at the project site. Select trees can be removed within this reach to thin the cover, facilitate understory growth, and provide material for the toe wood. The in-stream root wads create habitat complexity, while the vegetated bench separates the area of high erosive stress from the steep outer banks.

Disadvantages: Changing the stream alignment will result in a reduction in overall stream length by approximately 100 feet, which will increase the stream slope. Hydraulic modeling will be required during final design to ensure that flood impacts are acceptable. Toe wood installation is more challenging than hard armoring and will require additional construction oversight to achieve the desired flow patterns. The longevity of toe wood depends on the woody material being consistently submerged (less potential for rotting) and successful establishment of vegetation along the bench. A significant number of trees would need to be removed for grading and to ensure that enough material is available for toe wood.

Feasibility: Based on feedback from MDNR that reductions in stream length may be acceptable in order to increase stability and long-term habitat value of the stream, this alternative is feasible. Final design will need to verify that sufficient woody material is available and that design of the adjusted meander pattern can maintain existing flood elevations.

Infeasible alternatives

Stabilizing this meander with boulder or log vanes alone is not considered feasible due to the low meander radius. In conditions with very tight meander bends, installation of vanes to redirect flow is sensitive to minor error and unexpected outcomes, and this alternative would not address the tendency of the stream to cutoff the meander.

Site 20 recommendations

Alternative 20D is recommended to prevent uncontrolled stream avulsion, reduce erosion from the tight meander banks, and increase the long-term habitat value of the stream. This alternative will be significantly more expensive than stabilizing the meander with hard armoring, but will provide long-term benefits to the channel stability, stream habitat, and natural character of Plymouth Creek in Reach 3. Coordination with MDNR and other permitting agencies will be required throughout the final design process to ensure that the reduction in stream length is acceptable.

G.12 Site 21

Similar to Site 3 in Reach 1, Site 21 consists of an over-widened stream channel without an active floodplain (see Figure G-4 and Photo 20 in Appendix A).

Alternative 21A—Narrow stream channel and construct floodplain bench

Alternative summary: Narrow the stream channel by grading to establish a vegetated floodplain bench within the existing channel alignment; offset the decreased channel cross section by cutting back the existing high banks.

Advantages: Narrowing the channel will provide improved habitat by deepening the channel during low flows and create an active (if narrow) floodplain and vibrant stream buffer soon after construction.

Disadvantages: Creating a floodplain without decreasing the overall conveyance of the narrowed channel will require significant grading and excavation from the existing upper banks. Tree removals will likely be required in some locations to achieve the desired channel shape. Hydraulic modeling will be required during final design to ensure the flood profile is not impacted.

Feasibility: Providing that the design of the narrowed channel can maintain existing flood elevations, this alternative is feasible, although it will require significant and costly grading.

Alternative 21B—Install log vanes

Alternative summary: Install log vanes and reshape the channel bottom to narrow the low-flow channel while maintaining the overall channel cross section.

Advantages: Narrowing the low-flow channel with log vanes will provide improved habitat by deepening the channel during low flows and reduce the stress on the upper banks during high flows. Natural materials available onsite could be used for much of the log vane construction.

Disadvantages: The bench created by the log vanes will remain below the bankfull flow elevation and periodic inundation will prevent establishment of vegetation. The exposed soil creek bottom may be less aesthetically pleasing than a vegetated floodplain.

Feasibility: Providing that the design of the narrowed channel can maintain existing flood elevations, this alternative is feasible.

Infeasible alternatives

Narrowing the stream channel by importing soil or rock and without excavating the high banks is not considered feasible due to the inevitable increase in the flood profile, which is not permitted by BCWMC policies.

The preference of stakeholders to maintain a natural stream channel makes lining Plymouth Creek with riprap infeasible.

Site 21 recommendations

Alternative 21B is recommended for stabilizing the stream bed and lower banks of Site 21 because it will require minimal tree removal and grading and utilize natural materials available onsite. Alternative 21C is recommended for stabilizing the upper banks and providing long-term natural aesthetics to the stream corridor.

Table G-1 Plymouth Creek feasibility study alternatives summary

Reach	Site	Alternative	Alternative Description	Advantages	Disadvantages	Rec.?
Reach 1	Site 1	Alternative A	Remeander into historic channels	Adds habitat by adding stream length, improves aesthetics and water quality.	Decreases already shallow slope, requires tree removals.	N
Reach 1	Site 1	Alternative B	Stabilize erosion areas with hard armor	Inexpensive, effective at reducing bank erosion, resilient to large flood events.	Does not use historic channels, does not provide natural habitat, less aesthetically pleasing.	N
Reach 1	Site 1	Alternative C	Stabilize erosion areas with root wads, log vanes, and vegetation	Contributes to habitat, provides grade control, and utilizes materials generated on site.	Does not use historic channels, vegetation limited to shade-tolerant species.	Y
Reach 1	Site 2	Alternative A	Remeander into historic channels	Adds habitat by adding stream length, improves aesthetics and water quality.	Decreases already shallow slope, requires tree removals.	N
Reach 1	Site 2	Alternative B	Stabilize erosion areas with hard armor	Inexpensive, effective at reducing bank erosion, resilient to large flood events.	Does not use historic channels, does not provide natural habitat, less aesthetically pleasing.	N
Reach 1	Site 2	Alternative C	Stabilize erosion areas with root wads, log vanes, and vegetation	Contributes to habitat, provides grade control, and utilizes materials generated on site.	Does not use historic channels, vegetation limited to shade-tolerant species.	Y
Reach 1	Site 3	Alternative A	Narrow channel for approx. 800'	Improves habitat by deepening channel, improves access to floodplain.	Requires significant grading and tree removals.	N
Reach 1	Site 3	Alternative B	Install log vanes within reach	Improves habitat by deepening channel, provides grade control, reduces upper bank stress.	Does not create vegetated floodplain.	Y
Reach 1	Site 3	Alternative C	Upper bank vegetation	Improves aesthetics of stream bank, reduces erosion.	Requires careful coordination with disc golf users, vegetation limited to shade-tolerant species.	Y
Reach 1	Site 4	Alternative A	Establish vegetated buffer	Improves aesthetics of riparian area, reduces erosion.	Requires careful coordination with disc golf users, vegetation limited to shade-tolerant species.	Y
Reach 1	Site 4	Alternative B	Realign disc golf course	Reduces or removes foot traffic pressure on banks.	May decrease natural amenities of course, may require clearing.	N
Reach 1	Site 5	Alternative A	Stabilize steep, eroding bank with hard armor	Inexpensive, effective at reducing bank erosion, resilient to large flood events.	Does not provide natural habitat, less aesthetically pleasing.	N
Reach 1	Site 5	Alternative B	Vegetate steep, eroding bank with VRSS	Contributes to habitat, improves aesthetics.	More costly to install, vegetation limited to shade-tolerant species.	Y
Reach 1	Site 6	Alternative A	Stabilize bridge abutments with riprap and log vanes	Reduces erosion, reduces erosive pressure on abutments for added protection.	Riprap does not provide natural habitat, more complex design.	Y
Reach 1	Site 6	Alternative B	Stabilize bridge abutments with riprap only	Reduces erosion, less complex design.	Riprap does not provide natural habitat, requires more riprap.	N
Reach 1	Site 7	Alternative A	Stabilize bridge abutments with riprap and log vanes	Reduces erosion, reduces erosive pressure on abutments for added protection.	Riprap does not provide natural habitat, more complex design.	Y
Reach 1	Site 7	Alternative B	Stabilize bridge abutments with riprap only	Reduces erosion, less complex design.	Riprap does not provide natural habitat, requires more riprap.	N
Reach 2	Site 8	Alternative A	Stabilize bridge abutments with riprap and log vanes	Reduces erosion, reduces erosive pressure on abutments for added protection.	Riprap does not provide natural habitat, more complex design.	Y
Reach 2	Site 8	Alternative B	Stabilize bridge abutments with riprap only	Reduces erosion, less complex design.	Riprap does not provide natural habitat, requires more riprap.	N
Reach 2	Site 9	Alternative A	Stabilize bridge abutments with riprap and log vanes	Reduces erosion, reduces erosive pressure on abutments for added protection.	Riprap does not provide natural habitat, more complex design.	Y
Reach 2	Site 9	Alternative B	Stabilize bridge abutments with riprap only	Reduces erosion, less complex design.	Riprap does not provide natural habitat, requires more riprap.	N
Reach 2	Site 10	Alternative A	Raise stream bed in Fernbrook Lane North culvert	Low cost, improves stream access to floodplain.	Reduces culvert conveyance and may affect flood elevations.	N
Reach 2	Site 10	Alternative B	Create meanders in open area to add 70' of stream length	Improves habitat by adding stream length, improves stream access to floodplain, creates stable cross-section.	Decreases already shallow slope, increases wetland impacts, requires coordination with sanitary manholes.	N

Table G-1 Plymouth Creek feasibility study alternatives summary

Reach	Site	Alternative	Alternative Description	Advantages	Disadvantages	Rec.?
Reach 2	Site 10	Alternative C	Raise channel bed using cross vanes/constructed riffles	Reduces bed and bank erosion, improves stream access to floodplain.	Decreases already shallow slope, does not address stream cross-section in other locations.	Y
Reach 2	Site 10	Alternative D	Lower adjacent floodplain	Improves stream access to floodplain, improves buffer habitat, reduces flood elevation.	Significant disturbance of wetland, may require significant grading, requires coordination with sanitary manholes.	Y
Reach 2	Site 11	Alternative A	Stabilize eroding banks with hard armor	Inexpensive, effective at reducing bank erosion, resilient to large flood events.	Does not provide natural habitat, less aesthetically pleasing.	N
Reach 2	Site 11	Alternative B	Stabilize banks with root wads	Reduces bank erosion, improves in-stream habitat, utilizes materials generated on site.	Requires tree removals, more complex design.	Y
Reach 2	Site 12	Alternative A	Stabilize eroding banks with hard armor	Inexpensive, effective at reducing bank erosion, resilient to large flood events.	Does not provide natural habitat, less aesthetically pleasing.	N
Reach 2	Site 12	Alternative B	Stabilize banks with root wads	Reduces bank erosion, improves in-stream habitat, utilizes materials generated on site.	Requires tree removals, more complex design.	Y
Reach 2	Site 13	Alternative A	Stabilize eroding banks with hard armor	Inexpensive, effective at reducing bank erosion, resilient to large flood events.	Does not provide natural habitat, less aesthetically pleasing.	N
Reach 2	Site 13	Alternative B	Stabilize banks with root wads	Reduces bank erosion, improves in-stream habitat, utilizes materials generated on site.	Requires tree removals, more complex design.	Y
Reach 2	Site 14	Alternative A	Stabilize culvert outfall with hard armor	Inexpensive, effectively stabilizes outfall from erosion.	Does not provide natural habitat, not aesthetically pleasing.	Y
Reach 2	Site 14	Alternative B	Stabilize culvert outfall with concrete swale	Effectively stabilizes outfall from erosion, long life expectancy.	Does not provide natural habitat, not aesthetically pleasing.	N
Reach 3	Site 15	Alternative A	Install bank stabilization measures at eroding banks using hard armor	Inexpensive, effective at reducing bank erosion, resilient to large flood events.	Does not provide natural habitat, less aesthetically pleasing, does not reduce erosive stress.	N
Reach 3	Site 15	Alternative B	Install 4 rock vanes for bank protection	Reduces erosive stress and bank erosion, improves in-stream habitat.	Can result in increases in flood elevations, less effective at high flows.	N
Reach 3	Site 15	Alternative C	Install bank stabilization measures at eroding banks using toe wood	Stabilizes bank and reduces stress and erosion, provides habitat, utilizes materials generated on site.	Installation can be challenging, useful life is less than other options, requires significant woody debris.	Y
Reach 3	Site 16	Alternative A	Install bank stabilization measures at eroding banks using hard armor	Inexpensive, effective at reducing bank erosion, resilient to large flood events.	Does not provide natural habitat, less aesthetically pleasing, does not reduce erosive stress.	N
Reach 3	Site 16	Alternative B	Install 4 rock vanes for bank protection	Reduces erosive stress and bank erosion, improves in-stream habitat.	Can result in increases in flood elevations, less effective at high flows.	N
Reach 3	Site 16	Alternative C	Install bank stabilization measures at eroding banks using toe wood	Stabilizes bank and reduces stress and erosion, provides habitat, utilizes materials generated on site.	Installation can be challenging, useful life is less than other options, requires significant woody debris.	Y
Reach 3	Site 17	Alternative A	Install bank stabilization measures at eroding banks using hard armor	Inexpensive, effective at reducing bank erosion, resilient to large flood events.	Does not provide natural habitat, less aesthetically pleasing, does not reduce erosive stress.	N
Reach 3	Site 17	Alternative B	Install 4 rock vanes for bank protection	Reduces erosive stress and bank erosion, improves in-stream habitat.	Can result in increases in flood elevations, less effective at high flows.	Y
Reach 3	Site 17	Alternative C	Install bank stabilization measures at eroding banks using toe wood	Stabilizes bank and reduces stress and erosion, provides habitat, utilizes materials generated on site.	Installation can be challenging, useful life is less than other options, requires significant woody debris.	N
Reach 3	Site 18	Alternative A	Remove large woody debris	Reduces flooding potential and bank erosion.	Decreases stream roughness and may increase flow velocity.	Y
Reach 3	Site 19	Alternative A	Remove large woody debris	Reduces flooding potential and bank erosion.	Decreases stream roughness and may increase flow velocity.	Y
Reach 3	Site 20	Alternative A	Stabilize with hard armor	Inexpensive, effective at reducing bank erosion, resilient to large flood events.	Does not provide natural habitat, less aesthetically pleasing, does not reduce erosive stress.	N

Table G-1 Plymouth Creek feasibility study alternatives summary

Reach	Site	Alternative	Alternative Description	Advantages	Disadvantages	Rec.?
Reach 3	Site 20	Alternative B	Stabilize with toe wood and grading to broaden meander	Stabilizes bank and reduces stress and erosion, provides habitat, utilizes materials generated on site, maintains existing stream length.	Installation can be challenging, useful life is less than other options, requires significant woody debris.	N
Reach 3	Site 20	Alternative C	Controlled overflow, install grade control structure downstream	Stabilizes active meander cutoff, maintains existing stream length.	Can be flanked by erosion and stream avulsion.	N
Reach 3	Site 20	Alternative D	Realign channel and stabilize meanders with vanes and toe wood	Stabilizes bank and reduces stress and erosion, provides habitat, utilizes materials generated on site, improves cross section stability.	Reduces stream length and increases stream slope, installation can be challenging, useful life is less than other options, requires significant woody debris.	Y
Reach 3	Site 21	Alternative A	Narrow channel for approx. 80'	Improves habitat by deepening channel, improves access to floodplain.	Requires significant grading and tree removals.	N
Reach 3	Site 21	Alternative B	Install log vanes within reach	Improves habitat by deepening channel, provides grade control, reduces upper bank stress.	Does not create vegetated floodplain.	Y

Appendix H

Detailed Alternative Cost Estimates

Table H-1 Plymouth Creek feasibility study alternatives cost estimates

Reach	Site	Alternative	Alternative Description	Construction Cost Estimate [1]	Construction Contingency [2]	Engineering [3]	Capital Cost Estimate [4][5]	Estimated Life Span[6] (years)	Annual Maint. Est. [7]	Major Maint. Est. [8]	30-Year Future Worth Estimate[9][10]	Annualized Cost[10][11]	TP Loading: Load Reduction (lb/yr)	TP Loading: Cost/lb Reduced[12]	TSS Loading: Load Reduction (lb/yr)	TSS Loading: Cost/lb Reduced[12]	Rec.?
Reach 1	Site 1	Alternative A	Remeander into historic channels	$ 93,600	$ 28,080	$ 28,080	$ 149,800	30	$ 440	$ 14,980	$ 411,600	$ 8,700	0.20	$ 44,260	340	$ 25.59	N
Reach 1	Site 1	Alternative B	Stabilize erosion areas with hard armor	$ 17,420	$ 5,230	$ 5,230	$ 27,900	30	$ 210	$ 13,950	$ 102,900	$ 2,200	0.20	$ 11,190	340	$ 6.47	N
Reach 1	Site 1	Alternative C	Stabilize erosion areas with root wads, log vanes, and vegetation	$ 16,080	$ 4,820	$ 4,820	$ 25,700	20	$ 190	$ 6,430	$ 83,100	$ 1,700	0.20	$ 8,650	340	$ 5.00	Y
Reach 1	Site 2	Alternative A	Remeander into historic channels	$ 37,420	$ 11,230	$ 11,230	$ 59,900	30	$ 180	$ 5,990	$ 164,800	$ 3,500	0.23	$ 15,420	390	$ 8.97	N
Reach 1	Site 2	Alternative B	Stabilize erosion areas with hard armor	$ 21,770	$ 6,530	$ 6,530	$ 34,800	30	$ 260	$ 17,400	$ 128,300	$ 2,700	0.23	$ 11,890	390	$ 6.92	N
Reach 1	Site 2	Alternative C	Stabilize erosion areas with root wads, log vanes, and vegetation	$ 10,810	$ 3,240	$ 3,240	$ 17,300	20	$ 130	$ 4,330	$ 56,000	$ 1,200	0.23	$ 5,290	390	$ 3.08	Y
Reach 1	Site 3	Alternative A	Narrow channel for approx. 800'	$ 35,270	$ 10,580	$ 10,580	$ 56,400	30	$ 170	$ 5,640	$ 155,200	$ 3,300	1.7	$ 1,990	2,890	$ 1.14	N
Reach 1	Site 3	Alternative B	Install log vanes within reach	$ 31,450	$ 9,440	$ 9,440	$ 50,300	20	$ 370	$ 12,580	$ 162,400	$ 3,400	1.7	$ 2,050	2,890	$ 1.18	Y
Reach 1	Site 3	Alternative C	Upper bank vegetation	$ 14,150	$ 4,250	$ 4,250	$ 22,700	10	$ 350	$ 5,680	$ 103,400	$ 2,200	1.7	$ 1,320	2,890	$ 0.76	Y
Reach 1	Site 4	Alternative A	Establish vegetated buffer	$ 14,840	$ 4,450	$ 4,450	$ 23,700	10	$ 320	$ 5,930	$ 105,800	$ 2,200	2.2	$ 990	3,850	$ 0.57	Y
Reach 1	Site 4	Alternative B	Realign disc golf course	$ 50,510	$ 15,150	$ 15,150	$ 80,800	30	$ 250	$ 8,080	$ 222,600	$ 4,700	2.2	$ 2,120	3,850	$ 1.22	N
Reach 1	Site 5	Alternative A	Stabilize steep, eroding bank with hard armor	$ 9,280	$ 2,780	$ 2,780	$ 14,800	30	$ 110	$ 7,400	$ 54,500	$ 1,100	1.9	$ 590	3,240	$ 0.34	N
Reach 1	Site 5	Alternative B	Vegetate steep, eroding bank with VRSS	$ 20,480	$ 6,140	$ 6,140	$ 32,800	20	$ 570	$ 8,200	$ 121,500	$ 2,600	1.9	$ 1,400	3,240	$ 0.80	Y
Reach 1	Site 6	Alternative A	Stabilize bridge abutments with riprap and log vanes	$ 7,940	$ 2,380	$ 2,380	$ 12,700	30	$ 100	$ 6,350	$ 47,000	$ 1,000	0.13	$ 7,530	230	$ 4.35	Y
Reach 1	Site 6	Alternative B	Stabilize bridge abutments with riprap only	$ 7,550	$ 2,270	$ 2,270	$ 12,100	30	$ 90	$ 6,050	$ 44,600	$ 900	0.13	$ 6,770	230	$ 3.91	N
Reach 1	Site 7	Alternative A	Stabilize bridge abutments with riprap and log vanes	$ 7,940	$ 2,380	$ 2,380	$ 12,700	30	$ 100	$ 6,350	$ 47,000	$ 1,000	0.13	$ 7,530	230	$ 4.35	Y
Reach 1	Site 7	Alternative B	Stabilize bridge abutments with riprap only	$ 7,550	$ 2,270	$ 2,270	$ 12,100	30	$ 90	$ 6,050	$ 44,600	$ 900	0.13	$ 6,770	230	$ 3.91	N
Reach 2	Site 8	Alternative A	Stabilize bridge abutments with riprap and log vanes	$ 7,940	$ 2,380	$ 2,380	$ 12,700	30	$ 100	$ 6,350	$ 47,000	$ 1,000	0.13	$ 7,530	230	$ 4.35	Y
Reach 2	Site 8	Alternative B	Stabilize bridge abutments with riprap only	$ 7,550	$ 2,270	$ 2,270	$ 12,100	30	$ 90	$ 6,050	$ 44,600	$ 900	0.13	$ 6,770	230	$ 3.91	N
Reach 2	Site 9	Alternative A	Stabilize bridge abutments with riprap and log vanes	$ 7,940	$ 2,380	$ 2,380	$ 12,700	30	$ 100	$ 6,350	$ 47,000	$ 1,000	0.13	$ 7,530	230	$ 4.35	Y
Reach 2	Site 9	Alternative B	Stabilize bridge abutments with riprap only	$ 7,550	$ 2,270	$ 2,270	$ 12,100	30	$ 90	$ 6,050	$ 44,600	$ 900	0.13	$ 6,770	230	$ 3.91	N
Reach 2	Site 10	Alternative A	Raise stream bed in Fernbrook Lane North culvert	$ 6,700	$ 2,010	$ 2,010	$ 10,700	15	$ 20	$ 5,350	$ 48,300	$ 1,000	1.7	$ 590	2,970	$ 0.34	N
Reach 2	Site 10	Alternative B	Create meanders in open area to add 70' of stream length	$ 81,590	$ 24,480	$ 24,480	$ 130,600	30	$ 380	$ 13,060	$ 358,700	$ 7,500	1.7	$ 4,400	2,970	$ 2.53	N
Reach 2	Site 10	Alternative C	Raise channel bed using cross vanes/constructed riffles	$ 20,970	$ 6,290	$ 6,290	$ 33,600	20	$ 250	$ 16,800	$ 123,800	$ 2,600	1.7	$ 1,520	2,970	$ 0.88	Y
Reach 2	Site 10	Alternative D	Lower adjacent floodplain	$ 35,230	$ 10,570	$ 10,570	$ 56,400	30	$ 170	$ 5,640	$ 155,200	$ 3,300	1.7	$ 1,940	2,970	$ 1.11	Y
Reach 2	Site 11	Alternative A	Stabilize eroding banks with hard armor	$ 11,280	$ 3,380	$ 3,380	$ 18,000	30	$ 130	$ 9,000	$ 66,100	$ 1,400	1.9	$ 730	3,340	$ 0.42	N
Reach 2	Site 11	Alternative B	Stabilize banks with root wads	$ 11,750	$ 3,530	$ 3,530	$ 18,800	20	$ 140	$ 4,700	$ 60,800	$ 1,300	1.9	$ 680	3,340	$ 0.39	Y
Reach 2	Site 12	Alternative A	Stabilize eroding banks with hard armor	$ 11,280	$ 3,380	$ 3,380	$ 18,000	30	$ 130	$ 9,000	$ 66,100	$ 1,400	1.9	$ 730	3,340	$ 0.42	N
Reach 2	Site 12	Alternative B	Stabilize banks with root wads	$ 11,750	$ 3,530	$ 3,530	$ 18,800	20	$ 140	$ 4,700	$ 60,800	$ 1,300	1.9	$ 680	3,340	$ 0.39	Y
Reach 2	Site 13	Alternative A	Stabilize eroding banks with hard armor	$ 11,280	$ 3,380	$ 3,380	$ 18,000	30	$ 130	$ 9,000	$ 66,100	$ 1,400	1.9	$ 730	3,340	$ 0.42	N
Reach 2	Site 13	Alternative B	Stabilize banks with root wads	$ 11,750	$ 3,530	$ 3,530	$ 18,800	20	$ 140	$ 4,700	$ 60,800	$ 1,300	1.9	$ 680	3,340	$ 0.39	Y
Reach 2	Site 14	Alternative A	Stabilize culvert outfall with hard armor	$ 6,710	$ 2,010	$ 2,010	$ 10,700	30	$ 80	$ 5,350	$ 39,500	$ 800	1.1	$ 730	1,910	$ 0.42	Y

Table H-1 Plymouth Creek feasibility study alternatives cost estimates

Reach	Site	Alternative	Alternative Description	Construction Cost Estimate (1)	Construction Contingency (2)	Engineering (3)	Capital Cost Estimate (4)(5)	Estimated Life Span(6) (years)	Annual Maint. Est. (7)	Major Maint. Est. (8)	30-Year Future Worth Estimate(9)(10)	Annualized Cost(10)(11)	TP Loading		TSS Loading		Rec.?
													Load Reduction (lb/yr)	Cost/lb Reduced(12)	Load Reduction (lb/yr)	Cost/lb Reduced(12)	
Reach 2	Site 14	Alternative B	Stabilize culvert outfall with concrete swale	$ 7,730	$ 2,320	$ 2,320	$ 12,400	30	$ 100	$ 6,200	$ 46,100	$ 1,000	1.1	$ 910	1,910	$ 0.52	N
Reach 3	Site 15	Alternative A	Install bank stabilization measures at eroding banks using hard armor	$ 20,970	$ 6,290	$ 6,290	$ 33,600	30	$ 250	$ 16,800	$ 123,800	$ 2,600	7.0	$ 370	12,130	$ 0.21	N
Reach 3	Site 15	Alternative B	Install 4 rock vanes for bank protection	$ 23,010	$ 6,900	$ 6,900	$ 36,800	20	$ 220	$ 18,400	$ 133,000	$ 2,800	7.0	$ 400	12,130	$ 0.23	N
Reach 3	Site 15	Alternative C	Install bank stabilization measures at eroding banks using toe wood	$ 48,740	$ 14,620	$ 14,620	$ 78,000	20	$ 570	$ 19,500	$ 251,600	$ 5,300	7.0	$ 760	12,130	$ 0.44	Y
Reach 3	Site 16	Alternative A	Install bank stabilization measures at eroding banks using hard armor	$ 20,970	$ 6,290	$ 6,290	$ 33,600	30	$ 250	$ 16,800	$ 123,800	$ 2,600	7.0	$ 370	12,130	$ 0.21	N
Reach 3	Site 16	Alternative B	Install 4 rock vanes for bank protection	$ 23,010	$ 6,900	$ 6,900	$ 36,800	20	$ 220	$ 18,400	$ 133,000	$ 2,800	7.0	$ 400	12,130	$ 0.23	N
Reach 3	Site 16	Alternative C	Install bank stabilization measures at eroding banks using toe wood	$ 48,740	$ 14,620	$ 14,620	$ 78,000	20	$ 570	$ 19,500	$ 251,600	$ 5,300	7.0	$ 760	12,130	$ 0.44	Y
Reach 3	Site 17	Alternative A	Install bank stabilization measures at eroding banks using hard armor	$ 20,970	$ 6,290	$ 6,290	$ 33,600	30	$ 250	$ 16,800	$ 123,800	$ 2,600	7.0	$ 370	12,130	$ 0.21	N
Reach 3	Site 17	Alternative B	Install 4 rock vanes for bank protection	$ 23,010	$ 6,900	$ 6,900	$ 36,800	20	$ 220	$ 18,400	$ 133,000	$ 2,800	7.0	$ 400	12,130	$ 0.23	Y
Reach 3	Site 17	Alternative C	Install bank stabilization measures at eroding banks using toe wood	$ 48,740	$ 14,620	$ 14,620	$ 78,000	20	$ 570	$ 19,500	$ 251,600	$ 5,300	7.0	$ 760	12,130	$ 0.44	N
Reach 3	Site 18	Alternative A	Remove large woody debris	$ 3,670	$ 1,100	$ 1,100	$ 5,900	20	$ -	$ 1,480	$ 17,000	$ 400	0.09	$ 4,520	150	$ 2.67	Y
Reach 3	Site 19	Alternative A	Remove large woody debris	$ 3,670	$ 1,100	$ 1,100	$ 5,900	20	$ -	$ 1,480	$ 17,000	$ 400	0.09	$ 4,520	150	$ 2.67	Y
Reach 3	Site 20	Alternative A	Stabilize with hard armor	$ 29,880	$ 8,960	$ 8,960	$ 47,800	30	$ 350	$ 23,900	$ 175,800	$ 3,700	12.0	$ 310	20,800	$ 0.18	N
Reach 3	Site 20	Alternative B	Stabilize with toe wood and grading to broaden meander	$ 68,710	$ 20,610	$ 20,610	$ 109,900	20	$ 810	$ 27,480	$ 355,000	$ 7,500	12.0	$ 630	20,800	$ 0.36	N
Reach 3	Site 20	Alternative C	Controlled overflow, install grade control structure downstream	$ 31,240	$ 9,370	$ 9,370	$ 50,000	20	$ 370	$ 25,000	$ 184,200	$ 3,900	12.0	$ 330	20,800	$ 0.19	N
Reach 3	Site 20	Alternative D	Realign channel and stabilize meanders with vanes and toe wood	$ 92,380	$ 27,710	$ 27,710	$ 147,800	30	$ 440	$ 14,780	$ 406,300	$ 8,500	12.0	$ 710	20,800	$ 0.41	Y
Reach 3	Site 21	Alternative A	Narrow channel for approx. 80'	$ 16,650	$ 5,000	$ 5,000	$ 26,700	30	$ 80	$ 2,670	$ 73,400	$ 1,500	3.9	$ 380	6,780	$ 0.22	N
Reach 3	Site 21	Alternative B	Install log vanes within reach	$ 13,430	$ 4,030	$ 4,030	$ 21,500	20	$ 160	$ 5,380	$ 69,500	$ 1,500	3.9	$ 380	6,780	$ 0.22	Y
Project-wide			Educational signage	$ 2,500	$ 750	$ 750	$ 4,000	–	–	–	–	–	–	–	–	–	Y
Project-wide			Foot traffic management (temp. fencing and wood chip paths)	$ 5,000	$ 1,500	$ 1,500	$ 8,000	–	–	–	–	–	–	–	–	–	Y

Cost Summaries*

	Construction Cost Estimate	Construction Contingency	Engineering	Capital Cost Estimate	Estimated Life Span	Annual Maint. Est.	Major Maint. Est.	30-Year Future Worth Estimate	Annualized Cost	TP Load Reduction (lb/yr)	TP Cost/lb Reduced	TSS Load Reduction (lb/yr)	TSS Cost/lb Reduced
Lowest-cost feasible alternative at each site:	$ 316,000	$ 95,000	$ 95,000	$ 506,000		$ 3,400		$ 1,730,000	$ 36,300	52.2	$ 700	90,800	$ 0.40
Recommended alternative at each site:	**$ 479,000**	**$ 144,000**	**$ 144,000**	**$ 766,000**		**$ 5,200**		**$ 2,470,000**	**$ 52,100**	**52.2**	**$ 1,000**	**90,800**	**$ 0.57**
Highest-cost feasible alternative at each site:	$ 721,000	$ 216,000	$ 216,000	$ 1,153,000		$ 6,400		$ 3,510,000	$ 74,300	52.2	$ 1,420	90,800	$ 0.82

* Costs may not sum due to rounding.

(1) A Class 4 screening-level opinion of probable cost, as defined by the American Association of Cost Engineers International (AACI International), has been prepared for these alternatives. The opinion of probable construction cost provided in this table is made based on Barr's experience and qualifications and represents our best judgment as experienced and qualified professionals familiar with the project. The cost opinion is based on project-related information available to Barr at this time and includes a conceptual-level design of the project.

(2) Assumed 30% contingency on construction costs.

(3) Assumed 30% of construction costs for design, permitting, and adminstration.

(4) Includes estimated initial construction cost (with 30% contingency) and design, permitting, and adminstration costs (30% of construction cost).

(5) Many of the alternatives in this table are mutually exclusive. The total project cost will not be a sum of each of these alternatives, rather a sum of a unique combination of a portion of these alternatives.

(6) Estimated life span until significant maintenance is required.

(7) Assumed 50% of the initial establishment period maintenance for vegetation-only alternatives, 25% for all other alternatives. 2016 dollars.

(8) Assumed 50% of the original construction cost for hard armoring alternatives and 25% of the original construction cost for bioengineering alternatives. 2016 dollars.

(9) Future value of initial capital cost, annual maintenance cost, and major maintenance cost at end of expected life span.

(10) Assumes 3% inflation rate.

(11) Annualized 30-year future worth.

(12) Annualized cost divided by estimated annual pollution load reduction.

Table H2: Preliminary Cost Estimate for Site 1, Alternative A

Remeander into historic channels

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$8,509	$8,510	10% of project cost
Control of Water	LS	1	$2,934	$2,930	4% of primary item cost
Erosion Control	LS	1	$4,402	$4,400	6% of primary item cost
Clearing and Grubbing	ACRE	0.1	$7,000	$520	
Select Tree Removal (>4")	EACH	12	$200	$2,400	
Excavate/Salvage Soil	CY	477	$15	$7,160	
Grading	SY	358	$6	$2,150	
Topsoil Import	CY	60	$33	$1,970	
Root Wads	EACH	3	$750	$2,250	
Rock Vanes	EACH	2	$2,000	$4,000	
Plant Shrubs	EACH	25	$50	$1,250	
Replace Bridge	LS	1	$50,000	$50,000	
Seeding and Mulch	ACRE	0.1	$8,000	$590	
Erosion Control Blanket	SY	358	$3	$1,070	
Damage Repair	LS	1	$1,467	$1,470	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$2,934	$2,930	4% of primary item cost
			Total	**$ 93,600**	
			Contingency (30%)	$ 28,080	
			Subtotal	**$ 121,700**	
			Design, Permitting, and Administration (30%)	$ 28,080	
			Total w/ Contingency & Engineering	**$ 149,800**	

30-yr and Annualized Cost analysis

Category:	Remeander		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 440	10%	of damage repair and maintenance
End of life span maintenance	$ 14,980	10%	of original project cost
Future Capital Cost	$ 363,600		
Future annual maintenance	$ 20,930		
Future end of life span cost	$ 27,060		
Total Future Worth	**$ 411,600**		
Annualized Cost	**$ 8,700**		

Table H3: Preliminary Cost Estimate for Site 1, Alternative B

Stabilize erosion areas with hard armor

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$1,584	$1,580	10% of project cost
Control of Water	LS	1	$546	$550	4% of primary item cost
Erosion Control	LS	1	$819	$820	6% of primary item cost
Clearing and Grubbing	ACRE	0.1	$7,000	$460	
Select Tree Removal (>4")	EACH	6	$200	$1,200	
Grading	SY	316	$6	$1,890	
Furnish and Install Fieldstone Riprap	TON	74	$100	$7,360	
Topsoil Import	CY	26	$33	$870	
Plant Shrubs	EACH	10	$50	$500	
Seeding and Mulch	ACRE	0.1	$8,000	$520	
Erosion Control Blanket	SY	284	$3	$850	
Damage Repair	LS	1	$273	$270	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$546	$550	4% of primary item cost
			Total	**$ 17,420**	
			Contingency (30%)	$ 5,230	
			Subtotal	**$ 22,700**	
			Design, Permitting, and Administration (30%)	$ 5,230	
			Total w/ Contingency & Engineering	**$ 27,900**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 210	25%	of damage repair and maintenance
End of life span maintenance	$ 13,950	50%	of original project cost
Future Capital Cost	$ 67,700		
Future annual maintenance	$ 9,990		
Future end of life span cost	$ 25,200		
Total Future Worth	**$ 102,900**		
Annualized Cost	**$ 2,200**		

Table H4: Preliminary Cost Estimate for Site 1, Alternative C

Stabilize erosion areas with root wads, log vanes, and vegetation

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$1,462	$1,460	10% of project cost
Control of Water	LS	1	$504	$500	4% of primary item cost
Erosion Control	LS	1	$757	$760	6% of primary item cost
Clearing and Grubbing	ACRE	0.1	$7,000	$460	
Select Tree Removal (>4")	EACH	6	$200	$1,200	
Grading	SY	89	$6	$530	
Root Wads	EACH	3	$750	$2,250	
Log Vanes	EACH	4	$1,200	$4,800	
Plant Shrubs	EACH	40	$50	$2,000	
Seeding and Mulch	ACRE	0.1	$8,000	$520	
Erosion Control Blanket	SY	284	$3	$850	
Damage Repair	LS	1	$252	$250	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$504	$500	4% of primary item cost
			Total	**$ 16,080**	
			Contingency (30%)	$ 4,820	
			Subtotal	**$ 20,900**	
			Design, Permitting, and Administration (30%)	$ 4,820	
			Total w/ Contingency & Engineering	**$ 25,700**	

30-yr and Annualized Cost analysis

Category:	Bioengineering		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 190	25%	of damage repair and maintenance
End of life span maintenance	$ 6,430	25%	of original project cost
Future Capital Cost	$ 62,400		
Future annual maintenance	$ 9,040		
Future end of life span cost	$ 11,610		
Total Future Worth	**$ 83,100**		
Annualized Cost	**$ 1,700**		

Table H5: Preliminary Cost Estimate for Site 2, Alternative A

Remeander into historic channels

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$3,402	$3,400	10% of project cost
Control of Water	LS	1	$1,173	$1,170	4% of primary item cost
Erosion Control	LS	1	$1,760	$1,760	6% of primary item cost
Clearing and Grubbing	ACRE	0.1	$7,000	$670	
Select Tree Removal (>4")	EACH	20	$200	$4,000	
Excavate/Salvage Soil	CY	616	$15	$9,240	
Grading	SY	462	$6	$2,770	
Root Wads	EACH	4	$750	$3,000	
Rock Boulder Vane	EACH	3	$2,000	$6,000	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.1	$8,000	$760	
Erosion Control Blanket	SY	462	$3	$1,390	
Damage Repair	LS	1	$587	$590	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$1,173	$1,170	4% of primary item cost
			Total	**$ 37,420**	
			Contingency (30%)	$ 11,230	
			Subtotal	**$ 48,700**	
			Design, Permitting, and Administration (30%)	$ 11,230	
			Total w/ Contingency & Engineering	**$ 59,900**	

30-yr and Annualized Cost analysis

Category:	Remeander		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 180	10%	of damage repair and maintenance
End of life span maintenance	$ 5,990	10%	of original project cost
Future Capital Cost	$ 145,400		
Future annual maintenance	$ 8,560		
Future end of life span cost	$ 10,820		
Total Future Worth	**$ 164,800**		
Annualized Cost	**$ 3,500**		

Table H6: Preliminary Cost Estimate for Site 2, Alternative B

Stabilize erosion areas with hard armor

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$1,979	$1,980	10% of project cost
Control of Water	LS	1	$683	$680	4% of primary item cost
Erosion Control	LS	1	$1,024	$1,020	6% of primary item cost
Clearing and Grubbing	ACRE	0.1	$7,000	$530	
Select Tree Removal (>4")	EACH	16	$200	$3,200	
Grading	SY	364	$6	$2,190	
Furnish and Install Fieldstone Riprap	TON	85	$100	$8,500	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.1	$8,000	$600	
Erosion Control Blanket	SY	182	$3	$550	
Damage Repair	LS	1	$341	$340	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$683	$680	4% of primary item cost
			Total	**$ 21,770**	
			Contingency (30%)	$ 6,530	
			Subtotal	**$ 28,300**	
			Design, Permitting, and Administration (30%)	$ 6,530	
			Total w/ Contingency & Engineering	**$ 34,800**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 260	25%	of damage repair and maintenance
End of life span maintenance	$ 17,400	50%	of original project cost
Future Capital Cost	$ 84,500		
Future annual maintenance	$ 12,370		
Future end of life span cost	$ 31,430		
Total Future Worth	**$ 128,300**		
Annualized Cost	**$ 2,700**		

Table H7: Preliminary Cost Estimate for Site 2, Alternative C

Stabilize erosion areas with root wads, log vanes, and vegetation

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$983	$980	10% of project cost
Control of Water	LS	1	$339	$340	4% of primary item cost
Erosion Control	LS	1	$508	$510	6% of primary item cost
Clearing and Grubbing	ACRE	0.1	$7,000	$530	
Select Tree Removal (>4")	EACH	8	$200	$1,600	
Grading	SY	44	$6	$270	
Root Wads	EACH	3	$750	$2,250	
Log Vanes	EACH	2	$1,200	$2,400	
Plant Shrubs	EACH	15	$50	$750	
Seeding and Mulch	ACRE	0.1	$8,000	$600	
Erosion Control Blanket	SY	22	$3	$70	
Damage Repair	LS	1	$169	$170	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$339	$340	4% of primary item cost
			Total	**$ 10,810**	
			Contingency (30%)	$ 3,240	
			Subtotal	**$ 14,050**	
			Design, Permitting, and Administration (30%)	$ 3,240	
			Total w/ Contingency & Engineering	**$ 17,300**	

30-yr and Annualized Cost analysis

Category:	Bioengineering		
Estimated life span (year)	20	1	number of major maint. events
Expected annual maintenance	$ 130	25%	of damage repair and maintenance
End of life span maintenance	$ 4,330	25%	of original project cost
Future Capital Cost	$ 42,000		
Future annual maintenance	$ 6,180		
Future end of life span cost	$ 7,820		
Total Future Worth	**$ 56,000**		
Annualized Cost	**$ 1,200**		

Table H8: Preliminary Cost Estimate for Site 3, Alternative A

Narrow channel for approx. 800'

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$3,206	$3,210	10% of project cost
Control of Water	LS	1	$1,105	$1,110	4% of primary item cost
Erosion Control	LS	1	$1,658	$1,660	6% of primary item cost
Clearing and Grubbing	ACRE	0.3	$7,000	$1,930	
Select Tree Removal (>4")	EACH	20	$200	$4,000	
Excavate/Salvage Soil	CY	667	$15	$10,000	
Grading	SY	667	$6	$4,000	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.3	$8,000	$2,200	
Erosion Control Blanket	SY	1333	$3	$4,000	
Damage Repair	LS	1	$553	$550	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$1,105	$1,110	4% of primary item cost
Total				**$ 35,270**	
Contingency (30%)				$ 10,580	
Subtotal				**$ 45,900**	
Design, Permitting, and Administration (30%)				$ 10,580	
Total w/ Contingency & Engineering				**$ 56,400**	

30-yr and Annualized Cost analysis

Category:	General grading		
Estimated life span (year)	30	1	number of major maint. events
Expected annual maintenance	$ 170	10%	of damage repair and maintenance
End of life span maintenance	$ 5,640	10%	of original project cost
Future Capital Cost	$ 136,900		
Future annual maintenance	$ 8,090		
Future end of life span cost	$ 10,190		
Total Future Worth	**$ 155,200**		
Annualized Cost	**$ 3,300**		

Table H9: Preliminary Cost Estimate for Site 3, Alternative B

Install log vanes within reach

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$2,859	$2,860	10% of project cost
Control of Water	LS	1	$986	$990	4% of primary item cost
Erosion Control	LS	1	$1,478	$1,480	6% of primary item cost
Clearing and Grubbing	ACRE	0.02	$7,000	$160	
Select Tree Removal (>4")	EACH	20	$200	$4,000	
Log Vanes	EACH	14	$1,200	$16,800	
Grading	SY	111	$6	$670	
Plant Shrubs	EACH	50	$50	$2,500	
Seeding and Mulch	ACRE	0.02	$8,000	$180	
Erosion Control Blanket	SY	111	$3	$330	
Damage Repair	LS	1	$493	$490	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$986	$990	4% of primary item cost
			Total	**$ 31,450**	
			Contingency (30%)	$ 9,440	
			Subtotal	**$ 40,900**	
			Design, Permitting, and Administration (30%)	$ 9,440	
			Total w/ Contingency & Engineering	**$ 50,300**	

30-yr and Annualized Cost analysis

Category:	Bioengineering		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 370	25%	of damage repair and maintenance
End of life span maintenance	$ 12,580	25%	of original project cost
Future Capital Cost	$ 122,100		
Future annual maintenance	$ 17,600		
Future end of life span cost	$ 22,720		
Total Future Worth	**$ 162,400**		
Annualized Cost	**$ 3,400**		

Table H10: Preliminary Cost Estimate for Site 3, Alternative C

Upper bank vegetation

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$1,286	$1,290	10% of project cost
Erosion Control	LS	1	$689	$690	6% of primary item cost
Clearing and Grubbing	ACRE	0.1	$7,000	$960	
Topsoil Import	CY	73	$33	$2,420	
Plant Shrubs	EACH	100	$50	$5,000	
Seeding and Mulch	ACRE	0.1	$8,000	$1,100	
Erosion Control Blanket	SY	667	$3	$2,000	
Damage Repair	LS	1	$230	$230	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$459	$460	4% of primary item cost
			Total	**$ 14,150**	
			Contingency (30%)	$ 4,250	
			Subtotal	**$ 18,400**	
			Design, Permitting, and Administration (30%)	$ 4,250	
			Total w/ Contingency & Engineering	**$ 22,700**	

30-yr and Annualized Cost analysis

Category:	Veg. only		
Estimated life span (years)	10	3	number of major maint. events
Expected annual maintenance	$ 350	50%	of damage repair and maintenance
End of life span maintenance	$ 5,680	25%	of original project cost
Future Capital Cost	$ 55,100		
Future annual maintenance	$ 16,650		
Future end of life span cost	$ 31,680		
Total Future Worth	**$ 103,400**		
Annualized Cost	**$ 2,200**		

Table H11: Preliminary Cost Estimate for Site 4, Alternative A

Establish vegetated buffer

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$1,349	$1,350	10% of project cost
Erosion Control	LS	1	$637	$640	6% of primary item cost
Clearing and Grubbing	ACRE	0.2	$7,000	$1,290	
Topsoil Import	CY	49	$33	$1,610	
Plant Shrubs	EACH	125	$50	$6,250	
Seeding and Mulch	ACRE	0.2	$8,000	$1,470	
Temporary Fencing	LF	800	$2	$1,600	
Damage Repair	LS	1	$212	$210	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$425	$420	4% of primary item cost
Total				**$ 14,840**	
Contingency (30%)				$ 4,450	
Subtotal				**$ 19,300**	
Design, Permitting, and Administration (30%)				$ 4,450	
Total w/ Contingency & Engineering				**$ 23,700**	

30-yr and Annualized Cost analysis

Category:	Veg. only		
Estimated life span (years)	10	3	number of major maint. events
Expected annual maintenance	$ 320	50%	of damage repair and maintenance
End of life span maintenance	$ 5,930	25%	of original project cost
Future Capital Cost	$ 57,500		
Future annual maintenance	$ 15,220		
Future end of life span cost	$ 33,070		
Total Future Worth	**$ 105,800**		
Annualized Cost	**$ 2,200**		

Table H12: Preliminary Cost Estimate for Site 4, Alternative B

Realign disc golf course

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$4,592	$4,590	10% of project cost
Erosion Control	LS	1	$2,460	$2,460	6% of primary item cost
Clearing and Grubbing	ACRE	0.7	$7,000	$4,820	
Select Tree Removal (>4")	EACH	20	$200	$4,000	
Move Pin	EACH	4	$2,500	$10,000	
Move Tee Box	EACH	4	$500	$2,000	
Remove Old Tee Box	EACH	4	$500	$2,000	
Topsoil Import	CY	111	$33	$3,670	
Plant Trees	EACH	20	$250	$5,000	
Plant Shrubs	EACH	80	$50	$4,000	
Seeding and Mulch	ACRE	0.7	$8,000	$5,510	
Damage Repair	LS	1	$820	$820	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$1,640	$1,640	4% of primary item cost
			Total	**$ 50,510**	
			Contingency (30%)	$ 15,150	
			Subtotal	**$ 65,700**	
			Design, Permitting, and Administration (30%)	$ 15,150	
			Total w/ Contingency & Engineering	**$ 80,800**	

30-yr and Annualized Cost analysis

Category:	General grading		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 250	10%	of damage repair and maintenance
End of life span maintenance	$ 8,080	10%	of original project cost
Future Capital Cost	$ 196,100		
Future annual maintenance	$ 11,890		
Future end of life span cost	$ 14,590		
Total Future Worth	**$ 222,600**		
Annualized Cost	**$ 4,700**		

Table H13: Preliminary Cost Estimate for Site 5, Alternative A

Stabilize steep, eroding bank with hard armor

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$844	$840	10% of project cost
Control of Water	LS	1	$291	$290	4% of primary item cost
Erosion Control	LS	1	$436	$440	6% of primary item cost
Clearing and Grubbing	ACRE	0.01	$7,000	$80	
Select Tree Removal (>4")	EACH	6	$200	$1,200	
Grading	SY	56	$6	$330	
Furnish and Install Fieldstone Riprap	TON	26	$100	$2,590	
Topsoil Import	CY	9	$33	$310	
Plant Shrubs	EACH	50	$50	$2,500	
Seeding and Mulch	ACRE	0.01	$8,000	$90	
Erosion Control Blanket	SY	56	$3	$170	
Damage Repair	LS	1	$145	$150	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$291	$290	4% of primary item cost
			Total	**$ 9,280**	
			Contingency (30%)	$ 2,780	
			Subtotal	**$ 12,100**	
			Design, Permitting, and Administration (30%)	$ 2,780	
			Total w/ Contingency & Engineering	**$ 14,800**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 110	25%	of damage repair and maintenance
End of life span maintenance	$ 7,400	50%	of original project cost
Future Capital Cost	$ 35,900		
Future annual maintenance	$ 5,230		
Future end of life span cost	$ 13,370		
Total Future Worth	**$ 54,500**		
Annualized Cost	**$ 1,100**		

Table H14: Preliminary Cost Estimate for Site 5, Alternative B

Vegetate steep, eroding bank with VRSS

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$1,862	$1,860	10% of project cost
Control of Water	LS	1	$677	$680	4% of primary item cost
Erosion Control	LS	1	$1,015	$1,020	6% of primary item cost
Clearing and Grubbing	ACRE	0.01	$7,000	$80	
Select Tree Removal (>4")	EACH	6	$200	$1,200	
Grading	SY	56	$6	$330	
Furnish and Install Fieldstone Riprap	TON	26	$100	$2,590	
VRSS	SF	150	$45	$6,750	
Topsoil Import	CY	28	$33	$920	
Plant Shrubs	EACH	50	$50	$2,500	
Seeding and Mulch	ACRE	0.01	$8,000	$90	
Erosion Control Blanket	SY	56	$3	$170	
Damage Repair	LS	1	$293	$290	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$2,000	$2,000	
			Total	**$ 20,480**	
			Contingency (30%)	$ 6,140	
			Subtotal	**$ 26,600**	
			Design, Permitting, and Administration (30%)	$ 6,140	
			Total w/ Contingency & Engineering	**$ 32,800**	

30-yr and Annualized Cost analysis

Category:	Bioengineering		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 570	25%	of damage repair and maintenance
End of life span maintenance	$ 8,200	25%	of original project cost
Future Capital Cost	$ 79,600		
Future annual maintenance	$ 27,120		
Future end of life span cost	$ 14,810		
Total Future Worth	**$ 121,500**		
Annualized Cost	**$ 2,600**		

Table H15: Preliminary Cost Estimate for Site 6, Alternative A

Stabilize bridge abutments with riprap and log vanes

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$630	$630	10% of project cost
Control of Water	LS	1	$252	$250	4% of primary item cost
Erosion Control	LS	1	$378	$380	6% of primary item cost
Clearing and Grubbing	ACRE	0.005	$7,000	$30	
Select Tree Removal (>4")	EACH	4	$200	$800	
Grading	SY	44	$6	$270	
Furnish and Install Fieldstone Riprap	TON	21	$100	$2,070	
Log Vanes	EACH	2	$1,200	$2,400	
Topsoil Import	CY	4	$33	$120	
Plant Shrubs	EACH	10	$50	$500	
Seeding and Mulch	ACRE	0.005	$8,000	$40	
Erosion Control Blanket	SY	22	$3	$70	
Damage Repair	LS	1	$126	$130	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$252	$250	4% of primary item cost
			Total	**$ 7,940**	
			Contingency (30%)	$ 2,380	
			Subtotal	**$ 10,300**	
			Design, Permitting, and Administration (30%)	$ 2,380	
			Total w/ Contingency & Engineering	**$ 12,700**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 100	25%	of damage repair and maintenance
End of life span maintenance	$ 6,350	50%	of original project cost
Future Capital Cost	$ 30,800		
Future annual maintenance	$ 4,760		
Future end of life span cost	$ 11,470		
Total Future Worth	**$ 47,000**		
Annualized Cost	**$ 1,000**		

Table H16: Preliminary Cost Estimate for Site 6, Alternative B

Stabilize bridge abutments with riprap only

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$599	$600	10% of project cost
Control of Water	LS	1	$240	$240	4% of primary item cost
Erosion Control	LS	1	$359	$360	6% of primary item cost
Clearing and Grubbing	ACRE	0.005	$7,000	$30	
Select Tree Removal (>4")	EACH	8	$200	$1,600	
Grading	SY	67	$6	$400	
Furnish and Install Fieldstone Riprap	TON	31	$100	$3,110	
Topsoil Import	CY	7	$33	$240	
Plant Shrubs	EACH	10	$50	$500	
Seeding and Mulch	ACRE	0.005	$8,000	$40	
Erosion Control Blanket	SY	22	$3	$70	
Damage Repair	LS	1	$120	$120	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$240	$240	4% of primary item cost
			Total	**$ 7,550**	
			Contingency (30%)	$ 2,270	
			Subtotal	**$ 9,800**	
			Design, Permitting, and Administration (30%)	$ 2,270	
			Total w/ Contingency & Engineering	**$ 12,100**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 90	25%	of damage repair and maintenance
End of life span maintenance	$ 6,050	50%	of original project cost
Future Capital Cost	$ 29,400		
Future annual maintenance	$ 4,280		
Future end of life span cost	$ 10,930		
Total Future Worth	**$ 44,600**		
Annualized Cost	**$ 900**		

Table H17: Preliminary Cost Estimate for Site 7, Alternative A

Stabilize bridge abutments with riprap and log vanes

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$630	$630	10% of project cost
Control of Water	LS	1	$252	$250	4% of primary item cost
Erosion Control	LS	1	$378	$380	6% of primary item cost
Clearing and Grubbing	ACRE	0.005	$7,000	$30	
Select Tree Removal (>4")	EACH	4	$200	$800	
Grading	SY	44	$6	$270	
Furnish and Install Fieldstone Riprap	TON	21	$100	$2,070	
Log Vanes	EACH	2	$1,200	$2,400	
Topsoil Import	CY	4	$33	$120	
Plant Shrubs	EACH	10	$50	$500	
Seeding and Mulch	ACRE	0.005	$8,000	$40	
Erosion Control Blanket	SY	22	$3	$70	
Damage Repair	LS	1	$126	$130	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$252	$250	4% of primary item cost
			Total	**$ 7,940**	
			Contingency (30%)	$ 2,380	
			Subtotal	**$ 10,300**	
			Design, Permitting, and Administration (30%)	$ 2,380	
			Total w/ Contingency & Engineering	**$ 12,700**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 100	25%	of damage repair and maintenance
End of life span maintenance	$ 6,350	50%	of original project cost
Future Capital Cost	$ 30,800		
Future annual maintenance	$ 4,760		
Future end of life span cost	$ 11,470		
Total Future Worth	**$ 47,000**		
Annualized Cost	**$ 1,000**		

Table H18: Preliminary Cost Estimate for Site 7, Alternative B

Stabilize bridge abutments with riprap only

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$599	$600	10% of project cost
Control of Water	LS	1	$240	$240	4% of primary item cost
Erosion Control	LS	1	$359	$360	6% of primary item cost
Clearing and Grubbing	ACRE	0.005	$7,000	$30	
Select Tree Removal (>4")	EACH	8	$200	$1,600	
Grading	SY	67	$6	$400	
Furnish and Install Fieldstone Riprap	TON	31	$100	$3,110	
Topsoil Import	CY	7	$33	$240	
Plant Shrubs	EACH	10	$50	$500	
Seeding and Mulch	ACRE	0.005	$8,000	$40	
Erosion Control Blanket	SY	22	$3	$70	
Damage Repair	LS	1	$120	$120	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$240	$240	4% of primary item cost
			Total	**$ 7,550**	
			Contingency (30%)	$ 2,270	
			Subtotal	**$ 9,800**	
			Design, Permitting, and Administration (30%)	$ 2,270	
			Total w/ Contingency & Engineering	**$ 12,100**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 90	25%	of damage repair and maintenance
End of life span maintenance	$ 6,050	50%	of original project cost
Future Capital Cost	$ 29,400		
Future annual maintenance	$ 4,280		
Future end of life span cost	$ 10,930		
Total Future Worth	**$ 44,600**		
Annualized Cost	**$ 900**		

Table H19: Preliminary Cost Estimate for Site 8, Alternative A

Stabilize bridge abutments with riprap and log vanes

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$630	$630	10% of project cost
Control of Water	LS	1	$252	$250	4% of primary item cost
Erosion Control	LS	1	$378	$380	6% of primary item cost
Clearing and Grubbing	ACRE	0.005	$7,000	$30	
Select Tree Removal (>4")	EACH	4	$200	$800	
Grading	SY	44	$6	$270	
Furnish and Install Fieldstone Riprap	TON	21	$100	$2,070	
Log Vanes	EACH	2	$1,200	$2,400	
Topsoil Import	CY	4	$33	$120	
Plant Shrubs	EACH	10	$50	$500	
Seeding and Mulch	ACRE	0.005	$8,000	$40	
Erosion Control Blanket	SY	22	$3	$70	
Damage Repair	LS	1	$126	$130	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$252	$250	4% of primary item cost
			Total	**$ 7,940**	
			Contingency (30%)	$ 2,380	
			Subtotal	**$ 10,300**	
			Design, Permitting, and Administration (30%)	$ 2,380	
			Total w/ Contingency & Engineering	**$ 12,700**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 100	25%	of damage repair and maintenance
End of life span maintenance	$ 6,350	50%	of original project cost
Future Capital Cost	$ 30,800		
Future annual maintenance	$ 4,760		
Future end of life span cost	$ 11,470		
Total Future Worth	**$ 47,000**		
Annualized Cost	**$ 1,000**		

Table H20: Preliminary Cost Estimate for Site 8, Alternative B

Stabilize bridge abutments with riprap only

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$599	$600	10% of project cost
Control of Water	LS	1	$240	$240	4% of primary item cost
Erosion Control	LS	1	$359	$360	6% of primary item cost
Clearing and Grubbing	ACRE	0.005	$7,000	$30	
Select Tree Removal (>4")	EACH	8	$200	$1,600	
Grading	SY	67	$6	$400	
Furnish and Install Fieldstone Riprap	TON	31	$100	$3,110	
Topsoil Import	CY	7	$33	$240	
Plant Shrubs	EACH	10	$50	$500	
Seeding and Mulch	ACRE	0.005	$8,000	$40	
Erosion Control Blanket	SY	22	$3	$70	
Damage Repair	LS	1	$120	$120	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$240	$240	4% of primary item cost
			Total	**$ 7,550**	
			Contingency (30%)	$ 2,270	
			Subtotal	**$ 9,800**	
			Design, Permitting, and Administration (30%)	$ 2,270	
			Total w/ Contingency & Engineering	**$ 12,100**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 90	25%	of damage repair and maintenance
End of life span maintenance	$ 6,050	50%	of original project cost
Future Capital Cost	$ 29,400		
Future annual maintenance	$ 4,280		
Future end of life span cost	$ 10,930		
Total Future Worth	**$ 44,600**		
Annualized Cost	**$ 900**		

Table H21: Preliminary Cost Estimate for Site 9, Alternative A

Stabilize bridge abutments with riprap and log vanes

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$630	$630	10% of project cost
Control of Water	LS	1	$252	$250	4% of primary item cost
Erosion Control	LS	1	$378	$380	6% of primary item cost
Clearing and Grubbing	ACRE	0.005	$7,000	$30	
Select Tree Removal (>4")	EACH	4	$200	$800	
Grading	SY	44	$6	$270	
Furnish and Install Fieldstone Riprap	TON	21	$100	$2,070	
Log Vanes	EACH	2	$1,200	$2,400	
Topsoil Import	CY	4	$33	$120	
Plant Shrubs	EACH	10	$50	$500	
Seeding and Mulch	ACRE	0.005	$8,000	$40	
Erosion Control Blanket	SY	22	$3	$70	
Damage Repair	LS	1	$126	$130	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$252	$250	4% of primary item cost
			Total	**$ 7,940**	
			Contingency (30%)	$ 2,380	
			Subtotal	**$ 10,300**	
			Design, Permitting, and Administration (30%)	$ 2,380	
			Total w/ Contingency & Engineering	**$ 12,700**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 100	25%	of damage repair and maintenance
End of life span maintenance	$ 6,350	50%	of original project cost
Future Capital Cost	$ 30,800		
Future annual maintenance	$ 4,760		
Future end of life span cost	$ 11,470		
Total Future Worth	**$ 47,000**		
Annualized Cost	**$ 1,000**		

Table H22: Preliminary Cost Estimate for Site 9, Alternative B

Stabilize bridge abutments with riprap only

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$599	$600	10% of project cost
Control of Water	LS	1	$240	$240	4% of primary item cost
Erosion Control	LS	1	$359	$360	6% of primary item cost
Clearing and Grubbing	ACRE	0.005	$7,000	$30	
Select Tree Removal (>4")	EACH	8	$200	$1,600	
Grading	SY	67	$6	$400	
Furnish and Install Fieldstone Riprap	TON	31	$100	$3,110	
Topsoil Import	CY	7	$33	$240	
Plant Shrubs	EACH	10	$50	$500	
Seeding and Mulch	ACRE	0.005	$8,000	$40	
Erosion Control Blanket	SY	22	$3	$70	
Damage Repair	LS	1	$120	$120	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$240	$240	4% of primary item cost
			Total	**$ 7,550**	
			Contingency (30%)	$ 2,270	
			Subtotal	**$ 9,800**	
			Design, Permitting, and Administration (30%)	$ 2,270	
			Total w/ Contingency & Engineering	**$ 12,100**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 90	25%	of damage repair and maintenance
End of life span maintenance	$ 6,050	50%	of original project cost
Future Capital Cost	$ 29,400		
Future annual maintenance	$ 4,280		
Future end of life span cost	$ 10,930		
Total Future Worth	**$ 44,600**		
Annualized Cost	**$ 900**		

Table H23: Preliminary Cost Estimate for Site 10, Alternative A

Raise stream bed in Fernbrook Lane North culvert

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$593	$590	10% of project cost
Control of Water	LS	1	$1,000	$1,000	
Erosion Control	LS	1	$274	$270	6% of primary item cost
Raise Stream Bed in Culvert	TON	26	$136	$3,530	
Seeding and Mulch	ACRE	0.05	$8,000	$370	
Erosion Control Blanket	SY	222	$3	$670	
Damage Repair	LS	1	$91	$90	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$183	$180	4% of primary item cost
			Total	**$ 6,700**	
			Contingency (30%)	$ 2,010	
			Subtotal	**$ 8,700**	
			Design, Permitting, and Administration (30%)	$ 2,010	
			Total w/ Contingency & Engineering	**$ 10,700**	

30-yr and Annualized Cost analysis

Category:	Culvert bed		
Estimated life span (years)	15	2	number of major maint. events
Expected annual maintenance	$ 20	25%	of damage repair and maintenance
End of life span maintenance	$ 5,350	50%	of original project cost
Future Capital Cost	$ 26,000		
Future annual maintenance	$ 950		
Future end of life span cost	$ 21,320		
Total Future Worth	**$ 48,300**		
Annualized Cost	**$ 1,000**		

Table H24: Preliminary Cost Estimate for Site 10, Alternative B

Create meanders in open area to add 70' of stream length

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$7,417	$7,420	10% of project cost
Control of Water	LS	1	$2,557	$2,560	4% of primary item cost
Erosion Control	LS	1	$3,836	$3,840	6% of primary item cost
Clearing and Grubbing	ACRE	0.2	$7,000	$1,290	
Select Tree Removal (>4")	EACH	10	$200	$2,000	
Excavate/Salvage Soil	CY	1185	$15	$17,780	
Grading	SY	889	$6	$5,330	
Topsoil Import	CY	148	$33	$4,890	
Root Wads	EACH	15	$750	$11,250	
Rock Boulder Vane	EACH	3	$2,000	$6,000	
Plant Trees	EACH	5	$250	$1,250	
Plant Shrubs	EACH	200	$50	$10,000	
Seeding and Mulch	ACRE	0.2	$8,000	$1,470	
Erosion Control Blanket	SY	889	$3	$2,670	
Damage Repair	LS	1	$1,279	$1,280	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$2,557	$2,560	4% of primary item cost
			Total	**$ 81,590**	
			Contingency (30%)	$ 24,480	
			Subtotal	**$ 106,100**	
			Design, Permitting, and Administration (30%)	$ 24,480	
			Total w/ Contingency & Engineering	**$ 130,600**	

30-yr and Annualized Cost analysis

Category:	Remeander		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 380	10%	of damage repair and maintenance
End of life span maintenance	$ 13,060	10%	of original project cost
Future Capital Cost	$ 317,000		
Future annual maintenance	$ 18,080		
Future end of life span cost	$ 23,590		
Total Future Worth	**$ 358,700**		
Annualized Cost	**$ 7,500**		

Table H25: Preliminary Cost Estimate for Site 10, Alternative C

Raise channel bed using cross vanes/constructed riffles

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$1,906	$1,910	10% of project cost
Control of Water	LS	1	$657	$660	4% of primary item cost
Erosion Control	LS	1	$985	$990	6% of primary item cost
Rock Boulder Cross-Vane	EACH	4	$4,000	$16,000	
Seeding and Mulch	ACRE	0.02	$8,000	$150	
Erosion Control Blanket	SY	89	$3	$270	
Damage Repair	LS	1	$328	$330	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$657	$660	4% of primary item cost
			Total	**$ 20,970**	
			Contingency (30%)	$ 6,290	
			Subtotal	**$ 27,300**	
			Design, Permitting, and Administration (30%)	$ 6,290	
			Total w/ Contingency & Engineering	**$ 33,600**	

30-yr and Annualized Cost analysis

Category:	Rock vanes		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 250	25%	of damage repair and maintenance
End of life span maintenance	$ 16,800	50%	of original project cost
Future Capital Cost	$ 81,600		
Future annual maintenance	$ 11,890		
Future end of life span cost	$ 30,340		
Total Future Worth	**$ 123,800**		
Annualized Cost	**$ 2,600**		

Table H26: Preliminary Cost Estimate for Site 10, Alternative D

Lower adjacent floodplain

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$3,203	$3,200	10% of project cost
Control of Water	LS	1	$1,105	$1,100	4% of primary item cost
Erosion Control	LS	1	$1,657	$1,660	6% of primary item cost
Clearing and Grubbing	ACRE	0.2	$7,000	$1,290	
Select Tree Removal (>4")	EACH	10	$200	$2,000	
Excavation/Dispose of Soil	CY	296	$30	$8,890	
Grading	SY	889	$6	$5,330	
Excavate/Salvage Soil	CY	148	$15	$2,220	
Plant Trees	EACH	5	$250	$1,250	
Plant Shrubs	EACH	50	$50	$2,500	
Seeding and Mulch	ACRE	0.2	$8,000	$1,470	
Erosion Control Blanket	SY	889	$3	$2,670	
Damage Repair	LS	1	$552	$550	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$1,105	$1,100	4% of primary item cost
			Total	**$ 35,230**	
			Contingency (30%)	$ 10,570	
			Subtotal	**$ 45,800**	
			Design, Permitting, and Administration (30%)	$ 10,570	
			Total w/ Contingency & Engineering	**$ 56,400**	

30-yr and Annualized Cost analysis

Category:	General grading		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 170	10%	of damage repair and maintenance
End of life span maintenance	$ 5,640	10%	of original project cost
Future Capital Cost	$ 136,900		
Future annual maintenance	$ 8,090		
Future end of life span cost	$ 10,190		
Total Future Worth	**$ 155,200**		
Annualized Cost	**$ 3,300**		

Table H27: Preliminary Cost Estimate for Site 11, Alternative A

Stabilize eroding banks with hard armor

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$1,025	$1,030	10% of project cost
Control of Water	LS	1	$354	$350	4% of primary item cost
Erosion Control	LS	1	$530	$530	6% of primary item cost
Clearing and Grubbing	ACRE	0.02	$7,000	$140	
Select Tree Removal (>4")	EACH	10	$200	$2,000	
Grading	SY	100	$6	$600	
Furnish and Install Fieldstone Riprap	TON	23	$100	$2,330	
Topsoil Import	CY	17	$33	$550	
Plant Trees	EACH	5	$250	$1,250	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.02	$8,000	$170	
Erosion Control Blanket	SY	100	$3	$300	
Damage Repair	LS	1	$177	$180	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$354	$350	4% of primary item cost
			Total	**$ 11,280**	
			Contingency (30%)	$ 3,380	
			Subtotal	**$ 14,700**	
			Design, Permitting, and Administration (30%)	$ 3,380	
			Total w/ Contingency & Engineering	**$ 18,000**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 130	25%	of damage repair and maintenance
End of life span maintenance	$ 9,000	50%	of original project cost
Future Capital Cost	$ 43,700		
Future annual maintenance	$ 6,180		
Future end of life span cost	$ 16,260		
Total Future Worth	**$ 66,100**		
Annualized Cost	**$ 1,400**		

Table H28: Preliminary Cost Estimate for Site 11, Alternative B

Stabilize banks with root wads

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$1,068	$1,070	10% of project cost
Control of Water	LS	1	$368	$370	4% of primary item cost
Erosion Control	LS	1	$553	$550	6% of primary item cost
Clearing and Grubbing	ACRE	0.02	$7,000	$140	
Select Tree Removal (>4")	EACH	10	$200	$2,000	
Grading	SY	50	$6	$300	
Root Wads	EACH	4	$750	$3,000	
Topsoil Import	CY	17	$33	$550	
Plant Trees	EACH	5	$250	$1,250	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.02	$8,000	$170	
Erosion Control Blanket	SY	100	$3	$300	
Damage Repair	LS	1	$184	$180	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$368	$370	4% of primary item cost
			Total	**$ 11,750**	
			Contingency (30%)	$ 3,530	
			Subtotal	**$ 15,300**	
			Design, Permitting, and Administration (30%)	$ 3,530	
			Total w/ Contingency & Engineering	**$ 18,800**	

30-yr and Annualized Cost analysis

Category:	Bioengineering		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 140	25%	of damage repair and maintenance
End of life span maintenance	$ 4,700	25%	of original project cost
Future Capital Cost	$ 45,600		
Future annual maintenance	$ 6,660		
Future end of life span cost	$ 8,490		
Total Future Worth	**$ 60,800**		
Annualized Cost	**$ 1,300**		

Table H29: Preliminary Cost Estimate for Site 12, Alternative A

Stabilize eroding banks with hard armor

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$1,025	$1,030	10% of project cost
Control of Water	LS	1	$354	$350	4% of primary item cost
Erosion Control	LS	1	$530	$530	6% of primary item cost
Clearing and Grubbing	ACRE	0.02	$7,000	$140	
Select Tree Removal (>4")	EACH	10	$200	$2,000	
Grading	SY	100	$6	$600	
Furnish and Install Fieldstone Riprap	TON	23	$100	$2,330	
Topsoil Import	CY	17	$33	$550	
Plant Trees	EACH	5	$250	$1,250	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.02	$8,000	$170	
Erosion Control Blanket	SY	100	$3	$300	
Damage Repair	LS	1	$177	$180	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$354	$350	4% of primary item cost
			Total	**$ 11,280**	
			Contingency (30%)	$ 3,380	
			Subtotal	**$ 14,700**	
			Design, Permitting, and Administration (30%)	$ 3,380	
			Total w/ Contingency & Engineering	**$ 18,000**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 130	25%	of damage repair and maintenance
End of life span maintenance	$ 9,000	50%	of original project cost
Future Capital Cost	$ 43,700		
Future annual maintenance	$ 6,180		
Future end of life span cost	$ 16,260		
Total Future Worth	**$ 66,100**		
Annualized Cost	**$ 1,400**		

Table H30: Preliminary Cost Estimate for Site 12, Alternative B

Stabilize banks with root wads

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$1,068	$1,070	10% of project cost
Control of Water	LS	1	$368	$370	4% of primary item cost
Erosion Control	LS	1	$553	$550	6% of primary item cost
Clearing and Grubbing	ACRE	0.02	$7,000	$140	
Select Tree Removal (>4")	EACH	10	$200	$2,000	
Grading	SY	50	$6	$300	
Root Wads	EACH	4	$750	$3,000	
Topsoil Import	CY	17	$33	$550	
Plant Trees	EACH	5	$250	$1,250	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.02	$8,000	$170	
Erosion Control Blanket	SY	100	$3	$300	
Damage Repair	LS	1	$184	$180	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$368	$370	4% of primary item cost
			Total	**$ 11,750**	
			Contingency (30%)	$ 3,530	
			Subtotal	**$ 15,300**	
			Design, Permitting, and Administration (30%)	$ 3,530	
			Total w/ Contingency & Engineering	**$ 18,800**	

30-yr and Annualized Cost analysis

Category:	Bioengineering		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 140	25%	of damage repair and maintenance
End of life span maintenance	$ 4,700	25%	of original project cost
Future Capital Cost	$ 45,600		
Future annual maintenance	$ 6,660		
Future end of life span cost	$ 8,490		
Total Future Worth	**$ 60,800**		
Annualized Cost	**$ 1,300**		

Table H31: Preliminary Cost Estimate for Site 13, Alternative A

Stabilize eroding banks with hard armor

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$1,025	$1,030	10% of project cost
Control of Water	LS	1	$354	$350	4% of primary item cost
Erosion Control	LS	1	$530	$530	6% of primary item cost
Clearing and Grubbing	ACRE	0.02	$7,000	$140	
Select Tree Removal (>4")	EACH	10	$200	$2,000	
Grading	SY	100	$6	$600	
Furnish and Install Fieldstone Riprap	TON	23	$100	$2,330	
Topsoil Import	CY	17	$33	$550	
Plant Trees	EACH	5	$250	$1,250	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.02	$8,000	$170	
Erosion Control Blanket	SY	100	$3	$300	
Damage Repair	LS	1	$177	$180	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$354	$350	4% of primary item cost
Total				**$ 11,280**	
Contingency (30%)				$ 3,380	
Subtotal				**$ 14,700**	
Design, Permitting, and Administration (30%)				$ 3,380	
Total w/ Contingency & Engineering				**$ 18,000**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 130	25%	of damage repair and maintenance
End of life span maintenance	$ 9,000	50%	of original project cost
Future Capital Cost	$ 43,700		
Future annual maintenance	$ 6,180		
Future end of life span cost	$ 16,260		
Total Future Worth	**$ 66,100**		
Annualized Cost	**$ 1,400**		

Table H32: Preliminary Cost Estimate for Site 13, Alternative B

Stabilize banks with root wads

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$1,068	$1,070	10% of project cost
Control of Water	LS	1	$368	$370	4% of primary item cost
Erosion Control	LS	1	$553	$550	6% of primary item cost
Clearing and Grubbing	ACRE	0.02	$7,000	$140	
Select Tree Removal (>4")	EACH	10	$200	$2,000	
Grading	SY	50	$6	$300	
Root Wads	EACH	4	$750	$3,000	
Topsoil Import	CY	17	$33	$550	
Plant Trees	EACH	5	$250	$1,250	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.02	$8,000	$170	
Erosion Control Blanket	SY	100	$3	$300	
Damage Repair	LS	1	$184	$180	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$368	$370	4% of primary item cost
			Total	**$ 11,750**	
			Contingency (30%)	$ 3,530	
			Subtotal	**$ 15,300**	
			Design, Permitting, and Administration (30%)	$ 3,530	
			Total w/ Contingency & Engineering	**$ 18,800**	

30-yr and Annualized Cost analysis

Category:	Bioengineering		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 140	25%	of damage repair and maintenance
End of life span maintenance	$ 4,700	25%	of original project cost
Future Capital Cost	$ 45,600		
Future annual maintenance	$ 6,660		
Future end of life span cost	$ 8,490		
Total Future Worth	**$ 60,800**		
Annualized Cost	**$ 1,300**		

Table H33: Preliminary Cost Estimate for Site 14, Alternative A

Stabilize culvert outfall with hard armor

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$610	$610	10% of project cost
Control of Water	LS	1	$210	$210	4% of primary item cost
Erosion Control	LS	1	$315	$320	6% of primary item cost
Clearing and Grubbing	ACRE	0.01	$7,000	$100	
Select Tree Removal (>4")	EACH	4	$200	$800	
Grading	SY	67	$6	$400	
Furnish and Install Fieldstone Riprap	TON	31	$100	$3,110	
Topsoil Import	CY	6	$33	$180	
Plant Shrubs	EACH	10	$50	$500	
Seeding and Mulch	ACRE	0.01	$8,000	$60	
Erosion Control Blanket	SY	33	$3	$100	
Damage Repair	LS	1	$105	$110	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$210	$210	4% of primary item cost
			Total	**$ 6,710**	
			Contingency (30%)	$ 2,010	
			Subtotal	**$ 8,700**	
			Design, Permitting, and Administration (30%)	$ 2,010	
			Total w/ Contingency & Engineering	**$ 10,700**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 80	25%	of damage repair and maintenance
End of life span maintenance	$ 5,350	50%	of original project cost
Future Capital Cost	$ 26,000		
Future annual maintenance	$ 3,810		
Future end of life span cost	$ 9,660		
Total Future Worth	**$ 39,500**		
Annualized Cost	**$ 800**		

Table H34: Preliminary Cost Estimate for Site 14, Alternative B

Stabilize culvert outfall with concrete swale

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$773	$770	10% of project cost
Control of Water	LS	1	$266	$270	4% of primary item cost
Erosion Control	LS	1	$400	$400	6% of primary item cost
Clearing and Grubbing	ACRE	0.01	$7,000	$100	
Select Tree Removal (>4")	EACH	4	$200	$800	
Grading	SY	67	$6	$400	
Install Concrete Swale	CY	50	$80	$4,000	
Furnish and Install Fieldstone Riprap	TON	5	$100	$520	
Topsoil Import	CY	6	$33	$180	
Plant Shrubs	EACH	10	$50	$500	
Seeding and Mulch	ACRE	0.01	$8,000	$60	
Erosion Control Blanket	SY	33	$3	$100	
Damage Repair	LS	1	$133	$130	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$266	$270	4% of primary item cost
			Total	**$ 7,730**	
			Contingency (30%)	$ 2,320	
			Subtotal	**$ 10,100**	
			Design, Permitting, and Administration (30%)	$ 2,320	
			Total w/ Contingency & Engineering	**$ 12,400**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 100	25%	of damage repair and maintenance
End of life span maintenance	$ 6,200	50%	of original project cost
Future Capital Cost	$ 30,100		
Future annual maintenance	$ 4,760		
Future end of life span cost	$ 11,200		
Total Future Worth	**$ 46,100**		
Annualized Cost	**$ 1,000**		

Table H35: Preliminary Cost Estimate for Site 15, Alternative A

Install bank stabilization measures at eroding banks using hard armor

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$1,906	$1,910	10% of project cost
Control of Water	LS	1	$657	$660	4% of primary item cost
Erosion Control	LS	1	$985	$990	6% of primary item cost
Clearing and Grubbing	ACRE	0.02	$7,000	$160	
Select Tree Removal (>4")	EACH	20	$200	$4,000	
Grading	SY	111	$6	$670	
Furnish and Install Fieldstone Riprap	TON	65	$100	$6,480	
Topsoil Import	CY	19	$33	$610	
Plant Trees	EACH	10	$250	$2,500	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.02	$8,000	$180	
Erosion Control Blanket	SY	108	$3	$320	
Damage Repair	LS	1	$328	$330	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$657	$660	4% of primary item cost
			Total	**$ 20,970**	
			Contingency (30%)	$ 6,290	
			Subtotal	**$ 27,300**	
			Design, Permitting, and Administration (30%)	$ 6,290	
			Total w/ Contingency & Engineering	**$ 33,600**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 250	25%	of damage repair and maintenance
End of life span maintenance	$ 16,800	50%	of original project cost
Future Capital Cost	$ 81,600		
Future annual maintenance	$ 11,890		
Future end of life span cost	$ 30,340		
Total Future Worth	**$ 123,800**		
Annualized Cost	**$ 2,600**		

Table H36: Preliminary Cost Estimate for Site 15, Alternative B

Install 4 rock vanes for bank protection

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$2,092	$2,090	10% of project cost
Control of Water	LS	1	$584	$580	4% of primary item cost
Erosion Control	LS	1	$875	$880	6% of primary item cost
Select Tree Removal (>4")	EACH	20	$200	$4,000	
Rock Boulder Vane	EACH	4	$2,000	$8,000	
Seeding and Mulch	ACRE	0.1	$8,000	$920	
Plant Trees	EACH	10	$250	$2,500	
Plant Shrubs	EACH	30	$50	$1,500	
Erosion Control Blanket	SY	556	$3	$1,670	
Damage Repair	LS	1	$292	$290	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$584	$580	4% of primary item cost
Total				**$ 23,010**	
Contingency (30%)				$ 6,900	
Subtotal				**$ 29,900**	
Design, Permitting, and Administration (30%)				$ 6,900	
Total w/ Contingency & Engineering				**$ 36,800**	

30-yr and Annualized Cost analysis

Category:	Rock vanes		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 220	25%	of damage repair and maintenance
End of life span maintenance	$ 18,400	50%	of original project cost
Future Capital Cost	$ 89,300		
Future annual maintenance	$ 10,470		
Future end of life span cost	$ 33,230		
Total Future Worth	**$ 133,000**		
Annualized Cost	**$ 2,800**		

Table H37: Preliminary Cost Estimate for Site 15, Alternative C

Install bank stabilization measures at eroding banks using toe wood

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$4,431	$4,430	10% of project cost
Control of Water	LS	1	$1,528	$1,530	4% of primary item cost
Erosion Control	LS	1	$2,292	$2,290	6% of primary item cost
Clearing and Grubbing	ACRE	0.02	$7,000	$160	
Select Tree Removal (>4")	EACH	30	$200	$6,000	
Grading	SY	111	$6	$670	
Furnish and Install Toe Wood	LF	100	$250	$25,000	
Topsoil Import	CY	19	$33	$610	
Plant Trees	EACH	15	$250	$3,750	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.02	$8,000	$180	
Erosion Control Blanket	SY	111	$3	$330	
Damage Repair	LS	1	$764	$760	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$1,528	$1,530	4% of primary item cost
			Total	**$ 48,740**	
			Contingency (30%)	$ 14,620	
			Subtotal	**$ 63,400**	
			Design, Permitting, and Administration (30%)	$ 14,620	
			Total w/ Contingency & Engineering	**$ 78,000**	

30-yr and Annualized Cost analysis

Category:	Bioengineering		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 570	25%	of damage repair and maintenance
End of life span maintenance	$ 19,500	25%	of original project cost
Future Capital Cost	$ 189,300		
Future annual maintenance	$ 27,120		
Future end of life span cost	$ 35,220		
Total Future Worth	**$ 251,600**		
Annualized Cost	**$ 5,300**		

Table H38: Preliminary Cost Estimate for Site 16, Alternative A

Install bank stabilization measures at eroding banks using hard armor

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$1,906	$1,910	10% of project cost
Control of Water	LS	1	$657	$660	4% of primary item cost
Erosion Control	LS	1	$985	$990	6% of primary item cost
Clearing and Grubbing	ACRE	0.02	$7,000	$160	
Select Tree Removal (>4")	EACH	20	$200	$4,000	
Grading	SY	111	$6	$670	
Furnish and Install Fieldstone Riprap	TON	65	$100	$6,480	
Topsoil Import	CY	19	$33	$610	
Plant Trees	EACH	10	$250	$2,500	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.02	$8,000	$180	
Erosion Control Blanket	SY	108	$3	$320	
Damage Repair	LS	1	$328	$330	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$657	$660	4% of primary item cost
			Total	**$ 20,970**	
			Contingency (30%)	$ 6,290	
			Subtotal	**$ 27,300**	
			Design, Permitting, and Administration (30%)	$ 6,290	
			Total w/ Contingency & Engineering	**$ 33,600**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 250	25%	of damage repair and maintenance
End of life span maintenance	$ 16,800	50%	of original project cost
Future Capital Cost	$ 81,600		
Future annual maintenance	$ 11,890		
Future end of life span cost	$ 30,340		
Total Future Worth	**$ 123,800**		
Annualized Cost	**$ 2,600**		

Table H39: Preliminary Cost Estimate for Site 16, Alternative B

Install 4 rock vanes for bank protection

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$2,092	$2,090	10% of project cost
Control of Water	LS	1	$584	$580	4% of primary item cost
Erosion Control	LS	1	$875	$880	6% of primary item cost
Select Tree Removal (>4")	EACH	20	$200	$4,000	
Rock Boulder Vane	EACH	4	$2,000	$8,000	
Seeding and Mulch	ACRE	0.1	$8,000	$920	
Plant Trees	EACH	10	$250	$2,500	
Plant Shrubs	EACH	30	$50	$1,500	
Erosion Control Blanket	SY	556	$3	$1,670	
Damage Repair	LS	1	$292	$290	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$584	$580	4% of primary item cost
			Total	**$ 23,010**	
			Contingency (30%)	$ 6,900	
			Subtotal	**$ 29,900**	
			Design, Permitting, and Administration (30%)	$ 6,900	
			Total w/ Contingency & Engineering	**$ 36,800**	

30-yr and Annualized Cost analysis

Category:	Rock vanes		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 220	25%	of damage repair and maintenance
End of life span maintenance	$ 18,400	50%	of original project cost
Future Capital Cost	$ 89,300		
Future annual maintenance	$ 10,470		
Future end of life span cost	$ 33,230		
Total Future Worth	**$ 133,000**		
Annualized Cost	**$ 2,800**		

Table H40: Preliminary Cost Estimate for Site 16, Alternative C

Install bank stabilization measures at eroding banks using toe wood

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$4,431	$4,430	10% of project cost
Control of Water	LS	1	$1,528	$1,530	4% of primary item cost
Erosion Control	LS	1	$2,292	$2,290	6% of primary item cost
Clearing and Grubbing	ACRE	0.02	$7,000	$160	
Select Tree Removal (>4")	EACH	30	$200	$6,000	
Grading	SY	111	$6	$670	
Furnish and Install Toe Wood	LF	100	$250	$25,000	
Topsoil Import	CY	19	$33	$610	
Plant Trees	EACH	15	$250	$3,750	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.02	$8,000	$180	
Erosion Control Blanket	SY	111	$3	$330	
Damage Repair	LS	1	$764	$760	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$1,528	$1,530	4% of primary item cost
			Total	**$ 48,740**	
			Contingency (30%)	$ 14,620	
			Subtotal	**$ 63,400**	
			Design, Permitting, and Administration (30%)	$ 14,620	
			Total w/ Contingency & Engineering	**$ 78,000**	

30-yr and Annualized Cost analysis

Category:	Bioengineering		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 570	25%	of damage repair and maintenance
End of life span maintenance	$ 19,500	25%	of original project cost
Future Capital Cost	$ 189,300		
Future annual maintenance	$ 27,120		
Future end of life span cost	$ 35,220		
Total Future Worth	**$ 251,600**		
Annualized Cost	**$ 5,300**		

Table H41: Preliminary Cost Estimate for Site 17, Alternative A

Install bank stabilization measures at eroding banks using hard armor

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$1,906	$1,910	10% of project cost
Control of Water	LS	1	$657	$660	4% of primary item cost
Erosion Control	LS	1	$985	$990	6% of primary item cost
Clearing and Grubbing	ACRE	0.02	$7,000	$160	
Select Tree Removal (>4")	EACH	20	$200	$4,000	
Grading	SY	111	$6	$670	
Furnish and Install Fieldstone Riprap	TON	65	$100	$6,480	
Topsoil Import	CY	19	$33	$610	
Plant Trees	EACH	10	$250	$2,500	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.02	$8,000	$180	
Erosion Control Blanket	SY	108	$3	$320	
Damage Repair	LS	1	$328	$330	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$657	$660	4% of primary item cost
			Total	**$ 20,970**	
			Contingency (30%)	$ 6,290	
			Subtotal	**$ 27,300**	
			Design, Permitting, and Administration (30%)	$ 6,290	
			Total w/ Contingency & Engineering	**$ 33,600**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 250	25%	of damage repair and maintenance
End of life span maintenance	$ 16,800	50%	of original project cost
Future Capital Cost	$ 81,600		
Future annual maintenance	$ 11,890		
Future end of life span cost	$ 30,340		
Total Future Worth	**$ 123,800**		
Annualized Cost	**$ 2,600**		

Table H42: Preliminary Cost Estimate for Site 17, Alternative B

Install 4 rock vanes for bank protection

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$2,092	$2,090	10% of project cost
Control of Water	LS	1	$584	$580	4% of primary item cost
Erosion Control	LS	1	$875	$880	6% of primary item cost
Select Tree Removal (>4")	EACH	20	$200	$4,000	
Rock Boulder Vane	EACH	4	$2,000	$8,000	
Seeding and Mulch	ACRE	0.1	$8,000	$920	
Plant Trees	EACH	10	$250	$2,500	
Plant Shrubs	EACH	30	$50	$1,500	
Erosion Control Blanket	SY	556	$3	$1,670	
Damage Repair	LS	1	$292	$290	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$584	$580	4% of primary item cost
			Total	**$ 23,010**	
			Contingency (30%)	$ 6,900	
			Subtotal	**$ 29,900**	
			Design, Permitting, and Administration (30%)	$ 6,900	
			Total w/ Contingency & Engineering	**$ 36,800**	

30-yr and Annualized Cost analysis

Category:	Rock vanes		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 220	25%	of damage repair and maintenance
End of life span maintenance	$ 18,400	50%	of original project cost
Future Capital Cost	$ 89,300		
Future annual maintenance	$ 10,470		
Future end of life span cost	$ 33,230		
Total Future Worth	**$ 133,000**		
Annualized Cost	**$ 2,800**		

Table H43: Preliminary Cost Estimate for Site 17, Alternative C

Install bank stabilization measures at eroding banks using toe wood

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$4,431	$4,430	10% of project cost
Control of Water	LS	1	$1,528	$1,530	4% of primary item cost
Erosion Control	LS	1	$2,292	$2,290	6% of primary item cost
Clearing and Grubbing	ACRE	0.02	$7,000	$160	
Select Tree Removal (>4")	EACH	30	$200	$6,000	
Grading	SY	111	$6	$670	
Furnish and Install Toe Wood	LF	100	$250	$25,000	
Topsoil Import	CY	19	$33	$610	
Plant Trees	EACH	15	$250	$3,750	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.02	$8,000	$180	
Erosion Control Blanket	SY	111	$3	$330	
Damage Repair	LS	1	$764	$760	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$1,528	$1,530	4% of primary item cost
			Total	**$ 48,740**	
			Contingency (30%)	$ 14,620	
			Subtotal	**$ 63,400**	
			Design, Permitting, and Administration (30%)	$ 14,620	
			Total w/ Contingency & Engineering	**$ 78,000**	

30-yr and Annualized Cost analysis

Category:	Bioengineering		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 570	25%	of damage repair and maintenance
End of life span maintenance	$ 19,500	25%	of original project cost
Future Capital Cost	$ 189,300		
Future annual maintenance	$ 27,120		
Future end of life span cost	$ 35,220		
Total Future Worth	**$ 251,600**		
Annualized Cost	**$ 5,300**		

Table H44: Preliminary Cost Estimate for Site 18, Alternative A

Remove large woody debris

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$334	$330	10% of project cost
Select Tree Removal (>4")	EACH	8	$200	$1,600	
Seeding and Mulch	ACRE	0.1	$8,000	$550	
Erosion Control Blanket	SY	333	$3	$1,000	
Damage Repair	LS	1	$63	$60	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$126	$130	4% of primary item cost
			Total	**$ 3,670**	
			Contingency (30%)	$ 1,100	
			Subtotal	**$ 4,800**	
			Design, Permitting, and Administration (30%)	$ 1,100	
			Total w/ Contingency & Engineering	**$ 5,900**	

30-yr and Annualized Cost analysis

Category:	Debris Removal		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ -	0%	of damage repair and maintenance
End of life span maintenance	$ 1,480	25%	of original project cost
Future Capital Cost	$ 14,300		
Future annual maintenance	$ -		
Future end of life span cost	$ 2,670		
Total Future Worth	**$ 17,000**		
Annualized Cost	**$ 400**		

Table H45: Preliminary Cost Estimate for Site 19, Alternative A

Remove large woody debris

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$334	$330	10% of project cost
Select Tree Removal (>4")	EACH	8	$200	$1,600	
Seeding and Mulch	ACRE	0.1	$8,000	$550	
Erosion Control Blanket	SY	333	$3	$1,000	
Damage Repair	LS	1	$63	$60	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$126	$130	4% of primary item cost
			Total	**$ 3,670**	
			Contingency (30%)	$ 1,100	
			Subtotal	**$ 4,800**	
			Design, Permitting, and Administration (30%)	$ 1,100	
			Total w/ Contingency & Engineering	**$ 5,900**	

30-yr and Annualized Cost analysis

Category:	Debris Removal		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ -	0%	of damage repair and maintenance
End of life span maintenance	$ 1,480	25%	of original project cost
Future Capital Cost	$ 14,300		
Future annual maintenance	$ -		
Future end of life span cost	$ 2,670		
Total Future Worth	**$ 17,000**		
Annualized Cost	**$ 400**		

Table H46: Preliminary Cost Estimate for Site 20, Alternative A

Stabilize with hard armor

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$2,716	$2,720	10% of project cost
Control of Water	LS	1	$936	$940	4% of primary item cost
Erosion Control	LS	1	$1,405	$1,400	6% of primary item cost
Clearing and Grubbing	ACRE	0.05	$7,000	$320	
Select Tree Removal (>4")	EACH	10	$200	$2,000	
Grading	SY	222	$6	$1,330	
Furnish and Install Fieldstone Riprap	TON	162	$100	$16,200	
Topsoil Import	CY	19	$33	$610	
Plant Trees	EACH	5	$250	$1,250	
Plant Shrubs	EACH	20	$50	$1,000	
Seeding and Mulch	ACRE	0.05	$8,000	$370	
Erosion Control Blanket	SY	111	$3	$330	
Damage Repair	LS	1	$468	$470	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$936	$940	4% of primary item cost
			Total	**$ 29,880**	
			Contingency (30%)	$ 8,960	
			Subtotal	**$ 38,800**	
			Design, Permitting, and Administration (30%)	$ 8,960	
			Total w/ Contingency & Engineering	**$ 47,800**	

30-yr and Annualized Cost analysis

Category:	Hard armor		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 350	25%	of damage repair and maintenance
End of life span maintenance	$ 23,900	50%	of original project cost
Future Capital Cost	$ 116,000		
Future annual maintenance	$ 16,650		
Future end of life span cost	$ 43,170		
Total Future Worth	**$ 175,800**		
Annualized Cost	**$ 3,700**		

Table H47: Preliminary Cost Estimate for Site 20, Alternative B

Stabilize with toe wood and grading to broaden meander

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$6,246	$6,250	10% of project cost
Control of Water	LS	1	$2,154	$2,150	4% of primary item cost
Erosion Control	LS	1	$3,231	$3,230	6% of primary item cost
Clearing and Grubbing	ACRE	0.05	$7,000	$320	
Select Tree Removal (>4")	EACH	20	$200	$4,000	
Excavate/Salvage Soil	CY	296	$15	$4,440	
Grading	SY	222	$6	$1,330	
Topsoil Import	CY	37	$33	$1,220	
Furnish and Install Toe Wood	LF	150	$250	$37,500	
Plant Trees	EACH	10	$250	$2,500	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.0	$8,000	$370	
Erosion Control Blanket	SY	222	$3	$670	
Damage Repair	LS	1	$1,077	$1,080	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$2,154	$2,150	4% of primary item cost
			Total	**$ 68,710**	
			Contingency (30%)	$ 20,610	
			Subtotal	**$ 89,300**	
			Design, Permitting, and Administration (30%)	$ 20,610	
			Total w/ Contingency & Engineering	**$ 109,900**	

30-yr and Annualized Cost analysis

Category:	Bioengineering		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 810	25%	of damage repair and maintenance
End of life span maintenance	$ 27,480	25%	of original project cost
Future Capital Cost	$ 266,800		
Future annual maintenance	$ 38,540		
Future end of life span cost	$ 49,630		
Total Future Worth	**$ 355,000**		
Annualized Cost	**$ 7,500**		

Table H48: Preliminary Cost Estimate for Site 20, Alternative C

Controlled overflow, install grade control structure downstream

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$2,840	$2,840	10% of project cost
Control of Water	LS	1	$979	$980	4% of primary item cost
Erosion Control	LS	1	$1,469	$1,470	6% of primary item cost
Clearing and Grubbing	ACRE	0.02	$7,000	$160	
Select Tree Removal (>4")	EACH	10	$200	$2,000	
Grading	SY	333	$6	$2,000	
Furnish and Install Fieldstone Riprap	TON	156	$100	$15,560	
Plant Trees	EACH	5	$250	$1,250	
Plant Shrubs	EACH	20	$50	$1,000	
Rock Boulder Vane	EACH	1	$2,000	$2,000	
Seeding and Mulch	ACRE	0.02	$8,000	$180	
Erosion Control Blanket	SY	111	$3	$330	
Damage Repair	LS	1	$490	$490	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$979	$980	4% of primary item cost
			Total	**$ 31,240**	
			Contingency (30%)	$ 9,370	
			Subtotal	**$ 40,600**	
			Design, Permitting, and Administration (30%)	$ 9,370	
			Total w/ Contingency & Engineering	**$ 50,000**	

30-yr and Annualized Cost analysis

Category:	Rock vanes		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 370	25%	of damage repair and maintenance
End of life span maintenance	$ 25,000	50%	of original project cost
Future Capital Cost	$ 121,400		
Future annual maintenance	$ 17,600		
Future end of life span cost	$ 45,150		
Total Future Worth	**$ 184,200**		
Annualized Cost	**$ 3,900**		

Table H49: Preliminary Cost Estimate for Site 20, Alternative D

Realign channel and stabilize meanders with vanes and toe wood

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$8,398	$8,400	10% of project cost
Control of Water	LS	1	$2,896	$2,900	4% of primary item cost
Erosion Control	LS	1	$4,343	$4,340	6% of primary item cost
Clearing and Grubbing	ACRE	0.1	$7,000	$710	
Select Tree Removal (>4")	EACH	30	$200	$6,000	
Excavate/Salvage Soil	CY	652	$15	$9,780	
Grading	SY	489	$6	$2,930	
Topsoil Import	CY	81	$33	$2,690	
Furnish and Install Toe Wood	LF	150	$250	$37,500	
Rock Boulder Vane	EACH	2	$2,000	$4,000	
Plant Trees	EACH	20	$250	$5,000	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.1	$8,000	$810	
Erosion Control Blanket	SY	489	$3	$1,470	
Damage Repair	LS	1	$1,448	$1,450	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$2,896	$2,900	4% of primary item cost
			Total	**$ 92,380**	
			Contingency (30%)	$ 27,710	
			Subtotal	**$ 120,100**	
			Design, Permitting, and Administration (30%)	$ 27,710	
			Total w/ Contingency & Engineering	**$ 147,800**	

30-yr and Annualized Cost analysis

Category:	Remeander		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 440	10%	of damage repair and maintenance
End of life span maintenance	$ 14,780	10%	of original project cost
Future Capital Cost	$ 358,700		
Future annual maintenance	$ 20,930		
Future end of life span cost	$ 26,690		
Total Future Worth	**$ 406,300**		
Annualized Cost	**$ 8,500**		

Table H50: Preliminary Cost Estimate for Site 21, Alternative A

Narrow channel for approx. 80'

Item Description	Unit	Estimated Quantity	Unit Price	Extension	Notes
Mobilization	LS	1	$1,514	$1,510	10% of project cost
Control of Water	LS	1	$522	$520	4% of primary item cost
Erosion Control	LS	1	$784	$780	6% of primary item cost
Clearing and Grubbing	ACRE	0.04	$7,000	$260	
Select Tree Removal (>4")	EACH	20	$200	$4,000	
Common Fill Import	CY	119	$25	$2,960	
Grading	SY	89	$6	$530	
Topsoil Import	CY	15	$33	$490	
Plant Trees	EACH	10	$250	$2,500	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.04	$8,000	$290	
Erosion Control Blanket	SY	178	$3	$530	
Damage Repair	LS	1	$261	$260	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$522	$520	4% of primary item cost
			Total	**$ 16,650**	
			Contingency (30%)	$ 5,000	
			Subtotal	**$ 21,700**	
			Design, Permitting, and Administration (30%)	$ 5,000	
			Total w/ Contingency & Engineering	**$ 26,700**	

30-yr and Annualized Cost analysis

Category:	General grading		
Estimated life span (years)	30	1	number of major maint. events
Expected annual maintenance	$ 80	10%	of damage repair and maintenance
End of life span maintenance	$ 2,670	10%	of original project cost
Future Capital Cost	$ 64,800		
Future annual maintenance	$ 3,810		
Future end of life span cost	$ 4,820		
Total Future Worth	**$ 73,400**		
Annualized Cost	**$ 1,500**		

Table H51: Preliminary Cost Estimate for Site 21, Alternative B

Install log vanes within reach

Item Description	**Unit**	**Estimated Quantity**	**Unit Price**	**Extension**	**Notes**
Mobilization	LS	1	$1,221	$1,220	10% of project cost
Control of Water	LS	1	$421	$420	4% of primary item cost
Erosion Control	LS	1	$632	$630	6% of primary item cost
Clearing and Grubbing	ACRE	0.02	$7,000	$130	
Select Tree Removal (>4")	EACH	10	$200	$2,000	
Log Vanes	EACH	3	$1,200	$3,600	
Grading	SY	33	$6	$200	
Topsoil Import	CY	6	$33	$180	
Plant Trees	EACH	10	$250	$2,500	
Plant Shrubs	EACH	30	$50	$1,500	
Seeding and Mulch	ACRE	0.02	$8,000	$150	
Erosion Control Blanket	SY	89	$3	$270	
Damage Repair	LS	1	$211	$210	2% of primary item cost
One-Year Establishment Maintenance Period	LS	1	$421	$420	4% of primary item cost
			Total	**$ 13,430**	
			Contingency (30%)	$ 4,030	
			Subtotal	**$ 17,460**	
			Design, Permitting, and Administration (30%)	$ 4,030	
			Total w/ Contingency & Engineering	**$ 21,500**	

30-yr and Annualized Cost analysis

Category:	Bioengineering		
Estimated life span (years)	20	1	number of major maint. events
Expected annual maintenance	$ 160	25%	of damage repair and maintenance
End of life span maintenance	$ 5,380	25%	of original project cost
Future Capital Cost	$ 52,200		
Future annual maintenance	$ 7,610		
Future end of life span cost	$ 9,720		
Total Future Worth	**$ 69,500**		
Annualized Cost	**$ 1,500**		