PERFLUOROCARBON (PFC)-CONTAINING FIREFIGHTING FOAMS AND THEIR USE IN MINNESOTA: SURVEY AND SAMPLING ACTIVITIES, STATE FISCAL YEAR 2011

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Prepared for:
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155

Prepared by:
Antea™Group
5910 Rice Creek Parkway
Suite 100
Shoreview, MN 55126
651 639 9449

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1.0 INTRODUCTION

1.1 Purpose

Antea™ Group (formerly Delta Consultants) has worked under contract with the Minnesota Pollution Control Agency (MPCA) investigating perfluorochemicals in Class B firefighting foams and the use of Class B firefighting foams in Minnesota. Previous information regarding this investigation was presented in the following reports:

- Perfluorocarbon (PFC)-Containing Firefighting Foams and Their Use In Firefighting Training in Minnesota, dated June 30, 2008 (the June 2008 Report);
- Addendum to PFC-Containing Firefighting Foams and Their Use In Firefighting Training in Minnesota, dated October 22, 2008 (the October 2008 Addendum Report);
- Firefighting Training Area Site Reconnaissance, Pine Bend Flint Hills Refinery, Marathon Refinery, Burnsville Fire Training Center, and Site Access for 21 Fire Departments, dated April 3, 2009 (the April 2009 Report);
- Report of Site Reconnaissance and Sampling at Select Firefighting Foam Training Areas in Minnesota, dated June 30, 2009 (the June 2009 Report);
- Report of Investigation Activities at Select Firefighting Foam Training Areas and Foam Discharge Sites in Minnesota, dated February 10, 2010 (the February 2010 Report);
- Perfluorocarbon (PFC)-Containing Firefighting Foams and Their Use in Firefighting Training in Minnesota, dated June 30, 2010 (the June 2010 Report);
- Perfluorocarbon (PFC)-Containing Firefighting Foams and Their Use in Minnesota: Well Receptor Surveys and Follow-Up Sampling at Select Sites, dated November 15, 2010 (the November 2010 Report);
- Perfluorocarbon (PFC)-Containing Firefighting Foams and Their Use in Minnesota: Sampling at the Lake Superior College Emergency Response Training Center, Duluth, dated February 25, 2011 (the February 2011 Report); and,
- Perfluorocarbon (PFC)-Containing Firefighting Foams and Their Use in Minnesota: Sampling at the Hidden Harbor Marina, Burnsville Wetland, and Bemidji Private Wells dated May 13, 2011 (the May 2011 Report).

This report summarizes data and information for activities conducted for the "PFC/Firefighting Foam" project during the Minnesota State Fiscal Year of 2011.

1.2 Background

As a part of an overall investigation of PFCs in Minnesota, the MPCA and Minnesota Department of Health (MDH) have been investigating firefighting foams as a possible source of PFCs in the environment. Aqueous film-forming foam, or Class B AFFF, has a fluorochemical-based surfactant that rapidly forms a film across the fire surface, which prevents the release of flammable fuel vapors and excludes oxygen from the fuel surface. PFCs have been identified in soil,

sediment, surface water and groundwater samples collected from locations in Minnesota where various brands of Class B AFFF have been used repeatedly in training exercises or in large quantity to extinguish fires.

Municipal fire departments, fire departments at major oil refineries and airports in Minnesota, fire training schools in the State, and other knowledgeable persons were surveyed and interviewed regarding their use and knowledge of firefighting foams. Firefighting training sites and fire sites where Class B AFFF is or was used were ranked for their potential to release PFCs to the environment based on a number of criteria, including the following: the types and amounts of foam used, the frequency of the training events, the environmental setting of the site, and the presence of nearby receptors such as water supply wells and surface waters. The results of the survey and site ranking were presented in the June 2008 Report and October 2008 Addendum Report. Both reports are available on the MPCA website at www.pca.state.mn.us/cleanup/pfc/index.html.

Based on the site ranking, a number of firefighting training sites and fire sites where Class B AFFF was discharged were selected for further investigation. Additional investigation activities included site reconnaissance, in-depth interviews with knowledgeable persons, and/or sampling of potentially affected media including groundwater, soil, surface water and/or sediments. Information and data collected at these select sites were documented in the April 2009, June 2009, February 2010, June 2010, November 2010, February 2011 and May 2011 Reports. These reports are also available on the MPCA website. The investigation activities found that PFCs are present in the environment (soil, groundwater, surface water and/or sediment) at sites where Class B AFFF was discharged repeatedly in training exercises or where large amounts of Class B foam were utilized on Class B fires. The investigations have also identified PFCs in surface water or groundwater at concentrations above the State Health Risk Limits (HRLs) for drinking water at the following sites:

- a former firefighting training area behind the Richfield Ice Arena in Richfield;
- two former firefighting training areas at Minneapolis-St. Paul International (MSP) Airport;
- a firefighting training area at the Marathon Refinery in St. Paul Park;
- the Apple Valley-Burnsville-Lakeville-Eagan (ABLE) Training Center in Burnsville;
- a firefighting training area at the Bemidji Regional Airport; and,
- a firefighting training area at the Lake Superior College Emergency Response Training Center (ERTC) in Duluth.

PFC concentrations above the HRLs in groundwater were also identified by environmental consultants other than Antea Group at a former firefighting training area at the Duluth International Airport and at the Western Area Fire Training Academy (WAFTA) in St. Bonifacius. Sampling results for these sites are presented briefly in the June 2010 Report.

Laboratory results for all PFC sampling conducted in association with this PFC/Firefighting Foam project are summarized in **Table 1, *Groundwater and Surface Water PFC Analytical Results***, and **Table 2, *Soil and Sediment Analytical Results, PFCs and TOC (Total Organic Carbon)***.

One of the risks associated with PFCs in groundwater is to human health should a potable water well be drawing water from an impacted groundwater aquifer. The MPCA and MDH have worked together to identify public supply wells that may be at risk due to their proximity to firefighting foam training areas or large fire sites where Class B AFFF was discharged. The MDH has sampled water supply wells near several fire foam training areas and while low levels of some PFC compounds were detected in municipal well water samples, none of the water samples had PFC concentrations higher than the HRLs or State Health-Based Values (HBVs). Groundwater sampling conducted by the MDH is discussed briefly in the June 2010 Report.

Based on the presence of PFCs at levels above the HRLs in groundwater at the former firefighting training area in Richfield and the known presence of private water supply wells in the area, a receptor survey was conducted in the vicinity of the former training area in order to identify potential receptors of impacted groundwater. The survey identified several sealed and abandoned water supply wells and groundwater monitoring wells in the survey area, but no active water supply wells other than the municipal wells which were being sampled by MDH. Results of the receptor survey for the former firefighting training area in Richfield are presented in the February 2010 Report. Receptor survey results for the Duluth International Airport and the WAFTA site in St. Bonifacius are also briefly presented in the June 2010 Report.

In 2006 and 2007 a number of groundwater samples collected by the MPCA from multiple rural and urban locations in Minnesota were analyzed for PFCs as part of a State-wide monitoring effort of PFCs in the ambient environment. The results of that sampling and a comparison of groundwater data collected as part of the ambient sampling and the sampling done as part of the PFCs/Firefighting Foam project were presented in the June 2010 Report. Ambient sampling data is presented in the MPCA document *PFCs in Minnesota's Ambient Environment: 2008 Progress Report.*

At the end of the State Fiscal Year 2010, the following recommendations for additional work for the PFC/Firefighting Foam project were made in the June 2010 Report:

1. Conduct groundwater receptor surveys to evaluate risk at the following sites where PFOA and/or PFOS concentrations in groundwater exceeded the State HRLs:
    - Marathon Refinery in St. Paul Park
    - Bemidji Regional Airport
    - ABLE Training Center in Burnsville
    - Minneapolis-St. Paul International Airport (MSP)
2. Conduct a groundwater receptor survey to evaluate risk in the area of the Lake Superior College ERTC due to elevated PFOS and PFOA concentrations in the wetland adjacent to the training area.

3. Continue to monitor groundwater for PFCs at the existing monitoring well located downgradient of the fire site at the Kandiyohi County Landfill. Since the foam discharge occurred less than one year ago, it may take time for potential PFC impacts to migrate through the soil to the water table, and to migrate with groundwater to the location of monitoring well DMW-3. Consider installing a monitoring well closer to the site of the fire if site activities and land use nearer the fire site are conducive to the presence of a monitoring well.
4. At the time of sampling at Crystal Airport in January 2010, there was no water in Shingle Creek. Since PFCs were detected in a sediment sample collected on the downstream side of Crystal Airport, but none were detected in an upstream sediment sample, water samples should be collected at or near the locations of the previous sediment samples to test for PFCs in Shingle Creek adjacent to Crystal Airport.
5. Follow up with inquiries, and sampling if warranted, at any large fires that occur or have occurred where Class B AFFF is used extensively.

2.0 SCOPES OF WORK CONDUCTED IN STATE FISCAL YEAR 2011

As a result of finding PFCs at concentrations above the HRLs in groundwater or surface water at the sites identified in Section 1.2, receptor surveys were conducted in the vicinities of these sites in Fiscal Year 2011, except for the former firefighting training area in Richfield where a receptor survey was conducted in Fiscal Year 2010. The purpose of the receptor surveys was to identify potential receptors of PFC-impacted groundwater or surface water. Based on results of the receptor surveys, private wells near the Marathon Refinery, Bemidji Regional Airport, and Lake Superior College ERTC, and surficial water bodies near Lake Superior College ERTC and the ABLE Training Center, were sampled for PFCs.

Additional follow-up PFC sampling was also conducted in Fiscal Year 2011 at two sites: (1) groundwater samples were collected from two existing monitoring wells at the Kandiyohi County Landfill, where Class B AFFF was used on a fire in October 2009; and, (2) surface water and sediment samples were collected from Shingle Creek, adjacent to Crystal Airport.

2.1 Work Order SFDE1107-2

To address the recommendations included in the June 2010 Report, Antea Group performed the following scope of work under MPCA Work Order SFDE1107-2, dated July 23, 2010:

1. Conducted groundwater receptor surveys in the vicinity of current or former firefighting training sites at the following locations: Marathon Refinery in St. Paul Park; Bemidji Regional Airport; ABLE Training Center in Burnsville; MSP Airport; and, Lake Superior College ERTC in Duluth.
2. Conducted additional groundwater sampling from two existing wells at the Kandiyohi Landfill.
3. Conducted additional sediment and surface water sampling at Shingle Creek adjacent to the Crystal Airport in Crystal.

4. Prepared a report summarizing work performed as part of the scope of work (the November 2010 Report).

2.1.1 Groundwater Receptor Surveys

Groundwater receptor surveys conducted in the vicinity of the current or former firefighting training sites identified in Section 2.1 included the following activities:

- Walking surveys were conducted in order to identify all houses and businesses, surface water bodies, water wells, and any other features that may be a groundwater receptor. The walking surveys included the area within 500 feet upgradient and side-gradient of the sites and 1/2-mile downgradient of the sites. Hydrological resources used in determine groundwater flow directions at each of the sites are presented in the November 2010 Report.
- Information regarding the potable water source and water wells at the properties identified during the walking surveys was obtained from property owners or tenants. Information was obtained through personal interviews or via well survey questionnaires that were either left at a property or sent in the mail.
- Inquiries were made as necessary with the water supply utility regarding municipal water sources, municipal well locations, and the availability of municipal water in the area of the sites.
- The MDH County Well Index (CWI) was searched in order to identify registered water wells located within the survey areas.

Details and results for each of the receptor surveys are presented in the November 2010 Report. The November 2010 Report included references Findings of the surveys are summarized in **Table 3, *Well Receptor Summary for Select Firefighting Foam Training Sites in Minnesota***. The receptor surveys identified the following potential groundwater receptors:

- Marathon Refinery: As presented in the November 2010 Report, the inferred groundwater flow direction is generally to the southwest. An April 2008 groundwater elevation contour map prepared by URS in association with a petroleum release at the Marathon Refinery (unrelated to the firefighting foam area at the refinery) indicated a slightly more southerly groundwater flow direction at the southeast portion of the refinery property. Thus the receptor survey performed for this PFC/Firefighting Foam project included an area within 1/2-mile to the south and southwest of the firefighting training area at the refinery. A figure showing the October 2010 receptor survey area, inferred groundwater flow directions, returned well survey questionnaires, and a MDH CWI map of wells in the survey area and associated well logs are included as **Appendix A**.

  Of the eleven wells shown on the CWI map in the receptor survey area, eight are either monitoring wells, remedial wells, or abandoned wells. The remaining three wells mapped by the CWI, Unique Well nos.

441942, 576171, and 429870, are domestic wells registered to Willie Brown or Willie's Hidden Harbor. The well questionnaire survey identified five active water supply wells at or owned by the Hidden Harbor Marina. In addition to the three wells mentioned above Unique Well nos. 268354 and 559256 are registered to Harbor Village #2 and Willie's Hidden Harbor, respectively; however, these wells were not mapped on the CWI. According to the owner of the Hidden Harbor Marina, the five wells are used for a variety of purposes, including wash water and drinking water. The City of St. Paul Park confirmed that the Hidden Harbor Marina is not connected to the municipal water supply. The Hidden Harbor Marina is located approximately 0.3 miles south of the fire training area at Marathon Refinery. Discussion of sampling of the wells owned by the Hidden Harbor Marina is presented in **Section 2.3.1**.

The Mississippi River is located approximately 600 feet west of the firefighting training area at the Marathon Refinery. Previous sampling of water, sediments and fish tissue from the Mississippi River as part of the PFC/Firefighting Foam project and other unrelated State projects has identified PFCs in all sampled media. Therefore, the MPCA decided that additional sampling of surface water and sediment from the Mississippi River near the Marathon Refinery would not provide useful data for this project due to the previously identified presence of PFCs in the river and other regional PFC groundwater impacts associated with former 3M landfills in Washington County.

- Bemidji Regional Airport: As presented in the November 2010 Report, the regional groundwater flow direction in the area of the Bemidji Regional Airport is generally to the southeast. The initial receptor survey conducted in October 2010 identified one active water supply well within 1/2-mile downgradient of the Airport. The identified well is at the Kraus Anderson construction shop located to the southeast. However, review of the MDH CWI identified multiple residential wells located between 3/4-mile and 1 mile east and southeast of the firefighting training area at the Bemidji Regional Airport. An expansion of the receptor survey was conducted under a later Work Order, as discussed in **Section 2.3**.

  Grass Lake is located approximately 1/2-mile south-southwest of the firefighting foam training area at the Bemidji Regional Airport. According to personnel with the City of Bemidji Street Department, stormwater flow from the airport is ultimately routed to a wetland to the north of the Airport, thus, Grass Lake does not receive stormwater runoff from the Airport. A figure showing the October 2010 receptor survey area, inferred groundwater flow direction, returned well survey questionnaires, and a MDH CWI map of wells in the area and associated well logs are included as **Appendix B**. Discussion of the subsequent, expanded receptor survey is presented in **Section 2.3.3**.
- ABLE Training Center: As presented in the November 2010 Report, the regional groundwater flow direction in the area of the ABLE Training Center is generally to the northwest, toward the Minnesota River. A figure

showing the receptor survey area, completed well survey questionnaires, and a MDH CWI map of wells in the area of the ABLE Training Center and associated well logs are included as **Appendix C**. No active water supply wells were identified by the receptor survey, except for three municipal wells that were previously sampled twice by the MDH for PFCs. A wetland or pond located across Cliff Road from the ABLE Training Center was identified as a potential receptor for groundwater or stormwater runoff from the site.

- MSP Airport: As presented in the November 2010 Report, the regional groundwater flow direction in the area of MSP Airport is generally to the southeast, toward the Minnesota River. A figure showing the receptor survey area, inferred groundwater flow direction, and a MDH CWI map indicating the lack of wells within the survey area are included as **Appendix D**. No water supply wells or surface waters were identified within the receptor survey area. The Minnesota River is located approximately 1.8 miles southeast of the former firefighting training areas at MSP Airport.
- Lake Superior College ERTC: As presented in the November 2010 Report, the inferred groundwater flow direction in the area of the ERTC is generally to the south, toward the St. Louis River. However, localized features such as creeks that flow to the southeast and a historical gravel pit to the west may influence groundwater flow at the ERTC. Therefore the receptor survey included areas within 1/2-mile to the west and southeast. A figure showing the receptor survey area, inferred regional groundwater flow direction, completed well survey questionnaires, and a MDH CWI map of wells in the area of the ERTC are included as **Appendix E**. No well logs for the wells identified in the survey area were available on the CWI. Five active water supply wells were identified during the walking survey at nearby houses on Highway 23 in Duluth. One of the wells is shared by two houses. The City of Duluth Public Works Department confirmed that municipal water is not currently utilized by the identified houses. In addition, two creeks flow near the firefighting practice area at the ERTC, which apparently join up before flowing southward beneath Highway 23 to the backwater of the St. Louis River. One of the creeks appears to flow through a wetland located adjacent to the firefighting practice area. Sediments and surface waters of the wetland and creek were sampled previously.

Based on the results of the receptor surveys the following recommendations were made in the November 2010 Report:

- pursuit of access to the five wells at the Hidden Harbor Marina for PFC sampling;
- pursuit of access to the Kraus Anderson shop well in Bemidji for PFC sampling;
- completion of an expanded receptor survey to include private wells further east and southeast of the Bemidji Regional Airport;
- pursuit of access to the wetland or pond near the ABLE Training Center in Burnsville for PFC sampling of wetland surface water and sediment; and,

- pursuit of access to the residential wells near the Lake Superior College for PFC sampling, and access to the ERTC for follow-up surface water and sediment sampling for PFCs.

2.1.2 Follow-Up Sampling at Kandiyohi County Landfill

In October 2009 approximately 545 gallons of Class B AFFF were used on a fire at the Kandiyohi County Landfill. Groundwater samples were collected from existing landfill monitoring wells DMW-1A and DMW-3 in January 2010 and May 2010. Well DMW-1A is located upgradient of the fire area, and DMW-3 is located approximately 300 to 350 feet downgradient of the fire area. A figure illustrating the approximate area of the fire and the referenced monitoring wells is included in **Appendix F**. No PFCs were identified in either sample collected from DMW-1A, and only low levels of perflourobutanoic acid (PFBA) were found in the samples collected from DMW-3 (see **Table 1)**. Additional sampling was recommended in the June 2010 Report to assess groundwater conditions over time downgradient of the fire area.

Follow-up groundwater samples were collected from DMW-1A and DMW-3 on August 12, 2010, for PFC analysis. The samples were submitted to Axys Analytical Services for analysis of PFCs.

Laboratory analysis did not detect any PFCs in the (upgradient) DMW-1A sample and only a low concentration of PFBA in the (downgradient) DMW-3 sample, which is consistent with previous sampling results (see **Table 1**). Details of and results for the follow-up sampling at Kandiyohi County Landfill are presented in the November 2010 Report.

Continued groundwater sampling from DMW-1A and DMW-3 was recommended in the November 2010 Report. However, the MPCA decided that additional sampling was not warranted at that time since the nearest potential groundwater receptor is located approximately one-half mile southwest of the fire area at the landfill, and significant concentrations of PFCs have been not detected in DMW-3. With the passage of more time to allow for PFCs, if present, to reach the monitoring wells, re-sampling of DMW-1A and DMW-3 should be reconsidered.

2.1.3 Follow-Up Sampling at Shingle Creek

Interviews with responding municipal fire departments around the Crystal Airport in Crystal indicated that Class B AFFF may have been used in the past to respond to plane crash-related fires at the Crystal Airport. Generally, storm water runoff flows through various pathways and drainage ditches across the airport grounds to Shingle Creek. Shingle Creek flows along the east side of Crystal Airport to the southeast, emptying into Twin Lake. In a project unrelated to the PFC/Firefighting Foam project, PFCs were identified in fish samples collected from Twin Lake, including high levels of PFOS. The source of the PFOS in the fish collected from Twin Lake has not been identified to date.

Soil, groundwater, and sediment sampling for PFCs was conducted at Crystal Airport in January 2010 from several locations, including upstream and downstream locations in Shingle Creek adjacent to Crystal Airport. A figure showing the January 2010 sample locations is included in **Appendix G**. Due to the winter season and lack of water

in the creek, only sediment samples were collected from the Shingle Creek in January 2010. Sampling results identified several PFC compounds in the downstream sediment sample; PFCs were not detected above laboratory detection limits in the sediment sample collected from the upstream location in Shingle Creek (see **Table 2**). The January 2010 sampling event at Crystal Airport is presented in the February 2010 and June 1010 Reports. The June 2010 Report recommended surface water sampling and follow-up sediment sampling from Shingle Creek for PFCs.

Follow-up sediment samples and surface water samples were collected from Shingle Creek on October 1, 2010, from the same locations upstream and downstream of the Crystal Airport as the January 2010 samples. A figure showing the October 2010 sample locations is included in **Appendix G**. The samples were submitted to Axys Analytical Services for analysis of PFCs.

Laboratory results for surface water samples Crystal SW-1 (upstream sample) and Crystal SW-2 (downstream sample) detected concentrations of several PFC compounds; all of the concentrations were below the State HRLs (see **Table 1**). Although the HRLs are not necessarily applicable to the surface water in Shingle Creek, they are presented here and in Table 1 for comparison purposes only. The PFC concentrations detected in the upstream sample were slightly higher than those detected in the downstream sample. Details of the sampling and laboratory results for the surface water samples only are presented in the November 2010 Report; the laboratory results for the sediment sample were not available at the time of the November 2010 Report.

Laboratory results for the upstream and downstream sediment samples (Crystal Sed-3 and Crystal Sed-4, respectively) collected on October 1, 2010, were received after the November 2010 Report was finalized. Laboratory results are included in **Table 2**. Laboratory analysis did not detect any PFCs in the upstream Crystal Sed-3 sample. Low concentrations (less than 5 nanograms-per-gram (ng/g), which is roughly equivalent to parts-per-billion) of several PFC compounds were detected in the downstream Crystal Sed-4 sample. The PFC concentrations in Crystal Sed-4 were slightly lower than concentrations detected in downstream sample Crystal Sed-2 collected in January 2010. PFC concentrations in all sediment samples collected from Shingle Creek were below MPCA Tier 1 Soil Reference Values (SRVs). Although the Tier 1 SRVs are not necessarily applicable to sediments in Shingle Creek, they are presented here and in Table 2 for comparison purposes only.

Based on the relatively low concentrations of PFCs detected in sediment and surface water samples collected from Shingle Creek adjacent to Crystal Airport, no further sampling is recommended at this time.

2.2 Work Order SFDE1111

Antea Group performed the following scope of work under MPCA Work Order SFDE1111, dated October 20, 2010, based on results of the groundwater receptor survey and previous creek and wetland sampling at the Lake Superior College ERTC in Duluth:

1. An access agreement was implemented between the MPCA and Lake Superior College for additional PFC sampling of surface waters and sediments at the ERTC.

2. Access agreements were implemented between nearby well owners and the MPCA for PFC sampling of their water wells.
3. Surface water and sediment samples were collected at the ERTC from the wetland and the creek located adjacent to the ERTC fire training area for PFC analysis.
4. Water samples were collected from two of the (five) private water wells located within one-half mile of the ERTC for analysis of PFCs.
5. Sediment, surface water and well water samples were analyzed by a State-contracted laboratory for analysis of PFCs.
6. A report was prepared summarizing the work performed as part of the scope of work (the February 2010 Report).

2.2.1 Follow-up Sampling at Lake Superior College ERTC

Previous sampling in November 2009 of surface water and sediments from a wetland at the ERTC, as well as sampling of soil and creek sediment below the outfall for a 6-inch perforated pipe that runs beneath the fire training area identified PFC concentrations present in all of the media sampled (see **Tables 1 and 2**). A laboratory data table specific to samples collected at and in the vicinity of the ERTC is included in **Appendix H**. A Site Map showing sample locations at the ERTC is included in **Appendix H**. The concentrations of PFOA and PFOS detected in the surface water sample (ERTC SW-1) collected from the wetland were higher than the HRLs. Although the HRLs are not necessarily applicable to surface waters of the State, there was a concern that elevated concentrations of PFOA and PFOS could reach groundwater or a drinking water aquifer that is utilized by nearby water supply wells.

An access agreement between the MPCA and Lake Superior College was executed on November 8, 2010, allowing access for PFC sampling of a wetland and a creek at the ERTC. A copy of the access agreement is included in the February 2011 Report.

Sediment and surface water samples were collected by Antea Group on November 18, 2010, at or near the locations of previous sediment and surface water samples. Sample locations are shown on the Site Map included in Appendix H. In addition, a surface water sample was collected from the creek. Sediment and surface water samples collected from the wetland were labeled “ERTC Sed-3” and “ERTC SW-2”. The sediment and surface water samples collected from the creek were labeled “ERTC Sed-4” and “ERTC SW-3.” The samples were submitted to Axys Analytical Services for analysis of PFCs.

Laboratory analysis detected approximately similar PFC concentrations in ERTC Sed-4 as previous creek sediment sample ERTC Sed-1, and in ERTC Sed-3 as previous wetland sediment sample ERTC Sed-2 (see **Table 2**). PFC concentrations in all sediment samples, and soil sample ERTC SS-1 collected previously, were below MPCA Tier 1 SRVs. Although the Tier 1 SRVs are not necessarily applicable to soils and sediments at the ERTC, they are presented here and in Table 2 for comparison purposes only.

The PFC concentrations detected in wetland surface water sample SW-2 were lower than concentrations in the November 2009 wetland sample SW-1 (see **Table 1**). PFOS concentrations detected in both surface water samples SW-1 and SW-2 exceeded the HRL, with concentrations of 11,300 nanograms per liter (ng/L) and 7,640 ng/L, respectively. The PFOA concentration of 991 ng/L detected in the November 2009 SW-1 sample exceeded the HRL of 300 ng/L, but the PFOA concentration of 290 ng/L detected in SW-2 in November 2010 was below the HRL. The PFOS concentration of 7,630 ng/L detected in the creek surface water sample (ERTC-SW-3) also exceeded the HRL. Although the HRLs are not necessarily applicable to surface waters at the ERTC, they are presented here for comparison purposes only.

Details of and results for the follow-up sampling at Lake Superior College ERTC are presented in the February 2011 Report.

2.2.2 Well Sampling near Lake Superior College ERTC

The groundwater receptor survey conducted in September and October 2010 identified six residences within one-half mile of the ERTC that utilized drinking water from five private wells; two of the houses shared one well (see **Table 3**). The locations of the residences are shown on a map of the ERTC surrounding area included in **Appendix H**. The City of Duluth Public Works Department confirmed that the houses within the receptor survey area are not connected to the municipal water supply, but that a water main is available to one of the properties, at 11825 Highway 23.

Access agreements were sent to the owners of the identified residences with private wells, requesting access to their residences to collect water samples from private wells for analysis of PFCs. Three of the well owners provided access to the MPCA and Antea Group as their contractor to sample their wells. However, a sampling appointment for the residence at 11825 Highway 23 s was cancelled and was not rescheduled. Copies of the access agreements are included in the February 2011 Report.

On November 19, 2010, water samples were collected from private wells at two residences located within one-half mile of the Lake Superior College ERTC, at 10801 and 11601 Highway 23 in Duluth. The sample collected from the residence at 10801 Highway 23 was labeled “ERTC-10801,” and the sample collected at 11601 Highway 23 was labeled “ERTC-11601.” The samples were submitted to Axys Analytical Services for analysis of PFCs.

The only PFC compounds detected in the water well samples collected from the private water wells at 10801 and 11601 Highway 23 were PFOS and perfluorohexane sulfonate (PFHxS). The PFOS concentrations of 6.49 ng/L and 7.26 ng/L were below the HRL of 300 ng/L. The concentrations of PFHxS detected in the well water samples were 11.2 ng/L and 9.63 ng/L; the RAA for PFHxS does not include a numerical standard. All of the other PFC compounds were not detected above laboratory detection limits in either well water sample. Sample results are included on **Table 1**. Sample results were provided to the home owners.

Details of and results for the private well sampling associated with the Lake Superior College ERTC are presented in the February 2011 Report.

2.3 Work Order SFDE1113

Antea Group performed work under MPCA Work Order SFDE1113, dated November 30, 2010, based on results of the groundwater receptor surveys conducted in the vicinities of the firefighting training areas at the following locations: Marathon Refinery, Bemidji Regional Airport, and the ABLE Training Center. The scope of work performed under Work Order SFDE1113 included the following activities:

1. An access agreement was executed between the MPCA and the owner of the Hidden Harbor Marina to allow sampling of five water supply wells at the Marina for PFC analysis. Water samples were collected from these wells and submitted for laboratory analysis of PFCs.
2. An access agreement was executed between the MPCA and the City of Burnsville to allow surface water and sediment sampling for PFCs at the wetland or pond located on City property north of the ABLE Training Center. A surface water sample and a sediment sample were collected and submitted for laboratory analysis of PFCs.
3. A well receptor survey was conducted for the neighborhood located approximately 3/4-mile east of the Bemidji Regional Airport.
4. Access agreements were executed between the MPCA and select well owners in Bemidji for sampling of their water wells for PFCs. Water samples were collected from the select wells and submitted for laboratory analysis of PFCs.
5. A report was prepared summarizing the work performed as part of the scope of work (the May 2010 Report).

2.3.1 Sampling at the Hidden Harbor Marina

Sampling of select existing groundwater monitoring wells near and upgradient of the firefighting training area at the Marathon Refinery was conducted in August 2009. Laboratory analysis of five water samples plus one duplicate sample identified PFCs in all of the samples, including PFOS concentrations above the HRL. The laboratory analytical results are included in **Table 1**. Sampling at the Marathon Refinery is discussed in the February 2010 Report.

As discussed in **Section 2.1.1**, the groundwater receptor survey conducted in the vicinity of Marathon Refinery in October 2010 identified five water supply wells owned by the owner of the Hidden Harbor Marina, as follows:

- Unique Well No. 268354 at the marina workshop that is used for non-potable uses such as toilets and cleaning boats (labeled “Well A- Hidden Harbor” for sampling purposes).
- Unique Well No. 559256 at the marina that supplies water to the on-site restaurant and to marina boat customers (“Well B-Hidden Harbor”).
- A residential well located at the house associated with the marina. This house is currently being used as the shower house for marina customers. The unique well number for this well is unknown (“Well C-Hidden Harbor”).

- A residential well located at the house at 1001 Oak Street, just south of the marina. The unique well number for this well is unknown ("Well D-Hidden Harbor").
- Unique Well No. 429870 at the house at 115 10th Avenue West, just south of the marina ("Well E-Hidden Harbor").

Unique Well nos. 441942 and 576171 are likely associated with Well C and Well D, however, insufficient information was readily available to match up the physical wells with the unique well numbers. A figure showing the locations of the sampled wells at the Hidden Harbor Marina is included as **Appendix I**.

An access agreement between the MPCA and the owner of the Hidden Harbor Marina allowed for sampling of the above-identified wells. Water samples were collected from all five wells on March 3, 2011. The well samples were labeled as indicated above and submitted to Axys Analytical Services for analysis of PFCs.

Laboratory results for the well samples collected at the Hidden Harbor Marina are summarized on **Table 1**. Laboratory analysis detected low levels of perfluorinated carboxylic acids in three of the Hidden Harbor Marina well samples: the water well at the restaurant (Unique No. 559256/Well B), and the houses at 1001 Oak Street (Well D) and 115 10th Avenue West (Unique No. 429870/Well E). All detected PFC concentrations were below the HRL or other drinking water health-based values defined by the MDH (see **Table 1**). Sampling results were provided to the owner of the Hidden Harbor Marina.

The PFC compound that was detected above the HRL at the Marathon Refinery was PFOS, which is a perfluorinated sulfonate. No perfluorinated sulfonates were detected in any of the Hidden Harbor Marina well samples, only perfluorinated carboxylic acids were detected in the Hidden Harbor Marina well samples. Based on the different types of PFC compounds detected in the wells at the Marathon Refinery and the Hidden Harbor wells, the PFC impacts in groundwater at the Hidden Harbor Marina do not appear to be from the firefighting training area at the Marathon Refinery.

The City of St. Paul Park is included in an area of Washington County known to have low levels of PFC groundwater impacts associated with landfills where 3M wastes were historically dumped. Assessment and monitoring data associated with the 3M wastes in Washington County are available at the MPCA and MDH websites.

Details of and results of the Hidden Harbor Marina well sampling are presented in the May 2011 Report.

2.3.2 Sampling at Wetland Near the ABLE Training Center

Groundwater sampling was conducted at the ABLE Training Center in August 2009. A groundwater sample was collected from soil boring B-3. (Attempts to collect groundwater samples from borings B-1 and B-2 were unsuccessful.) Laboratory analysis of the groundwater sample (Burnsville B-3 GW 44.5 ft.) detected several PFCs in the sample, including PFOA and PFOS at concentrations above the HRL (see **Table 1**).

As discussed in **Section 2.1.1**, the groundwater receptor survey conducted in the vicinity of the ABLE Training Center did not identify any water supply wells except for the municipal wells already sampled by the MDH. A wetland or pond located across Cliff Road from the ABLE Training Center was identified as a potential receptor for storm water runoff. The wetland is on property owned by the City of Burnsville.

An access agreement executed between the MPCA and the City of Burnsville allowed for sampling of the surface water and sediment from the wetland for PFCs. A surface water sample (Burnsville Pond SW-1) and a sediment sample (Burnsville Pond Sed-1) were collected from the wetland on April 20, 2011. The sample locations are shown on a figure included as **Appendix J**. The well samples were submitted to Axys Analytical Services for analysis of PFCs.

The laboratory results for the surface water sample collected at the Burnsville wetland are included on **Table 1**. Low levels of perfluorinated carboxylic acids were detected in the surface water sample, at concentrations below the HRL or other drinking water health-based values defined by the MDH. The State drinking water criteria are not necessarily applicable to surface waters, but are discussed here for comparison purposes only. There are no surface water criteria for PFCs applicable to the sampled wetland in Burnsville. Details of the sampling from the Burnsville wetland, and laboratory results for the surface water sample only, are presented in the May 2011 Report; the laboratory results for the sediment sample were not available at the time of the May 2011 Report.

Laboratory results for the sediment sample collected from the Burnsville wetland were received after the May 2011 Report was finalized. Laboratory results are included in **Table 2**. Laboratory analysis detected relatively low concentrations of PFCs in the Burnsville Pond Sed-1 sample, at concentrations below the MPCA Tier 1 SRVs. Although the Tier 1 SRVs are not necessarily applicable to sediments at the wetland in Burnsville, they are presented here and in Table 2 for comparison purposes only.

The types of PFC compounds detected in soil and groundwater samples collected from soil borings at the ABLE Training Center are similar to those detected in the Burnsville Pond samples. The PFCs detected in the Burnsville pond/wetland may or may not be from the ABLE Training Center, as stormwater runoff entering the pond/wetland may be picking up PFCs from other potential sources in the area. An assessment of other potential PFC sources in the area was not completed as part of this project. Since the PFC concentrations in the Burnsville Pond samples were relatively low an assessment of other potential PFC sources in the area does not appear to be warranted at this time.

2.3.3 Expanded Well Survey and Sampling Near the Bemidji Regional Airport

Soil and groundwater sampling was conducted in November 2009 at the area in front of the fire station at the Bemidji Regional Airport, where the Bemidji Fire Department trains periodically with Class B AFFF. Soil and groundwater samples were collected from two soil borings, B-1 and B-2. Laboratory analysis of the groundwater samples identified several PFCs, including PFOS at concentrations above the HRL (see **Table 1**).

As discussed in Section 2.1.1, Antea Group conducted a groundwater receptor survey in October 2010 of the area located within one-half mile south and southeast of the training area at the Bemidji Airport. This initial receptor survey identified one active water supply well, the Kraus Anderson shop well. Information regarding the October 2010 receptor survey is presented in the November 2010 Report.

Other domestic water wells were known to exist outside the October 2010 receptor survey area. The MDH expressed some concern that shallow domestic wells located in a neighborhood between 3/4-mile and 1 mile east of the fire foam training area at the airport could potentially be impacted by the PFC groundwater impacts. Thus, a recommendation was made in the November 2010 Report to conduct a receptor survey in this area and sample a select number of wells identified in the survey.

Well survey letters were mailed to the owners of 33 properties in the neighborhood immediately east of the Bemidji Regional Airport in December 2010. Completed well surveys were returned by 17 well owners; the completed surveys identified 13 active wells in the neighborhood. A table summarizing all properties surveyed and survey responses received is included in **Appendix K**. A map showing the survey area is also included in **Appendix K**.

Of the thirteen active wells identified during the survey, six of the wells were selected for PFC sampling. The wells were selected so as to sample from varying depths and locations within the survey neighborhood. A seventh well, the well at the Kraus Anderson shop, was also selected for PFC sampling.

Access agreements between the MPCA and the selected seven well owners allowed for the sampling of their wells for PFCs. The wells were sampled on March 24, 2011, with the following exception: the well owner at 2120 Anne Street NW was not available on the day of sampling. The locations of the wells sampled are included on the map of the survey area included in **Appendix K**. A laboratory-supplied sample jar, nitrile sampling gloves, and cooler were left at 2120 Anne Street NW by Antea Group personnel on March 24, 2011. The property owner collected a sample from the well on March 29, 2011 and shipped the sample in the cooler provided to Antea Group. The well samples were labeled as follows:

- Bemidji 2021 Anne
- Bemidji 2326 Bardwell
- Bemidji 3481 Laurel
- Bemidji 2316 Bardwell
- Bemidji 2103 Anne
- Bemidji Kraus Anderson
- Bemidji 2120 Anne

Water samples were submitted to Axys Analytical Services for laboratory analysis of PFCs. Details of the sampling from the wells in Bemidji are presented in the May 2011 Report; the laboratory results for the water samples were not available at the time of the May 2011 Report.

Laboratory analysis of the well samples did not detect any PFCs in the following samples: Bemidji 2021 Anne, Bemidji 2326 Bardwell, Bemidji 3481 Laurel, and, Bemidji 2120 Anne. Low levels of PFBA were detected in the Bemidji 2316 Bardwell and Bemidji Kraus Anderson samples, at concentrations higher than PFBA levels detected in soil boring samples B-1 and B-2 collected at the airport. Low levels of PFHxS and PFOS were detected in the Bemidji 2103 Anne sample. All PFC concentrations detected were below the HRLs or HBVs. Laboratory results are included on **Table 1**.

The well at 2103 Anne Street NW is reportedly 55 feet deep; a search of the MDH CWI did not locate the well log. This is the only well sampled where PFOS was detected; PFOS is the PFC compound detected in groundwater above the HRL at the Bemidji Regional Airport borings. The wells at 2021 and 2120 Anne Street NW are located on adjoining properties to 2103 Anne Street NW and are both reportedly 30 feet deep; no PFCs were detected in either of these wells. The well at 2326 Bardwell Drive NW is reportedly 52 feet and is situated roughly between the firefighting training area at the Bemidji Regional Airport and the house at 2103 Anne Street NW and is of similar depth to the well at 2103 Anne Street NW; however, no PFCs were detected in the well sample collected at 2326 Bardwell Drive NW.

The data collected during this investigation is inconclusive in determining whether or not the PFCs detected in the wells at 2103 Anne Street NW, 2316 Bardwell Drive NW, and the Kraus Anderson shop are due to the discharge of Class B AFFF at the Bemidji Regional Airport.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 MSP Airport

No potential groundwater receptors were identified in the receptor survey area at MSP Airport. Antea Group recommends no further actions at this time with regards to PFCs in the soil and groundwater at the former fire training areas at MSP Airport.

3.2 Kandiyohi County Landfill

Three rounds of groundwater sampling have been collected from existing monitoring wells since the October 2009 fire at the Kandiyohi County Landfill. Laboratory analyses of the groundwater samples have detected similar concentrations of PFBA in DMW-3, which is presumably located downgradient of the site of the landfill fire. No other PFC compounds were detected in groundwater samples from DMW-3, and no PFCs have been detected in upgradient groundwater samples collected from DMW-1A.

At all of the firefighting foam training sites where groundwater was sampled as part of the PFC/Firefighting Foam investigation, foam training occurred either historically or over the course of several years time. There are no other sites besides the Kandiyohi County Landfill where groundwater was sampled so soon after the release of Class B AFFF, thus, there are no comparable sites to evaluate “breakthrough” data for PFC migration through soil and

groundwater to a monitoring point. The lack of significant concentrations of PFCs detected in groundwater at DMW-3 may be due to travel time associated with both the migration of PFC-containing Class B AFFF from the surface of the landfill where foam was discharged to the water table, and the transport of PFCs in groundwater to the location of DMW-3.

Antea Group recommends additional sampling of groundwater at DMW-1A and DMW-3 to continue monitoring for PFCs in groundwater associated with the October 2009 discharge of firefighting foam. If significant concentrations of PFCs are detected at DMW-3 in the future, sampling for PFCs at the private well located approximately 1/2-mile downgradient should be considered.

3.3 Crystal Airport

Based on the relatively low concentrations of PFCs detected in soil and groundwater samples collected at Crystal Airport and in sediment and surface water samples collected from Shingle Creek adjacent to Crystal Airport, no further sampling at Crystal Airport or Shingle Creek is recommended at this time.

3.4 Lake Superior College ERTC

Based on the sediment and water samples collecting during this assessment, the elevated levels of PFCs detected in the creek and wetland sediment and surface water samples at the ERTC do not appear to be impacting the nearby drinking water supply wells at or above drinking water standards. According to the former and current program supervisors at the ERTC, Class B AFFF is no long used in training. The former program supervisor interviewed as part of this PFC/Firefighting Foam investigation indicated Class B AFFF hadn't been used at the ERTC since approximately 1996. No further assessment of PFCs at the Lake Superior College ERTC is recommended at this time.

3.5 Marathon Refinery

Sampling results for the water well samples collected from the five wells at the Hidden Harbor Marina indicate concentrations of PFCs are below the State HRL or other drinking water health-based values defined by the MDH. Based on the type of PFC compounds detected in the wells at the Marathon Refinery and the Hidden Harbor wells, the PFC impacts in groundwater at the Hidden Harbor Marina do not appear to be from the firefighting training area at the Marathon Refinery. The Marathon Refinery's fire department switched from 3M Class B alcohol resistant (AR)-AFFF to Ansul-brand AR-AFFF in approximately 2000. Spent foam and water used at the fire training area at the refinery is routed via storm sewers to an on-site wastewater treatment plant. No further well sampling at Marathon Refinery or the Hidden Harbor Marina in association with the PFC/Firefighting Foam project is recommended at this time.

3.6 ABLE Training Center, Burnsville

Relatively low levels of PFCs were detected in the surface water and sediment samples collected from the pond or wetland located downgradient of the ABLE Training Center. According to fire department personnel from Apple Valley, Burnsville, Lakeville and Eagan interviewed during this PFC/Firefighting Foam investigation, Class B AFFF has

not been used at the ABLE Training Center since approximately 2004. No further sampling in association with PFCs identified at the ABLE Training Center in Burnsville is recommended at this time.

3.7 Bemidji Regional Airport

PFC concentrations detected in groundwater samples collected from nearby private wells were below the State HRL or other drinking water health-based values defined by the MDH. PFC concentrations detected in nearby municipal wells sampled by the MDH were also below the HRL or other drinking water health-based values. According to the training officer for the Bemidji Fire Department, they no longer train with Class B AFFF but use dish soap instead for training purposes. No further PFC sampling at the Bemidji Regional Airport or nearby wells appears warranted at this time.

3.8 Large Fire Sites

Sampling conducted as part of the MPCA's PFCs/Firefighting Foam investigation has identified PFCs in soil, groundwater, surface water and sediments at sites where significant quantities of Class B AFFF were discharged either repeatedly over time at a training site, or during a fire response. While the use of Class B AFFF is necessary and should be used to protect lives and property at a Class B fire, the release or migration of PFC-containing Class B AFFF to non-paved surfaces or surface water bodies will likely result in the release of PFCs to the environment. The release of PFC-containing Class B AFFF in or near environmentally sensitive areas such as Wellhead Protection Areas, areas with shallowly underlying karst bedrock, or lakes or streams may inadvertently provide an exposure pathway that may potentially impact human health via drinking water, direct exposure, or fish consumption. At large fire sites were significant quantities of Class B AFFF are discharged, the MPCA may want to assess the environmental setting, the presence of nearby surface waters, the presence of water supply wells in the area, and the potential risk posed to identified receptors. Water sample collection from private wells or surface water bodies for PFCs may be warranted dependent upon results of the assessment.

4.0 REMARKS

The recommendations contained in this report represent Antea Group's professional opinions based upon the currently available information and are arrived at in accordance with currently accepted professional standards. This report is based upon a specific scope of work requested by the client. The contract between Antea Group and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of Antea Group's client. Antea Group will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Antea Group makes no express or implied warranty as to the contents of this report.

Nancy Rodning
Project Geologist

Date: July 1, 2011

Reviewed by:

John Estes
Project Manager

Date: July 1, 2011

TABLES

TABLE 1
Groundwater and Surface Water PFC Analytical Results
Minnesota Fire Foam Training and Discharge Sites

			Perfluorobutanoic acid (PFBA)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorododecanoic acid (PFDoA)	Perfluorobutanoic sulfonate (PFBS)	Perfluorohexane sulfonate (PFHxS)	Perfluorooctane sulfonate (PFOS)	Perfluorooctane sulfonylamide (PFOSA)
#Perfluorinated Carbon Chains:			**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**4**	**6**	**8**	**8**
Health-Based Limits:			**7000**[1]	**ND**	**ND**	**ND**	**300**[2]	**ND**	**ND**	**ND**	**ND**	**7000**[1]	**RAA**[3]	**300**[2]	**ND**
Sample ID	**Date**	**Laboratory**													
Harmony B-1 GW	4/23/2009	Axys	**7.3**	**3.27**	**2.67**	< 2.49	**7**	< 2.49	< 2.49	< 2.49	< 2.49	< 4.98	< 4.98	**8.33**	< 2.49
Harmony B-2 GW	4/23/2009	Axys	**9.04**	**2.52**	< 2.46	< 2.46	**6.92**	< 2.46	< 2.46	< 2.46	< 2.46	< 4.92	< 4.92	**6.74**	< 2.46
No St Paul B-1 GW	5/6/2009	Axys	**137**	**13.3**	**13.2**	**8.83**	**13.8**	< 3.49	< 3.49	< 3.49	< 3.49	< 6.99	**14.1**	< 6.99	< 3.49
No St Paul B-2 GW	5/6/2009	Axys	**145**	**15.5**	**14.1**	**8.22**	**13.2**	< 2.50	< 2.50	< 2.50	< 2.50	< 5.01	**14.8**	< 5.01	< 2.50
Richfield B-1 GW	5/7/2009	Axys	**1070**	**3470**	**3500**	**819**	**50.3**	< 18.8	< 18.8	< 18.8	< 18.8	**737**	**76.2**	< 37.7	< 18.8
Richfield B-2 GW	5/7/2009	Axys	**1240**	**4890**	**4170**	**1920**	**1330**	< 91.4	< 91.4	< 91.4	< 91.4	< 183	< 183	< 183	< 91.4
Richfield B-3 GW	5/7/2009	Axys	**201**	**331**	**888**	**217**	**458**	< 66.7	< 66.7	< 66.7	< 66.7	**293**	**689**	< 133	< 66.7
Legion Lake SW-1	8/27/2009	Axys	**4.02**	<7.21	< 2.51	**3.55**	**5.69**	**3.63**	**3.92**	< 2.51	< 2.51	< 5.02	< 5.02	**13.2**	< 2.51
*Richfield B-4 GW 29 ft.	10/8/2009	Axys	**228**	**10.3**	**10.3**	**5.43**	**38.7**	< 2.48	< 2.48	< 2.48	< 2.48	< 4.96	**71.4**	< 4.96	< 2.48
Luverne B-1 GW 8 ft.	5/22/2009	Axys	< 2.53	< 2.53	< 2.53	< 2.53	< 2.53	< 2.53	< 2.53	< 2.53	< 2.53	< 5.05	**18.1**	< 5.05	< 2.53
Luverne B-1 GW 8 ft.	5/22/2009	MPI	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0[4]	<25.0	<25.0
Luverne B-2 GW 12 ft.	5/22/2009	Axys	< 2.55	< 2.55	**3.78**	< 2.55	**2.73**	< 2.55	< 2.55	< 2.55	< 2.55	< 5.10	**22.8**	**18.4**	< 2.55
Luverne B-2 GW 12 ft.	5/22/2009	MPI	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	**25.1**	<25.0[6]	<25.0
Luverne B-3 GW 12 ft.	5/22/2009	Axys	< 2.53	**3.99**	**11.3**	< 2.53	**3.39**	< 2.53	< 2.53	< 2.53	< 2.53	< 5.07	**21.4**	**20.1**	< 2.53
Luverne B-3 GW 12 ft.	5/22/2009	MPI	<25.0	<25.0	<25.0[5]	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0	**28.8**	<25.0[7]	<25.0
Fridley B-1 GW	5/27/2009	Axys	**37.6**	**34**	**27.1**	**23.2**	**32.7**	< 4.27	< 4.27	< 4.27	< 4.27	**15.2**	**98.9**	**21.9**	< 4.27
Fridley B-2 GW	5/27/2009	Axys	**88.3**	**97.2**	**166**	**59.5**	**86.8**	< 5.39	< 5.39	< 5.39	< 5.39	**182**	**1330**	**35**	< 5.39
MSP Airport B-1 GW	5/29/2009	Axys	**279**	**909**	**1640**	**317**	**988**	**42**	< 41.2	< 41.2	< 41.2	**332**	**3090**	< 82.5	< 41.2
MSP Airport B-2 GW	5/29/2009	Axys	**190**	**507**	**817**	**198**	**958**	< 48.8	< 48.8	< 48.8	< 48.8	**286**	**2920**	< 97.6	< 48.8
MSP Airport B-3 GW	5/29/2009	Axys	**151**	**148**	**477**	< 135	**12000**	< 135	< 135	< 135	< 135	< 269	**21200**	**281**	< 135
MSP Airport B-4 GW	5/29/2009	Axys	< 1250	< 1250	**3140**	**5830**	**286000**	< 1250	< 1250	< 1250	< 1250	< 2500	**145000**	< 2500	< 1250
*MSP Airport B-5 GW	1/19/2010	Axys	**103**	**81.3**	**168**	**17.5**	**7.29**	< 2.63	< 2.63	< 2.63	< 2.63	160	110	< 5.26	< 2.63
*MSP Airport B-6 GW	1/19/2010	Axys	**58.6**	**60.4**	**187**	**44.6**	**11.2**	< 2.55	< 2.55	< 2.55	< 2.55	**64.1**	**204**	**11**	< 2.55
*MSP Airport B-7 GW	1/19/2010	Axys	**130**	**233**	**114**	< 2.53	**3.77**	< 2.53	< 2.53	< 2.53	< 2.53	**7.77**	< 5.05	< 5.05	< 2.53
CWN-14A GW	1/19/2010	Axys	**40.9**	**32.3**	**42.2**	**17.8**	**19.1**	< 2.54	< 2.54	< 2.54	< 2.54	< 5.07	**19.3**	**15.6**	< 2.54
CWN-15A GW	1/19/2010	Axys	**72**	**15.3**	**20.2**	**7.27**	**56.9**	< 2.75	< 2.75	< 2.75	< 2.75	**9.45**	**202**	< 5.50	< 2.75
Signature MW-2 GW	1/19/2010	Axys	**83.7**	**96.8**	**162**	**69.7**	**79.5**	< 6.57	< 5.40	< 5.40	< 5.40	**151**	**1780**	**953**	< 5.40

TABLE 1
Groundwater and Surface Water PFC Analytical Results
Minnesota Fire Foam Training and Discharge Sites

			Perfluorobutanoic acid (PFBA)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorododecanoic acid (PFDoA)	Perfluorobutanoic sulfonate (PFBS)	Perfluorohexane sulfonate (PFHxS)	Perfluorooctane sulfonate (PFOS)	Perfluorooctane sulfonylamide (PFOSA)
#Perfluorinated Carbon Chains:			**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**4**	**6**	**8**	**8**
Health-Based Limits:			**7000[1]**	**ND**	**ND**	**ND**	**300[2]**	**ND**	**ND**	**ND**	**ND**	**7000[1]**	**RAA[3]**	**300[2]**	**ND**
Sample ID	**Date**	**Laboratory**													
MSP SW-1	1/19/2010	Axys	**46.8**	**46**	**82.1**	**24.6**	**50.1**	**13.4**	**13.9**	< 2.46	< 2.46	**46.5**	**184**	**39**	< 2.46
Marathon MW-101	8/20/2009	MPI	**183**	**403**	**150**	**12.4**	**36.7**	<2.5	<2.5	<2.5	<2.5	**479**	**3710**	**93.2**	<2.5
*Marathon MW-912	8/20/2009	MPI	**462**	**298**	**51.5**	**21.8**	**17.5**	<2.5	<2.5	<2.5	<2.5	**37.0**	**1580**	**731**	<2.5
Marathon SP-11	8/20/2009	MPI	**182**	**458**	**171**	**52.2**	**35.6**	**20.7**	<2.5	<2.5	<2.5	**369**	**4910**	**5770**	<2.5
Marathon MW-172	8/20/2009	MPI	**59.8**	**245**	**154**	**25.1**	**15.5**	**11.4**	<2.5	<2.5	<2.5	**49.0**	**1220**	**1330**	<2.5
Marathon MW-156	8/20/2009	MPI	**220**	**1730**	**527**	**200**	**73.1**	**26.9**	<2.5	**2.58**	<2.5	**462**	**10500**	**14900**	<2.5
Marathon MW-156 Dupl.	8/20/2009	MPI	**221**	**1660**	**534**	**184**	**81.4**	**23.7**	<2.5	**2.93**	<2.5	**502**	**8930**	**11700**	**2.62**
Well A - Hidden Harbor	3/3/2011	Axys	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 5.02	< 5.02	< 5.02	< 2.51
Well B - Hidden Harbor	3/3/2011	Axys	**94.3**	**3.11**	< 2.49	< 2.49	< 2.49	< 2.49	< 2.49	< 2.49	< 2.49	< 4.98	< 4.98	< 4.98	< 2.49
Well C - Hidden Harbor	3/3/2011	Axys	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 5.03	< 5.03	< 5.03	< 2.51
Well D - Hidden Harbor	3/3/2011	Axys	**965**	**67.5**	**34.4**	< 11.8	**61.5**	< 11.8	< 11.8	< 11.8	< 11.8	< 23.5	< 23.5	< 23.5	< 11.8
Well E - Hidden Harbor	3/3/2011	Axys	**542**	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 33.1	< 33.1	< 33.1	< 16.5
Burnsville B-3 GW 44.5 ft.	8/27/2009	Axys	**146**	**422**	**281**	**447**	**1260**	**81.7**	**17.8**	< 2.52	< 2.52	**12.8**	**279**	**522**	< 2.52
Burnsville Pond SW-1	4/20/2011	Axys	**10.8**	< 2.55	< 2.55	**2.82**	**4.16**	< 2.55	< 2.55	< 2.55	< 2.55	< 5.10	< 5.10	< 5.10	< 2.55
Goodview SW-1	10/19/2009	Axys	< 2.53	< 2.53	**4.78**	< 2.53	**4.49**	**2.56**	**2.82**	< 2.53	< 2.53	< 5.06	< 5.06	**8.19**	< 2.53
Bemidji B-1 GW 15 ft.	11/5/2009	Axys	**4.14**	**3.85**	**14.5**	**3.75**	**49**	< 2.50	< 2.50	< 2.50	< 2.50	**19.1**	**227**	**483**	< 2.50
Bemidji B-2 GW 15 ft.	11/5/2009	Axys	**21.1**	**55.5**	**340**	**33.8**	**200**	< 12.2	< 12.2	< 12.2	< 12.2	**129**	**1490**	**789**	< 12.2
Bemidji 2021 Anne	3/24/2011	Axys	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 4.99	< 4.99	< 4.99	< 2.50
Bemidji 2326 Bardwell	3/24/2011	Axys	< 2.46	< 2.46	< 2.46	< 2.46	< 2.46	< 2.46	< 2.46	< 2.46	< 2.46	< 4.91	< 4.91	< 4.91	< 2.46
Bemidji 3481 Laurel	3/24/2011	Axys	< 2.52	< 2.52	< 2.52	< 2.52	< 2.52	< 2.52	< 2.52	< 2.52	< 2.52	< 5.05	< 5.05	< 5.05	< 2.52
Bemidji 2316 Bardwell	3/24/2011	Axys	**5.04**	< 2.56	< 2.56	< 2.56	< 2.56	< 2.56	< 2.56	< 2.56	< 2.56	< 5.12	< 5.12	< 5.12	< 2.56
Bemidji 2103 Anne	3/24/2011	Axys	< 2.48	< 2.48	< 2.48	< 2.48	< 2.48	< 2.48	< 2.48	< 2.48	< 2.48	< 4.96	**6.52**	**5.76**	< 2.48
Bemidji Kraus Anderson	3/24/2011	Axys	**6.68**	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 5.02	< 5.02	< 5.02	< 2.51
Bemidji 2120 Anne	3/29/2011	Axys	< 2.48	< 2.48	< 2.48	< 2.48	< 2.48	< 2.48	< 2.48	< 2.48	< 2.48	< 4.97	< 4.97	< 4.97	< 2.48
River Grove SW-1	11/18/2009	MPI	**3.54**	<2.5	<2.5	<2.5	**2.79**	<2.5	<2.5	<2.5	<2.5	**4.00**	<2.5	<2.5	<2.5
*River Grove SW-2	11/18/2009	MPI	**4.23**	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	**3.43**	<2.5	<2.5	<2.5

TABLE 1
Groundwater and Surface Water PFC Analytical Results
Minnesota Fire Foam Training and Discharge Sites

			Perfluorobutanoic acid (PFBA)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorododecanoic acid (PFDoA)	Perfluorobutanoic sulfonate (PFBS)	Perfluorohexane sulfonate (PFHxS)	Perfluorooctane sulfonate (PFOS)	Perfluorooctane sulfonylamide (PFOSA)
#Perfluorinated Carbon Chains:			**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**4**	**6**	**8**	**8**
Health-Based Limits:			**7000[1]**	**ND**	**ND**	**ND**	**300[2]**	**ND**	**ND**	**ND**	**ND**	**7000[1]**	**RAA[3]**	**300[2]**	**ND**
Sample ID	**Date**	**Laboratory**													
ERTC SW-1	11/25/2009	Axys	**257**	**537**	**1790**	**348**	**991**	**31.8**	**3.45**	< 2.51	< 2.51	**1870**	**9390**	**11300**	**360**
ERTC SW-2	11/18/2010	Axys	**76.8**	**144**	**476**	**66.2**	**290**	**22.4**	< 2.49	< 2.49	< 2.49	**315**	**2630**	**7640[1]**	**134[1]**
ERTC SW-3	11/18/2010	Axys	**35**	**62.8**	**366**	**39.5**	**234**	**5.62**	< 2.49	< 2.49	< 2.49	**135**	**1510**	**7630**	**385**
ERTC-10801	11/29/2010	Axys	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 5.00	**11.2**	**6.49**	< 2.50
ERTC-11601	11/29/2010	Axys	< 2.47	< 2.47	< 2.47	< 2.47	< 2.47	< 2.47	< 2.47	< 2.47	< 2.47	< 4.95	**9.63**	**7.26**	< 2.47
Kandiyohi DMW-1A	1/12/2010	Axys	< 2.43	< 2.43	< 2.43	< 2.43	< 2.43	< 2.43	< 2.43	< 2.43	< 2.43	< 4.87	< 4.87	< 4.87	< 2.43
Kandiyohi DMW-3	1/12/2010	Axys	**6.1**	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 2.51	< 5.01	< 5.01	< 5.01	< 2.51
Kandiyohi DMW-1A	5/4/2010	Axys	< 2.49	< 2.49	< 2.49	< 2.49	< 2.49	< 2.49	< 2.49	< 2.49	< 2.49	< 4.99	< 4.99	< 4.99	< 2.49
Kandiyohi DMW-3	5/4/2010	Axys	**11**	< 2.49	< 2.49	< 2.49	< 2.49	< 2.49	< 2.49	< 2.49	< 2.49	< 4.98	< 4.98	< 4.98	< 2.49
Kandiyohi DMW-1A	8/12/2010	Axys	< 2.54	< 2.54	< 2.54	< 2.54	< 2.54	< 2.54	< 2.54	< 2.54	< 2.54	< 5.09	< 5.09	< 5.09	< 2.54
Kandiyohi DMW-3	8/12/2010	Axys	**7.61**	< 2.48	< 2.48	< 2.48	< 2.48	< 2.48	< 2.48	< 2.48	< 2.48	< 4.95	< 4.95	< 4.95	< 2.48
Crystal B-1 GW 5.5 ft.	1/20/2010	Axys	**16.2**	< 2.56	< 2.56	< 2.56	< 2.56	< 2.56	< 2.56	< 2.56	< 2.56	< 5.12	< 5.12	< 5.12	< 2.56
Crystal B-2 GW 6 ft.	1/20/2010	Axys	**37.3**	< 2.50	< 2.50	< 2.50	**2.65**	< 2.50	< 2.50	< 2.50	< 2.50	< 5.01	< 5.01	**5.27**	< 2.50
Crystal SW-1	10/1/2010	Axys	**35.7**	**5.54**	**5.62**	**3.31**	**6.28**	< 2.48	< 2.48	< 2.48	< 2.48	< 4.97	< 4.97	**8.18**	< 2.48
Crystal SW-2	10/1/2010	Axys	**25.4**	**4.58**	**4.91**	< 2.58	**5.95**	< 2.58	< 2.58	< 2.58	< 2.58	< 5.16	< 5.16	< 5.16	< 2.58
*FHR Pine Bend MW-1	1/21/2010	Axys	**179**	**12.5**	**10.1**	< 2.45	**4.63**	< 2.45	< 2.45	< 2.45	< 2.45	**8.67**	**25.9**	**28.5**	< 2.45
FHR Pine Bend MW-3	1/21/2010	Axys	**310**	**136**	**251**	**43.7**	**49.1**	< 2.48	< 2.48	< 2.48	< 2.48	**181**	**516**	**245**	< 2.48
FHR Pine Bend MW-111	1/21/2010	Axys	**156**	**7.58**	**3.62**	< 2.42	**3.92**	< 2.42	< 2.42	< 2.42	< 2.42	< 4.84	< 4.84	< 4.84	< 2.42
Kings Cove Marina SW-1	12/3/2009	MPI	**180**	**10.2**	**9.87**	**3.41**	**25.8**	< 2.5	< 2.5	< 2.5	< 2.5	**17.5**	**17.8**	**13.7**	< 2.5
Kings Cove Marina Dup (SW-1)	12/3/2009	MPI	**177**	**10.0**	**8.83**	**2.95**	**22.9**	< 2.5	< 2.5	< 2.5	< 2.5	**18.7**	**17.9**	**13.4**	<2.5
Kings Cove Marina SW-2	12/3/2009	MPI	**170**	**9.93**	**10.5**	**3.05**	**25.4**	< 2.5	< 2.5	< 2.5	< 2.5	**16.8**	**19.1**	**16.2**	< 2.5
Duluth Intl. Airport GWS-1	10/2007	Axys	**2310**	**7160**	**13000**	**1340**	**4800**	< 45.7	< 45.7	< 45.7	< 45.7	**2000**	**626**	< 91.3	< 45.7
Duluth Intl. Airport GWS-2	10/2007	Axys	**482**	**1090**	**3590**	**534**	**4640**	**13.1**	< 12.4	< 12.4	< 12.4	**913**	**3440**	< 24.8	< 12.4
Duluth Intl. Airport Dup (GWS-2)	10/2007	Axys	**496**	**1250**	**4370**	**522**	**4250**	< 12.6	< 12.6	< 12.6	< 12.6	**953**	**3320**	< 25.2	< 12.6
Duluth Intl. Airport GWS-3	10/2007	Axys	**1900**	**6940**	**10800**	**1760**	**6790**	**88.5**	< 43.6	< 43.6	< 43.6	**2020**	**1690**	**98.8**	< 43.6
Duluth Intl. Airport GWS-4	10/2007	Axys	**1110**	**4780**	**11500**	**2000**	**8780**	< 31.9	< 31.9	< 31.9	< 31.9	**1630**	**4070**	< 63.8	< 31.9
Duluth Intl. Airport GWS-5	10/2007	Axys	**6.25**	**1.66**	**3.06**	**1.96**	**6.18**	< 0.991	< 0.991	< 0.991	< 0.991	**2.87**	**33.5**	**3.41**	< 0.991

TABLE 1
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Minnesota Fire Foam Training and Discharge Sites

			Perfluorobutanoic acid (PFBA)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorododecanoic acid (PFDoA)	Perfluorobutanoic sulfonate (PFBS)	Perfluorohexane sulfonate (PFHxS)	Perfluorooctane sulfonate (PFOS)	Perfluorooctane sulfonylamide (PFOSA)
#Perfluorinated Carbon Chains:			**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**4**	**6**	**8**	**8**
Health-Based Limits:			**7000(1)**	**ND**	**ND**	**ND**	**300(2)**	**ND**	**ND**	**ND**	**ND**	**7000(1)**	**RAA(3)**	**300(2)**	**ND**
Sample ID	**Date**	**Laboratory**													
Duluth Intl. Airport GWS-6	10/2007	Axys	**694**	**1750**	**2750**	**497**	**1500**	**14.8**	< 10.3	< 10.3	< 10.3	**776**	**1880**	< 20.6	< 10.3
WAFTA BG-2	5/11/2006	MDH	< 1000	< 1000	< 1000	NA	**1000**	NA	NA	NA	NA	< 500	**200(J)**	< 500	NA
WAFTA BG-4	5/11/2006	MDH	**800(J)**	**3200**	**2300**	NA	**2100**	NA	NA	NA	NA	< 500	**2100**	**2200**	NA
WAFTA MW-1	5/11/2006	MDH	< 1000	< 1000	**300(J)**	NA	**7400**	NA	NA	NA	NA	< 500	**200(J)**	< 500	NA
WAFTA MW-2	5/11/2006	MDH	**2400**	**8900**	**7800**	NA	**7900**	NA	NA	NA	NA	**600**	**9900**	**9500**	NA
WAFTA MW-3	5/10/2006	MDH	< 1000	< 1000	**300(J)**	NA	< 1000	NA	NA	NA	NA	**200(J)**	**5100**	**22000**	NA
WAFTA MW-4	5/10/2006	MDH	**9900**	**42000**	**30000**	NA	**43000**	NA	NA	NA	NA	**1500**	**42000**	**118000**	NA
WAFTA MW-4	5/10/2006	Exygen	**14100**	**66300**	**43600**	NA	**41100**	NA	NA	NA	NA	**1820**	**43800**	**114000**	NA
WAFTA MW-5	5/10/2006	MDH	< 1000	**200(J)**	**300(J)**	NA	**700(J)**	NA	NA	NA	NA	< 500	**700**	**2100**	NA
WAFTA MW-5	5/10/2006	Exygen	< 1000	< 1000	< 1000	NA	< 1000	NA	NA	NA	NA	< 1000	< 1000	**1460**	NA
WAFTA MW-7	5/11/2006	MDH	**1200**	**3800**	**3400**	NA	**1000**	NA	NA	NA	NA	**200(J)**	**2300**	**3900**	NA
WAFTA MW-8	5/10/2006	MDH	**90(J)**	**400(J)**	**300(J)**	NA	**100(J)**	NA	NA	NA	NA	< 500	< 500	**1300**	NA
WAFTA MW-8	5/10/2006	Exygen	< 1000	< 1000	< 1000	NA	< 1000	NA	NA	NA	NA	< 1000	< 1000	< 1000	NA
WAFTA MW-9	5/11/2006	MDH	< 1000	< 1000	< 1000	NA	< 1000	NA	NA	NA	NA	< 500	< 500	< 500	NA
WAFTA MW-10	5/10/2006	MDH	**700(J)**	**2000**	**2000**	NA	**2300**	NA	NA	NA	NA	**500**	**12000**	**27000**	NA
WAFTA MW-10	5/10/2006	Exygen	< 1000	**3350**	**3320**	NA	**2270**	NA	NA	NA	NA	< 1000	**11600**	**18400**	NA
WAFTA MW-11	5/10/2006	MDH	< 1000	< 1000	< 1000	NA	< 1000	NA	NA	NA	NA	< 500	< 500	< 500	NA
WAFTA MW-11	5/10/2006	Exygen	< 1000	< 1000	< 1000	NA	< 1000	NA	NA	NA	NA	< 1000	< 1000	< 1000	NA
WAFTA MW-12	5/11/2006	MDH	< 1000	< 1000	< 1000	NA	< 1000	NA	NA	NA	NA	< 500	< 500	< 500	NA
WAFTA MW-13	5/10/2006	MDH	< 1000	< 1000	< 1000	NA	< 1000	NA	NA	NA	NA	< 500	**300(J)**	< 500	NA
Up North Plastics SW-1	7/16/2009	Axys	**1230**	**64.3**	**34.5**	**12**	**242**	< 2.52	< 2.52	< 2.52	< 2.52	**20.7**	**32.4**	< 5.04	< 2.52
Up North Plastics SW-2	7/16/2009	Axys	**436**	**36.1**	**26.9**	**9.43**	**78.3**	**3.37**	< 2.53	< 2.53	< 2.53	**9.42**	**7.4**	< 5.06	< 2.53
Up North Plastics SW Dup	7/16/2009	Axys	**572**	**39.4**	**28.1**	**9.92**	**87.5**	< 2.50	< 2.50	< 2.50	< 2.50	**10.3**	**10.8**	**7.64**	< 2.50
Up North Plastics Zywiec Irrigation Well 1	7/29/2009	MDH	**1242.3**	**51.4**	0	NA	0	NA	NA	NA	NA	0	0	0	NA
Up North Plastics Zywiec Irrigation Well 2	7/29/2009	MDH	**447**	0	0	NA	0	NA	NA	NA	NA	0	0	0	NA
Up North Plastics Zywiec Irrigation Well 3	7/29/2009	MDH	**2133.6**	**106.2**	**61**	NA	**55**	NA	NA	NA	NA	0	0	0	NA

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Minnesota Fire Foam Training and Discharge Sites

			Perfluorobutanoic acid (PFBA)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorododecanoic acid (PFDoA)	Perfluorobutanoic sulfonate (PFBS)	Perfluorohexane sulfonate (PFHxS)	Perfluorooctane sulfonate (PFOS)	Perfluorooctane sulfonylamide (PFOSA)
#Perfluorinated Carbon Chains:			**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**4**	**6**	**8**	**8**
Health-Based Limits:			**7000(1)**	**ND**	**ND**	**ND**	**300(2)**	**ND**	**ND**	**ND**	**ND**	**7000(1)**	**RAA(3)**	**300(2)**	**ND**
Sample ID	**Date**	**Laboratory**													
Up North Plastics Smallidge	7/29/2009	MDH	**1046.3**	**51.6**	0	NA	**53.3**	NA	NA	NA	NA	0	0	0	NA

Notes:
All results and standards are in nanograms per liter (ng/L), which is equivalent to parts per trillion.
Axys: Axys Analytical Services LTD
MPI: MPI Research
MDH: Minnesota Department of Health Environmental Laboratory.
Exygen: Exygen Research
Bolded type indicates detection above the laboratory method detection limit.
Highlighted concentrations exceed the Health-Based Limit.
(1) Health-Based Value (HBV) for chronic exposure defined by the Minnesota Department of Health.
(2) Health Risk Limit (HRL) for drinking water defined by the Minnesota Department of Health.
(3) Risk Assessment Advice (RAA) set by the Minnesota Department of Health for PFHxS does not specify numeric values.
ND: No health-based limit defined.
(4) Manually Calculated Result is 18.9
(5) Manually Calculated Result is 17.1
(6) Manually Calculated Result is 23.3
(7) Manually Calculated Result is 21.7
(J) Analyte positively identified, result is below reporting limit and is estimated.
*Sample collected upgradient of fire foam training or discharge area, intended to act as "background" sample.
NA: Not analyzed

TABLE 2
Soil and Sediment Analytical Results, PFCs and TOC
Minnesota Fire Foam Training and Discharge Sites

				Perfluorobutanoic acid (PFBA)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorododecanoic acid (PFDoA)	Perfluorobutanoic sulfonate (PFBS)	Perfluorohexane sulfonate (PFHxS)	Perflourooctane sulfonate (PFOS)	Perfluorooctane sulfonylamide (PFOSA)	Mean Total Organic Carbon (TOC)
#Perfluorinated Carbon Chains:				**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**4**	**6**	**8**	**8**	**-**
Tier 1 Residential SRV:				**77000**	**ND**	**ND**	**ND**	**2100**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**2100**	**ND**	**ND**
Tier 2 Recreational SRV:				**94000**	**ND**	**ND**	**ND**	**2500**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**2600**	**ND**	**ND**
Tier 2 Industrial SRV:				**500000**	**ND**	**ND**	**ND**	**13000**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**14000**	**ND**	**ND**
Sample ID	**Sample Depth**	**Sample Date**	**Laboratory**														
Harmony B-1 SL 0-4'	0-4 ft.	4/23/2009	Axys	< 0.0955	< 0.0955	< 0.0955	< 0.0955	< 0.0955	< 0.0955	< 0.0955	< 0.0955	< 0.0955	< 0.191	< 0.191	< 0.191	< 0.0955	3230
Harmony B-1 SL 4-8'	4-8 ft.	4/23/2009	Axys	< 0.101	< 0.101	< 0.101	< 0.101	< 0.101	< 0.101	< 0.101	< 0.101	< 0.101	< 0.201	< 0.201	< 0.201	< 0.101	1720
Harmony B-2 SL 0-4'	0-4 ft.	4/23/2009	Axys	< 0.0947	< 0.0947	< 0.0947	< 0.0947	< 0.0947	< 0.0947	< 0.0947	< 0.0947	< 0.0947	< 0.189	< 0.189	< 0.189	< 0.0947	6150
Harmony B-2 SL 4-8'	4-8 ft.	4/23/2009	Axys	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.192	< 0.192	< 0.192	< 0.0962	1260
Harmony B-3 SL 0-4'	0-4 ft.	4/23/2009	Axys	< 0.0977	**0.2**	< 0.0977	**0.161**	< 0.0977	**0.125**	< 0.0977	< 0.0977	< 0.0977	< 0.195	< 0.195	< 0.195	< 0.0977	2380
Harmony B-3 SL 4-8'	4-8 ft.	4/23/2009	Axys	< 0.0950	< 0.0950	< 0.0950	< 0.0950	< 0.0950	< 0.0950	< 0.0950	< 0.0950	< 0.0950	< 0.190	< 0.190	< 0.190	< 0.0950	1770
Harmony B-4 SL 0-4'	0-4 ft.	4/23/2009	Axys	< 0.0989	**0.253**	**0.133**	**0.15**	< 0.0989	< 0.0989	< 0.0989	< 0.0989	< 0.0989	< 0.198	< 0.198	< 0.198	< 0.0989	2380
Harmony B-4 SL 4-8'	4-8 ft.	4/23/2009	Axys	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200	< 0.200	< 0.200	< 0.100	1500
Burnsville B-1 SL 0-4'	0-4 ft.	4/24/2009	Axys	**1.73**	**5.32**	**3.27**	**6.72**	**11.4**	**10.2**	**4.37**	**0.537**	**0.542**	< 0.192	**2.63**	**102**	< 0.0962	21700
Burnsville B-1 SL 4-8'	4-8 ft.	4/24/2009	Axys	**0.132**	**1.54**	**1.77**	**8.46**	**14.8**	< 0.0956	< 0.0956	< 0.0956	< 0.0956	< 0.191	**11**	**1.62**	< 0.0956	2240
Burnsville B-2 SL 0-4'	0-4 ft.	4/24/2009	Axys	**0.796**	**3.08**	**1.69**	**1.05**	**5.78**	**7.92**	< 0.0992	< 0.0992	< 0.0992	< 0.198	< 0.198	**2.8**	< 0.0992	22300
Burnsville B-2 SL 4-8'	4-8 ft.	4/24/2009	Axys	**1.83**	**4.81**	**3.97**	**4.14**	**0.355**	< 0.0985	< 0.0985	< 0.0985	< 0.0985	< 0.197	**1.2**	< 0.197	< 0.0985	12400
Burnsville Pond Sed-1	0-6 in.	4/20/2011	Axys	< 0.0986	< 0.0986	< 0.0986	< 0.0986	< 0.0986	< 0.0986	**0.168**	**0.371**	**0.787**	< 0.197	< 0.197	**0.87**	**0.122**	NA
No St Paul B-1 SL 0-4'	0-4 ft.	5/6/2009	Axys	< 0.0926	< 0.0926	< 0.0926	< 0.0926	< 0.0926	< 0.0926	< 0.0926	< 0.0926	< 0.0926	< 0.185	< 0.185	< 0.185	< 0.0926	19600
No St Paul B-1 SL 4-8'	4-8 ft.	5/6/2009	Axys	< 0.0998	< 0.0998	< 0.0998	< 0.0998	< 0.0998	< 0.0998	< 0.0998	< 0.0998	< 0.0998	< 0.200	< 0.200	< 0.200	< 0.0998	624
No St Paul B-2 SL 0-4'	0-4 ft.	5/6/2009	Axys	< 0.0954	< 0.0954	< 0.0954	< 0.0954	< 0.0954	< 0.0954	< 0.0954	< 0.0954	< 0.0954	< 0.191	< 0.191	< 0.191	< 0.0954	27400
No St Paul B-2 SL 4-8'	4-8 ft.	5/6/2009	Axys	< 0.0978	< 0.0978	< 0.0978	< 0.0978	< 0.0978	< 0.0978	< 0.0978	< 0.0978	< 0.0978	< 0.196	< 0.196	< 0.196	< 0.0978	796
No St Paul B-3 SL 0-2'	0-2 ft.	5/6/2009	Axys	< 0.0972	< 0.0972	< 0.0972	< 0.0972	**0.107**	< 0.0972	< 0.0972	< 0.0972	< 0.0972	< 0.194	< 0.194	**0.623**	< 0.0972	12700
Richfield B-1 0-4'	0-4 ft.	5/7/2009	Axys	< 0.0932	**0.226**	**0.191**	**0.433**	**1.36**	**1.44**	**0.095**	< 0.0932	< 0.0932	< 0.186	**1.26**	**104**	**0.21**	2170
Richfield B-1 4-8'	4-8 ft.	5/7/2009	Axys	**0.322**	**1.43**	**0.905**	**0.592**	**1.11**	**1.89**	< 0.0966	< 0.0966	< 0.0966	< 0.193	**1.44**	**102**	< 0.0966	355
Richfield B-2 0-4'	0-4 ft.	5/7/2009	Axys	**0.464**	**1.33**	**1.07**	**0.85**	**2.32**	**5.03**	**0.306**	< 0.186	< 0.186	< 0.373	**13**	**401**	**0.47**	8370
Richfield B-2 4-8'	4-8 ft.	5/7/2009	Axys	**1.04**	**4.52**	**4.7**	**3.28**	**5.02**	**4.83**	< 0.379	< 0.379	< 0.379	< 0.757	**32.2**	**666**	< 0.379	6100
Richfield B-3 0-4'	0-4 ft.	5/7/2009	Axys	< 0.0942	< 0.0942	**0.314**	**0.309**	**1.49**	< 0.0942	< 0.0942	< 0.0942	< 0.0942	< 0.188	**21.9**	**56.4**	< 0.0942	13100
Richfield B-3 4-8'	4-8 ft.	5/7/2009	Axys	**0.173**	**0.439**	**1.02**	**0.283**	**0.336**	< 0.104	< 0.104	< 0.104	< 0.104	**0.57**	**2.35**	**9.33**	< 0.104	36900
Richfield B-4 0-8'	0-8 ft.	10/8/2009	Axys	< 0.0956	< 0.0956	< 0.0956	< 0.0956	**0.129**	< 0.0956	< 0.0956	< 0.0956	< 0.0956	< 0.191	**0.236**	**4.52**	< 0.0956	NA
Kenyon B-1 SL 0-4'	0-4 ft.	5/15/2009	Axys	< 0.0963	< 0.0963	< 0.0963	**0.111**	< 0.0963	< 0.0963	< 0.0963	< 0.0963	< 0.0963	< 0.193	< 0.193	< 0.193	< 0.0963	26300
Kenyon B-1 SL 0-4'	0-4 ft.	5/15/2009	MPI	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Kenyon B-1 SL 4-8'	4-8 ft.	5/15/2009	Axys	< 0.0944	< 0.0944	< 0.0944	< 0.0944	< 0.0944	< 0.0944	< 0.0944	< 0.0944	< 0.0944	< 0.189	< 0.189	< 0.189	< 0.0944	23600
Kenyon B-1 SL 4-8'	4-8 ft.	5/15/2009	MPI	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Kenyon B-2 SL 0-4'	0-4 ft.	5/15/2009	Axys	< 0.0937	< 0.0937	< 0.0937	< 0.0937	< 0.0937	< 0.0937	< 0.0937	< 0.0937	< 0.0937	< 0.187	< 0.187	< 0.187	< 0.0937	13300
Kenyon B-2 SL 0-4'	0-4 ft.	5/15/2009	MPI	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA

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				Perfluorobutanoic acid (PFBA)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorododecanoic acid (PFDoA)	Perfluorobutanoic sulfonate (PFBS)	Perfluorohexane sulfonate (PFHxS)	Perflourooctane sulfonate (PFOS)	Perfluorooctane sulfonylamide (PFOSA)	Mean Total Organic Carbon (TOC)
#Perfluorinated Carbon Chains:				**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**4**	**6**	**8**	**8**	**-**
Tier 1 Residential SRV:				**77000**	**ND**	**ND**	**ND**	**2100**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**2100**	**ND**	**ND**
Tier 2 Recreational SRV:				**94000**	**ND**	**ND**	**ND**	**2500**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**2600**	**ND**	**ND**
Tier 2 Industrial SRV:				**500000**	**ND**	**ND**	**ND**	**13000**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**14000**	**ND**	**ND**
Sample ID	**Sample Depth**	**Sample Date**	**Laboratory**														
Kenyon B-2 SL 4-8'	4-8 ft.	5/15/2009	Axys	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.0943	< 0.189	< 0.189	< 0.189	< 0.0943	25600
Kenyon B-2 SL 4-8'	4-8 ft.	5/15/2009	MPI	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Claremont B-1 SL 0-4'	0-4 ft.	5/15/2009	Axys	< 0.0907	< 0.0907	< 0.0907	< 0.0907	< 0.0907	< 0.0907	< 0.0907	< 0.0907	< 0.0907	< 0.181	< 0.181	**0.308**	< 0.0907	217000
Claremont B-1 SL 0-4'	0-4 ft.	5/15/2009	MPI	**0.413**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**0.773**	<0.2	<0.2	NA
Claremont B-1 SL 4-8'	4-8 ft.	5/15/2009	Axys	< 0.0966	< 0.0966	< 0.0966	< 0.0966	< 0.0966	< 0.0966	< 0.0966	< 0.0966	< 0.0966	< 0.193	**0.224**	**0.321**	< 0.0966	14800
Claremont B-1 SL 4-8'	4-8 ft.	5/15/2009	MPI	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Claremont B-2 SL 0-4'	0-4 ft.	5/15/2009	Axys	< 0.0936	< 0.0936	**0.385**	< 0.0936	**0.154**	< 0.0936	< 0.0936	< 0.0936	< 0.0936	**0.491**	**1.65**	**24.7**	**0.129**	184000
Claremont B-2 SL 4-8'	4-8 ft.	5/15/2009	Axys	< 0.0958	< 0.0958	< 0.0958	< 0.0958	< 0.0958	< 0.0958	< 0.0958	< 0.0958	< 0.0958	< 0.192	< 0.192	**0.25**	< 0.0958	7500
Claremont B-3 SL 0-4'	0-4 ft.	5/15/2009	Axys	**0.114**	**0.167**	**0.427**	**0.232**	**0.174**	< 0.0912	< 0.0912	< 0.0912	< 0.0912	**2.39**	**5.25**	**3.46**	< 0.0912	35200
Claremont B-3 SL 4-8'	4-8 ft.	5/15/2009	Axys	< 0.0935	< 0.0935	< 0.0935	< 0.0935	< 0.0935	< 0.0935	< 0.0935	< 0.0935	< 0.0935	< 0.187	**0.561**	**0.988**	< 0.0935	453
Luverne B-1 SL 0-4'	0-4 ft.	5/22/2009	Axys	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.0962	< 0.192	< 0.192	< 0.481	< 0.241	12500
Luverne B-1 SL 0-4'	0-4 ft.	5/22/2009	MPI	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Luverne B-1 SL 4-8'	4-8 ft.	5/22/2009	Axys	< 0.0981	< 0.0981	< 0.0981	< 0.0981	< 0.0981	< 0.0981	< 0.0981	< 0.0981	< 0.0981	< 0.196	< 0.196	< 0.490	< 0.245	13300
Luverne B-1 SL 4-8'	4-8 ft.	5/22/2009	MPI	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Luverne B-2 SL 0-4'	0-4 ft.	5/22/2009	Axys	< 0.0954	< 0.0954	< 0.0954	< 0.0954	< 0.0954	< 0.0954	< 0.0954	< 0.0954	< 0.0954	< 0.191	< 0.191	**0.481**	< 0.239	10300
Luverne B-2 SL 0-4'	0-4 ft.	5/22/2009	MPI	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Luverne B-2 SL 4-8'	4-8 ft.	5/22/2009	Axys	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200	< 0.200	< 0.500	< 0.250	14400
Luverne B-2 SL 4-8'	4-8 ft.	5/22/2009	MPI	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Luverne B-3 SL 0-4'	0-4 ft.	5/22/2009	Axys	< 0.0974	< 0.0974	< 0.0974	< 0.0974	< 0.0974	< 0.0974	< 0.0974	< 0.0974	< 0.0974	< 0.195	< 0.195	< 0.487	< 0.244	7860
Luverne B-3 SL 0-4'	0-4 ft.	5/22/2009	MPI	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Luverne B-3 SL 4-8'	4-8 ft.	5/22/2009	Axys	< 0.0984	< 0.0984	< 0.0984	< 0.0984	< 0.0984	< 0.0984	< 0.0984	< 0.0984	< 0.0984	< 0.197	< 0.197	< 0.492	< 0.246	39500
Luverne B-3 SL 4-8'	4-8 ft.	5/22/2009	MPI	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Fridley B-1 SL 0-4'	0-4 ft.	5/27/2009	Axys	**0.242**	**0.422**	**0.413**	**0.27**	**0.291**	**0.144**	< 0.100	< 0.100	< 0.100	< 0.201	**1.25**	**43**	< 0.100	55700
Fridley B-1 SL 4-8'	4-8 ft.	5/27/2009	Axys	< 0.101	< 0.101	< 0.101	< 0.101	< 0.101	< 0.101	< 0.101	< 0.101	< 0.101	< 0.201	< 0.201	**2.45**	< 0.101	1670
Fridley B-2 SL 0-4'	0-4 ft.	5/27/2009	Axys	**1.34**	**1.67**	**2.78**	**0.735**	**0.699**	< 0.102	< 0.102	< 0.102	< 0.102	**3.01**	**23.4**	**3.48**	< 0.102	11400
Fridley B-2 SL 4-8'	4-8 ft.	5/27/2009	Axys	**0.601**	**1.13**	**1.53**	**0.335**	**0.493**	< 0.0950	< 0.0950	< 0.0950	< 0.0950	**1.32**	**14.2**	**1.31**	< 0.0950	19800
Fridley B-3 Sediment 6"	0.5 ft.	5/27/2009	Axys	< 0.0966	< 0.0966	< 0.0966	< 0.0966	< 0.0966	< 0.0966	< 0.0966	< 0.0966	< 0.0966	< 0.193	< 0.193	**18.3**	< 0.0966	14800
Rochester B-1 SL 0-4'	0-4 ft.	5/28/2009	Axys	**0.207**	< 0.0979	< 0.0979	< 0.0979	< 0.0979	< 0.0979	< 0.0979	< 0.0979	< 0.0979	< 0.196	**0.361**	**0.559**	< 0.0979	4100
Rochester B-1 SL 4-8'	4-8 ft.	5/29/2009	Axys	< 0.0957	< 0.0957	< 0.0957	< 0.0957	< 0.0957	< 0.0957	< 0.0957	< 0.0957	< 0.0957	< 0.191	< 0.191	< 0.191	< 0.0957	1440
Rochester B-2 SL 0-4'	0-4 ft.	5/28/2009	Axys	**0.142**	< 0.0999	**0.173**	< 0.0999	< 0.0999	< 0.0999	< 0.0999	< 0.0999	< 0.0999	< 0.200	**1.7**	**1.12**	< 0.0999	4780
Rochester B-2 SL 4-8'	4-8 ft.	5/29/2009	Axys	< 0.0949	< 0.0949	< 0.0949	< 0.0949	< 0.0949	< 0.0949	< 0.0949	< 0.0949	< 0.0949	< 0.190	< 0.190	< 0.190	< 0.0949	431

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				Perfluorobutanoic acid (PFBA)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorododecanoic acid (PFDoA)	Perfluorobutanoic sulfonate (PFBS)	Perfluorohexane sulfonate (PFHxS)	Perflourooctane sulfonate (PFOS)	Perfluorooctane sulfonylamide (PFOSA)	Mean Total Organic Carbon (TOC)
#Perfluorinated Carbon Chains:				**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**4**	**6**	**8**	**8**	**-**
Tier 1 Residential SRV:				**77000**	**ND**	**ND**	**ND**	**2100**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**2100**	**ND**	**ND**
Tier 2 Recreational SRV:				**94000**	**ND**	**ND**	**ND**	**2500**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**2600**	**ND**	**ND**
Tier 2 Industrial SRV:				**500000**	**ND**	**ND**	**ND**	**13000**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**14000**	**ND**	**ND**
Sample ID	**Sample Depth**	**Sample Date**	**Laboratory**														
Goodview Sed-1	0-6 in.	10/19/2009	Axys	< 0.0883	< 0.0883	< 0.0883	< 0.0883	< 0.0883	< 0.0883	< 0.0883	< 0.0883	< 0.0883	< 0.177	< 0.177	**0.332**	< 0.0883	NA

TABLE 2
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				Perfluorobutanoic acid (PFBA)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorododecanoic acid (PFDoA)	Perfluorobutanoic sulfonate (PFBS)	Perfluorohexane sulfonate (PFHxS)	Perflourooctane sulfonate (PFOS)	Perfluorooctane sulfonylamide (PFOSA)	Mean Total Organic Carbon (TOC)
#Perfluorinated Carbon Chains:				**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**4**	**6**	**8**	**8**	**-**
Tier 1 Residential SRV:				**77000**	**ND**	**ND**	**ND**	**2100**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**2100**	**ND**	**ND**
Tier 2 Recreational SRV:				**94000**	**ND**	**ND**	**ND**	**2500**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**2600**	**ND**	**ND**
Tier 2 Industrial SRV:				**500000**	**ND**	**ND**	**ND**	**13000**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**14000**	**ND**	**ND**
Sample ID	**Sample Depth**	**Sample Date**	**Laboratory**														
Bemidji B-1 SL 0-4'	0-4 ft.	11/5/2009	Axys	< 0.0951	< 0.0951	**0.216**	< 0.0951	**0.118**	< 0.0951	< 0.0951	< 0.0951	< 0.0951	< 0.190	**3.12**	**55.7**	**0.112**	6230
Bemidji B-1 SL 4-8'	4-8 ft.	11/5/2009	Axys	< 0.0913	< 0.0913	< 0.0913	< 0.0913	**0.498**	< 0.0913	< 0.0913	< 0.0913	< 0.0913	**0.267**	**3.98**	**56**	< 0.0913	535
Bemidji B-2 SL 0-4'	0-4 ft.	11/5/2009	Axys	**0.184**	**0.322**	**1.44**	**0.143**	**1.31**	**0.099**	< 0.0933	< 0.0933	< 0.0933	< 1.87	**13.9**(1)	**1200**(1)	**18.5**	3540
Bemidji B-2 SL 4-8'	4-8 ft.	11/5/2009	Axys	< 0.276	< 0.276	**0.411**(1)	**0.917**(1)	**19.6**(1)	< 0.276	< 0.276	< 0.276	< 0.276	**0.957**(1)	**147**(1)	**606**(1)	< 0.276	487
River Grove Sed-1	0-6 in.	11/18/2009	MPI	<0.333	<0.333	<0.333	<0.333	<0.333	<0.333	<0.333	<0.333	<0.333	<0.667	<0.667	<0.667	<0.333	NA
River Grove Sed-2	0-6 in.	11/18/2009	MPI	<0.333	<0.333	<0.333	<0.333	<0.333	<0.333	<0.333	<0.333	<0.333	<0.667	<0.667	<0.667	<0.333	NA
River Grove Sed-3	0-6 in.	11/18/2009	MPI	<0.333	<0.333	<0.333	<0.333	<0.333	<0.333	<0.333	<0.333	<0.333	<0.667	<0.667	<0.667	<0.333	NA
ERTC SS-1	0-6 in.	11/25/2009	Axys	< 0.0998	**0.205**	**0.794**	**0.139**	**0.495**	< 0.0998	< 0.0998	< 0.0998	< 0.0998	< 0.200	**3.49**	**83.5**	**4.54**	NA
ERTC Sed-1	0-6 in.	11/25/2009	Axys	< 0.0917	< 0.0917	< 0.0917	< 0.0917	**0.225**	< 0.0917	< 0.0917	< 0.0917	< 0.0917	< 0.183	**1.2**	**57.5**	**6.52**	NA
ERTC Sed-2	0-6 in.	11/25/2009	Axys	**0.218**	**0.536**	**1.72**	**0.268**	**1.26**	**0.184**	**0.101**	**0.174**	< 0.0933	**1.47**	**19.6**	**538**	**181**	NA
ERTC Sed-3	0-6 in.	11/18/2010	Axys	**0.118**	**0.202**	**1.01**	**0.171**	**0.75**	**0.149**	< 0.0955	**0.174**	**0.156**	**0.318**	**7.1**	**476**(1)	**207**(1)	NA
ERTC Sed-4	0-6 in.	11/28/2010	Axys	< 0.0933	**0.135**	**0.628**	**0.119**	**0.581**	< 0.0933	< 0.0933	< 0.0933	< 0.0933	< 0.187	**3.52**	**51.3**	**1.95**	NA
MSP Sed-1	0-6 in.	1/19/2010	Axys	< 0.484	< 0.484	< 0.484	< 0.484	**1.8**	**1.89**	**17.3**	**2.5**	**15.6**	< 0.968	< 0.968	**8.84**	**3.55**	NA
Crystal B-1 SL 0-4'	0-4 ft.	1/20/2010	Axys	< 0.486	< 0.486	< 0.486	< 0.486	< 0.486	< 0.486	< 0.486	< 0.486	< 0.486	< 0.972	< 0.972	< 0.972	< 0.486	458
Crystal B-1 SL 4-8'	4-8 ft.	1/20/2010	Axys	< 0.493	< 0.493	< 0.493	< 0.493	< 0.493	< 0.493	< 0.493	< 0.493	< 0.493	< 0.985	< 0.985	< 0.985	< 0.493	5610
Crystal B-2 SL 0-4'	0-4 ft.	1/20/2010	Axys	< 0.488	< 0.488	< 0.488	< 0.488	< 0.488	< 0.488	< 0.488	< 0.488	< 0.488	< 0.977	< 0.977	< 0.977	< 0.488	3840
Crystal B-2 SL 4-8'	4-8 ft.	1/20/2010	Axys	< 0.490	< 0.490	< 0.490	< 0.490	< 0.490	< 0.490	< 0.490	< 0.490	< 0.490	< 0.979	< 0.979	< 0.979	< 0.490	569
Crystal SS-1	2 ft.	1/20/2010	Axys	< 0.498	**0.929**	< 0.498	< 0.498	< 0.498	< 0.498	< 0.498	< 0.498	< 0.498	< 0.996	< 0.996	< 0.996	< 0.498	NA
Crystal Sed-1	0-6 in.	1/20/2010	Axys	< 0.513	< 0.513	< 0.513	< 0.513	< 0.513	< 0.513	< 0.513	< 0.513	< 0.513	< 1.03	< 1.03	< 1.03	< 0.513	NA
Crystal Sed-2	0-6 in.	1/20/2010	Axys	**0.467**	**1.16**	< 0.404	**0.491**	**0.654**	**0.412**	**0.863**	**1.17**	**2.47**	< 0.807	**1.03**	**7.1**	**1.45**	NA
Crystal Sed-3	0-6 in.	10/1/2010	Axys	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.376	< 0.752	< 0.752	< 0.752	< 0.376	NA
Crystal Sed-4	0-6 in.	10/1/2010	Axys	< 0.474	< 0.474	< 0.474	< 0.474	< 0.474	< 0.474	< 0.474	**0.661**	**1.65**	< 0.949	< 0.949	**4.64**	**1.13**	NA
Kings Cove Marina Soil	0-4 in.	12/3/2009	MPI	<0.333	<0.333	<0.333	<0.333	<0.333	<0.333	**1.11**	**2.07**	**10.4**	<0.667	<0.667	<0.667	<0.333	NA
Kings Cove Marina Sed 1	0-4 in.	12/3/2009	MPI	<0.333	<0.333	<0.333	<0.333	**0.841**	<0.333	<0.333	<0.333	<0.333	<0.667	<0.667	**1.34**	<0.333	NA
Kings Cove Marina Sed 2	0-4 in.	12/3/2009	MPI	<0.333	<0.333	**0.773**	<0.333	**0.736**	<0.333	<0.333	<0.333	<0.333	<0.667	**4.44**	**6.12**	<0.333	NA

TABLE 2
Soil and Sediment Analytical Results, PFCs and TOC
Minnesota Fire Foam Training and Discharge Sites

				Perfluorobutanoic acid (PFBA)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorododecanoic acid (PFDoA)	Perfluorobutanoic sulfonate (PFBS)	Perfluorohexane sulfonate (PFHxS)	Perflourooctane sulfonate (PFOS)	Perfluorooctane sulfonylamide (PFOSA)	Mean Total Organic Carbon (TOC)
#Perfluorinated Carbon Chains:				**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**4**	**6**	**8**	**8**	**-**
Tier 1 Residential SRV:				**77000**	**ND**	**ND**	**ND**	**2100**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**2100**	**ND**	**ND**
Tier 2 Recreational SRV:				**94000**	**ND**	**ND**	**ND**	**2500**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**2600**	**ND**	**ND**
Tier 2 Industrial SRV:				**500000**	**ND**	**ND**	**ND**	**13000**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**14000**	**ND**	**ND**
Sample ID	**Sample Depth**	**Sample Date**	**Laboratory**														
Up North Plastics Soil 1			Axys	**2.45**	**0.419**	**0.682**	**0.189**	**1.18**	**0.342**	**0.642**	**2.46**	**1.27**	**0.296**	**20.6**	**258**	**8.91**	NA
Up North Plastics Soil 2			Axys	**0.985**	< 0.0982	**0.205**	**0.115**	**0.381**	< 0.0982	< 0.0982	**0.341**	**0.343**	< 0.196	**2.07**	**59.1**	**2.99**	NA
Up North Plastics Soil 3			Axys	**0.203**	< 0.101	< 0.101	< 0.101	< 0.101	< 0.101	< 0.101	< 0.101	< 0.101	< 0.202	< 0.202	< 0.202	< 0.101	NA
Up North Plastics Soil 4			Axys	< 0.0964	< 0.0964	**0.233**	< 0.0964	**0.172**	< 0.0964	**0.097**	**1.88**	< 0.0964	< 0.193	**3.91**	**355**	**16.5**	NA
Up North Plastics Soil 5			Axys	**3.82**	**0.628**	**0.477**	**0.266**	**8.29**	< 0.0964	< 0.0964	**0.122**	**0.128**	**0.199**	**0.712**	**7.48**	**0.428**	NA
Up North Plastics Sed 1			Axys	**0.659**	< 0.0965	< 0.0965	< 0.0965	**0.406**	< 0.0965	< 0.0965	< 0.0965	< 0.0965	< 0.193	< 0.193	**1.15**	< 0.0965	NA
Up North Plastics Sed 2			Axys	**3.37**	**0.195**	**0.19**	< 0.110	**0.957**	**0.113**	< 0.110	**0.165**	**0.713**	**0.284**	**1.65**	**104**	**0.782**	NA
Up North Plastics Sed 3			Axys	**14.2**	**1.94**	**1.32**	**0.608**	**14.6**	< 0.104	< 0.104	< 0.104	**0.188**	< 0.207	**0.764**	**16.3**	< 0.104	NA
Up North Plastics Sed 4			Axys	**2.35**	**0.265**	**0.143**	< 0.119	**1.49**	< 0.119	**0.331**	**0.657**	**1.24**	< 0.238	**0.596**	**13.6**	**0.325**	NA
Up North Plastics Sed Dup			Axys	**1.25**	< 0.102	< 0.102	< 0.102	**0.726**	< 0.102	< 0.102	< 0.102	< 0.102	< 0.204	< 0.204	**1.67**	< 0.102	NA

Notes:
PFC results and standards are in nanograms per gram (ng/g), which is equivalent to parts per billion.
TOC results are in milligrams per kilogram (mg/kg), which is equivalent to parts per million.
Tier 1 Residential SRV: Minnesota soil reference value for chronic human exposure in a residential setting.
Tier 2 Recreational SRV: Minnesota soil reference value for exposure in a recreational setting.
Tier 2 Industrial SRV: Minnesota soil reference value for exposure in an industrial setting.
PFC compounds soil results reported on a dry weight basis.
ND: No SRV defined.
Axys: Axys Analytical Services LTD
MPI: MPI Research
TOC analyses performed by Pace Analytical Services.
Bolded type indicates detection above the laboratory method detection limit.
NA: not analyzed
(1) Results based on analysis of a dilution of the sample extract.

TABLE 3
WELL RECEPTOR SURVEY SUMMARY FOR SELECT FIRFIGHTING FOAM TRAINING SITES IN MINNESOTA
OCTOBER - NOVEMBER 2010

Site # From Receptor Survey Map	Property Address	Property Occupant	Water Supply Well (Yes or No)	Well Use	Use of Public Water Supply?	How Determined	Public Water Supply Connection Confirmed?	Comments
BEMIDJI REGIONAL AIRPORT								
1	3824 Moberg Dr. NW	Bemidji Regional Airport	No	NA	Yes	Interview, Airport Manager	No	
2	3507 Gillet Dr. NW	Rausch Cold Weather Testing Facility	No	NA	Yes	Interview, site personnel	No	
3	3700 Norris Ct. NW	Bureau of Criminal Apprehension, MN Dept. of Public Safety	No	NA	Yes	Interview, site personnel	No	
4	3622 Moberg Dr. NW	Great River Dentistry	No	NA	Yes	Questionnaire returned	No	
5	3600 Moberg Dr. NW	Indoor Auto Mall	No	NA	Yes	Interviews, current and previous site owners	No	Well no. 169190 was a water supply well at this site; well has been sealed.
6	3500 Moberg Dr. NW	Quality Inn	No	NA	Yes	Interview, site manager	No	
7	3300 Gillett Dr. NW	Paul Bunyan Elementary & ISD #31 Offices	No	NA	Yes	Interview, school district business manager	No	
8	Gillett Dr. NW	City of Bemidji Water Treatment Facility	No	NA	Yes	Interview, City of Bemidji Public Works	No	
9	3168 Adams Av. NW	Kraus Anderson Construction Co.	Yes	Non-potable		Interview, site personnel	No	
10	3920 Hwy. 2 W.	MNDOT Northwest District	No	NA	Yes	Interview, site personnel	No	
ABLE TRAINING CENTER, BURNSVILLE								
Site	River Ridge Blvd.	ABLE Fire Training Center	No	NA	Yes	Interview, Burnsville Fire Chief	No	
1	12205 River Ridge Blvd.	Northern Tool & Equipment	No	NA	Yes	Interview, site personnel	No	
2	12101 Interstate 35W S.	Dodge of Burnsville	No	NA	Yes	Questionnaire returned	No	
3	600 121st St. W.	Walser Suburu	No	NA	Yes	Interview, site personnel	No	
4	12001 Interstate 35W S.	All State Self Storage	No	NA	Yes	Interview, site personnel	No	
5	11937 Interstate 35W S.	Chalet Driving Range	No	NA	Yes	Interview, property owner	No	Several groundwater monitoring wells related to a historical dump are located on the property.
6	Pleasant Av.	Archery range, tree/brush dump	No	NA	No	Interview, Burnsville Public Works	No	
7	201 121st St. W.	Bury & Carlson, concrete/asphalt recycling	No	NA	Yes	Interview, site personnel	No	
8	25 Cliff Rd. W.	Rivers Edge Business Center	No	NA	Yes	Questionnaire returned	No	
9	15 Cliff Rd. W.	American Electric Motion	No[1]	NA	Yes	Questionnaire not returned	No	
10	12259 Nicollet Av.	Nicollet Business Campus II	Unknown	NA	Yes	Questionnaire returned	No	Managed by Wellington Management
11	12270 Nicollet Av.	Nicollet Business Campus	No	NA	Yes	Questionnaire returned	No	Managed by Wellington Management
12	50 River Ridge Ct.	Burnsville Public Works	Yes	Municipal	Yes	Interviews with Public Works personnel	NA	City well nos. 1, 2, 4, 5, 7, 8 nearby, locations indicated by Public Works personnel. No other water supply in survey area known to Public Works personnel.
13	12200 River Ridge Blvd.	Vacant/undeveloped	Yes	Industrial	NA	Site visit; correspondence with State, County.	No	Unique well no. 229108, industrial well, registered active. Buildings recently demolished and site razed. Site currently vacant. State and County cannot confirm current well status. No wells were observed on the property.
LAKE SUPERIOR COLLEGE ERTC, DULUTH								
Site	11501 Hwy. 23	Lake Superior College ERTC	No	NA	Yes	Interview, Program Supervisor	Yes	
1	10401 Hwy. 23	Residence	No	NA	No	Interview, homeowner	City Public Works confirmed no connection	Residence connected to private well at 10423 Hwy. 23.
2	10423 Hwy. 23	Residence	Yes	Drinking	No	Based on other interviews	City Public Works confirmed no connection	Questionnaire not returned.
3	11801 Hwy. 23	Residence	Yes	Drinking	No	Interview, homeowner	City Public Works confirmed no connection	
4	11601 Hwy. 23	Residence	Yes	Drinking	No	Interview, homeowner	City Public Works confirmed no connection	Well depth 411 feet.
5	11605 Hwy. 23	Residence	Yes	Drinking	No	Interview, homeowner	City Public Works confirmed no connection	New well pump recently installed, depth to water ~75 feet.
6	11825 Hwy. 23	Residence	Yes	Drinking	No	Interview, homeowner	City Public Works confirmed no connection	

TABLE 3
WELL RECEPTOR SURVEY SUMMARY FOR SELECT FIRFIGHTING FOAM TRAINING SITES IN MINNESOTA
OCTOBER - NOVEMBER 2010

Site # From Receptor Survey Map	Property Address	Property Occupant	Water Supply Well (Yes or No)	Well Use	Use of Public Water Supply?	How Determined	Public Water Supply Connection Confirmed?	Comments
MSP AIRPORT								
1	7150 Humphrey Drive	Humphrey Terminal	No	NA	Yes	Interview, Mark Wacek, MAC	No	
2	Humphrey Drive	Humphrey Terminal Parking Ramp	No	NA	Yes	Interview, Mark Wacek, MAC	No	
3	34th Ave. S.	MSP Fire Station No. 1	No	NA	Yes	Interview, Mark Wacek, MAC	No	
4	34th Ave. S.	Hangars 4-8	No	NA	Yes	Interview, Mark Wacek, MAC	No	
5	2825 Cargo Rd.	FedEx	No	NA	Yes	Interview, Mark Wacek, MAC	No	
6	Cargo Rd.	UPS	No	NA	Yes	Interview, Mark Wacek, MAC	No	
7	MSP Airport	South airfield lighting electrical center	No	NA	Yes	Interview, Mark Wacek, MAC	No	
8	MSP Airport	Glycol Management Facility	No	NA	Yes	Interview, Mark Wacek, MAC	No	
MARATHON REFINERY, ST. PAUL PARK								
1	729 Factory St.	Residence, vacant	No	NA	Yes	Questionnaire not delivered	Yes	Questionnaire returned by Post Office, marked "vacant". Municipal water connection confirmed by City Public Works Dept; assume no water supply well on property.
2	812 Front St.	Residence	No	No	Yes	Questionnaire not returned	Yes	Two houses located on property, owned by Hidden Harbor Marina. Marina owner not aware of water wells on property.
3	388 9th Ave.	Hidden Harbor Marina	Yes	Potable uses	No	Interview, property owner	Confirmed no connection	Five water supply wells located on property.
4	Lions Levee Park	7th Ave. W.	NA	NA	NA	Site reconnaissance	NA	No buildings with water service.

Notes:

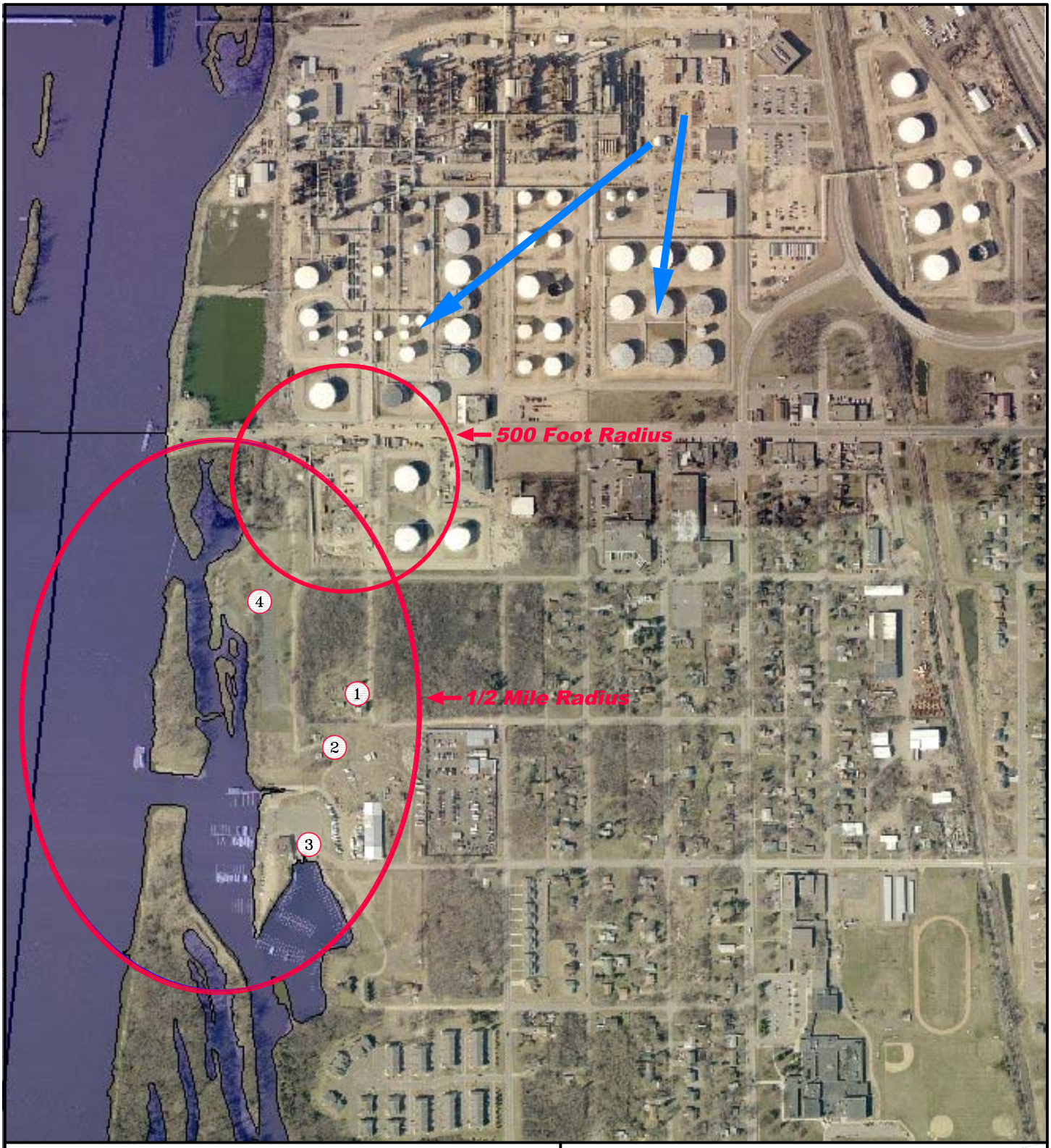
Sites included on this Table are depicted on applicable Well Receptor Survey figures included in report.

[1] Receptor Survey Questionnaire indicated that if questionnaire was not returned it would be assumed that the property has no water wells, basements or sumps.
NA - Not Applicable

ANTEA GROUP

Appendix A

Marathon Refinery Groundwater Receptor Survey Documents



LEGEND:

Property Occupant

1. Residence – 729 Factory St.
2. Residence – 812 Front St.
3. Hidden Harbor Marina – 388 9th Ave.
4. Lions Levee Park – 7th Ave. S.

Inferred Groundwater Flow Direction

North

FIGURE
RECEPTOR SURVEY
MARATHON OIL FIRE TRAINING AREA
ST. PAUL PARK, MINNESOTA

PROJECT NO.	PREPARED BY	DRAWN BY	
45618DEL04	NR	DD	anteagroup
DATE	REVIEWED BY	FILE NAME	
06/30/11		Marathon-1	

via telephone 10-26-10

Receptor Survey Questionnaire

PROPERTY ADDRESS: 388 9th Av. W - Hidden Harbor Marina

1. Is there, or has there ever been, a water well on the property? **(Yes)** **No** **Unknown**

If you answered **No or Unknown**, proceed to Question 2. 5 wells on property

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

X ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____ Bought property ~1 year ago

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

1f. Where on the property is (was) the well located? 1 - Maintenance 1 - Restaurant 1 - Boats 1 - Hosing 1 - Drink water

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No** 810 & 812 Front St - owned by Marina

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? **Yes** **(No)**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name Tim Kennedy

Telephone Number 651-400-0846 DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

Nancy Rodning
5910 RICE CREEK PARKWAY • SUITE 100
ST. PAUL, MINNESOTA 55126 USA

UNITED STATES POSTAGE
PITNEY BOWES
$ 000.44[0]

DELTA

VAC

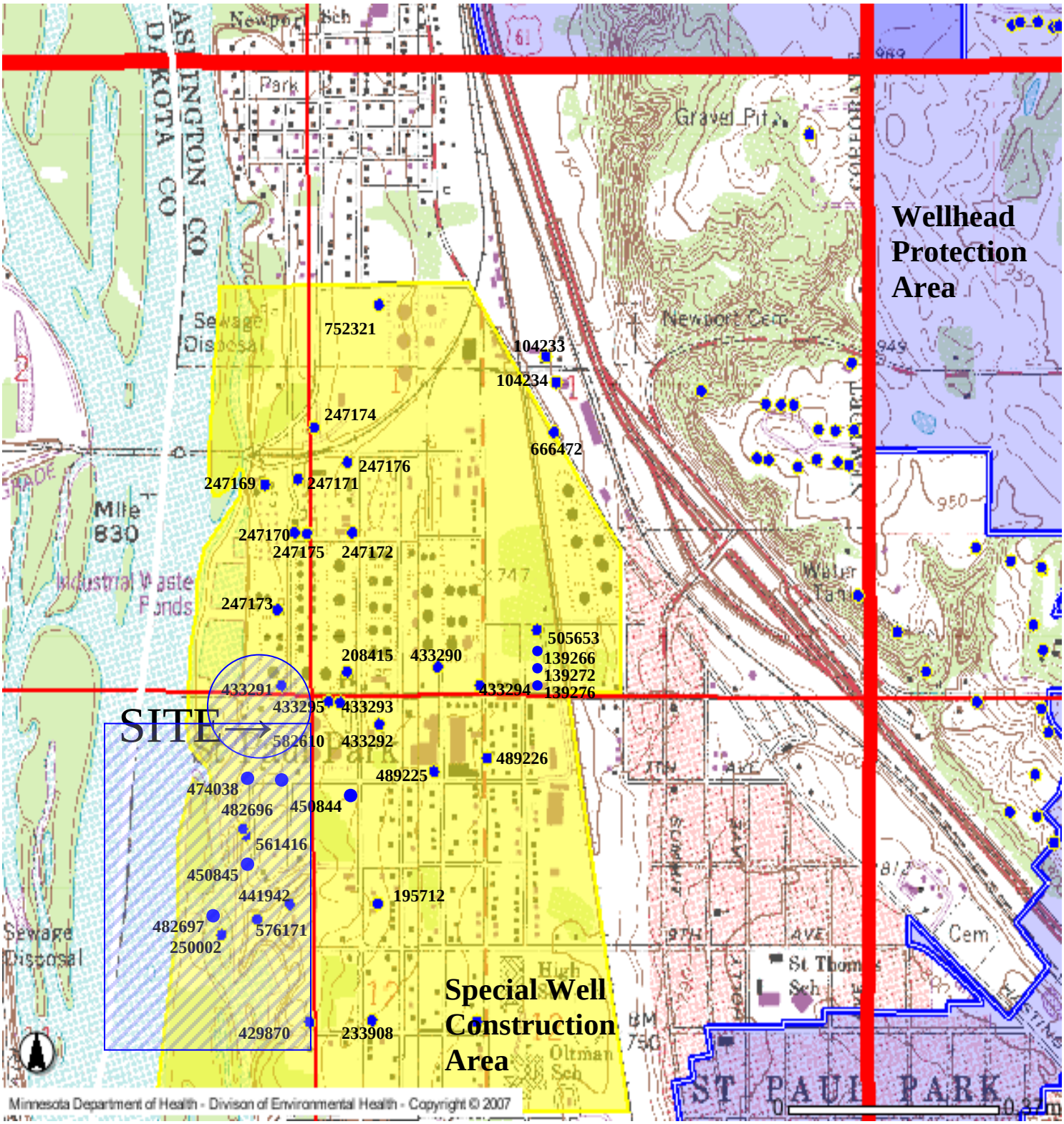
PROPERTY OWNER OR TENANT
729 FACTORY STREET
ST. PAUL PARK, MN 55071

NIXIE 550 4E 1 VAC
RETURN TO SEND
VACANT
UNABLE
BC: 55125502[illegible]

NOT A SOLICITATION

55071[illegible]5023

MARATHON PETROLEUM REFINERY CWI Well Map



Approximate Area of Receptor Survey

Minnesota Unique Well No.
250002

County Washington
Quad Inver Grove Heights
Quad ID 103D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 07/25/1995
Update Date 05/11/2005
Received Date

Well Name WILLIE'S HIDDEN HARBOR
Township Range Dir Section Subsections Elevation
27 22 W 11 ADBDCD Elevation Method 690 ft. 7.5 minute topographic map (+/- 5 feet)

Well Depth	Depth Completed	Date Well Completed
235 ft.	235 ft.	

Drilling Method --

Drilling Fluid --

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Abandoned Status Sealed

Casing Type Steel (black or low carbon) Joint No Information Drive Shoe? ☐ Yes ☐ No Above/Below 0 ft.

Geological Material	Color	Hardness	From	To
PRAIRIE DU CHIEN GROUP			0	146
JORDAN SANDSTONE			146	230
ST. LAWRENCE FORMATION			230	235

Casing Diameter	Weight	Hole Diameter
4 in. to 220 ft.	lbs./ft.	

Open Hole from 220 ft. to 235 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
14 ft. from Land surface Date Measured 06/06/1995

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
GAMMA LOGGED 6-6-1995.
WELL SEALED 07-15-1996 BY 62119

Grouting Information Well Grouted? ☐ Yes ☐ No

Located by: Minnesota Geological Survey
Method: Digitized - scale 1:24,000 or larger (Digitizing Table)
Unique Number Verification: Information from owner
Input Date: 07/18/1996
System: UTM - Nad83, Zone15, Meters
X: 499426 Y: 4965451

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP 0 Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Borehole Geophysics Yes
First Bedrock Prairie Du Chien Group
Last Strat St.Lawrence
Aquifer Multiple
Depth to Bedrock 0 ft.

Well Contractor Certification
Minnesota Geological Survey | MGS
License Business Name | Lic. Or Reg. No. | Name of Driller

County Well Index Online Report

250002

Printed 11/3/2010
HE-01205-07

Minnesota Unique Well No.
268354

County Washington
Quad Inver Grove Heights
Quad ID 103D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 02/07/2007
Update Date 03/01/2011
Received Date

Well Name HARBOR VILLAGE #2
Township Range Dir Section Subsections Elevation
27 22 W 11 ADADCA Elevation Method
718 ft.
Calc from NED (National Elevation Dataset)

Well Depth	Depth Completed	Date Well Completed
0 ft.	0 ft.	0

Drilling Method

Drilling Fluid

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Public Supply/non-comm.-transient PWS ID Source

Casing Type Joint Drive Shoe? ☐ Yes ☐ No Above/Below ft.

Geological Material	Color	Hardness	From	To

Casing Diameter	Weight	Hole Diameter

Open Hole from ft. to ft.

Screen

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
ft. from Date Measured

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☐ Yes ☐ No

Located by: Washington Cty.
Unique Number Verification: Info/GPS from data source
System: UTM - Nad83, Zone15, Meters
Method: GPS SA Off (averaged)
Input Date: 06/10/2009
X: 499620 Y: 4965494

Nearest Known Source of Contamination
0 feet direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number HP Volts
Length of drop Pipe ft. Capacity g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

License Business Name | Lic. Or Reg. No. | Name of Driller

County Well Index Online Report

268354

Printed 6/29/2011
HE-01205-07

Minnesota Unique Well No.
429870

County Washington
Quad Inver Grove Heights
Quad ID 103D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 08/15/1991
Update Date 09/29/2005
Received Date

Well Name BROWN, WILLIE
Township Range Dir Section Subsections Elevation
27 22 W 11 DAAAAA Elevation Method
733 ft.
CALC FROM 2-FOOT COUNTY DEM

Well Depth	Depth Completed	Date Well Completed
220 ft.	220 ft.	02/23/1987

Drilling Method Non-specified Rotary

Well Address
215 10TH AV W
ST PAUL PARK MN 55071

Geological Material	Color	Hardness	From	To
GRAVEL	BROWN	SOFT	0	8
LIME	YELLOW	HARD	8	165
SANDROCK	YELLOW	SOFT	165	220

Drilling Fluid
Bentonite

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Steel (black or low carbon) Joint Welded Drive Shoe? ☑ Yes ☐ No Above/Below 1 ft.

Casing Diameter	Weight	Hole Diameter
8 in. to 8 ft.	18 lbs./ft.	12 in. to 8 ft.
4 in. to 189 ft.	11 lbs./ft.	8 in. to 18 ft.

Open Hole from 189 ft. to 220 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
40 ft. from Land surface Date Measured 02/23/1987

PUMPING LEVEL (below land surface)
80 ft. after 2 hrs. pumping 20 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from 0 to 189 ft. 5 yrds.

Located by: Minnesota Geological Survey
Unique Number Verification: Information from owner
System: UTM - Nad83, Zone15, Meters
Method: Digitization (Screen) - Map (1:24,000)
Input Date: 09/07/2005
X: 499675 Y: 4965234

Nearest Known Source of Contamination
75 feet N direction Sewer type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed 04/03/1987
Manufacturer's name GRUNDFOS Model number SP-2-12 HP 0.5 Volts 230
Length of drop Pipe 84 ft. Capacity 12 g.p.m Type Submersible Material Galvanized

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Kimmes-Bauer	19521	ANDERSON, L.

First Bedrock Prairie Du Chien Group
Last Strat Jordan
Aquifer Jordan
Depth to Bedrock 8 ft.

County Well Index Online Report

429870

Printed 11/3/2010
HE-01205-07

Minnesota Unique Well No.
433291

County Washington
Quad Inver Grove Heights
Quad ID 103D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 06/07/1993
Update Date 03/06/2002
Received Date

Well Name ASHLAND PETROLEUM MW-102
Township Range Dir Section Subsections Elevation
27 22 W 2 DDDDCC Elevation Method
725 ft.
7.5 minute topographic map (+/- 5 feet)

Well Depth	Depth Completed	Date Well Completed
47 ft.	47 ft.	04/26/1989

Drilling Method Non-specified Rotary

Drilling Fluid --

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Monitor well

Casing Type Steel (black or low carbon) Joint Welded Drive Shoe? ☐ Yes ☑ No Above/Below 3 ft.

Casing Diameter	Weight	Hole Diameter
8 in. to 13 ft.	lbs./ft.	
4 in. to 22 ft.	lbs./ft.	

Open Hole from 22 ft. to 47 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Well Address

ST PAUL PARK MN 55071

Geological Material	Color	Hardness	From	To
DRIFT, SAND & CLAY	BLACK		0	6
LIMEROCK	YEL/TAN		6	47

Static Water Level
ft. from Date Measured

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
M.G.S. NO. 2788.
27-22-2 DDDDCC
ELEV 725-+5
103-D

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from 0 to 22 ft. 8.5 bags

Located Minnesota Geological Survey
Unique Number Verification Information from owner
System UTM - Nad83, Zone15, Meters

Method Digitization (Screen) - Map (1:24,000)
Date 02/13/2004
X: 499596 Y: 4966070

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP 0 Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Cuttings Yes
First Bedrock Prairie Du Chien Group
Last Strat Prairie Du Chien Group

Aquifer Prairie Du Chien Group
Depth to Bedrock 6 ft.

Well Contractor Certification

Keys Well Co.	62012	SAMPSON, C.
License Business Name	Lic. Or Reg. No.	Name of Driller

County Well Index Online Report

433291

Printed 6/29/2008
HE-01205-07

Minnesota Unique Well No.
441942

County Washington
Quad Inver Grove Heights
Quad ID 103D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 08/14/1991
Update Date 09/29/2005
Received Date

Well Name WILLIE'S HIDDEN HARBOR
Township Range Dir Section Subsections Elevation
27 22 W 11 ADADBA Elevation Method
727 ft.
CALC FROM 2-FOOT COUNTY DEM

Well Depth	Depth Completed	Date Well Completed
240 ft.	240 ft.	10/29/1984

Drilling Method Non-specified Rotary

Well Address
388 9TH AV W
ST PAUL PARK MN 55071

Geological Material	Color	Hardness	From	To
SAND	BROWN	SOFT	0	25
LIME	YELLOW	HARD	25	170
SAND ROCK	BROWN	SOFT	170	200
SAND ROCK	BLUE	HARD	200	240

Drilling Fluid
Bentonite

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Steel (black or low carbon) Joint Welded Drive Shoe? ☑ Yes ☐ No Above/Below 1 ft.

Casing Diameter	Weight	Hole Diameter
8 in. to 25 ft.	18 lbs./ft.	12 in. to 25 ft.
4 in. to 203 ft.	11 lbs./ft.	8 in. to 200 ft.

Open Hole from 203 ft. to 240 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
25 ft. from Land surface Date Measured 10/29/1987

PUMPING LEVEL (below land surface)
30 ft. after 2 hrs. pumping 50 g.p.m.

Well Head Completion
Pitless adapter manufacturer WHITEWATER Model SU4X5
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from 0 to 203 ft. 4 yrds.

Located by: Minnesota Geological Survey
Unique Number Verification: Information from owner
System: UTM - Nad83, Zone15, Meters
Method: Digitization (Screen) - Map (1:24,000)
Input Date: 09/07/2005
X: 499620 Y: 4965527

Nearest Known Source of Contamination
75 feet E direction Septic tank/drain field type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed 12/03/1987
Manufacturer's name GRUNDFOS Model number SP-2-12 HP 1.5 Volts 230
Length of drop Pipe 42 ft. Capacity 10 g.p.m Type Submersible Material Galvanized

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Kimmes-Bauer	19521	ANDERSON, L.

First Bedrock Prairie Du Chien Group
Last Strat Jordan
Aquifer Jordan
Depth to Bedrock 25 ft.

County Well Index Online Report

441942

Printed 11/3/2010
HE-01205-07

Minnesota Unique Well No.
450845

County Washington
Quad Inver Grove Heights
Quad ID 103D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 12/21/1992
Update Date 02/14/2008
Received Date

Well Name PIRNIE, MALCOLM
Township 27 Range 22 Dir W Section 11 Subsections AAD
Elevation ft.
Elevation Method

Well Depth 54 ft. | Depth Completed 54 ft. | Date Well Completed 10/17/1988

Drilling Method --

Drilling Fluid --

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Monitor well

Casing Type Joint No Information Drive Shoe? ☐ Yes ☐ No Above/Below ft.

Geological Material	Color	Hardness	From	To

Casing Diameter	Weight	Hole Diameter

Open Hole from ft. to ft.

Screen Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
35 ft. from Land surface Date Measured 12/21/1988

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
END OF FRONT ST.
MW 5

Grouting Information Well Grouted? ☐ Yes ☑ No

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification
Thein Well Co. | 34050
License Business Name | Lic. Or Reg. No. | Name of Driller

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report | 450845 | Printed 11/3/2010
HE-01205-07

Minnesota Unique Well No.
474038

County Washington
Quad Inver Grove Heights
Quad ID 103D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 12/21/1992
Update Date 09/01/2009
Received Date

Well Name CITY OF ST.PAUL PARK

Township	Range	Dir	Section	Subsections	Elevation	ft.
27	22	W	11	AA	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
19 ft.	18 ft.	11/11/1991

Drilling Method --

Drilling Fluid --

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Monitor well

Casing Type Joint No Information Drive Shoe? ☐ Yes ☐ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter

Open Hole from ft. to ft.

Screen Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
11 ft. from Land surface Date Measured 11/11/1991

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☑ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Geological Material	Color	Hardness	From	To
FILL W/ SILTY SAND & LEAN CLAY	BLK/BRN		0	10
LEAN CLAY	DK. BRN	V.SOFT	10	17
SAND FINE GRAINED (VERY LOOSE)	BROWN		17	19

REMARKS
MW 107
NEAR 7TH AVE & FRONT ST., ST.PAUL PARK

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from to 4.5 ft.

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

Twin City Testing	M0112	NELSON, T.
License Business Name	Lic. Or Reg. No.	Name of Driller

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

474038

Printed 11/3/2010
HE-01205-07

Minnesota Unique Well No.
482696

County Washington
Quad Inver Grove Heights
Quad ID 103D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 04/22/2003
Update Date 04/25/2007
Received Date

Well Name W-200

Township	Range	Dir	Section	Subsections	Elevation
27	22	W	11	AADCBC	702 ft.

Elevation Method: 7.5 minute topographic map (+/- 5 feet)

Well Depth	Depth Completed	Date Well Completed
195 ft.	195 ft.	09/18/1992

Drilling Method Non-specified Rotary

Well Address
100 3RD W
ST PAUL PARK MN 55071

Geological Material	Color	Hardness	From	To
DRIFT			0	3
LIMESTONE			3	155
SANDSTONE			155	195

Drilling Fluid --

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Abandoned Status Sealed

Casing Type Steel (black or low carbon) Joint Welded Drive Shoe? ☑ Yes ☐ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
14 in. to 3 ft.	55.57 lbs./ft.	17.5 in. to 3 ft.
8 in. to 155 ft.	28.55 lbs./ft.	13 in. to 155 ft.

Open Hole from 170 ft. to 195 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
46 ft. from Land surface Date Measured 09/18/1992

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☑ Casing Protection Y ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
WELL SEALED 08-16-2000 BY 62012
ORIGINAL USE : MONITOR WELL

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement	from	to 3 ft.	2 bags
Grout Material: Neat Cement	from	to 170 ft.	4 yrds.
Grout Material: Neat Cement	from	to 155 ft.	5 yrds.

Located by: Minnesota Department of Health
Method: GPS SA Off (averaged)
Unique Number Verification: N/A
Input Date: 08/15/2000
System: UTM - Nad83, Zone15, Meters
X: 499487 Y: 4965714

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Keys Well Co.	62012	CONTONIKOLAS.

First Bedrock Prairie Du Chien Group
Last Strat Jordan
Aquifer Jordan
Depth to Bedrock 3 ft.

County Well Index Online Report

482696

Printed 11/3/2010
HE-01205-07

Minnesota Unique Well No.
482697

County Washington
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 09/01/2009
Update Date 09/01/2009
Received Date

Well Name ASHLAND PETROLEUM COMPANY

Township	Range	Dir	Section	Subsections	Elevation	ft.
27	22	W	11	ACD	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
47 ft.	47 ft.	09/09/1992

Drilling Method Non-specified Rotary

Well Address
100 3RD AV W 55071
ST PAUL PARK MN 55071

Geological Material	Color	Hardness	From	To
DRIFT	BLACK	SOFT	0	3
LIMESTONE	BROWN	HARD	3	47

Drilling Fluid
Other

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Monitor well

Casing Type Steel (black or low carbon) Joint Welded Drive Shoe? ☐ Yes ☑ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
12 in. to 2.5 ft.	lbs./ft.	12 in. to 22 ft.
6 in. to 22 ft.	lbs./ft.	6 in. to 47 ft.

Open Hole from 22 ft. to 47 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
32.25 ft. from Land surface Date Measured 09/09/1992

PUMPING LEVEL (below land surface)
34 ft. after 1.25 hrs. pumping 11 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☑ Casing Protection Y ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
WELL LABELED: W-108

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from to 22 ft. 10 bags

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☑ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

Keys Well Co.	62012	CONTONIKOLAS.
License Business Name	Lic. Or Reg. No.	Name of Driller

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

482697

Printed 11/3/2010
HE-01205-07

Minnesota Unique Well No.
559256

County Washington
Quad Inver Grove Heights
Quad ID 103D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 08/22/1996
Update Date 03/01/2011
Received Date

Well Name WILLIES HIDDEN HARBOR
Township Range Dir Section Subsections Elevation
27 22 W 11 ADBDDA Elevation Method
692 ft.
Calc from NED (National Elevation Dataset)

Well Depth	Depth Completed	Date Well Completed
234 ft.	234 ft.	05/17/1996

Drilling Method Non-specified Rotary

Well Address
388 9TH AV
ST PAUL PARK MN 55071

Drilling Fluid --
Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Public Supply/non-comm.-transient PWS ID 5820301 Source S01

Casing Type Steel (black or low carbon) Joint Welded Drive Shoe? ☑ Yes ☐ No Above/Below 1 ft.

Geological Material	Color	Hardness	From	To
SAND	BROWN	SOFT	0	25
LIME	YELLOW	SOFT	25	34
LIME	YELLOW	HARD	34	45
SHALE	BLUE	HARD	45	55
LIME	YELLOW	HARD	55	137
SANDROCK	YELLOW	SOFT	137	141
SANDROCK	YELLOW	SOFT	141	190
SANDROCK	GRAY	MEDIUM	190	227
SANDROCK	GRAY	MEDIUM	227	234

Casing Diameter	Weight	Hole Diameter
8 in. to 24 ft.	28.55 lbs./ft.	12 in. to 34 ft.
4 in. to 225 ft.	10.79 lbs./ft.	8 in. to 225 ft.

Open Hole from 225 ft. to 234 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
0 ft. from Land surface Date Measured 05/17/1996

PUMPING LEVEL (below land surface)
30 ft. after hrs. pumping 20 g.p.m.

Well Head Completion
Pitless adapter manufacturer WHITEWATER Model SU4X5.5
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
GAMMA LOGGED 5-17-1996.
27-22-11 ADBDDB
ELEV 688-+5
103-D
WELL #1

Grouting Information Well Grouted? ☑ Yes ☐ No
Grout Material: Neat Cement from 0 to 225 ft. 6.5 yrds.

Located by: Washington Cty.
Unique Number Verification: Info/GPS from data source
System: UTM - Nad83, Zone15, Meters
Method: GPS SA Off (averaged)
Input Date: 06/10/2009
X: 499471 Y: 4965491

Nearest Known Source of Contamination
60 feet E direction Septic tank/drain field type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☑ Not Installed Date Installed 06/13/1996
Manufacturer's name GRUNDFOS Model number 25S10-7 HP 1 Volts 230
Length of drop Pipe 42 ft. Capacity 20 g.p.m Type Submersible Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Borehole Geophysics Yes
First Bedrock Prairie Du Chien Group
Last Strat St.Lawrence
Aquifer Multiple
Depth to Bedrock 25 ft.

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Kimmes-Bauer	19521	PEINE, J.

County Well Index Online Report

559256

Printed 6/29/2011
HE-01205-07

Minnesota Unique Well No.
561416

County Washington
Quad Inver Grove Heights
Quad ID 103D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 04/22/2003
Update Date 04/25/2007
Received Date

Well Name RW-5
Township Range Dir Section Subsections Elevation 705 ft.
27 22 W 11 AADCCB Elevation Method 7.5 minute topographic map (+/- 5 feet)

Well Depth	Depth Completed	Date Well Completed
75 ft.	75 ft.	07/06/1995

Drilling Method Non-specified Rotary

Well Address
ST PAUL PARK MN 55071

Geological Material	Color	Hardness	From	To
LIMESTONE	TAN	HARD	0	40
LIMESTONE	TAN	SOFT	40	45
LIMESTONE	TAN	HARD	45	70
LIMESTONE	TAN	SOFT	70	75

Drilling Fluid Bentonite
Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Other (specify in remarks)

Casing Type Steel (black or low carbon) Joint No Information Drive Shoe? ☐ Yes ☑ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
8 in. to 25 ft.	lbs./ft.	12 in. to 25 ft.
		8 in. to 75 ft.

Open Hole from 25 ft. to 75 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
30 ft. from Land surface Date Measured 07/06/1995

PUMPING LEVEL (below land surface)
75 ft. after 2 hrs. pumping 30 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
WELL LOCATION: 700 BLOCK OF FRONT ST. ST. PAUL PARK, MN 55071
WATER STARTED COMING AT 32'
USE-REMEDIAL

Grouting Information Well Grouted? ☑ Yes ☐ No
Grout Material: Neat Cement from to 24 ft. 8 bags

Located by: Minnesota Department of Health
Unique Number Verification: N/A
System: UTM - Nad83, Zone15, Meters
Method: GPS SA Off (averaged)
Input Date: 08/15/2000
X: 499494 Y: 4965698

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☑ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Traut M.J. Well Co.	71536	ROBBIE&JEFF

First Bedrock Prairie Du Chien Group
Last Strat Prairie Du Chien Group
Aquifer Prairie Du Chien Group
Depth to Bedrock ft.

County Well Index Online Report

561416

Printed 4/10/2009
HE-01205-07

Minnesota Unique Well No.
576171

County Washington
Quad Inver Grove Heights
Quad ID 103D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 09/25/1996
Update Date 12/30/2004
Received Date

Well Name WILLIES HIDDEN HARBOR
Township Range Dir Section Subsections Elevation
27 22 W 11 ADACCA Elevation Method
702 ft.
Calc from DEM (USGS 7.5 min or equiv.)

Well Depth	Depth Completed	Date Well Completed
200 ft.	200 ft.	07/17/1996

Drilling Method Non-specified Rotary

Well Address
388 9TH AV
ST PAUL PARK MN

Geological Material	Color	Hardness	From	To
SAND	BROWN	SOFT	0	30
ROCK	TAN	HARD	30	132
SANDROCK	YELLOW	SOFT	132	189
SANDROCK	YELLOW	HARD	189	200

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Steel (black or low carbon) Joint Welded Drive Shoe? ☑ Yes ☐ No Above/Below 0 ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 189 ft.	lbs./ft.	12 in. to 30 ft.
		8 in. to 189 ft.

Open Hole from 189 ft. to 200 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
12 ft. from Land surface Date Measured 07/17/1996

PUMPING LEVEL (below land surface)
20 ft. after 1 hrs. pumping 30 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☑ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
27-22-11
ELEV 103-D

Located by: Minnesota Department of Health
Unique Number Verification: N/A
System: UTM - Nad83, Zone15, Meters
Method: Digitization (Screen) - Map (1:24,000)
Input Date: 10/24/2003
X: 499527 Y: 4965490

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from 2 to 160 ft. 54 bags

Nearest Known Source of Contamination
100 feet W direction Body of water type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☑ Not Installed Date Installed 07/18/1996
Manufacturer's name OWNER'S Model number __ HP 0 Volts
Length of drop Pipe _ ft. Capacity _ g.p.m Type Submersible Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☑ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Schroepfer Well Co.	62119	SCHROEPFER, T

First Bedrock Prairie Du Chien Group
Last Strat Jordan
Aquifer Jordan
Depth to Bedrock 30 ft.

County Well Index Online Report

576171

Printed 11/3/2010
HE-01205-07

Minnesota Unique Well No.
582610

County Washington
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date
Update Date 09/01/2009
Received Date

Well Name ASHLAND PETROLEUM COMPANY

Township	Range	Dir	Section	Subsections	Elevation	ft.
27	22	W	11	AAA	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
193 ft.	193 ft.	07/28/1997

Drilling Method Non-specified Rotary

Well Address
BROADWAY & MAIN ST
ST PAUL PARK MN 55071

Geological Material	Color	Hardness	From	To
FILL	BLACK	SOFT	0	2
LIMESTONE	TAN	HARD	2	158
SANDSTONE	TAN	MEDIUM	158	193

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Remedial

Casing Type Steel (black or low carbon) Joint No Information Drive Shoe? ☑ Yes ☐ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
6 in. to 173 ft.	lbs./ft.	12 in. to 173 ft.
		6 in. to 193 ft.

Open Hole from 173 ft. to 193 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
20 ft. from Land surface Date Measured 07/28/1997

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☑ Casing Protection Y ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
ENGINEER - BAYWEST
WELL NUMBERED W-205

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from to 173 ft. 110 bags

Nearest Known Source of Contamination
25 feet W direction type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number HP Volts
Length of drop Pipe ft. Capacity g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☑ No

Well Contractor Certification

Keys Well Co.	62012	MARK & KEVIN
License Business Name	Lic. Or Reg. No.	Name of Driller

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

582610

Printed 11/3/2010
HE-01205-07

Appendix B

Bemidji Regional Airport Groundwater Receptor Survey Documents, October 2010 Survey

LEGEND:

Inferred Groundwater Flow Direction

Property Occupant

1. Bemidji Regional Airport
2. Rausch Cold Weather Testing Facility
3. Bureau of Criminal Apprehension, MN Dept. of Public Safety
4. Great River Dentistry
5. Indoor Auto Mall
6. Quality Inn
7. Paul Bunyan Elementry & ISD #31 Offices
8. City of Bemidji Water Treatment Facility
9. Kraus Anderson Construction Co.
10. MNDOT Northwest District

North

FIGURE
RECEPTOR SURVEY
BEMIDJI FIRE DEPARTMENT FIRE TRAINING AREA
BEMIDJI AIRPORT
BEMIDJI, MINNESOTA

PROJECT NO.	PREPARED BY	DRAWN BY
45618DEL04	NR	DD
DATE	REVIEWED BY	FILE NAME
06/30/11		Bemidji-1

anteagroup

Receptor Survey Questionnaire – over Telephone 10-11-10 12:50pm

PROPERTY ADDRESS: Quality Inn 3500 Mokena Dr.

1. Is there, or has there ever been, a water well on the property? **Yes** (No) **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

_____

1f. Where on the property is (was) the well located?_____

_____

_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? (Yes) **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name Kevin Rakow - GM

Telephone Number 218-444-7708 DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

Not the Holiday Inn.

via telephone 10-11-10

Receptor Survey Questionnaire

PROPERTY ADDRESS: 3600 Moberg DR NW - Indoor Auto Mall

1. Is there, or has there ever been, a water well on the property? **Yes** **(No)** **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_______ACTIVE _________ABANDONED _________SEALED

1b. How deep is (was) the well? _______FEET (if depth is unknown check here _______)

1c. In what year was the well installed (if known)? ____________

1d. If the well was abandoned, what year was the well sealed?_________

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)____________________

1f. Where on the property is (was) the well located?____________________

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name____________________

Telephone Number____________________DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? **(Yes)** **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name Todd Lowth

Telephone Number 218-751-3140 DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

11/3/10 Former Holiday Inn. Well registered. Knowing no well, on city water. Former owner is Gary Crangle hoff Properties

DELTA

PHONE COMMUNICATION RECORD

Date 11-3-10 Time 12:00

Person Contacted — Incoming ☐ Outgoing ☒ Gary Congdon, Bemidji

Phone 218-444-6900 Project No.

Project Name/Location

Contacted by Nancy R

Participants

Subject well 169190 - Holiday Inn (Indoor Auto Mall)

Notes

there was a well there in the 1970's, there was no city water then.

(City water came to area). well was capped. the ~~was~~ convention center addition was built over the location of that well.

Receptor Survey Questionnaire

PROPERTY ADDRESS: Great River Dentistry, 3622 Mobers Drive NW, Bemidji

1. Is there, or has there ever been, a water well on the property? **Yes** (No) **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

_____

1f. Where on the property is (was) the well located?_____

_____

_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? (Yes) **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name Douglas R. Williams, DDS

Telephone Number 218-751-4216 DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

Receptor Survey Questionnaire

via telephone 10-11-10

PROPERTY ADDRESS: 3700 Norris Ct NW

1. Is there, or has there ever been, a water well on the property? **Yes** (No) **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

_____

1f. Where on the property is (was) the well located?_____

_____

_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? (Yes) **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name Jim Dougherty, MN Bureau of Criminal Apprehension

Telephone Number 218-755-6050 DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

Receptor Survey Questionnaire

PROPERTY ADDRESS: 3300 Gilbert Dr NW - Paul Bunyan ISD #31

1. Is there, or has there ever been, a water well on the property? **Yes** (No) **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

_____

1f. Where on the property is (was) the well located?_____

_____

_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? (Yes) **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name Chris - Business Manager

Telephone Number 218-333-3100 DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

Via Telephone 10-21-10

Receptor Survey Questionnaire

PROPERTY ADDRESS: ~~3507~~ Gilbert Dr NW - Rausch Cold Weather Testing

1. Is there, or has there ever been, a water well on the property? **Yes** **No** **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

_____

1f. Where on the property is (was) the well located?_____

_____

_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? **Yes** **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name Jason

Telephone Number 218-751-0016 DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

Receptor Survey Questionnaire — via telephone 10-14-10

PROPERTY ADDRESS: 3920 Hwy 2 west - MNDOT

1. Is there, or has there ever been, a water well on the property? **Yes** (**No**) **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

_____

1f. Where on the property is (was) the well located?_____

_____

_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? (**Yes**) **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name Dan Tricke

Telephone Number 218-755-6507 DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

Receptor Survey Questionnaire

PROPERTY ADDRESS: Kraus Anderson Const. Shop 3168

1. Is there, or has there ever been, a water well on the property? **Yes** **No** **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? ~20 FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

1f. Where on the property is (was) the well located?_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? **Yes** **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

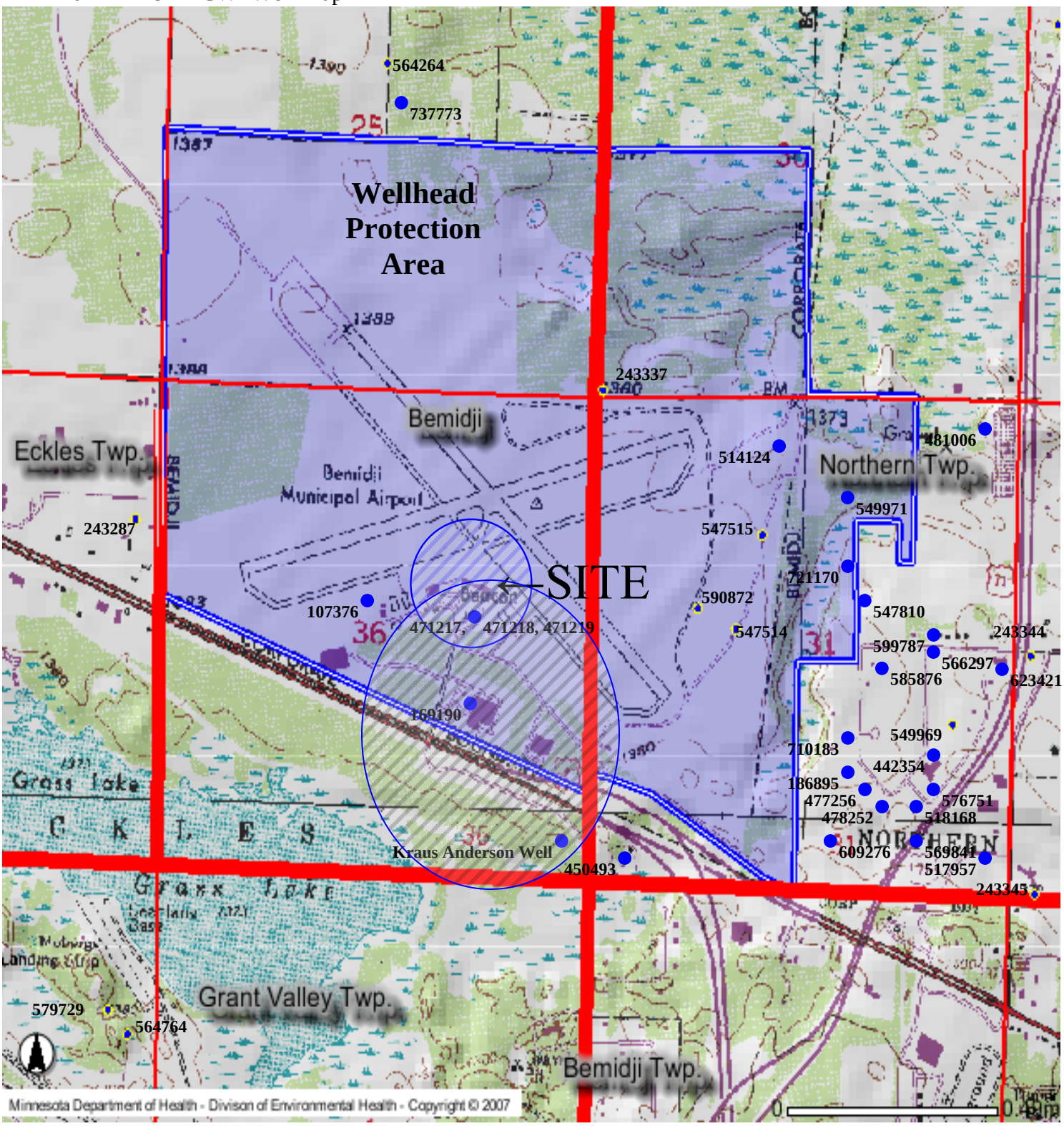
Name_____

Telephone Number 218-751-4207 DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

BEMIDJI AIRPORT CWI Well Map



Approximate Area of Receptor Survey (October 2010)

Minnesota Unique Well No.
169190

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 02/28/1989
Update Date 03/11/2005
Received Date

Well Name HOLIDAY INN

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	34	W	36		Elevation Method	

Well Depth	Depth Completed	Date Well Completed
86 ft.	86 ft.	03/14/1980

Drilling Method Non-specified Rotary

Geological Material	Color	Hardness	From	To
FINE SAND	BROWN	SOFT	0	43
CLAY	GRAY	HARD	43	55
BOULDERS		HARD	55	74
SAND	GRAY	SOFT	74	86

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Commercial

Casing Type Steel (black or low carbon) Joint Welded Drive Shoe? ☐ Yes ☐ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter

Open Hole from ft. to ft.

Screen YES Make JOHNSON Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
	15		76 ft. and 86 ft.

Static Water Level
10 ft. from Land surface Date Measured 03/14/1980

PUMPING LEVEL (below land surface)
70 ft. after 60 hrs. pumping 100 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
FRONT SECTION 36

Grouting Information Well Grouted? ☑ Yes ☐ No

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Diamond Water Wells	18446	WADDELL, L.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

169190

Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
186895

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 02/28/1989
Update Date 03/11/2005
Received Date

Well Name RUEBEN ROBERTSON

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31	DC	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
66 ft.	66 ft.	08/16/1984

Drilling Method Cable Tool

Geological Material	Color	Hardness	From	To
SAND & CLAY	YELLOW	HARD	0	18
SAND	YELLOW	HARD	18	42
SAND & CLAY	YELLOW	HARD	42	61
SAND	YELLOW	HARD	61	66

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Galvanized Joint Threaded Drive Shoe? ☑ Yes ☐ No Above/Below 1 ft.

Casing Diameter	Weight	Hole Diameter
2 in. to 62 ft.	3.75 lbs./ft.	

Open Hole from ft. to ft.

Screen YES Make JOHNSON Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
1.3	8	4	62 ft. and 66 ft.

Static Water Level
18 ft. from Land surface Date Measured 08/16/1984

PUMPING LEVEL (below land surface)
18 ft. after 120 hrs. pumping 10 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☑ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☐ Yes ☑ No

Nearest Known Source of Contamination
75 feet E direction Other type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed 08/16/1984
Manufacturer's name TAIT Model number 5CAT HP 0.5 Volts 110
Length of drop Pipe 21 ft. Capacity 6 g.p.m Type Jet Material Galvanized

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Nelson Well Drilling	04121	NELSON, L.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

186895

Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
442354

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 11/08/1990
Update Date 02/04/2004
Received Date

Well Name KERNMER, KAY

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31		Elevation Method	

Well Depth	Depth Completed	Date Well Completed
52 ft.	52 ft.	10/06/1989

Drilling Method Non-specified Rotary

Well Address
2316 BARDWELL DR NW
BEMIDJI MN 5660

Geological Material	Color	Hardness	From	To
SAND	YELLOW	SOFT	0	15
SAND	BLUE	SOFT	15	35
CLAY	BLUE	SOFT	35	43
SAND	YELLOW	MEDIUM	43	52

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Plastic Joint No Information Drive Shoe? ☐ Yes ☐ No Above/Below 1 ft.

Casing Diameter	Weight	Hole Diameter
		6.25 in. to 52 ft.

Open Hole from ft. to ft.

Screen YES Make SMITH Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
	12	4	ft. and ft.

Static Water Level
15 ft. from Land surface Date Measured 10/06/1989

PUMPING LEVEL (below land surface)
ft. after hrs. pumping 40 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
NORTH OF THE EAST END OF THE AIRPORT

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from to ft.

Nearest Known Source of Contamination
__feet __direction __type

Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Aqua Well Drilling	04463	YERBICH, A.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

442354

Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
450493

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 03/03/1991
Update Date 07/24/2000
Received Date

Well Name OLSON, RON

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31	CCC	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
47 ft.	47 ft.	09/23/1987

Drilling Method Jetted

Well Address

BEMIDJI MN 56601

Geological Material	Color	Hardness	From	To
SAND			0	39
CLAY	BLUE		39	43
SAND	BLUE		43	47

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Galvanized Joint Threaded Drive Shoe? ☑ Yes ☐ No Above/Below 1 ft.

Casing Diameter	Weight	Hole Diameter
2 in. to 42 ft.	3 lbs./ft.	

Open Hole from ft. to ft.

Screen YES Make JOHNSON Type

Diameter	Slot/Gauze	Length	Set Between
1.3	12	48	43 ft. and 47 ft.

Static Water Level
14 ft. from Land surface Date Measured 09/23/1987

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☑ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

License Business Name | Lic. Or Reg. No. | SIZER, G. Name of Driller

County Well Index Online Report | 450493 | Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
471217

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 09/25/1992
Update Date 08/28/2007
Received Date 06/24/1991

Well Name BEMIDJI AVIATION MW-1

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	34	W	36	ACD	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
20 ft.	20 ft.	06/06/1991

Drilling Method Other

Drilling Fluid --

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Abandoned Status Sealed

Casing Type Steel (black or low carbon) Joint Threaded Drive Shoe? ☐ Yes ☑ No Above/Below 2 ft.

Geological Material	Color	Hardness	From	To
CONCRETE	WHITE		0	1
SAND - MODERATE	YEL/BRN		1	6
SAND - DARK, YELL/BRN			6	14
SAND - PALE, YELL/BRN			14	20

Casing Diameter	Weight	Hole Diameter
2 in. to 10 ft.	lbs./ft.	8 in. to 20 ft.

Open Hole from ft. to ft.

Screen YES Make JOHNSON Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
2	20	10	10 ft. and 20 ft.

Static Water Level
15 ft. from Land surface Date Measured 06/06/1991

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
MONITORING WELL IS USED TO CK THE SPREAD OF GAS IN THE GROUND WATER.
WELL SEALED 10-05-1993 BY 75330
ORIGINAL USE MW - MONITOR WELL - #1
DRILLING METHOD - HOLLOW ROD

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Bentonite from 9 to 10 ft.
Grout Material: Neat Cement from to 9 ft.

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Valnes Well Co.	75330	VALNES, T.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report 471217 Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
471218

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 09/25/1992
Update Date 10/16/2008
Received Date 06/24/1991

Well Name BEMIDJI AVIATION MW-2

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	34	W	36	ACD	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
20 ft.	20 ft.	06/06/1991

Drilling Method Other

Well Address
2 HY W
MN

Geological Material	Color	Hardness	From	To
CONCRETE	WHITE		0	1
SAND - MODERATE YELL/BRN			1	6
SAND - DARK YELL/BRN			6	14
SAND - PALE YELL/BRN			14	20

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Abandoned Status Sealed

Casing Type Steel (black or low carbon) Joint Threaded Drive Shoe? ☐ Yes ☑ No Above/Below 2 ft.

Casing Diameter	Weight	Hole Diameter
2 in. to 10 ft.	lbs./ft.	8 in. to 20 ft.

Open Hole from ft. to ft.

Screen YES Make JOHNSON Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
2	10	10	10 ft. and 20 ft.

Static Water Level
16 ft. from Land surface Date Measured 06/06/1991

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
MW WELL IS USED TO CHECK THE SPREAD OF GASOLINE IN THE GROUND WATER.
WELL SEALED 10-05-1993 BY 75330
ORIGINAL USE MW - MONITOR WELL - #2
DRILLING METHOD - HOLLOW ROD

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Bentonite from 9 to 10 ft.
Grout Material: Neat Cement from to 9 ft.

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

Valnes Well Co.	75330	VALNES, T.
License Business Name	Lic. Or Reg. No.	Name of Driller

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

471218

Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
471219

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 09/25/1992
Update Date 10/16/2008
Received Date 06/24/1991

Well Name BEMIDJI AVIATION MW-3

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	34	W	36	ACD	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
20 ft.	20 ft.	06/06/1991

Drilling Method --

Well Address
2 HY W
MN

Geological Material	Color	Hardness	From	To

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Abandoned Status Sealed

Casing Type Steel (black or low carbon) Joint Threaded Drive Shoe? ☐ Yes ☑ No Above/Below 2 ft.

Casing Diameter	Weight	Hole Diameter
2 in. to 10 ft.	lbs./ft.	8 in. to 20 ft.

Open Hole from ft. to ft.

Screen YES Make JOHNSON Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
2	10	10	10 ft. and 20 ft.

Static Water Level
15.5 ft. from Land surface Date Measured 06/06/1991

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
MW WELL IS TO CHECK TO SPREAD OF GASOLINE IN THE GROUND WATER.
WELL SEALED 10-05-1993 BY 75330
ORIGINAL USE MW - MONITOR WELL

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Bentonite from 9 to 10 ft.
Grout Material: Neat Cement from to 9 ft.

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Valnes Well Co.	75330	VALNES, T.

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HE-01205-07

Minnesota Unique Well No.
477256

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 04/04/1992
Update Date 07/24/2000
Received Date

Well Name PETSCHE, WILLIAM

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31	DDB	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
54 ft.	54 ft.	07/03/1991

Drilling Method Cable Tool

Well Address
2323 ALGEE CT NW
MN

Geological Material	Color	Hardness	From	To
SAND	YELLOW		0	27
CLAY			27	48
SAND			48	54
CLAY & ROCK	BLACK		54	

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Steel (black or low carbon) Joint Threaded Drive Shoe? ☑ Yes ☐ No Above/Below 3 ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 50 ft.	lbs./ft.	

Open Hole from ft. to ft.

Screen YES Make COOK Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
2	12	4	50 ft. and 54 ft.

Static Water Level
26 ft. from Land surface Date Measured 07/03/1991

PUMPING LEVEL (below land surface)
38 ft. after 30 hrs. pumping 15 g.p.m.

Well Head Completion
Pitless adapter manufacturer MAASS Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☐ Yes ☑ No

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name AERMOTOR Model number __ HP 0.5 Volts 220
Length of drop Pipe 30 ft. Capacity __g.p.m Type Submersible Material Plastic

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Lahman Well Drilling	04051	LAHMAN, C.

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Minnesota Unique Well No.
478252

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 09/19/1991
Update Date 07/24/2000
Received Date

Well Name SHIPPER, SHARON

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31	ACC	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
50 ft.	50 ft.	07/01/1991

Drilling Method Non-specified Rotary

Well Address
2405 ALYCE CT
BEMIDJI MN 56601

Geological Material	Color	Hardness	From	To
SAND	BROWN		0	19
SAND	GRAY		19	26
SILTY CLAY	GRAY		26	30
SAND	GRAY		30	50

Drilling Fluid
Bentonite

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Plastic Joint No Information Drive Shoe? ☐ Yes ☑ No Above/Below 1 ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 45 ft.	lbs./ft.	8.8 in. to 50 ft.

Open Hole from ft. to ft.

Screen YES Make JOHNSON Type plastic

Diameter	Slot/Gauze	Length	Set Between
4	23	5	45 ft. and 50 ft.

Static Water Level
12 ft. from Land surface Date Measured 07/01/1991

PUMPING LEVEL (below land surface)
38 ft. after 60 hrs. pumping 30 g.p.m.

Well Head Completion
Pitless adapter manufacturer STEEL MASS Model J
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from 40 to 10 ft.

Nearest Known Source of Contamination
100 feet direction Septic tank/drain field type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed 07/02/1991
Manufacturer's name AERMOTOR Model number SD12-50 HP 0.5 Volts 230
Length of drop Pipe 35 ft. Capacity 9 g.p.m Type Submersible Material Plastic

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
North Star Drilling	49588	FELL, B.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

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Minnesota Unique Well No.
514124

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 03/09/1993
Update Date 03/11/2005
Received Date

Well Name FRONTIER HOMES INC

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31	BAA	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
56 ft.	56 ft.	09/28/1992

Drilling Method Cable Tool

Drilling Fluid --

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Steel (black or low carbon) Joint Welded Drive Shoe? ☑ Yes ☐ No Above/Below ft.

Geological Material	Color	Hardness	From	To
SAND	YELLOW		0	56

Casing Diameter	Weight	Hole Diameter
4 in. to 52 ft.	11 lbs./ft.	

Open Hole from ft. to ft.

Screen YES Make COOK Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
4	10	4	52 ft. and 52 ft.

Static Water Level
18 ft. from Land surface Date Measured 09/28/1992

PUMPING LEVEL (below land surface)
33 ft. after 30 hrs. pumping 15 g.p.m.

Well Head Completion
Pitless adapter manufacturer MAASS Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Lahman Well Drilling	04051	LAHMAN, C.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

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Minnesota Unique Well No.
518168

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
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Entry Date 03/09/1993
Update Date 02/04/2004
Received Date

Well Name KOLP, RICHARD

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31	DAC	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
54 ft.	54 ft.	10/20/1992

Drilling Method Non-specified Rotary

Well Address
3611 LAUREL DR NW
MN

Geological Material	Color	Hardness	From	To
SAND	YELLOW	SOFT	0	27
CLAY	BLUE	SOFT	27	31
SAND	BLUE	HARD	31	54

Drilling Fluid
Revert

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Plastic Joint No Information Drive Shoe? ☐ Yes ☐ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 50 ft.	lbs./ft.	8.5 in. to 30 ft.
		6.25 in. to 54 ft.

Open Hole from ft. to ft.

Screen YES Make JOHNSON Type

Diameter	Slot/Gauze	Length	Set Between
2	12	4	50 ft. and 54 ft.

Static Water Level
16 ft. from Land surface Date Measured 10/20/1992

PUMPING LEVEL (below land surface)
16 ft. after 120 hrs. pumping 35 g.p.m.

Well Head Completion
Pitless adapter manufacturer MAASS Model 4J1
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
DICK'S MARINE

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from 7 to 30 ft.
Grout Material: Cuttings from 30 to 39 ft.

Nearest Known Source of Contamination
60 feet South West direction Septic tank/drain field type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed 10/22/1992
Manufacturer's name STA-RITE Model number 10SP4C02T HP 0.5 Volts 220
Length of drop Pipe 40 ft. Capacity 10 g.p.m Type Submersible Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Nelson Well Drilling	04121	REED, G.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report 518168 Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
547810

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 10/26/1994
Update Date 02/04/2004
Received Date

Well Name OLSON, REID & KATHY

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31	ACC	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
55 ft.	55 ft.	06/23/1994

Drilling Method Non-specified Rotary

Well Address
2321 ANNE ST NW
BEMIDJI MN 56601

Geological Material	Color	Hardness	From	To
SAND	YELLOW	SOFT	0	30
CLAY	YELLOW	SOFT	30	45
SAND	YELLOW	HARD	45	55

Drilling Fluid
Bentonite

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Plastic Joint No Information Drive Shoe? ☐ Yes ☐ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 50 ft.	lbs./ft.	8 in. to 30 ft.
		6.25 in. to 55 ft.

Open Hole from ft. to ft.

Screen YES Make Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
2	10	5	50 ft. and 55 ft.

Static Water Level
18 ft. from Land surface Date Measured 06/23/1994

PUMPING LEVEL (below land surface)
18 ft. after 120 hrs. pumping 20 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Bentonite from 8 to 30 ft. 3 bags

Nearest Known Source of Contamination
75 feet S direction Septic tank/drain field type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number HP Volts
Length of drop Pipe ft. Capacity g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Nelson Well Drilling	04121	REED, G.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

547810

Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
549969

County Beltrami
Quad Peterson Lake
Quad ID 329C

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 01/01/1980
Update Date 01/03/2005
Received Date

Well Name LOREN, ROBERT
Township Range Dir Section Subsections Elevation
147 33 W 31 ABD
Elevation Method 1380 ft. Calc from DEM (USGS 7.5 min or equiv.)

Well Depth	Depth Completed	Date Well Completed
108 ft.	108 ft.	03/24/1995

Drilling Method Non-specified Rotary

Drilling Fluid Bentonite

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Plastic Joint Glued Drive Shoe? ☑ Yes ☐ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 96 ft.	1.87 lbs./ft.	8.3 in. to 30 ft.
		6.25 in. to 108 ft.

Open Hole from ft. to ft.

Screen YES Make COOK Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
2	12	12	96 ft. and 108 ft.

Geological Material	Color	Hardness	From	To
SAND	BROWN	SOFT	0	49
CLAY	GRAY	MEDIUM	49	67
SAND	GRAY	SOFT	67	72
CLAY AND SAND	GRAY	MEDIUM	72	93
SAND	YELLOW	MEDIUM	93	108

Static Water Level
12 ft. from Land surface Date Measured 03/24/1995

PUMPING LEVEL (below land surface)
108 ft. after 120 hrs. pumping 75 g.p.m.

Well Head Completion
Pitless adapter manufacturer MONITOR Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from 7 to 30 ft. 4 bags

Located Beltrami Cty. Soil & Water Cons. Dist.
Method GPS SA On (averaged)
Unique Number Verification Information from owner
Date N/A
System UTM - Nad83, Zone15, Meters
X: 356185 Y: 5262812

Nearest Known Source of Contamination
55 feet W direction Septic tank/drain field type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed 03/24/1995
Manufacturer's name GOULD Model number 48LE30 HP 3 Volts 230
Length of drop Pipe 80 ft. Capacity 70 g.p.m Type Submersible Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Bradseth Well Co.	04527	BRADSETH, C.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

549969

Printed 6/25/2008
HE-01205-07

Minnesota Unique Well No.
566297

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 12/20/1995
Update Date 02/04/2004
Received Date

Well Name BEWELY, DAVID

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31	ACD	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
55 ft.	55 ft.	11/14/1995

Drilling Method Non-specified Rotary

Well Address
2120 ANNE ST
BEMIDJI MN 56601

Geological Material	Color	Hardness	From	To
SAND	BROWN	SOFT	0	12
CLAY	GRAY	MEDIUM	12	19
SAND, GRAVEL	GRAY	MEDIUM	19	28
CLAY	GRAY	MEDIUM	28	41
SAND	BROWN	SOFT	41	55

Drilling Fluid
Bentonite

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Plastic Joint No Information Drive Shoe? ☐ Yes ☑ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 51 ft.	lbs./ft.	6.75 in. to 55 ft.

Open Hole from ft. to ft.

Screen YES Make HALBURTON Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
2	12	4	51 ft. and 55 ft.

Static Water Level
13 ft. from Land surface Date Measured 11/14/1995

PUMPING LEVEL (below land surface)
22 ft. after 60 hrs. pumping 25 g.p.m.

Well Head Completion
Pitless adapter manufacturer MONITOR Model SNAPPY
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Bentonite from 8 to 30 ft. 2 bags

Nearest Known Source of Contamination
60 feet W direction Septic tank/drain field type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed 11/15/1995
Manufacturer's name MYERS Model number __ HP 0.5 Volts 230
Length of drop Pipe _ft. Capacity 10 g.p.m Type Submersible Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☑ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☑ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Aqua Well Drilling	04463	SCANDIN, R.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

566297

Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
569841

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 12/20/1995
Update Date 07/24/2000
Received Date

Well Name HURLEY, LLOYD

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31	DDC	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
57 ft.	57 ft.	11/20/1995

Drilling Method Non-specified Rotary

Well Address
BANDWELL PARK
MN

Geological Material	Color	Hardness	From	To
SAND	BROWN	SOFT	0	22
CLAY	BROWN	SOFT	22	24
SAND	BROWN	SOFT	24	30
SAND	GRAY	SOFT	30	57

Drilling Fluid
Other

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Plastic Joint No Information Drive Shoe? ☐ Yes ☐ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 52 ft.	lbs./ft.	8 in. to 57 ft.

Open Hole from ft. to ft.

Screen YES Make HOWARD SMITH Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
2	12	5	52 ft. and 57 ft.

Static Water Level
17 ft. from Land surface Date Measured 11/20/1995

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
BANDWELL PARK

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from 8 to 40 ft. 1 yrds.

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name STA-RITE Model number __ HP 0.5 Volts 230
Length of drop Pipe _ft. Capacity 10 g.p.m Type Submersible Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☑ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Sizer Water Well	04620	PINK, C.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

569841

Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
576751

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 03/06/1997
Update Date 02/04/2004
Received Date

Well Name WIEBOLT, DARWIN

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31	DAD	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
55 ft.	55 ft.	06/07/1996

Drilling Method Non-specified Rotary

Well Address
LUELE DR
BEMIDJI MN 56601

Geological Material	Color	Hardness	From	To
SAND	BROWN	SOFT	0	10
SAND	GRAY	SOFT	10	45
CLAY	BROWN	MEDIUM	45	49
SAND	GRAY	SOFT	49	55

Drilling Fluid
Bentonite

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Plastic Joint No Information Drive Shoe? ☐ Yes ☑ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 51 ft.	lbs./ft.	6.75 in. to 55 ft.

Open Hole from ft. to ft.

Screen YES Make JOHNSON Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
2	12	4	51 ft. and 55 ft.

Static Water Level
20 ft. from Land surface Date Measured 06/07/1996

PUMPING LEVEL (below land surface)
30 ft. after 60 hrs. pumping 20 g.p.m.

Well Head Completion
Pitless adapter manufacturer MONITOR Model SNAPPY
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Bentonite from 8 to 30 ft. 2 bags

Nearest Known Source of Contamination
60 feet S direction Septic tank/drain field type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed 06/14/1996
Manufacturer's name STA-RITE Model number HP 0.75 Volts 230
Length of drop Pipe 40 ft. Capacity 12 g.p.m Type Submersible Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☑ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Aqua Well Drilling	04463	SCANDIN, R.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

576751

Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
585876

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 09/26/1997
Update Date 10/08/2008
Received Date

Well Name OTTERTAIL REALTY

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31	ADC	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
57 ft.	57 ft.	06/14/1997

Drilling Method Non-specified Rotary

Well Address
1925 ANN ST NW
BEMIDJI MN

Geological Material	Color	Hardness	From	To
NO RECORD			0	57

Drilling Fluid
Bentonite

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Plastic Joint No Information Drive Shoe? ☐ Yes ☐ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 53 ft.	lbs./ft.	8.5 in. to 30 ft.
		6.25 in. to 57 ft.

Open Hole from ft. to ft.

Screen YES Make JOHNSON Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
2	12	4	53 ft. and 57 ft.

Static Water Level
18 ft. from Land surface Date Measured 06/14/1997

PUMPING LEVEL (below land surface)
20 ft. after 2 hrs. pumping 30 g.p.m.

Well Head Completion
Pitless adapter manufacturer SNAPPY Model 8PL41U
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from 0 to 30 ft. 3 bags

Nearest Known Source of Contamination
78 feet N direction Septic tank/drain field type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed 06/17/1997
Manufacturer's name MEYERS Model number 2N52-12 HP 0.5 Volts 220
Length of drop Pipe 40 ft. Capacity 12 g.p.m Type Submersible Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☑ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Nelson Well Drilling	04121	REED, G.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report 585876 Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
599787

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 05/10/1999
Update Date 03/11/2005
Received Date

Well Name HWMENIK, JAMES

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31		Elevation Method	

Well Depth	Depth Completed	Date Well Completed
55 ft.	55 ft.	04/17/1998

Drilling Method Non-specified Rotary

Well Address
1898 ANN ST

Drilling Fluid
Bentonite

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Domestic

Casing Type Plastic Joint No Information Drive Shoe? ☐ Yes ☐ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 55 ft.	lbs./ft.	

Open Hole from ft. to ft.

Screen YES Make JOHNSON Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
2	12	5	50 ft. and 55 ft.

Geological Material	Color	Hardness	From	To
SAND	BROWN	SOFT	0	15
SAND	GRAY	SOFT	15	28
CLAY	GRAY	SOFT	28	47
SAND	BROWN	SOFT	47	55

Static Water Level
15 ft. from Land surface Date Measured 04/17/1998

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer SNAPPY Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: from 8 to 30 ft. 2 bags

Nearest Known Source of Contamination
55 feet North West direction Tanks type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name STA RITE Model number __ HP 0.5 Volts 230
Length of drop Pipe _ft. Capacity 10 g.p.m Type Submersible Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Sizer Water Well	04620	PINK, C.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report 599787 Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
609276

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 07/01/1998
Update Date 07/24/2000
Received Date

Well Name DAHL, JOHN

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31	DCB	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
60 ft.	60 ft.	04/14/1998

Drilling Method Non-specified Rotary

Well Address
BARDWELL PARK
BEMIDJI MN 56601

Geological Material	Color	Hardness	From	To
SAND	BROWN		0	25
CLAY	BRN/GRY		25	35
SAND	BROWN		35	50
SAND	GRAY		50	60

Drilling Fluid
Bentonite

Well Hydrofractured? ☐ Yes ☑ No
From Ft. to Ft.

Use Domestic

Casing Type Plastic Joint No Information Drive Shoe? ☐ Yes ☑ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 55 ft.	lbs./ft.	8.8 in. to 60 ft.

Open Hole from ft. to ft.

Screen YES Make CERTAINTEED Type plastic

Diameter	Slot/Gauze	Length	Set Between
4	23	5	55 ft. and 60 ft.

Static Water Level
12 ft. from Land surface Date Measured 04/14/1998

PUMPING LEVEL (below land surface)
40 ft. after 60 hrs. pumping 30 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☑ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Bentonite from 0 to 30 ft.

Nearest Known Source of Contamination
50 feet direction Septic tank/drain field type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number HP Volts
Length of drop Pipe ft. Capacity g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☑ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
North Star Drilling	49588	FELL, B.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

609276

Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
623421

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 03/07/2000
Update Date 03/11/2005
Received Date

Well Name HASKELL, JAMES

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31	ADC	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
64 ft.	64 ft.	04/12/1999

Drilling Method Non-specified Rotary

Well Address
1931 ANNE ST NW
BEMIDJI MN 56601

Geological Material	Color	Hardness	From	To
SNAD	BROWN	MEDIUM	0	15
SAND/GRAVEL	BROWN	MEDIUM	15	30
CLAY	GRAY	MEDIUM	30	35
CLAYFINE SAND	BROWN	MEDIUM	35	45
CLAY/SANDY	GRAY	MEDIUM	45	55
SAND	GRAY	MEDIUM	55	64

Drilling Fluid
Bentonite

Well Hydrofractured? ☐ Yes ☑ No
From Ft. to Ft.

Use Domestic

Casing Type Plastic Joint No Information Drive Shoe? ☐ Yes ☑ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 60 ft.	lbs./ft.	6.75 in. to 64 ft.

Open Hole from ft. to ft.

Screen YES Make WESCO Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
4	12	4	60 ft. and 64 ft.

Static Water Level
14 ft. from Land surface Date Measured 04/12/1999

PUMPING LEVEL (below land surface)
20 ft. after 1 hrs. pumping 30 g.p.m.

Well Head Completion
Pitless adapter manufacturer MERRILL Model MCK4100
☐ Casing Protection ☑ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Bentonite from 8 to 30 ft. 2 bags

Nearest Known Source of Contamination
100 feet North East direction Septic tank/drain field type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed 04/29/1999
Manufacturer's name GOULD Model number 10SB05 HP 0.5 Volts 230
Length of drop Pipe 30 ft. Capacity 10 g.p.m Type Submersible Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☑ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Aqua Well Drilling	04463	EVANS, T.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

623421

Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
710183

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date
Update Date 05/03/2006
Received Date 12/22/2004

Well Name
Township 147 | Range 33 | Dir W | Section 31 | Subsections DAD | Elevation ft. | Elevation Method

Well Depth: 84 ft. | Depth Completed: 84 ft. | Date Well Completed: 06/17/2004

Drilling Method: Non-specified Rotary

Well Address
BARDWELL CT
BEMIDJI MN 56601

Geological Material	Color	Hardness	From	To
SAND	BROWN	SOFT	0	22
FINE SAND	GRAY	SOFT	22	45
SAND	BROWN	SOFT	45	84

Drilling Fluid: Bentonite

Well Hydrofractured? ☐ Yes ☑ No
From Ft. to Ft.

Use: Domestic

Casing Type: Plastic | Joint: No Information | Drive Shoe? ☐ Yes ☑ No | Above/Below ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 80 ft.	lbs./ft.	6.75 in. to 84 ft.

Open Hole from ft. to ft.

Screen YES | Make: JOHNSON | Type: stainless steel

Diameter	Slot/Gauze	Length	Set Between
2	10	4	80 ft. and 84 ft.

Static Water Level
15 ft. from Land surface Date Measured 06/17/2004

PUMPING LEVEL (below land surface)
30 ft. after 1 hrs. pumping 35 g.p.m.

Well Head Completion
Pitless adapter manufacturer: MERRILL | Model:
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
WELL LOCATION: LOT 17 BLOCK 1 BARDWELL CT. BEMIDJI

Grouting Information: Well Grouted? ☑ Yes ☐ No

Grout Material: High solids bentonite | from | to 30 ft. | 2 bags

Nearest Known Source of Contamination
200 feet South East direction Septic tank/drain field type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed 06/23/2004
Manufacturer's name RED JACKET Model number 50F211 HP 0.5 Volts 230
Length of drop Pipe 40 ft. Capacity 12 g.p.m Type Submersible Material

Abandoned Wells: Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance: Was a variance granted from the MDH for this well? ☐ Yes ☑ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Aqua Well Drilling	04463	CESOLINI, C.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report | 710183 | Printed 4/3/2009
HE-01205-07

Minnesota Unique Well No.
721170

County Beltrami
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date
Update Date 08/02/2006
Received Date 01/12/2006

Well Name COOP. DEVELOPMENT

Township	Range	Dir	Section	Subsections	Elevation	ft.
147	33	W	31	ACB	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
72 ft.	72 ft.	04/18/2005

Drilling Method Non-specified Rotary

Well Address
2419 BORING CT NW
BEMIDJI MN 56601

Geological Material	Color	Hardness	From	To
SAND	BROWN	MEDIUM	0	28
CLAY	BLUE	MEDIUM	28	56
SAND	BROWN	HARD	56	72

Drilling Fluid
Bentonite

Well Hydrofractured? ☐ Yes ☑ No
From Ft. to Ft.

Use Domestic

Casing Type Plastic Joint No Information Drive Shoe? ☐ Yes ☑ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
4 in. to 60 ft.	lbs./ft.	8.5 in. to 30 ft.
		6.25 in. to 72 ft.

Open Hole from ft. to ft.

Screen YES Make JOHNSON Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
4	10	12	60 ft. and 72 ft.

Static Water Level
15 ft. from Land surface Date Measured 04/18/2005

PUMPING LEVEL (below land surface)
20 ft. after 2 hrs. pumping 100 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection N ☑ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Bentonite from to 30 ft. 3 bags

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed 04/21/2005
Manufacturer's name GOULD Model number 556530 HP 3 Volts 230
Length of drop Pipe 40 ft. Capacity 70 g.p.m Type Submersible Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☑ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☑ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Nelson Well Drilling	04121	REED, J.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report 721170 Printed 4/3/2009
HE-01205-07

Appendix C

Burnsville ABLE Training Center Groundwater Receptor Survey Documents

LEGEND:

Inferred Groundwater Flow Direction

North

FIGURE
RECEPTOR SURVEY
ABLE FIRE TRAINING CENTER
BURNSVILLE, MINNESOTA

PROJECT NO.	PREPARED BY	DRAWN BY
45618DEL04	NR	DD
DATE	REVIEWED BY	FILE NAME
06/30/11		Burnsville-1

anteagroup

In Person Interview 8-17-10

Receptor Survey Questionnaire

PROPERTY ADDRESS: 12205 River Ridge Blvd - Northern Tool & Equip

1. Is there, or has there ever been, a water well on the property? **Yes** (**No**) **Unknown**

If you answered **No or Unknown**, proceed to Question 2. No awareness of any

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

_____

1f. Where on the property is (was) the well located?_____

_____

_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? (**Yes**) **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name Store Manager

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

Receptor Survey Questionnaire

PROPERTY ADDRESS: John Adamich => Lodge of Bemidji
12101 Hwy 35 SW

1. Is there, or has there ever been, a water well on the property? **Yes** (**No**) **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

_____

1f. Where on the property is (was) the well located?_____

_____

_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? (**Yes**) **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name John Adamich => Lodge of Bemidji

Telephone Number 612/237-8021 (cell) DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

Receptor Survey Questionnaire

PROPERTY ADDRESS: 12101 Hwy 35 W SOUTH BURNSVILLE

1. Is there, or has there ever been, a water well on the property? **Yes** (No) **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

_____

1f. Where on the property is (was) the well located?_____

_____

_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name JOHN HAMICH

Telephone Number CELL 612-237-8001 DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? (**Yes**) **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name JOHN HAMICH

Telephone Number CELL 612-237-8001 DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

– In Person Interview 8-17-10

Receptor Survey Questionnaire

PROPERTY ADDRESS: 600 12th St. W. – Walser Suburu

1. Is there, or has there ever been, a water well on the property? **Yes** **No** **Unknown**

Not aware of

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

_____

1f. Where on the property is (was) the well located?_____

_____

_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? **Yes** **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

In Person Interview 8-17-10

Receptor Survey Questionnaire

PROPERTY ADDRESS: 12001 Hwy 35 - All State Self Storage

1. Is there, or has there ever been, a water well on the property? **Yes** (**No**) **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

_____

1f. Where on the property is (was) the well located?_____

_____

_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? (**Yes**) **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name Owner/Manager

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

Receptor Survey Questionnaire

PROPERTY ADDRESS: 11737 HWY 35W CHAKA GOLF

1. Is there, or has there ever been, a water well on the property? **Yes** **No** **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

_____

1f. Where on the property is (was) the well located?_____

_____

_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name MICHAEL McGOWAN

Telephone Number (952) 890-1081 DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? **Yes** **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name ABOVE

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

11-3-10 No water supply wells, just monitoring wells.

PLEASE CONTACT CAMPBELL KNUTSON FOR MPCA

In Person Interview - 8-17-10

Receptor Survey Questionnaire

PROPERTY ADDRESS: Bury & Carlson - 201 12 1st St. NW

1. Is there, or has there ever been, a water well on the property? **Yes** (**No**) **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

_____

1f. Where on the property is (was) the well located?_____

_____

_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? (**Yes**) **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

Receptor Survey Questionnaire

PROPERTY ADDRESS: Rivers Edge Business Center, 25 W. Cliff Road, Burnsville

1. Is there, or has there ever been, a water well on the property? **Yes** (No) **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

_____

1f. Where on the property is (was) the well located?_____

_____

_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name_____

Telephone Number_____ DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? (Yes) **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name MICHAEL VALENTINE, MANAGING PARTNER

Telephone Number 612-850-4374 DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

Receptor Survey Questionnaire

PROPERTY ADDRESS: 12259 (12250-12268) Nicollet Avenue, Burnsville

1. Is there, or has there ever been, a water well on the property? **Yes** **No** **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

_____

1f. Where on the property is (was) the well located?_____

_____

_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? **Yes** **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

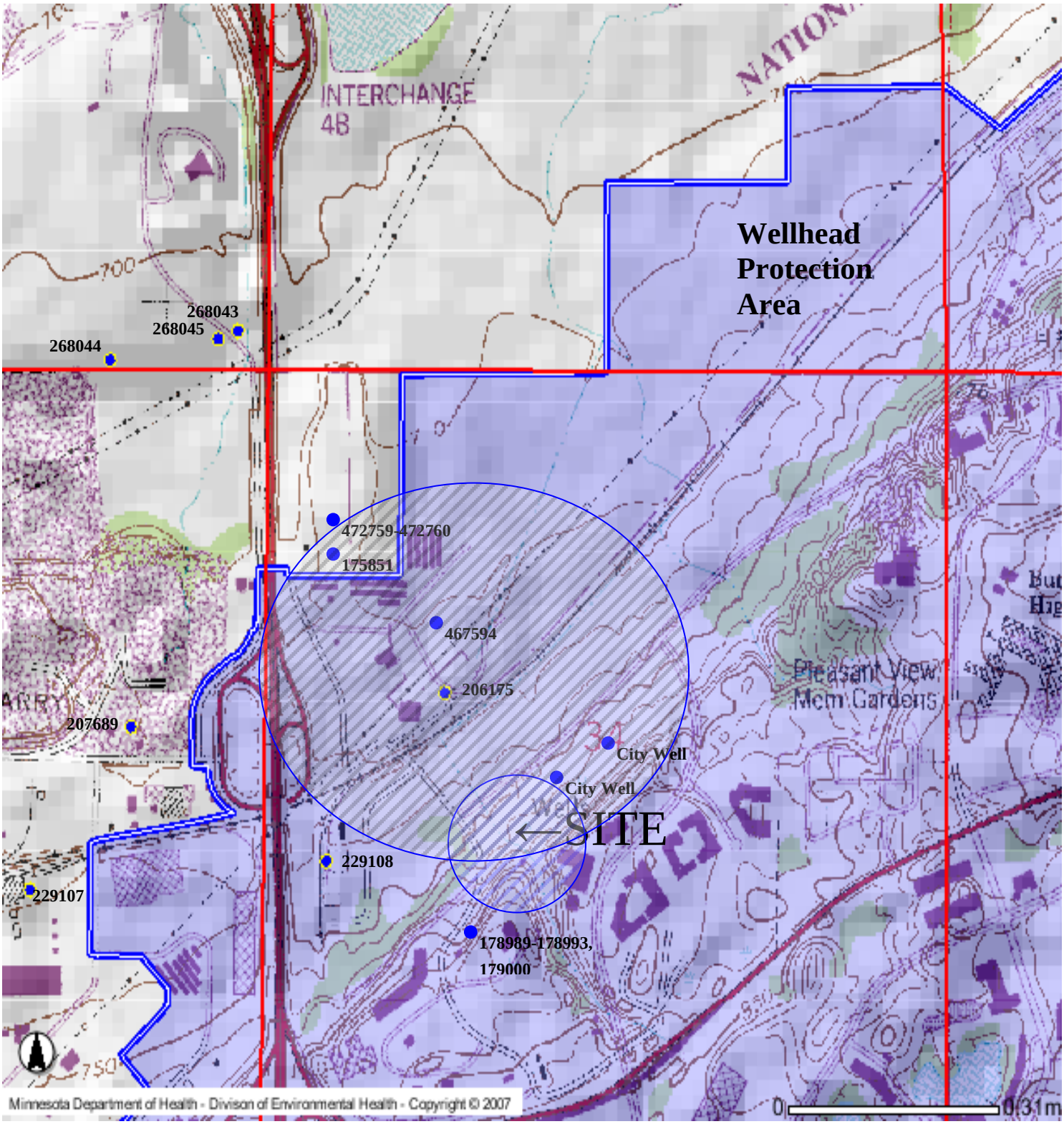
Name Nick Kau - Wellington Mgmt.

Telephone Number 651-999-5537 DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

BURNSVILLE CWI Well Map



Approximate Area of Receptor Survey

Minnesota Unique Well No.
175851

County Dakota
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 06/22/2001
Update Date
Received Date

Well Name BURNSVILLE TW
Township 27 Range 24 Dir W Section 34 Subsections BCD Elevation ft. Elevation Method

Well Depth 100 ft. | Depth Completed 100 ft. | Date Well Completed 04/16/1980

Drilling Method Non-specified Rotary

Drilling Fluid --

Well Hydrofractured? ☐ Yes ☐ No From Ft. to Ft.

Use Test well

Casing Type Steel (black or low carbon) Joint No Information Drive Shoe? ☑ Yes ☐ No Above/Below 2 ft.

Geological Material	Color	Hardness	From	To
DRIFT			0	17
SHAKOPEE	YELLOW	HARD	17	100

Casing Diameter	Weight	Hole Diameter
6 in. to 60 ft.	20 lbs./ft.	

Open Hole from 60 ft. to 160 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
5 ft. from Land surface Date Measured 04/16/1980

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☑ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from 0 to 60 ft. 2.5 yrds.

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☑ Yes ☐ No

Pump ☐ Not Installed Date Installed 05/16/1980
Manufacturer's name DEMPSTER Model number 15C2-59-S1 HP 0.5 Volts 115
Length of drop Pipe 54 ft. Capacity 20 g.p.m Type Submersible Material Galvanized

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Stevens Well Co.	27194	KADERLIK, C.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report | 175851 | Printed 4/2/2009
HE-01205-07

Minnesota Unique Well No.
178989

County Dakota
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 06/22/2001
Update Date
Received Date

Well Name BURNSVILLE MW

Township	Range	Dir	Section	Subsections	Elevation	ft.
27	24	W	34		Elevation Method	

Well Depth	Depth Completed	Date Well Completed
110 ft.	110 ft.	06/00/1981

Drilling Method Non-specified Rotary

Well Address
12111 RIVER RIDGE
BURNSVILLE MN

Geological Material	Color	Hardness	From	To
DRIFT	BLACK	SOFT	0	11
LIMEROCK	YELLOW	HARD	11	65
SANDSTONE	YELLOW	SOFT	65	68
LIMEROCK	YEL/GRY	HARD	68	110

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Monitor well

Casing Type Steel (black or low carbon) Joint Welded Drive Shoe? ☐ Yes ☑ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
12 in. to 11 ft.	49 lbs./ft.	18.5 in. to 11 ft.
6 in. to 70 ft.	19 lbs./ft.	12 in. to 70 ft.

Open Hole from 70 ft. to 110 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
ft. from Date Measured

PUMPING LEVEL (below land surface)
ft. after hrs. pumping 200 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from 0 to 70 ft.

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Stevens Well Co.	27194	KADERLIK, C.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

178989

Printed 4/2/2009
HE-01205-07

Minnesota Unique Well No.
178990

County Dakota
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 06/22/2001
Update Date 06/22/2001
Received Date

Well Name BURNSVILLE MW

Township	Range	Dir	Section	Subsections	Elevation	ft.
27	24	W	34		Elevation Method	

Well Depth	Depth Completed	Date Well Completed
110 ft.	110 ft.	06/00/1981

Drilling Method Non-specified Rotary

Well Address
12111 RIVERRIDGE BL
BURNSVILLE MN

Geological Material	Color	Hardness	From	To
DRIFT	BLACK	SOFT	0	11
LIMEROCK	YELLOW	HARD	11	65
SANDSTONE	YELLOW	SOFT	65	68
LIMEROCK	YEL/GRY	HARD	68	94
SANDSTONE	YELLOW	SOFT	94	100
LIMEROCK	YELLOW	M.HARD	100	110

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Test well

Casing Type Steel (black or low carbon) Joint No Information Drive Shoe? ☐ Yes ☑ No Above/Below 110 ft.

Casing Diameter	Weight	Hole Diameter
12 in. to 11 ft.	49 lbs./ft.	18.5 in. to 11 ft.
6 in. to 70 ft.	19 lbs./ft.	12 in. to 70 ft.

Open Hole from 70 ft. to 110 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
ft. from Date Measured

PUMPING LEVEL (below land surface)
ft. after hrs. pumping 200 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
MONITORING WELL SHAKOPEE.

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from 0 to 70 ft.

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Stevens Well Co.	27194	KADERLIK, C.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

178990

Printed 4/2/2009
HE-01205-07

Minnesota Unique Well No.
178991

County Dakota
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 06/22/2001
Update Date
Received Date

Well Name BURNSVILLE MW

Township	Range	Dir	Section	Subsections	Elevation	ft.
27	24	W	34		Elevation Method	

Well Depth	Depth Completed	Date Well Completed
110 ft.	110 ft.	06/00/1981

Drilling Method Non-specified Rotary

Well Address
12111 RIVER RIDGE BL

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Monitor well

Geological Material	Color	Hardness	From	To
DRIFT	BLACK	SOFT	0	12
LIMEROCK	YELLOW	HARD	12	94
SANDSTONE	YELLOW	SOFT	94	99
LIMEROCK	YELLOW	M.HARD	99	110

Casing Type Steel (black or low carbon) Joint Welded Drive Shoe? ☐ Yes ☑ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
12 in. to 12 ft.	49 lbs./ft.	18.5 in. to 12 ft.
6 in. to 70 ft.	19 lbs./ft.	12 in. to 70 ft.

Open Hole from 70 ft. to 110 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
ft. from Date Measured

PUMPING LEVEL (below land surface)
ft. after hrs. pumping 200 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
IN THE PUMP SECTION LOCK BOXES & RECORDERS WERE USED.

Grouting Information Well Grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Stevens Well Co.	27194	KADERLIK, C.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

178991

Printed 4/2/2009
HE-01205-07

Minnesota Unique Well No.
178992

County Dakota
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 06/22/2001
Update Date 06/22/2001
Received Date

Well Name BURNSVILLE MW

Township	Range	Dir	Section	Subsections	Elevation	ft.
27	24	W	34		Elevation Method	

Well Depth	Depth Completed	Date Well Completed
220 ft.	220 ft.	06/00/1981

Drilling Method Non-specified Rotary

Well Address
12111 RIVER RIDGE BL
MN

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Monitor well

Casing Type Steel (black or low carbon) Joint Welded Drive Shoe? ☐ Yes ☑ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
12 in. to 35 ft.	lbs./ft.	18.5 in. to 35 ft.
6 in. to 185 ft.	lbs./ft.	12 in. to 183 ft.

Open Hole from ft. to ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Geological Material	Color	Hardness	From	To
CLAY	BLACK	SOFT	0	21
COARSE GRAVEL	GRAY	SOFT	21	35
LIMESTONE	YELLOW	M.HARD	35	38
LIMEROCK CAVERN	YELLOW	SOFT	38	39
LIMEROCK	YELLOW	M.HARD	39	45
LIMEROCK CAVERN	YELLOW	SOFT	45	48
LIMEROCK	YELLOW	HARD	48	65
SANDSTONE	YELLOW	SOFT	65	68
LIMEROCK	YELLOW	SOFT	68	96
SANDSTONE W/LIMEROCK LENS	YELLOW	SOFT	96	104
LIMEROCK	YELLOW	M.HARD	104	125
LIMEROCK	GRAY	HARD	125	155
SANDROCK ONEOTA	DK. GRY	HARD	160	160
SANDSTONE/ JORDAN	DK. GRY	M.HARD	160	220

Static Water Level
ft. from Date Measured

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
JORDAN EVERY 8-10 FEET HAD HARD LENSES.

Grouting Information Well Grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

Stevens Well Co.	27194	KADERLIK, C.
License Business Name	Lic. Or Reg. No.	Name of Driller

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

178992

Printed 4/2/2009
HE-01205-07

Minnesota Unique Well No.
178993

County Dakota
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 06/22/2001
Update Date
Received Date

Well Name BURNSVILLE MW

Township	Range	Dir	Section	Subsections	Elevation	ft.
27	24	W	34		Elevation Method	

Well Depth	Depth Completed	Date Well Completed
220 ft.	220 ft.	06/00/1981

Drilling Method Non-specified Rotary

Well Address
12111 RIVER RIDGE BL

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Monitor well

Geological Material	Color	Hardness	From	To
DRIFT	BLACK	SOFT	0	11
LIMEROCK	YELLOW	HARD	11	94
SANDSTONE	YELLOW	SOFT	94	100
LIMEROCK	YELLOW	HARD	100	163
SANDSTONE	WHT/GRY	M.HARD	163	220

Casing Type Steel (black or low carbon) Joint Welded Drive Shoe? ☐ Yes ☑ No Above/Below ft.

Casing Diameter	Weight	Hole Diameter
12 in. to 11 ft.	49 lbs./ft.	18.5 in. to 11 ft.
6 in. to 183 ft.	19 lbs./ft.	12 in. to 183 ft.

Open Hole from 183 ft. to 220 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
ft. from Date Measured

PUMPING LEVEL (below land surface)
ft. after hrs. pumping 200 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
LOCK BOXES & RECORDERS

Grouting Information Well Grouted? ☐ Yes ☐ No

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Stevens Well Co.	27194	KADERLIK, C.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

178993

Printed 4/2/2009
HE-01205-07

Minnesota Unique Well No.
179000

County Dakota
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 06/22/2001
Update Date
Received Date

Well Name BURNSVILLE MW

Township	Range	Dir	Section	Subsections	Elevation	ft.
27	24	W	34		Elevation Method	

Well Depth	Depth Completed	Date Well Completed
220 ft.	220 ft.	06/00/1981

Drilling Method Non-specified Rotary

Well Address
121111 RIVER RIDGE BL
BURNSVILLE MN

Geological Material	Color	Hardness	From	To
DRIFT	BLACK	SOFT	0	11
LIMEROCK	YELLOW	HARD	11	66
SANDSTONE	YELLOW	SOFT	66	69
LIMEROCK	YELLOW	HARD	69	159
SANDROCK	DK. GRY	HARD	159	165
SANDSTONE	WHT/GRY	SOFT	165	220

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Monitor well

Casing Type Steel (black or low carbon) Joint Welded Drive Shoe? ☐ Yes ☑ No Above/Below 2.5 ft.

Casing Diameter	Weight	Hole Diameter
12 in. to 11 ft.	49 lbs./ft.	18.5 in. to 11 ft.
6 in. to 183 ft.	19 lbs./ft.	12 in. to 183 ft.

Open Hole from 183 ft. to 220 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Static Water Level
ft. from Date Measured

PUMPING LEVEL (below land surface)
ft. after hrs. pumping 200 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

NO REMARKS

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from 0 to 183 ft.

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Stevens Well Co.	27194	KADERLIK, C.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report

179000

Printed 4/2/2009
HE-01205-07

Minnesota Unique Well No.
206175

County Dakota
Quad Bloomington
Quad ID 104D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 10/19/1990
Update Date 06/22/2001
Received Date

Well Name BURNSVILLE
Township Range Dir Section Subsections Elevation
27 24 W 34 BDC Elevation Method 725 ft. 7.5 minute topographic map (+/- 5 feet)

Well Depth	Depth Completed	Date Well Completed
220 ft.	220 ft.	12/20/1963

Drilling Method --

Drilling Fluid --

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Abandoned Status Inactive

Casing Type Steel (black or low carbon) Joint No Information Drive Shoe? ☐ Yes ☐ No Above/Below 0 ft.

Casing Diameter	Weight	Hole Diameter
6 in. to 180 ft.	lbs./ft.	
6 in. to 180 ft.	lbs./ft.	

Open Hole from ft. to ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Well Address
12111 RIVER RIDGE BL
BURNSVILLE MN

Geological Material	Color	Hardness	From	To
FILL			0	12
SHAKOPEE-ONEOTA DOLOMITE			12	168
JORDAN SANDSTONE			168	220

Static Water Level
ft. from Date Measured

PUMPING LEVEL (below land surface)
0 ft. after hrs. pumping 200 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
ABANDONED OPEN HOLE ARTESIAN FLOW OPEN HOLE
CASING: 010 TO 0012;006 TO 0180.

Grouting Information Well Grouted? ☐ Yes ☐ No

Located United States Geological Survey
Method Digitized - scale 1:24,000 or larger (Digitizing Table)
Unique Number Verification N/A
Date N/A
System UTM - Nad83, Zone15, Meters X: 477578 Y: 4959030

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP 0 Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification
Tri-state Well Co. 27118
License Business Name Lic. Or Reg. No. Name of Driller

First Bedrock Prairie Du Chien Group
Last Strat Jordan
Aquifer Jordan
Depth to Bedrock 12 ft.

County Well Index Online Report

206175

Printed 6/26/2008
HE-01205-07

Minnesota Unique Well No.
229108

County Dakota
Quad Bloomington
Quad ID 104D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 05/20/1991
Update Date 03/08/2007
Received Date

Well Name NORTHWESTERN STATES CEMENT CO.
Township Range Dir Section Subsections Elevation 743 ft.
27 24 W 34 CBCABA Elevation Method 7.5 minute topographic map (+/- 5 feet)

Well Depth	Depth Completed	Date Well Completed
270 ft.	270 ft.	10/04/1963

Drilling Method --

Drilling Fluid --

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Industrial

Casing Type Steel (black or low carbon) Joint No Information Drive Shoe? ☐ Yes ☐ No Above/Below 0 ft.

Casing Diameter	Weight	Hole Diameter
20 in. to 29 ft.	lbs./ft.	
12 in. to 194 ft.	lbs./ft.	

Open Hole from 194 ft. to 270 ft.

Screen NO Make Type

Diameter	Slot/Gauze	Length	Set Between

Well Address

BURNSVILLE MN

Geological Material	Color	Hardness	From	To
GLACIAL DRIFT			0	27
SHAKOPEE-ONEOTA DOLOMITE			27	179
JORDAN SANDSTONE			179	270

Static Water Level
-1 ft. from Land surface Date Measured 10/04/1963

PUMPING LEVEL (below land surface)
14 ft. after hrs. pumping 360 g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
WELL FLOWS DON'T KNOW HOW HIGH ABOVE GROUND LEVEL.
LINER PIPE GROUTED WITH PURE CEMENT.

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from to ft.

Located Minnesota Geological Survey Method Digitization (Screen) - Map (1:24,000)
Unique Number Verification Information from owner Date 08/30/2004
System UTM - Nad83, Zone15, Meters X: 477296 Y: 4958679

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP 0 Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
Tri-state Well Co.	27118	BENEKE, R.

First Bedrock Prairie Du Chien Group
Last Strat Jordan
Aquifer Jordan
Depth to Bedrock 27 ft.

County Well Index Online Report

229108

Printed 6/26/2008
HE-01205-07

Minnesota Unique Well No.
467594

County Dakota
Quad Bloomington
Quad ID 104D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 12/04/1992
Update Date 10/01/2008
Received Date

Well Name MW-1
Township 27 | Range 24 | Dir W | Section 34 | Subsections BBA | Elevation ft. | Elevation Method

Well Depth 22 ft. | Depth Completed 22 ft. | Date Well Completed 10/09/1990

Drilling Method Power Auger

Well Address
121ST ST & PLEASANT LM
BURNSVILLE MN

Drilling Fluid --

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Monitor well

Geological Material	Color	Hardness	From	To
SAND FILL	BROWN	MEDIUM	0	3
SWAMP DEPOSIT	BLACK	SOFT	3	13
SANDY SILTY CLAY	BROWN	SOFT	13	18
COARSE SAND	BROWN	MEDIUM	18	22

Casing Type Steel (black or low carbon) Joint Threaded Drive Shoe? ☐ Yes ☑ No Above/Below 3 ft.

Casing Diameter	Weight	Hole Diameter
2 in. to 16.5 ft.	lbs./ft.	8.25 in. to 21.5 ft.

Open Hole from ft. to ft.

Screen YES Make JOHNSON Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
2	10	5	16.3 ft. and 21.3 ft.

Static Water Level
19 ft. from Land surface Date Measured 10/09/1990

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☑ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
121ST ST. & PLEASANT AVE., BURNSVILLE
BURNSVILLE IND. PARK 3RD ADDITION, BLOCK 3, LOT 1
DAKOTA COUNTY PERMIT #90-6095; MW 1

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from 2 to 14 ft. 0.05 yrds.
Grout Material: CONCRETE from to 2 ft.

Nearest Known Source of Contamination
1500 feet North West direction Landfill type
Well disinfected upon completion? ☐ Yes ☑ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number HP Volts
Length of drop Pipe ft. Capacity g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

License Business Name	Lic. Or Reg. No.	Name of Driller
American Eng Testing	M0024	ROMAN, B.

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

County Well Index Online Report | 467594 | Printed 4/2/2009
HE-01205-07

Minnesota Unique Well No.
472759

County Dakota
Quad
Quad ID

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 103I

Entry Date 09/29/2008
Update Date 09/29/2008
Received Date

Well Name MW-1

Township	Range	Dir	Section	Subsections	Elevation	ft.
27	24	W	34	BB	Elevation Method	

Well Depth	Depth Completed	Date Well Completed
22 ft.	21 ft.	09/18/1990

Drilling Method Power Auger

Well Address

BURNSVILLE MN

Geological Material	Color	Hardness	From	To
FILL, MIX OF SILT OR FLY ASH & PEA			0	1
PEAT	BLACK		1	3
ORG CLAY W/ FEW SHELLS, ROOTS PEAT	GRAY	SOFT	3	8
SANDY LEAN CLAY SOME GRAVEL	BROWN	SOFT	8	9
LEAN CLAY W/ SAND	BROWN	SOFT	9	17
SANDY LEAN CLAY W/ SOME GRAVEL STI	GRY/BRN		17	22

Drilling Fluid
--

Well Hydrofractured? ☐ Yes ☐ No
From Ft. to Ft.

Use Monitor well

Casing Type Steel (black or low carbon) Joint Threaded Drive Shoe? ☐ Yes ☑ No Above/Below 2.7 ft.

Casing Diameter	Weight	Hole Diameter
2 in. to 10.5 ft.	lbs./ft.	8 in. to 20.5 ft.

Open Hole from ft. to ft.

Screen YES Make WESCO Type stainless steel

Diameter	Slot/Gauze	Length	Set Between
2	10		10.5 ft. and 20.5 ft.

Static Water Level
14.1 ft. from Land surface Date Measured 09/18/1990

PUMPING LEVEL (below land surface)
ft. after hrs. pumping g.p.m.

Well Head Completion
Pitless adapter manufacturer Model
☐ Casing Protection ☑ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

REMARKS
LOCATION: MAP ATTACHED TO WELL LOG

Grouting Information Well Grouted? ☑ Yes ☐ No

Grout Material: Neat Cement from to 5.5 ft.

Nearest Known Source of Contamination
__feet __direction __type
Well disinfected upon completion? ☐ Yes ☑ No

Pump ☐ Not Installed Date Installed
Manufacturer's name Model number __ HP _ Volts
Length of drop Pipe _ft. Capacity _g.p.m Type Material

Abandoned Wells Does property have any not in use and not sealed well(s)? ☐ Yes ☐ No

Variance Was a variance granted from the MDH for this well? ☐ Yes ☐ No

Well Contractor Certification

Gislason, John	M0070	BRABENDER, K.
License Business Name	Lic. Or Reg. No.	Name of Driller

First Bedrock
Last Strat
Aquifer
Depth to Bedrock ft.

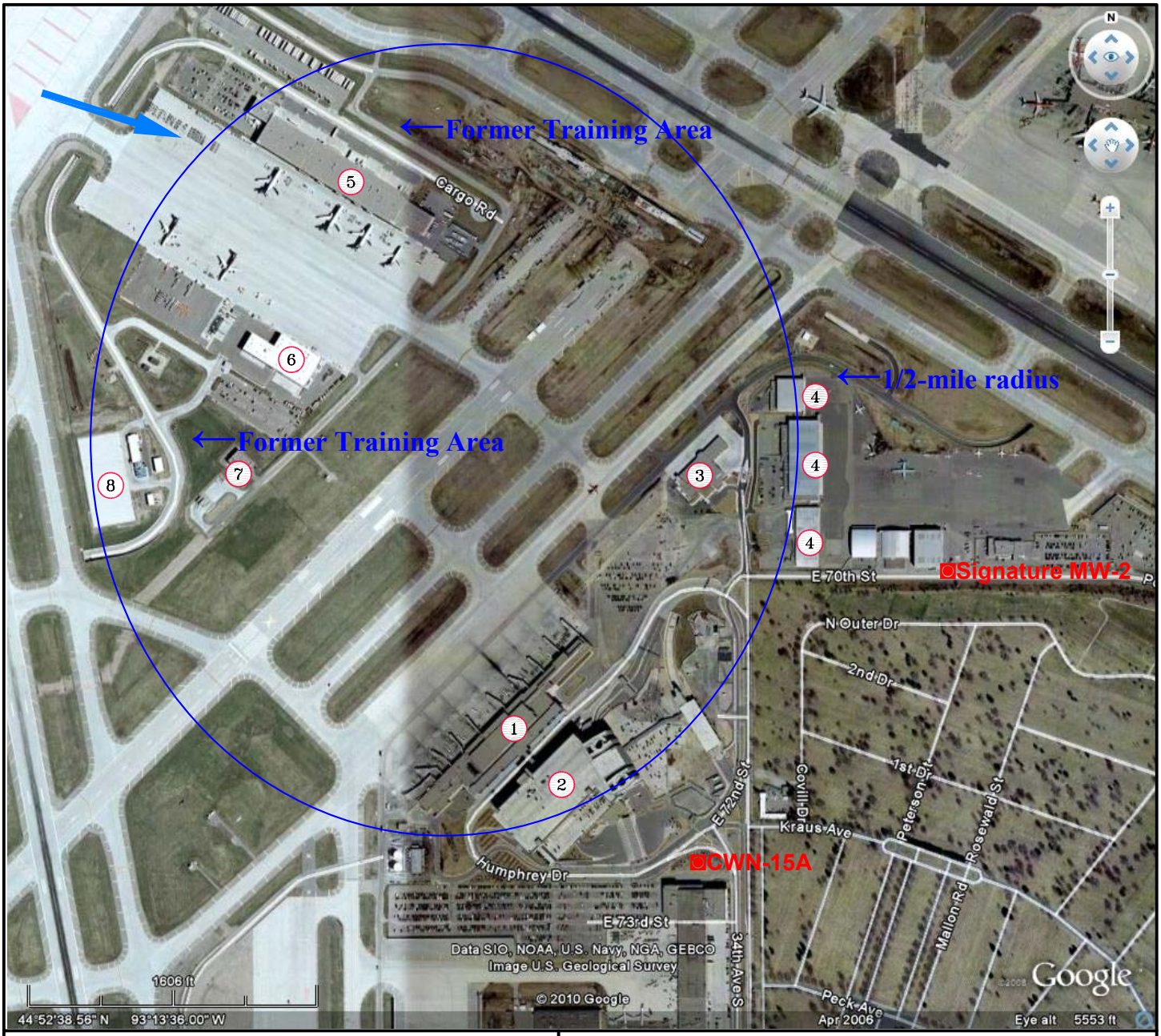
County Well Index Online Report

472759

Printed 4/2/2009
HE-01205-07

Appendix D

MSP Airport Groundwater Receptor Survey Documents



LEGEND:

- Monitoring Well
- Inferred Groundwater Flow Direction

Property Occupant

1. Humphrey Terminal
2. Humphrey Terminal Parking Ramp
3. MSP Fire Station No. 1
4. Hangers 4–8
5. FedEx
6. UPS
7. South airfield lighting electrical center
8. Glycol Management Facility

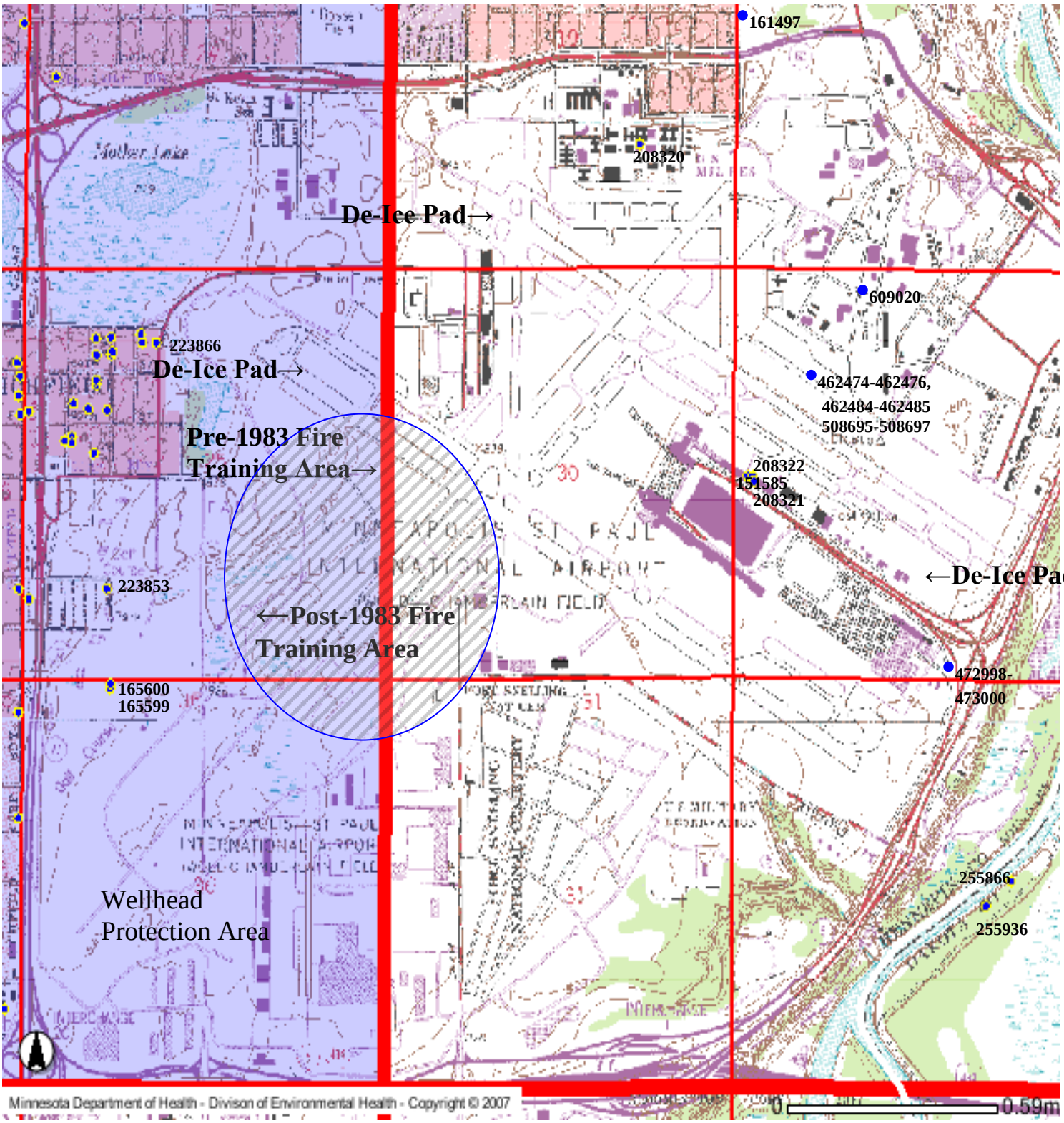
North

FIGURE
RECEPTOR SURVEY
FORMER FIRE TRAINING AREAS
MSP AIRPORT
MINNEAPOLIS, MINNESOTA

PROJECT NO.	PREPARED BY	DRAWN BY
45618DEL04	NR	DD
DATE	REVIEWED BY	FILE NAME
06/30/11		MSP Airport–1

anteagroup

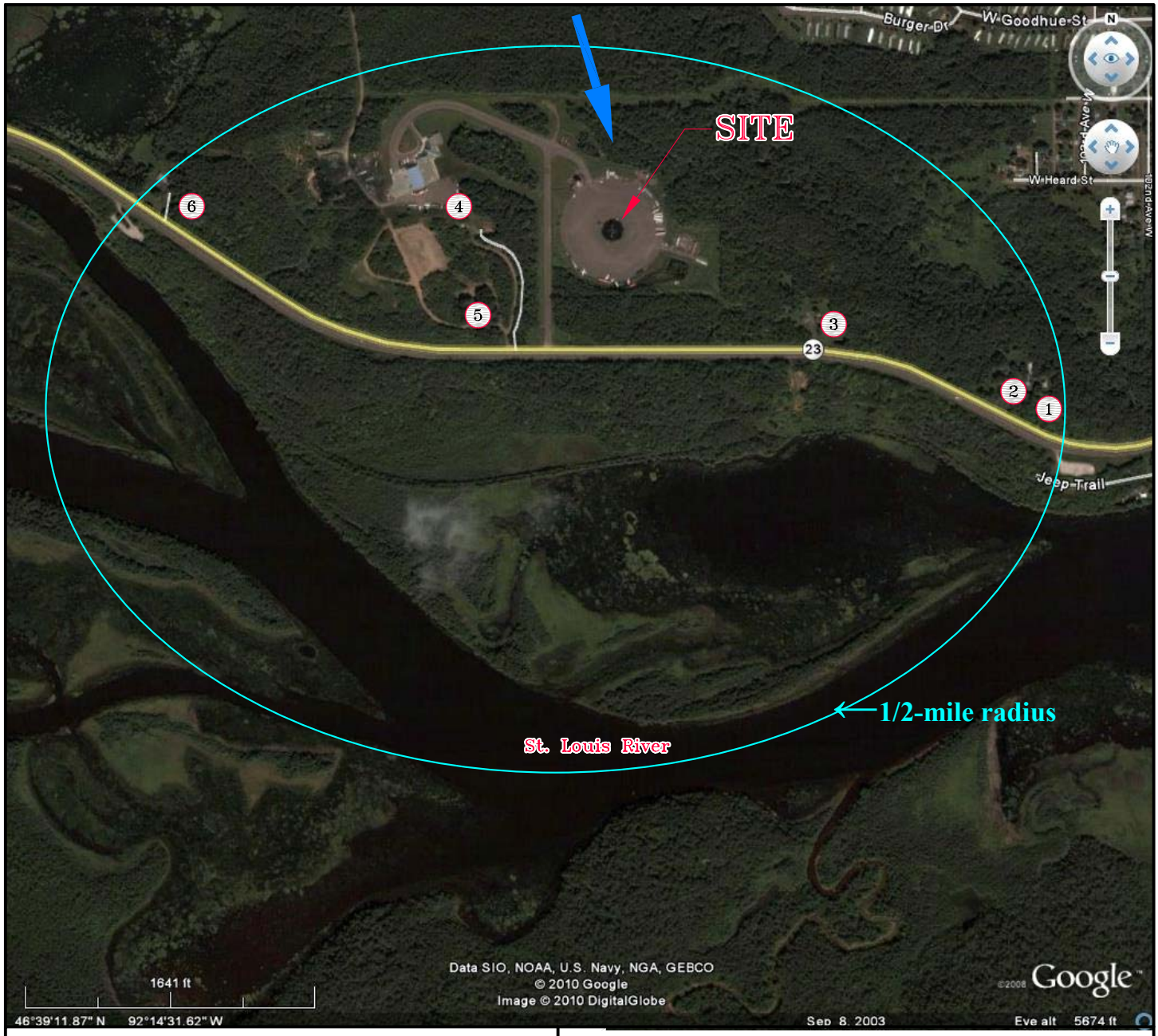
MINNEAPOLIS-ST. PAUL INTERNATIONAL AIRPORT CWI Well Map



Approximate Area of Receptor Survey

Appendix E

Lake Superior College ERTC Receptor Survey Documents



LEGEND:

Inferred Groundwater Flow Direction

Property Occupant

1. Residence – 10401 Hwy 23
2. Residence – 10423 Hwy 23
3. Residence – 11801 Hwy 23
4. Residence – 11601 Hwy 23
5. Residence – 11605 Hwy 23
6. Residence – 11825 Hwy 23

North

FIGURE
RECEPTOR SURVEY
LAKE SUPERIOR COLLEGE ERTC
11501 HIGHWAY 23
DULUTH, MINNESOTA

PROJECT NO.	PREPARED BY	DRAWN BY
45618DEL04	NR	DD
DATE	REVIEWED BY	FILE NAME
06/30/11		Superior-1

anteagroup

Receptor Survey Questionnaire

via telephone 11-2-10

PROPERTY ADDRESS: 11825 Hwy 23

1. Is there, or has there ever been, a water well on the property? **(Yes)** **No** **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____ All domestic

1f. Where on the property is (was) the well located?_____

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

(Yes) **No**

Name Bob Fspenson

Telephone Number 218-626-2746 DAY or EVENING (please circle one and state best time to reach you)
218-393-4966

2. Is a public water supply currently utilized by the property? **Yes** **(No)**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or MPCA Project Manager Nile Fellows at 651-757-2352.

Receptor Survey Questionnaire - via telephone 10-26-10

PROPERTY ADDRESS: 10401 Hwy 23

1. Is there, or has there ever been, a water well on the property? (Yes) **No** **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

_____ACTIVE ___X___ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? _____

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.)_____

1f. Where on the property is (was) the well located? Well didn't have good water. Use well from next door - nephew's well water

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name Ruth McIntyre

Telephone Number 218-620-1128 DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? **Yes** (No)

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name_____

Telephone Number_____ DAY or EVENING (please circle one and state best time to reach you)

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If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

Receptor Survey Questionnaire

- In Person Interview

PROPERTY ADDRESS: 11605 W Hwy 23

1. Is there, or has there ever been, a water well on the property? **Yes** (circled) **No** **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

X ACTIVE ________ABANDONED ________SEALED

1b. How deep is (was) the well? _______FEET (if depth is unknown check here _______)

1c. In what year was the well installed (if known)? ?

1d. If the well was abandoned, what year was the well sealed?_________

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.) all - drinking, etc

Pump - 150'
Water - 75'

1f. Where on the property is (was) the well located? in house

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes (circled) **No**

Name Jerry Ferrori

Telephone Number 626 3525 DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? **Yes** **No**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name_______________________________

Telephone Number_______________________________DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

In Person Interview

Receptor Survey Questionnaire

PROPERTY ADDRESS: 10801 Hwy 23 Duluth 55808

1. Is there, or has there ever been, a water well on the property? **(Yes)** **No** **Unknown**

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

X ACTIVE _____ABANDONED _____SEALED

1b. How deep is (was) the well? _____FEET (if depth is unknown check here ?)

1c. In what year was the well installed (if known)? 1950s

1d. If the well was abandoned, what year was the well sealed?_____

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.) drinking, etc.

1f. Where on the property is (was) the well located? house corner - SE corner

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

Yes **No**

Name John McIntosh

Telephone Number 218-213-7850 cell DAY or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? **Yes** **(No)**

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

Name_____

Telephone Number_____DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

Receptor Survey Questionnaire

PROPERTY ADDRESS: 11601 HIGHWAY 23, DULUTH, MN 55808

1. Is there, or has there ever been, a water well on the property? (Yes) No Unknown

If you answered **No or Unknown**, proceed to Question 2.

1a. If you answered **Yes**, is the well *active* (in use), *abandoned* (not in use), or *sealed* (decommissioned following Minnesota Department of Health [MDH] Well Code guidelines).

X ACTIVE _____ ABANDONED _____ SEALED

1b. How deep is (was) the well? 411 FEET (if depth is unknown check here _____)

1c. In what year was the well installed (if known)? 1991

1d. If the well was abandoned, what year was the well sealed? - NA -

3e. If the well is active, for what purpose is it used? Example: (drinking water, lawn sprinkler, cooling, etc.) DRINKING WATER, SHOWERS, LAUNDRY USE

1f. Where on the property is (was) the well located? APPROXIMATELY 40' NORTHWEST OF THE HOUSE IN THE REAR YARD AREA

1g. If there is currently a water supply well on the property, would you grant access to the property in order to obtain a water sample from either an indoor or outside faucet (at no cost to property owner)?

(Yes) No

Name DIXON R. BASTIE

Telephone Number (218) 348-2287 (DAY) or EVENING (please circle one and state best time to reach you)

2. Is a public water supply currently utilized by the property? Yes (No)

3. May we contact you for further information if necessary? If so, please provide your name and telephone number.

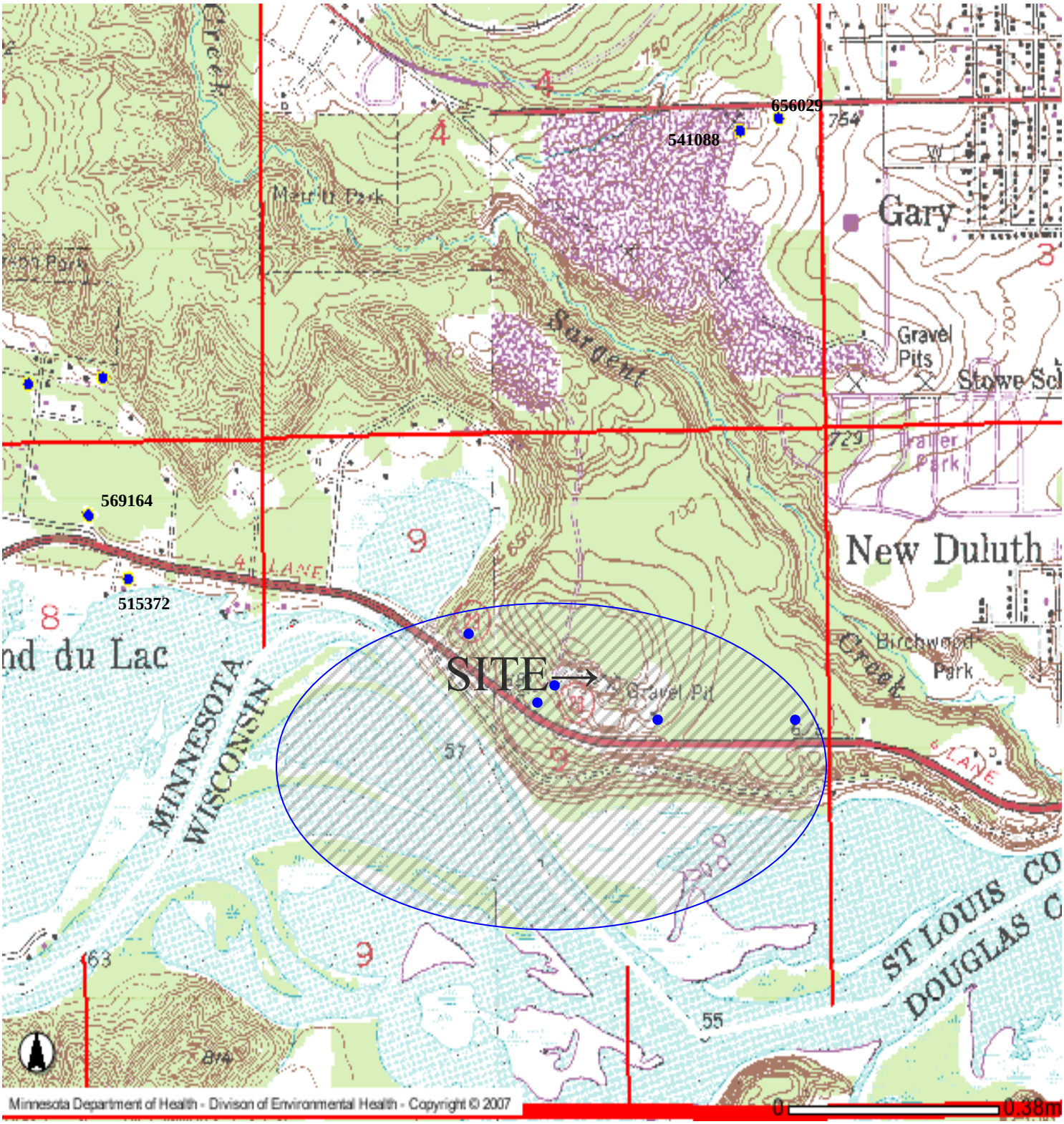
Name -- SEE ABOVE --

Telephone Number _____ DAY or EVENING (please circle one and state best time to reach you)

Please complete this form and mail it back to Delta in the enclosed self-addressed stamped envelope. Delta thanks you in advance for taking the time to complete this form.

If you have any questions, or need help completing this form, please feel free to contact Nancy Rodning, Delta Consultants, at (651)697-5152 or 1-800-477-7411, or Nile Fellows, MPCA, at 651-757-2352.

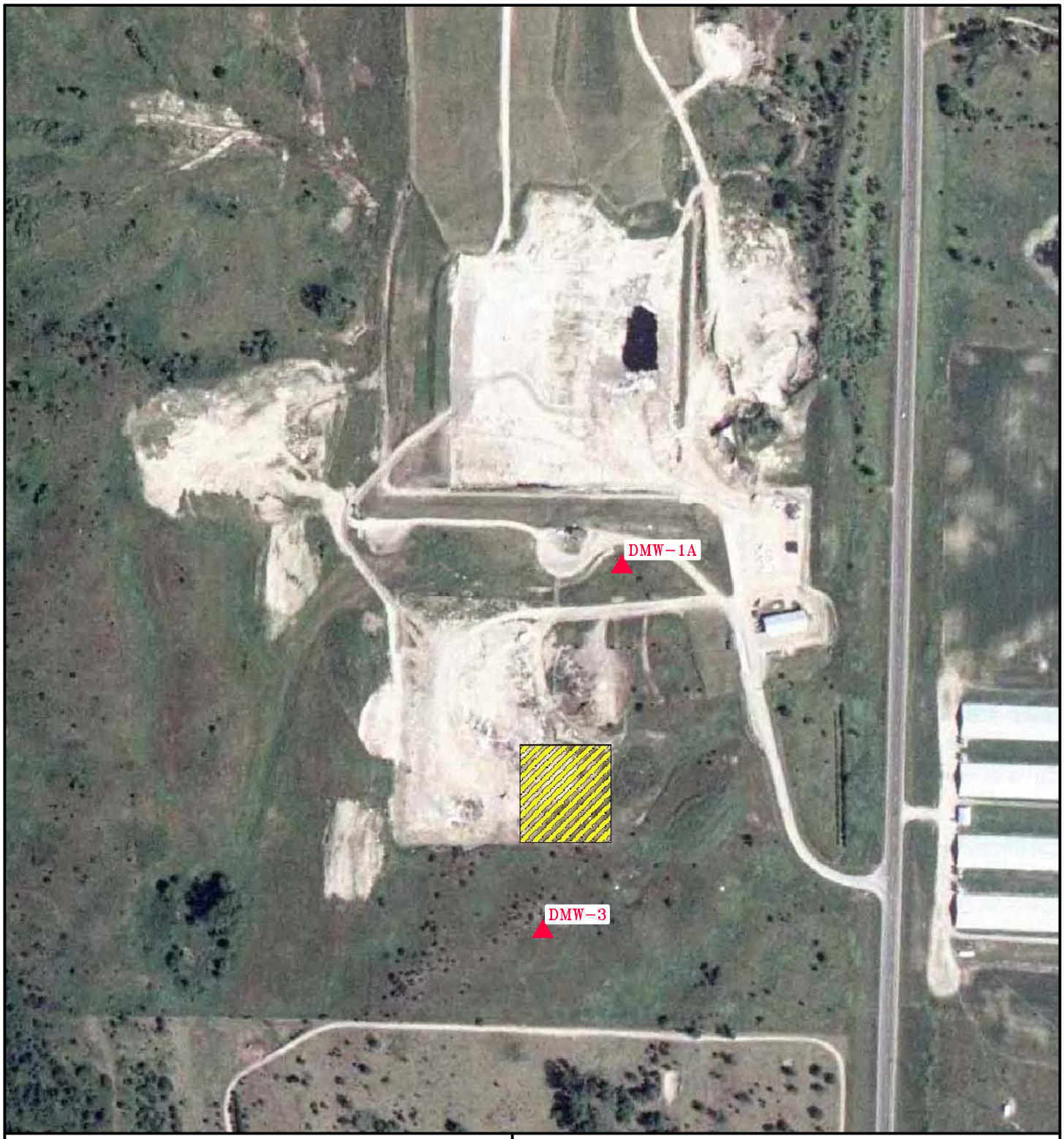
LAKE SUPERIOR COLLEGE - DULUTH CWI Well Map



Approximate Area of Receptor Survey

Appendix F

Kandiyohi County Landfill Sample Location Map



LEGEND:

Sample Location

Foam Use Area

North

0 350

SCALE IN FEET

FIGURE
SAMPLE LOCATIONS
KANDIYOHI LANDFILL
NEW LONDON, MINNESOTA

PROJECT NO.	PREPARED BY	DRAWN BY
45618DEL04	NR	DD
DATE	REVIEWED BY	FILE NAME
06/20/11		Kandiyohi-1

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Appendix G

Crystal Airport Sample Location Maps

LEGEND:

Sample Location

Boring Location

North

0 750

SCALE IN FEET

FIGURE
JANUARY 2010 PFC SAMPLING LOCATIONS
CRYSTAL AIRPORT
CRYSTAL, MINNESOTA

PROJECT NO.	PREPARED BY	DRAWN BY
45618DEL04	NR	DD
DATE	REVIEWED BY	FILE NAME
06/20/11		Crystal-3

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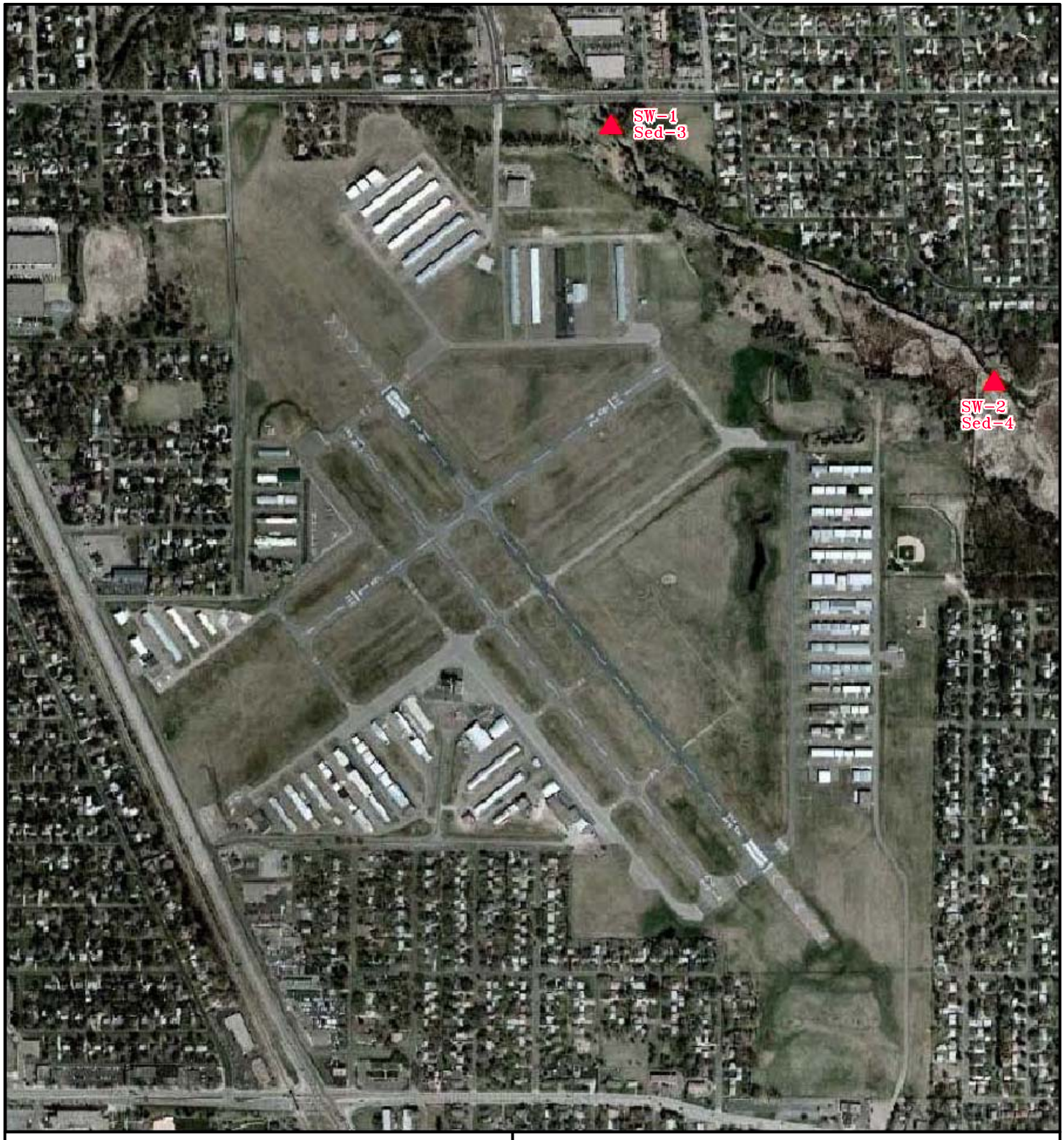

LEGEND:

▲ Sample Location

North

0 750

SCALE IN FEET

FIGURE
OCTOBER 2010 SAMPLE LOCATIONS
CRYSTAL AIRPORT
CRYSTAL, MINNESOTA

PROJECT NO.	PREPARED BY	DRAWN BY	
45618DEL04	NR	DD	
DATE	REVIEWED BY	FILE NAME	
06/20/11		Crystal-1	

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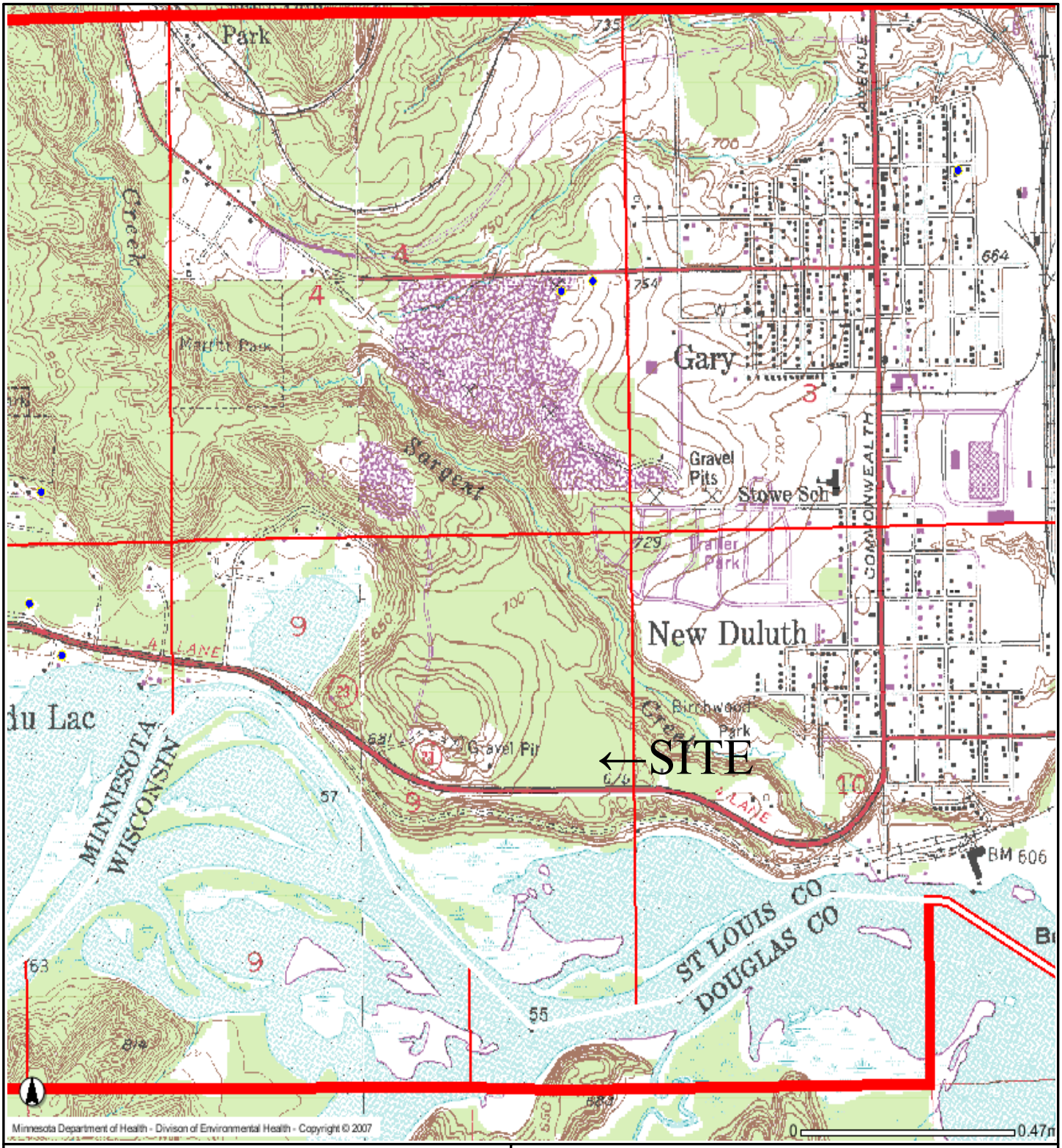
Appendix H

Lake Superior College ERTC Sample Location Maps and Analytical Summary Table



LEGEND:

- Well Locations

North

FIGURE 1
SITE LOCATION MAP
LAKE SUPERIOR COLLEGE ERTC
11501 HWY 23
DULUTH, MINNESOTA

PROJECT NO.	PREPARED BY	DRAWN BY
45618DEL02	NR	DD
DATE	REVIEWED BY	FILE NAME
02/18/11		Duluth-1

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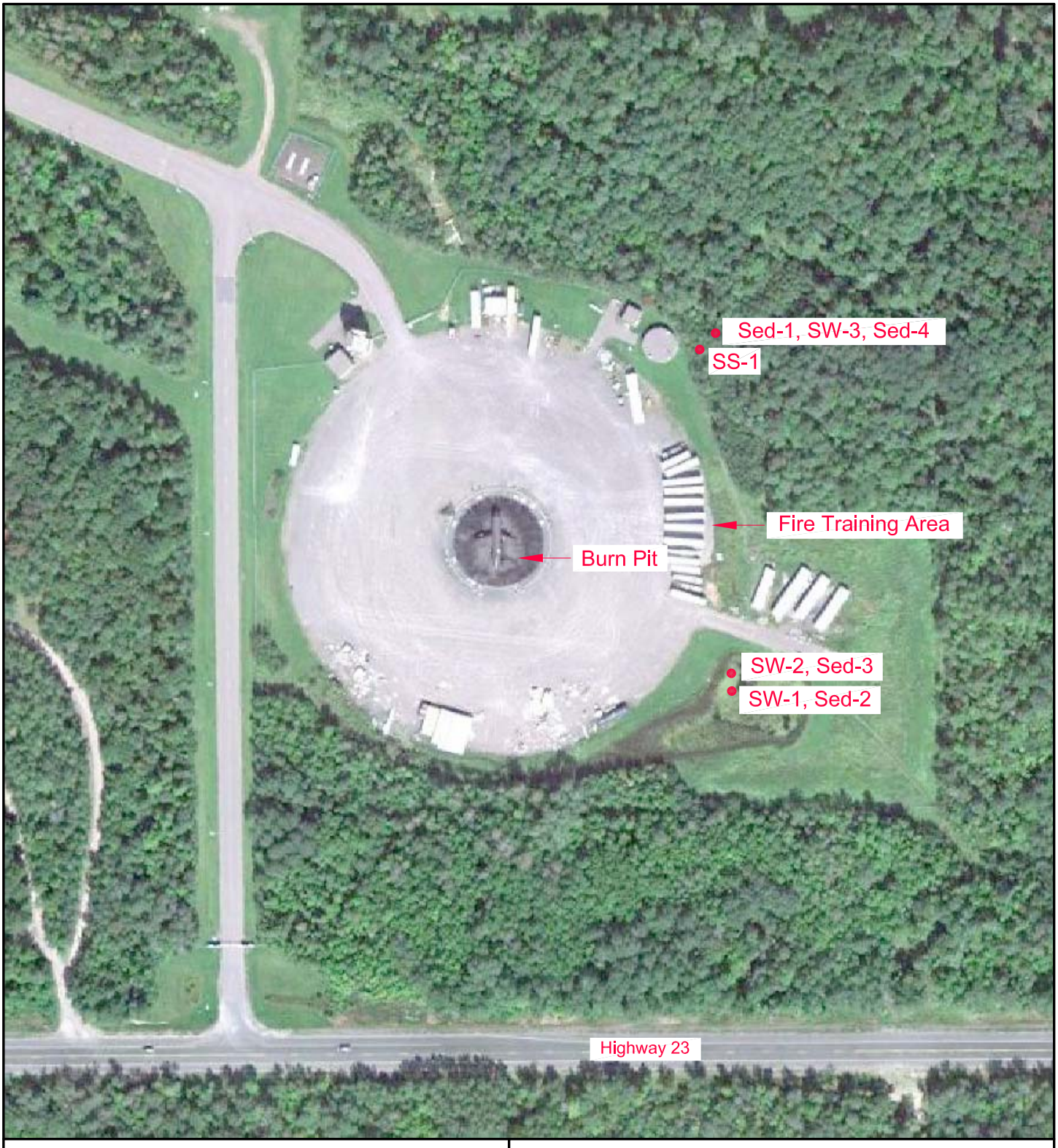

LEGEND:

● Sample Locations

North

0 200

SCALE IN FEET

FIGURE 2
SITE MAP
LAKE SUPERIOR COLLEGE ERTC
11501 HWY 23
DULUTH, MINNESOTA

PROJECT NO.	PREPARED BY	DRAWN BY	
45618DEL02	NR	DD	
DATE	REVIEWED BY	FILE NAME	
02/18/11		Duluth-2	

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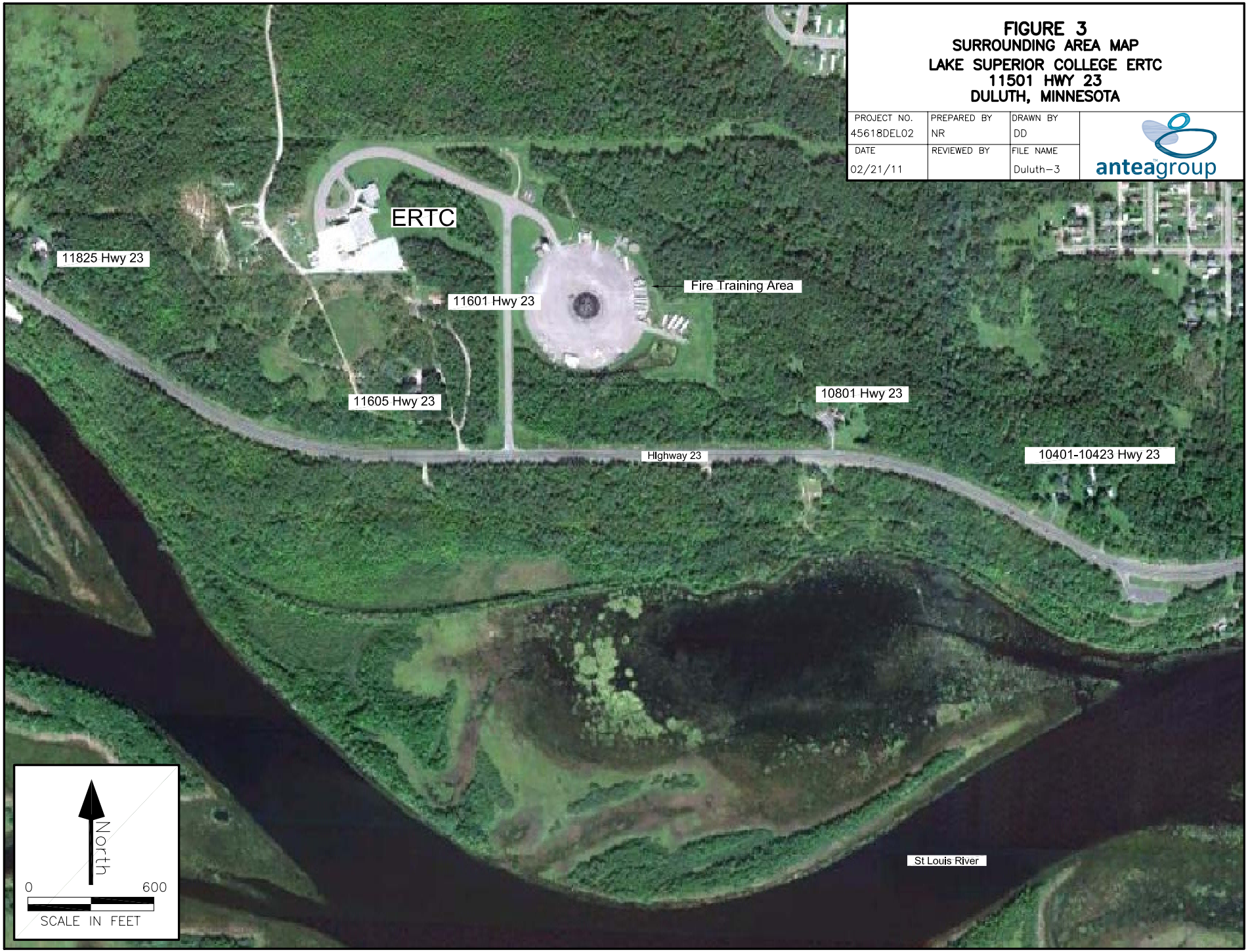
FIGURE 3
SURROUNDING AREA MAP
LAKE SUPERIOR COLLEGE ERTC
11501 HWY 23
DULUTH, MINNESOTA
PROJECT NO. 45618DEL02
PREPARED BY NR
DRAWN BY DD
DATE 02/21/11
REVIEWED BY
FILE NAME Duluth-3
anteagroup
ERTC
11825 Hwy 23
11601 Hwy 23
Fire Training Area
11605 Hwy 23
10801 Hwy 23
Highway 23
10401-10423 Hwy 23
St Louis River
North
0
600
SCALE IN FEET

PFC Analytical Results for Lake Superior College ERTC Samples
Antea Group Project No. 45618DEL0

		Perfluorobutanoic acid (PFBA)	Perfluoro-n-pentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnA)	Perfluorododecanoic acid (PFDoA)	Perfluorobutanoic sulfonate (PFBS)	Perfluorohexane sulfonate (PFHxS)	Perflourooctane sulfonate (PFOS)	Perfluorooctane sulfonylamide (PFOSA)
#Perfluorinated Carbon Chains:		**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**4**	**6**	**8**	**8**
Tier 1 Residential SRV, ng/g:		**77000**	**ND**	**ND**	**ND**	**2100**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**2100**	**ND**
Tier 2 Recreational SRV, ng/g:		**94000**	**ND**	**ND**	**ND**	**2500**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**2600**	**ND**
Tier 2 Industrial SRV, ng/g:		**500000**	**ND**	**ND**	**ND**	**13000**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**14000**	**ND**
Drinking Water Health-Based Limits, ng/L:		**7000**(1)	**ND**	**ND**	**ND**	**300**(2)	**ND**	**ND**	**ND**	**ND**	**7000**(1)	**RAA**(3)	**300**(2)	**ND**
Sample ID	**Sample Date**													
Wetland Samples														
ERTC Sed-2	11/25/2009	**0.218**	**0.536**	**1.72**	**0.268**	**1.26**	**0.184**	**0.101**	**0.174**	< 0.0933	**1.47**	**19.6**	**538**	**181**
ERTC Sed-3	11/18/2010	**0.118**	**0.202**	**1.01**	**0.171**	**0.75**	**0.149**	< 0.0955	**0.174**	**0.156**	**0.318**	**7.1**	**476**(D)	**207**(D)
ERTC SW-1	11/25/2009	**257**	**537**	**1790**	**348**	**991**	**31.8**	**3.45**	< 2.51	< 2.51	**1870**	**9390**	**11300**	**360**
ERTC SW-2	11/18/2010	**76.8**	**144**	**476**	**66.2**	**290**	**22.4**	< 2.49	< 2.49	< 2.49	**315**	**2630**	**7640**(D)	**134**(D)
Creek Samples														
ERTC Sed-1	11/25/2009	< 0.0917	< 0.0917	< 0.0917	< 0.0917	**0.225**	< 0.0917	< 0.0917	< 0.0917	< 0.0917	< 0.183	**1.2**	**57.5**	**6.52**
ERTC Sed-4	11/18/2010	< 0.0933	**0.135**	**0.628**	**0.119**	**0.581**	< 0.0933	< 0.0933	< 0.0933	< 0.0933	< 0.187	**3.52**	**51.3**	**1.95**
ERTC SW-3	11/18/2010	**35**	**62.8**	**366**	**39.5**	**234**	**5.62**	< 2.49	< 2.49	< 2.49	**135**	**1510**	**7630**	**385**
Private Well Water Samples														
ERTC-10801	11/19/2010	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 2.50	< 5.00	**11.2**	**6.49**	< 2.50
ERTC-11601	11/19/2010	< 2.47	< 2.47	< 2.47	< 2.47	< 2.47	< 2.47	< 2.47	< 2.47	< 2.47	< 4.95	**9.63**	**7.26**	< 2.47

Notes:
All samples were analyzed by Axys Analytical Services LTD of British Columbia, Canada.
Sediment results and standards are in nanograms per gram (ng/g), which is approximately equivalent to parts-per-billion.
Surface water and well water results and water standards are in nanograms per liter (ng/L), which is approximately equivalent to parts-per-trillion.
Non-detect results are expressed as "less than" the laboratory detection limit.
Bolded type indicates detection above the laboratory method detection limit.
Tier 1 Residential SRV: Minnesota soil reference value for chronic human exposure in a residential setting.
Tier 2 Recreational SRV: Minnesota soil reference value for exposure in a recreational setting.
Tier 2 Industrial SRV: Minnesota soil reference value for exposure in an industrial setting.
PFC compounds soil results reported on a dry weight basis.
(1) Health-Based Value (HBV) for chronic exposure defined by the Minnesota Department of Health.
(2) Health Risk Limit (HRL) for drinking water defined by the Minnesota Department of Health.
(3) Risk Assessment Advise (RAA) set by the Minnesota Department of Health for PFHxS does not specify numeric values.
ND: No State or Federal values or limits defined.
(D) Dilution performed on sample by laboratory.

Appendix I

Hidden Harbor Marina Well Location Map

Hidden Harbor Marina Water Supply Wells

Well A	Located in the marina workshop, used for non-potable uses. Unique Well #268354.
Well B	Located in the parking lot north of the restaurant/bar. Restaurant/bar and marina docks connected to this well. Unique Well #559256
Well C	Located in backyard of marina house. This house is currently being used as the shower house for use by marina customers. Unique Well # unknown.
Well D	Located in the crawl space of the house at 1001 Oak Street. Unique Well # unknown.
Well E	Located in the house basement at 115 10th Avenue West. Unique Well #429870

North

FIGURE
SAMPLING LOCATIONS
HIDDEN HARBOR MARINA
ST. PAUL PARK, MINNESOTA

PROJECT NO.	PREPARED BY	DRAWN BY	
45618DEL04	NR	DD	
DATE	REVIEWED BY	FILE NAME	
06/21/11		H Harbor-1	anteagroup

Appendix J

Burnsville ABLE Training Center Sample Location Map

North

FIGURE
SAMPLING LOCATIONS
ABLE TRAINING CENTER
BURNSVILLE, MINNESOTA

PROJECT NO.	PREPARED BY	DRAWN BY	
45618DEL04	NR	DD	
DATE	REVIEWED BY	FILE NAME	
06/21/11		ABLE-1	

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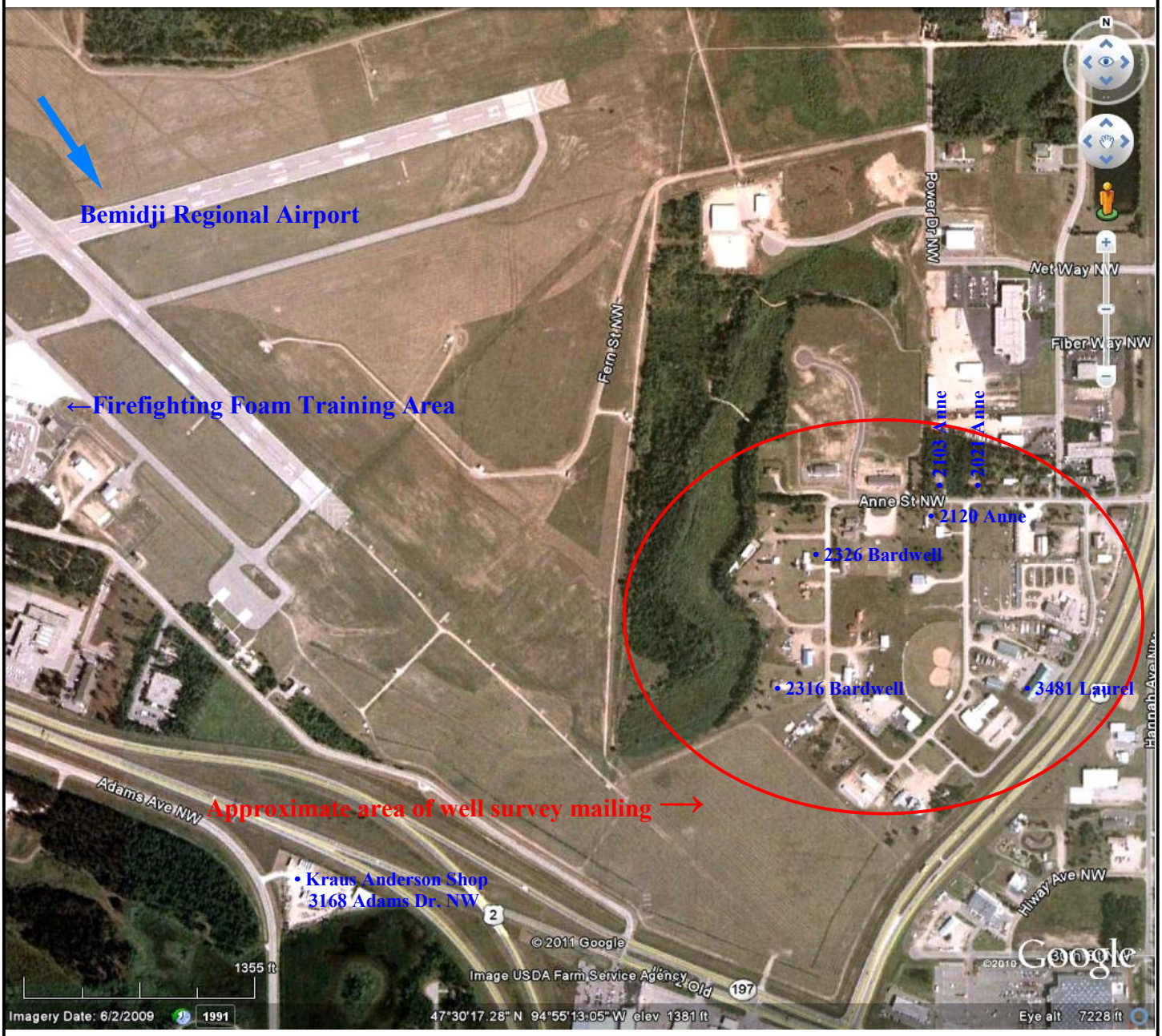
Appendix K

Bemidji Regional Airport December 2010 Well Receptor Survey and Well Sampling Documents



LEGEND

Inferred Groundwater Flow Direction

North

FIGURE
DECEMBER 2010 RECEPTOR SURVEY AND WELL SAMPLE LOCATIONS
BEMIDJI REGIONAL AIRPORT
BEMIDJI, MINNESOTA

PROJECT NO.	PREPARED BY	DRAWN BY	
45618DEL04	NR	DD	
DATE	REVIEWED BY	FILE NAME	
06/30/11		Bemidji-2	

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WELL RECEPTOR SURVEY RESULTS
BEMIDJI FIRE DEPARTMENT TRAINING AREA - BEMIDJI REGIONAL AIRPORT
March 2011

ADDRESS	WELL? Yes/No	UNIQUE WELL NO.	ACTIVE? Yes/No	WELL USE	WELL DEPTH	COMMENTS
2405 Alyce Court NW		478252				No questionnaire returned.
1826 Anne Street NW						No questionnaire returned.
1925 Anne Street NW		585876				No questionnaire returned.
2001 Anne Street NW						No questionnaire returned.
2014 Anne Street NW						No questionnaire returned.
2015 Anne Street NW						No questionnaire returned.
2021 Anne Street NW	yes		yes	drinking, lawn	30 feet	Well installed 1972, basement. Municipal water also being utlilized.
2027 Anne Street NW						No questionnaire returned.
2103 Anne Street NW	yes		yes	all household uses	55 feet	Well installed 1987, front yard. No municipal water being utilized.
2120 Anne Street NW	yes	566297	yes	drinking, lawn	unknown	Well installed ~1995, located between shop and trailer house. No municipal water being utilized.
2220 Anne Street NW						No questionnaire returned.
2127 Bardwell Drive NW	yes	549971	no	NA	unknown	Well installed 1997, abandoned/sealed 2010. Located just north of building. Municipal water being utilized.
2201 Bardwell Drive NW	yes		yes	lawn irrigation	65 feet	Well installed 1995, east side of office portion of building. Municipal water being utilized.
2212 Bardwell Drive NW	no		NA	NA	NA	Reported no well, no municipal water.
2231 Bardwell Drive NW	yes		yes	lawn irrigation	44 feet	Well installed 1995. Accessible via outside faucet. Municipal water also being utilized.
2310 Bardwell Drive NW						No questionnaire returned.
2316 Bardwell Drive NW	yes	442354	yes	all household uses	100+ feet	Well installed 1989. Municipal water not being utilized.
2322 Bardwell Drive NW	yes		yes	bathroom utilities	unknown	Well installed 1997, northeast corner of the property. No municipal water being utilized.
2324 Bardwell Drive NW						No questionnaire returned.
2326 Bardwell Drive NW	yes		yes	all household uses	52 feet	Well installed 1992, front of house. Municipal water also being utilized.
2532 Bardwell Drive NW						No questionnaire returned.
3354 Laurel Drive NW	yes		yes	lawn irrigation	unknown	Located between building and fence.
3455 Laurel Drive NW	yes		no	NA	NA	Well sealed 2010, northwest corner of property.
3481 Laurel Drive NW	yes	576751 710183	yes	drinking	60 feet	No municipal water being utilized.

WELL RECEPTOR SURVEY RESULTS
BEMIDJI FIRE DEPARTMENT TRAINING AREA - BEMIDJI REGIONAL AIRPORT
March 2011

ADDRESS	WELL? Yes/No	UNIQUE WELL NO.	ACTIVE? Yes/No	WELL USE	WELL DEPTH	COMMENTS
2134 Bardwell Drive NW	yes		yes	drinking	60 feet	No municipal water being utilized.
3501 Laurel Drive NW	yes		yes	irrigation	100 feet?	Well installed 1987, 10 ft. north of office building. Not used for drinking water. Municipal water also being utilized.
3611 Laurel Drive NW	yes	518168	yes	toilets, washing boats	unknown	Bemidji Marine. Bottled water for drinking. No municipal water being utilized.
3709 Laurel Drive NW	yes		yes	irrigation, pressure wash	unknown	One active and two sealed wells (2010). Well located between the two site buildings. Municipal water also being utilized.
2221 Tod Court NW	no		NA	NA	NA	Reported no well, no municipal water.
2225 Tod Court NW						[1]Survey returned NSN; remailed to property owner tax address.
2402 Tracy Court NW						No questionnaire returned.
2408 Tracy Court NW						[1]Survey returned NSN; remailed to property owner tax address.
3810 Whispering Meadows Court NW						No questionnaire returned.
3813 Whispering Meadows Court NW						No questionnaire returned.
3168 Adams Drive NW	yes		yes	pressure wash, bathrooms	~20 feet	Telephone interview, October 2010, Kraus Anderson Construction Shop

Notes:

(1) mail returned by Post Office, "no such number."

Water sample collected for PFC analysis.

Antea Group