

ENVIRONMENTAL ASSESSMENT WORKSHEET

This Environmental Assessment Worksheet (EAW) form and EAW Guidelines are available at the Environmental Quality Board's website at:

<http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm>. The EAW form provides information about a project that may have the potential for significant environmental effects. The EAW Guidelines provide additional detail and resources for completing the EAW form.

Cumulative potential effects can either be addressed under each applicable EAW Item, or can be addresses collectively under EAW Item 19.

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. Project title: Kettle River Development

2. Proposer: Moxness Development Group, LLC

Contact person: Jesse Moxness
Title: President
Address: 11556 Bristol Road
City, State, ZIP: Chisago City, MN, 55013
Phone: 651-368-6767
Fax:
Email: jesse@moxnessdevelopment.com

3. RGU: City of Wyoming

Contact person: Fred Weck
Title: Zoning Administrator
Address: 26885 Forest Boulevard
City, State, ZIP: Wyoming, MN 55092
Phone: (651) 462-4947
Fax: (651) 462-0576
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4. Reason for EAW Preparation: (check one)

Required:

- EIS Scoping
 Mandatory EAW

Discretionary:

- Citizen petition
 RGU discretion
 Proposer initiated

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s):

- MR4410.4300 subpart 19a (Residential development in shoreland outside of the seven-county Twin Cities metropolitan area)

5. Project Location:

County: Chisago County
City/Township: Wyoming
PLS Location (1/4, 1/4, Section, Township, Range): SW 1/4 NE 1/4 in Section 30, Township 33, Range 21
Watershed (81 major watershed scale): St. Croix River -- Stillwater
GPS Coordinates: -93.009267, 45.322034
Tax Parcel Number: 211058205, 211058210

At a minimum attach each of the following to the EAW:

- County map showing the general location of the project;
- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); and
- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.

6. Project Description:

- a. *Provide the brief project summary to be published in the EQB Monitor, (approximately 50 words).*

Moxness Development Group (Moxness, proposer) is proposing a residential development along Kettle River Boulevard, south of 258th Street in the City of Wyoming. This development includes 72 single family homes and 76 townhomes on approximately 90.86 acres within the shoreland district for Tyra Slough. Construction will also include stormwater infrastructure, internal roads, and utilities.

- b. *Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.*

Moxness is proposing the Kettle Development (project, site) in Wyoming, MN (**Figures 1-3, Appendix A**). The project is in the southwest and northeast quadrants of 258th Street and Kettle River Boulevard. The site totals 90.86 acres and is comprised of two parcels on either side of Kettle River Blvd. The parcel (#211058205) to the southwest of Kettle River Blvd, encompasses approximately 63.5 acres while the parcel (#211058210) encompasses approximately 28 acres. Of the 90.86 acres, approximately 39 acres will be developed for housing units. The project concept includes 72 single family homes and 76 townhomes for a total of 148 units (**Figure 4, Appendix A**). The development will be constructed in 4 phases, with the first phase beginning in July/August 2020 and closed out by Fall 2022 or Spring 2023, depending on demand. New utility infrastructure will also be included as a part of this project including gas, electric, sanitary sewer, cable/internet, storm sewer, water, stormwater ponds, sidewalks, and internal roads.

Minor demolition and removal of sheds on proposed Lot # 65 may be pursued, however, the existing house will remain.

c. *Project magnitude:*

Table 1: Project Magnitude

Total Project Acreage	90.86 acres
Linear project length	n/a
Number and type of residential units	72 Single Family, 76 Townhomes
Commercial building area (in square feet)	0
Industrial building area (in square feet)	0
Institutional building area (in square feet)	0
Other uses – specify (in square feet)	0
Structure height(s)	2 story single family; 3-4 story townhomes

d. *Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.*

The Kettle River Development is proposed by private developers, Moxness Development Group, LLC. The project will provide housing to meet the continued population growth and evolving lifestyle preferences within the City of Wyoming, MN.

e. *Are future stages of this development including development on any other property planned or likely to happen?* Yes No

If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

f. *Is this project a subsequent stage of an earlier project?* Yes No

If yes, briefly describe the past development, timeline and any past environmental review.

7. **Cover types:** *Estimate the acreage of the site with each of the following cover types before and after development:*

Existing land cover for the project site is shown on **Figure 5, Appendix A** and summarized in **Table 2** below.

Table 2: Cover Types

	Before	After		Before	After
Wetlands	30.16	29.96	Lawn/landscaping	0.5	22.7
Deep water/streams	0	0	Impervious surface	1.70	17.2
Wooded/forest	17.90	6.74	Stormwater Pond	0	5.7
Brush/Grassland	0.10	8.56	Other	0	0
Cropland	40.50	0			
			TOTAL	90.86	90.86

8. **Permits and approvals required:** List all known local, state and federal permits, approvals, certifications and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.

Table 3. Approvals and Permits Required

Unit of Government	Type of Application	Status
Federal		
US Army Corps of Engineers	Section 404 Permit	To be obtained
State		
Pollution Control Agency	NPDES/SDS Construction Stormwater Permit	To be obtained
Pollution Control Agency	Section 401 Certification	To be obtained
Pollution Control Agency	Sanitary Sewer Extension	To be obtained
Department of Health	Watermain Extension Plan Review	To be obtained
Department of Natural Resources	Water Appropriation (Construction Dewatering) Permit	To be obtained, if needed
Local		
City of Wyoming	Conditional Use Permit	To be obtained
City of Wyoming	Re-zone & Zoning Ordinance Amendment	To be obtained
City of Wyoming	Site Plan Review	To be obtained
City of Wyoming	Subdivision Application	To be obtained
City of Wyoming	Variance Application	To be obtained
City of Wyoming	Wetland Conservation Act Boundary and Type Approval	Obtained
City of Wyoming	Wetland Conservation Act – Impact Approval	To be obtained
City of Wyoming	Right of Way Permit	To be obtained
City of Wyoming	Demolition Permit	To be obtained
City of Wyoming	Sewer & Water Connection & Repair Permit	To be obtained
City of Wyoming	Grading Permit	To be obtained

Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos. 9-18, or the RGU can address all cumulative potential effects in response to EAW Item No. 19. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item No. 19

9. Land use:

a. Describe:

- i. *Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.*

Existing land use on the site includes one homestead that is surrounded by a combination of cultivated crops, grassland, and wooded and wetland areas. Adjacent properties to the north and west include lower-density suburban neighborhoods, woodland, and wetland areas. Adjacent properties to the south include lower-density suburban neighborhoods and semi-rural housing, woodland, and wetland areas. Immediately adjacent land use to the east is Interstate 35 and is followed by office and health care business (**Figure 6, Appendix A**).

There are no parks or trails adjacent to the project area. However, the area west of Kettle River Blvd is within the Lions Park service area as cited within the City's Comprehensive Plan. The Plan does not propose a new park in this area but will be providing a monetary dedication to the Joint Powers Park Board. There are two City of Wyoming park properties within 0.5 miles of the site, one to the northwest (Lions Park) and one to the southwest (Fireside Park). Carlos Avery State Wildlife Management Area (WMA) is located approximately 0.5 miles west and can be accessed via trails through Lions Park.

Approximately 9% of the site is classified as farmland of statewide importance according to the NRCS web soil survey; none is classified as prime or unique farmlands. The farmland of statewide importance is comprised of Lino loamy fine sand (162) and is shown on **Figure 10, Appendix A**.

- ii. *Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.*

The city of Wyoming Comprehensive Planning document describes future planned land use for the project area as lower-density suburban neighborhoods to the west of Kettle River Blvd and Mixed Use to the east (**Figure 6, Appendix A**). Within the area, open water and wetlands are preserved.

Lower density suburban neighborhoods are described as parcels that are in the range of 9,000 to 18,000 square feet and can be economically served with either public or private shared wastewater treatment systems. Mixed Use must include two or more types of land use which may include multiple-family housing and retail businesses. Any development in this category should be required to obtain a conditional use permit or go through the planned unit development process.

- iii. *Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.*

Current zoning for the proposed project area is R-1 – Rural Residential I (**Figure 7, Appendix A**), which is meant to provide for very low-density housing with on-site water systems.

A portion of the project is located within a shoreland management overlay that encompasses open water and wetland features of Tyra Slough (13-137). Developments within the shoreland district are limited with regard to density as outline in the Zoning Ordinance. A FEMA floodplain is located to the west of the project area and does not appear to impact the site.

- b. *Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.*

The project conforms with the City of Wyoming future planned use for the project site as outlined in the current Wyoming Comprehensive Planning Document. Proposed development for the area, however, does not match the current zoning designation (R-1). The sites proposed for Mixed Use includes the addition of townhomes (R-6 Standard) and lower density housing includes 2 – 1 acre lots (R-1 Standard), and 70 – 75 feet wide lots (R-4 Standard) that would be on municipal water and sewer, therefore re-zoning would be necessary. The project area must go through a re-zoning process before the project is approved.

The project area lies partially within Shoreland Management Overlay that encompasses Tyra Slough (natural environment). The submitted plans include density calculations as outlined in the Zoning Ordinance. Deviation from the minimum lot size standards of the Shoreland Management Overlay is allowed if all standards for a Planned Unit Development are met including a requirement to maintain 50 percent of the development area as open space.

- c. *Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.*

The project applicant will pursue the development as a Planned Unit Development to provide the proposed configuration of single-family and townhome dwellings and accommodate the sensitive environmental features on the site. The Planned Unit Development process allows variation from the conventional standards and dimensional criteria of the Zoning Code. The degree to which variation from traditional standards is granted is to be determined during review of the Planned Unit Development which is processed as a Conditional Use Permit.

The submitted plans from the developer include setbacks of structures from the shoreland overlay district that comply with those outlined in the City Zoning Ordinance. In these plans, structures are to be set back from the ordinary high-water level at least 50 percent greater than the minimum set-back to reduce impact to this natural environment.

10. Geology, soils and topography/land forms:

- a. *Geology - Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.*

Surface geology at the project area consists of Outwash-Undivided as to Moraine Association (**Figure 8, Appendix A**). These deposits are mainly very fine to medium grained sand with scattered lenses of silt and silty clay at depth.

According to the C-22 geologic atlas of Chisago County data, published by the Minnesota Geological Survey in 2010, bedrock at the project area is 251-350 feet below grade. Additionally, the Minnesota Department of Health (MDH) Minnesota Well Index identified multiple wells within 500 feet of the project area that did not encounter bedrock to a depth of 263 feet below grade. Bedrock at the project area consists of the sandstone, siltstone, shale, and dolostone of the Upper Cambrian series, which is depicted on **Figure 9, Appendix A**. This is consistent with the 2010 Minnesota Geological Survey (County Atlas Series C-22, Part A) which identified bedrocks at the site to consist of the Tunnel City Group which consists of white to yellowish gray fine to medium grained quartz sandstone and pale yellowish-green very fine to fine grained glauconitic, feldspathic sandstone, and siltstone with thin shale partings.

The Minnesota Department of Natural Resources (DNR) Aggregate Resource Web Map did not identify any gravel pits at the project area and the sand and gravel quality is nonsignificant with limited potential for sand and gravel resources. According to the Minnesota Karst Land Map, the project area is located in a region that is not prone to surface karst features. Based upon these geological findings, no project area design limitations are anticipated.

- b. *Soils and topography - Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii.*

Existing topography at the site is mostly flat with slight depressions in wetland areas (**Figure 2**). The soils in the project area range from fine sand to loamy fine sand and contains some areas of muck (**Table 4**), (**Figure 10, Appendix A**). According to the NRCS Web Soil Survey, erosion hazards for these types of soils is slight and the drainage class varies from very poorly drained to somewhat excessively drained. Approximately \pm 120,000 cubic yards of material will be excavated (ponds, basements, etc.). Efforts will be made to balance the material onsite, but if that is not feasible, excess material will be hauled to a suitable location in accordance with applicable state and local policies and procedures.

Table 4: Soil Survey

Map Unit Symbol	Soil Name	Percent Slope
158B	Zimmerman fine sand	1% to 6%
161	Isanti loamy fine sand	n/a
162	Lino loamy fine sand	n/a
543	Markey muck	n/a

NOTE: For silica sand projects, the EAW must include a hydrogeologic investigation assessing the potential groundwater and surface water effects and geologic conditions that could create an increased risk of potentially significant effects on groundwater and surface water. Descriptions of water resources and potential effects from the project in EAW Item 11 must be consistent with the geology, soils and topography/landforms and potential effects described in EAW Item 10.

11. Water resources:

- a. *Describe surface water and groundwater features on or near the site in a.i. and a.ii. below.*
 - i. *Surface water - lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.*

The DNR National Wetlands Inventory (NWI) shows seven (7) wetlands within the project area (**Figure 11, Appendix A**). These wetlands are identified as:

- Forested Wetland (PEM1F, PFO1A)
- Freshwater Emergent Wetland (PEM1A, PEM1C)
- Freshwater Pond (PUBG)
- Freshwater Shrub Wetland (PSS1A, PSS1C)

A wetland delineation has been completed for this site and has identified 7 wetlands within the project area. Delineated wetlands are depicted on the concept plan in **Figure 4, Appendix A**. One public water basin, Tyra Sough (MN DNR PWI # 13013700), is located on site to the east of Kettle River Blvd. Other nearby DNR Public Waters include a Freshwater emergent wetland complex (MN DNR PWI# 02050600, 02070600, 02050800, 02020600) located approximately 0.5 miles west of the site, Heims Lake (MN DNR PWI# 13005600) located approximately 0.5 mile east of the site, Ashton Lake (MN DNR PWI# 13005100) located approximately 1 mile northeast of the site, and (PWI# 07030005-528) located approximately 1 mile north of the site.

The South Branch of the Sunrise River is listed on the MPCA 303d Impaired Waters List as impaired for Aquatic Life and Dissolved Oxygen conditions.

According to the DNR, a colonial waterbird nesting site is located approximately 0.5 mile east of the project. No trout streams, outstanding resource value waters, or migratory waterfowl feeding/resting lakes exist in or within 1 mile of the project.

- ii. *Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.*

The depth to groundwater in the project area and adjacent properties is 15 to 40 feet as determined by review of static water depth in nearby wells (**Table 5**). The Wyoming Wellhead Protection Area (DWSID 638; PWSID 1130018) encompasses the site. According to the Minnesota Well Index, one (1) well is located on site and twelve (12) wells are located within 700 feet of the project area and all are classified for domestic use (**Figure 12, Appendix A**). Well logs are provided in **Appendix C**.

Table 5: Wells located within 700 feet of the project area

Well ID #	Use	Status	Static Water Depth (ft)
Within Project Area			
151805	Domestic	Active	20
Within 700 ft of Project Area			
402296	Domestic	Active	19
512005	Domestic	Active	30
150873	Domestic	Active	15
448860	Domestic	Active	18
725508	Domestic	Active	20
725507	Domestic	Active	21
642609	Domestic	Active	40
432458	Domestic	Active	25
432485	Domestic	Active	14
659771	Domestic	Active	25
577855	Domestic	Active	25
544319	Domestic	Active	15

b. *Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.*

i. *Wastewater - For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.*

1) *If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.*

Wastewater will be discharged to the existing sanitary sewer system and treated at Chisago Lakes Joint Sewer Treatment Facility (CLJSTC). The proposed development will connect to the sanitary sewer at the existing 8-inch sanitary hub located at the intersection of 258th Street and Euclid Avenue. The downstream lift station and gravity mains have adequate capacity to serve the development and beyond; however, the sanitary sewer is not deep enough to serve the proposed development, therefore, a sanitary sewer lift station would be required and needs to be sighted within the development. Design of this lift station will be provided by the City to ensure consistency with lift station design standards and equipment. An agreement for design services will be established and reimbursed by the developer.

The estimate for wastewater flow is 180 GPD/unit. With 150 proposed units, this equates to an estimated total of 27,000 GPD of wastewater produced at the site. The City of Wyoming has an average GPD treatment capacity of 478,000 agreement with CLJSTC. As the city develops and demand increases CLJSTC has indicated they will add treatment capacity as necessary. Since the project area is in the 1st tier of development priorities as outlined in Wyoming Comprehensive Plan, sewer service will be prioritized and extended to this area based on demand.

- 2) *If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system.*

Wastewater will not be discharged to a subsurface sewage treatment system.

- 3) *If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges.*

Wastewater will not be discharged into a surface water.

- ii. *Stormwater - Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.*

Existing Conditions

The existing land use on the site includes one homestead that is surrounded by a combination of cultivated crops, grassland, wooded, and wetland areas. There is a FEMA floodplain just west of the site, however, it appears the site is just outside of the floodplain.

Under existing conditions, drainage is split by Kettle River Boulevard with drainage on the west side of the boulevard draining to the large wetland complex on site and eventually offsite in the southwest corner of the site. Once offsite, this drainage from the western portion of the site continues north through a series of natural ditches and wetland complexes until it reaches its way to the impaired North Branch Sunrise River approximately 0.6 miles north of the site. Drainage on the east side of Kettle River Boulevard drains to Tyra Slough in the southeast corner of the site. There is no known piped outlet from Tyra Slough, so it is treated as a landlocked basin.

As noted previously, according to the NRCS Web Soil Survey the soils in the project area range from fine sand to loamy fine sand with some areas of muck. The soils are generally characterized as hydrologic soil group (HSG) A. Curve numbers for modeling purposes were defined using the HSG A classification for both existing and proposed conditions. A HydroCAD Version 10.00-24 model was created to compare the existing and proposed discharge rates leaving the site. Atlas 14 precipitation depths for the Chisago County area and the Midwest South East (MSE) 3 storm distribution were used in the modeling. The high-level modeling shows the existing conditions discharge rates to the west and east discharge points are as noted in the table below.

Table 6: Existing Conditions Peak Runoff Rates

Discharge Point*	Atlas -14, MSE 3 Design Storm Events		
	2-year [cfs]	10-year [cfs]	100-year [cfs]
West	7.6	35.8	123.3
East	14.7	39.7	99.5
Total	22.3	75.5	222.8

*This analysis assumes an aggregate discharge rate for the west and east portions for the project site.

Proposed Conditions

For the developable portion of the site, the developer proposes for mixed use residential includes the addition of townhomes (R-6 Standard) and lower density housing includes 2 – 1 acre lots (R-1 Standard), and 70 – 75 feet wide lots (R-4 Standard) along with internal roadways and land dedicated to stormwater management features. The anticipated disturbed area onsite is estimated at 39 acres. Based on the concept sketch provided the total net new impervious is estimated at 15.5 acres.

Relevant Regulations and Considerations

The site does not fall within a watershed district so the City of Wyoming would regulate stormwater requirements for the proposed development. For areas in the City outside of the Comfort Lake Forest Lake Watershed District (CLFLWD), the City adopts the requirements of the CLFLWD with minor modifications noted in the City’s Water Resource Guidance Document. City regulations are noted in the City’s ordinances and the City’s Water Resource Guidance Document. The City regulates stormwater runoff rate, volume, and water quality treatment. The project will be required to apply for a MPCA National Pollutant Discharge Elimination System (NPDES) Construction General Permit and will need to comply with the permit’s requirements. The site must meet the following criteria:

- Stormwater management basins should maintain existing flow rates for the 2, 10, and 100-year 24-hour rainfalls utilizing Atlas 14 rainfall depths.
- A proposed development shall provide volume control by capturing and retaining 1.0 inches times the net increase of impervious surface in the post-construction condition on site.
- If the volume control standard is not fully met by a volume reduction practice, other stormwater management practices must be used to provide the remaining volume equivalent using the Volume Conversion Factors in the CLFLWD rules.
- For stormwater ponds used to provide water quality a permanent pool volume equal to 1,800 cubic feet for each acre draining to the pond is required.

A stormwater management facility will need to be designed to retain 1-inch times the net increase of impervious surface, provide rate control, and water quality treatment to meet the City of Wyoming’s and the MPCA’s requirements. There are approximately 5.7 acres of land committed to stormwater ponding based on the concept sketch for the site.

The site contains an assumed total net increase of 15.5 acres of impervious based on the concept sketch. Retaining 1.0-inch times the net increase of impervious (15.5 acres) requires a total of 56,265 cubic feet of runoff be retaining on site. The developable

portion of the site was shown as having HSG A soils based on the NRCS Web Soil Survey and confirmed with the soil borings. Assuming HSG A soils, the Minnesota Stormwater Manual recommends an infiltration rate of 0.8 inches per hour. The City of Wyoming and the MPCA NPDES Construction General Permit require a 48-hour drawdown for all infiltration practices. The maximum depth allowed for an infiltration practice would be 3.2 feet in order to meet the 48-hour drawdown requirement. A minimum bottom footprint of 17,580 square feet or 0.4 acres would be needed to meet the permit requirements for infiltration. Soil borings were completed in 4 of the proposed basins. The geotechnical report recommends field-testing of in-situ soils to determine infiltration rates. High groundwater elevations were shown in multiple of the proposed ponding locations which would likely prohibit infiltration in those locations in which case other stormwater management practices must be used using the Volume Conversion Factors in the CLFLWD rules. The developer’s intent is to infiltrate is pursuant to ground water elevations and restraints due to wells.

If infiltration is found to be infeasible on site due to site conditions and stormwater ponding is proposed to provide water quality as well as rate control a permanent pool volume equal to 1,800 cubic feet for each acre draining to the pond is required. Excluding the wetland area onsite there are 46.6 acres that drain to the west discharge point requiring 83,880 cubic feet of permanent pool storage. Excluding the wetland area onsite there are 14.5 acres that drain to the east discharge point requiring 26,100 cubic feet of permanent pool storage. Assuming an average depth of 4 feet to meet NURP requirements the required pond normal water level footprints would need to be 0.5 acres and 0.15 acres for the west and east discharge points respectively or a total of 0.65 acres. The concept sketch shows 5.7 acres of land committed to stormwater BMPs which should be adequate to achieve stormwater requirements either through the use of infiltration basins or stormwater ponds. The high-level proposed condition HydroCAD model produced the following peak discharge rates assuming a 24-inch outlet pipe for proposed ponds and assuming the 5.7 acre of ponding shown on the concept sketch was utilized.

Table 7: Proposed Conditions Peak Runoff Rates

Discharge Point*	Atlas -14, MSE 3 Design Storm Events		
	2-year [cfs]	10-year [cfs]	100-year [cfs]
West	8.9	15.1	24.5
East	6.3	14.2	25.3
Total	15.2	29.3	49.8

*This analysis assumes an aggregate discharge rate for the west and east portions for the project site.

A Stormwater Pollution Prevention Plan (SWPPP) will be required in accordance with the NPDES Construction General Permit guidelines and the City of Wyoming’s stormwater and erosion control criteria. The SWPPP will be required to be submitted and approved prior to the start of construction. Prior to any site disturbance, temporary sediment control practices will be installed on all down-gradient perimeters. The SWPPP will address any concerns with the South Branch Sunrise River as the side does eventually drain to this impaired water. The site will be graded in accordance with the construction schedule. When one phase of the grading site is complete all exposed soils

will need to be stabilized. The use of temporary sediment basins shall be provided when 5 or more acres of disturbed soil drain to a common location.

- iii. *Water appropriation - Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.*

The construction of this development may require construction dewatering in areas near wetlands or other groundwater sources during grading and excavation operations. Depending on the amount of water pumped, a water appropriation permit may be required from the DNR and will need to be obtained by the proposer. Best management activities should be used to control sediment and to prevent erosion per the NDPES/SDS construction stormwater permit.

One well is located at the existing home on the western portion of the project area. However, this home will remain standing as part of the site re-development and abandonment and sealing of wells is not anticipated.

The project will connect to the City of Wyoming municipal water supply. The existing watermain will have to be extended in order to serve the development. An existing 10-inch watermain exists at the northern edge of the parcel on the east side of Kettle River Boulevard. This watermain will be extended south to 258th street to serve the parcel on the east side of Kettle River Boulevard and then west on 258th Street to connect to the existing eight-inch watermain stub located at the intersection of 258th Street and Euclid Avenue to serve parcels on the west side of Kettle River Boulevard. These connections will not have impacts to the municipal water supply or infrastructure.

- iv. *Surface Waters*
- a) *Wetlands - Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed, and identify those probable locations.*

Seven wetlands are located within the project area and are shown on **Figure 4, Appendix A**. The project may impact wetland as a result of grading for home sites and interior roadways. No impacts to DNR Public Waters are expected. Impacts to wetlands must be avoided and minimized to the extent practicable.

If wetland impacts are expected, the developer will need to apply to the Wetland Conservation Act for a replacement plan and US Army Corps of Engineers for a Section 404 permit. As part of the permit application, alternatives to avoid or further minimize impacts will need to be reviewed. Mitigation for unavoidable impacts will be required at a 2:1 ratio. Mitigation must either be provided onsite or purchased from an approved wetland bank. The location of the mitigation must follow the siting requirements outlined by the Wetland Conservation Act (MN Rules 8420). Wetland mitigation will need to be completed in advance of impacting wetlands or as approved by the agencies.

- b) *Other surface waters- Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.*

Impacts to other surface waters (lakes, streams, ponds, intermittent channels, county/judicial ditches) from this project are not anticipated.

12. Contamination/Hazardous Materials/Wastes:

- a. *Pre-project site conditions - Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.*

Publicly available data from the Minnesota Pollution Control Agency (MPCA) and Minnesota Department of Agriculture (MDA) databases were reviewed to identify verified or potentially contaminated sites that may be encountered during the proposed development (**Figure 13, Appendix A**). The following database listings were reviewed:

- MPCA “What’s in My neighborhood (WIMN)?” website
- MPCA Petroleum Remediation Program Map Online website
- Minnesota Department of Agriculture (MDA) “What’s in My neighborhood?” website

MPCA “What’s in My Neighborhood?” website

No listings were identified within the project area, but 14 listings were identified on parcels located within 1,000 feet of the project area. The fourteen MPCA WIMN listings include:

1. SRC Inc – 260th St (Site ID 56187) – Active hazardous waste generator (very small quantity generator), active industrial stormwater permit, inactive industrial stormwater permit.
2. Fairview Lakes Regional Medical Center (Site ID 4630) – Inactive construction stormwater permit.
3. Xccent (Site 132782) – Active construction stormwater permit, active hazardous waste generator (minimal quantity generator).
4. Orthopedic Specialty Center (Site 143196) – Inactive stormwater permit.
5. Fairview Lakes Regional Medical Center (Site not identified on **Figure 13**. Site is located east of the project area at 5200 Fairview Boulevard) – Active air quality permit.
6. Fairview Lakes Regional Med Ctr (Site not identified on **Figure 13**. Site is located east of the project area at 5200 Fairview Boulevard) – Active hazardous waste generator (very small quantity generator), active emergency management, active leak site, inactive construction stormwater permit, active tank site.
7. General Safety Equipment Corp (Site not identified on **Figure 13**. Site is located east of the project area at 5181 260th Street) – Active air quality permit, active hazardous waste permit (very small quantity generator).
8. Century Fixtures & Millwork LLC. (Site 61553) – Inactive air quality permit.
9. Sunrise Fiberglass, LLC. (Site 50297) – Active air quality permit, active hazardous waste generator (very small quantity generator), toxics reduction inventory facility, inactive industrial stormwater permit, active industrial stormwater permit, active tank site.
10. Hallberg Inc Rosenbauer General Safety (Site 150332) – Active construction stormwater permit.
11. Hallberg Inc Boat Storage Building (Site 154249) – Active construction stormwater permit.
12. Xcel Energy-Wyoming Service Center (Site 112636) – Active tank site.
13. Excel Tool Co (Site 31412) – Inactive hazardous waste generator.
14. Weather Pro Cellular Products (Site 11866) – Inactive hazardous waste generator.

MPCA Petroleum Remediation Program Map Online website

No listings were identified within the project area, but one listing was identified on a parcel within 1,000 feet of the project area. The single listing includes:

- Fairview Lakes Medical Center (LS0020910) – Leak Site
 - This listing was also identified as one of the fourteen listings identified in the MPCA WIMN listings described above.

In addition to the above described listings, the project area is located within the Wyoming Drinking Water Supply Management Area (DWSMA) and the Wyoming Wellhead Protection Area (WPA), but the vulnerability to the DWSMA is low.

MDA “What’s in My Neighborhood?” website

No listings were mapped within the project area or on parcels located within 1,000 feet of the project area.

Based upon the types of MPCA database listings and distance from the project area, the potential for these listings to have adverse effect or potential for contamination to the project area is low at this time. If any contaminated soil/groundwater or hazardous material is encountered during construction, necessary steps to remediate will need to be taken.

- b. *Project related generation/storage of solid wastes - Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.*

Project activities will generate wastes and debris typical of construction operations. All waste and unused materials will be properly contained and disposed of off-site in conformance with state and local standards. Debris resulting from the demolition of the shed on the existing homestead property will need to be disposed of following local rules and approved facilities. After construction, garbage/recycling for single family homes and townhomes will be provided through one of the four garbage services offered by the City.

- c. *Project related use/storage of hazardous materials - Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any above or below ground tanks to store petroleum or other materials. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.*

Products, materials, or wastes typical of construction sites will be present during the construction of this project (e.g. gasoline, diesel fuel, oil, hydraulic fluid, portable toilets, etc.). To ensure compliance with the NPDES/SDS Construction Stormwater permit, products that have the potential to leach pollutants will be stored under cover; hazardous materials will be stored in sealed containers and will have secondary containment to prevent spills, solid wastes will be collected and disposed of properly, and vehicle and equipment washing will not be allowed on site.

- d. *Project related generation/storage of hazardous wastes - Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.*

The proposed project is not expected to generate any hazardous wastes during construction or operation. If hazardous wastes are generated by the contractor, it will be the responsibility of the contractor to recycle and/or dispose of the waste in accordance with local, State, and Federal regulations.

13. Fish, wildlife, plant communities, and sensitive ecological resources (rare features):

- a. *Describe fish and wildlife resources as well as habitats and vegetation on or in near the site.*

Existing landcover within the project area is comprised of approximately 40 acres of cropland and 48 acres of wetland and wooded area. Since the site is actively used for agriculture, it is likely

wildlife typical of the site have adapted to an agricultural setting with frequent disturbance and crop availability for food resources. Wetland areas have the potential to provide habitat for wildlife such as waterfowl, water birds, songbirds, amphibians/reptiles, and mammals adapted to wetland areas such as muskrats, raccoons, and deer among others. Woodland areas dot the project area and connect to unfragmented wooded areas to the west of the project area west of Kettle River Blvd N. Unfragmented wooded areas can provide habitat for wildlife, especially when connectivity to other natural landscapes is available. The wooded area connects to a large wooded and wetland complex to the west of the site which connects to Carlos Avery State Wildlife Area that is approximately 1.5 miles away. Wildlife may currently utilize the site for feeding off crop thatch and remnant row crops. Open space of the fields may also be utilized by flocks of geese or pairs of sandhill cranes. Once developed, the woodland area and wetland complex will generally remain intact and provide some shelter to resident wildlife, but the open space of the field will be converted to housing and will deter use by wildlife in most of the site. Resident wildlife may avoid the site after construction, due to an increase in human activity and a reduction in available food sources and isolation.

- b. *Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-____) and/or correspondence number (ERDB 20200340) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.*

The Minnesota DNR Natural Heritage Information System (NHIS) documented rare species or other significant natural features are known to occur within an approximately 1-mile radius of the proposed site. The rare species list includes the Blanding's Turtle and three threatened or endangered plant species including cross-leaved milkwort (endangered), hidden-fruit bladderwort (threatened), and tubercled rein-orchid (threatened). Additionally, a portion of the project boundary is within an area the Minnesota Biological Survey (MBS) has identified as a Site of High Biodiversity Significance. This particular site contains Black Ash, Yellow Birch, Red Maple, and Basswood swamp native plant community. A copy of the NHIS correspondence is included in **Appendix B**.

According to the Fish and Wildlife Service's Information for Planning and Consultation (IPaC) database, the northern long-eared bat (*Myotis septentrionalis*) has the potential to occur within Chisago County. The northern long-eared bat is a federally threatened bat species which typically hibernates in caves and mines in the winter, and roosts in both live and dead trees during the summer. This species typically forms maternity roosts in May or June where pups are reared until they can fly around 18-21 days after birth. According to the DNR, no known maternity roost or hibernacula are located within the project's township.

No federal critical habitats were identified for the project area.

- c. *Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.*

The site itself currently provides moderate wildlife habitat, as a majority of the site is agricultural with areas of wetland and woodland surrounding the site. Some of the wetland complexes may provide specialized habitat required of some rare species, but the development is planned to occur on areas that are currently agricultural while avoiding the large wetland complexes. Developing the agricultural areas will eliminate open space that may be used by migratory waterfowl for foraging and resting. Approximately 11 acres of tree clearing will occur as a part of this project. Tree clearing will occur at the site perimeter in order to grade some of the single-family home lots and roadways. Loss of trees reduces available cover and nesting habitat for native wildlife that may occur in this area. Woodland areas surrounding the site tend to be contiguous with large wetlands and tree clearing will be kept to the minimum necessary to achieve the project goals in order to preserve naturally vegetated areas. The City of Wyoming will require a woodland preservation plan that will outline how the development layout will preserve significant trees and woodlands and enhance the efforts to minimize damage to significant trees and woodlands. The MBS Site of high biodiversity significance are located on the northwestern edge of the site, within this woodland. Portions of this area have an existing home, which will remain as part of this project. A 1.6-acre lot is also proposed within this site. Access to this lot will be provided via an existing roadway.

Blanding's turtle has been identified within the project. Impacts to Blanding's turtle typically occur as a result of entrapment within roadways or through general habitat loss. Minor (less than 0.5 acre) impacts to wetland may occur with this project, but impacts are not expected to affect wetland areas that would be used for overwintering by the turtle. Impacts to agricultural lands may impact areas where the turtle may travel between overwintering and nesting areas.

The three plant species noted by the DNR require habitat that is in or near low depressions or wetland areas. Hidden-fruit bladderwort and cross-leaved milkwort can be threatened by changes to the surrounding wetland complex and alterations to groundwater and surface water flow patterns. Other important considerations are the introduction of invasive plant species such as reed canary grass and purple loosestrife, which threaten the survival of these species. Stormwater pond construction may alter the ground and surface water flow patterns to nearby wetlands. This could be impactful to cross-leaved milkwort and hidden-fruit bladderwort, if present onsite.

The site may contain some invasive species, although no site-specific surveys have been completed to verify their presence. Invasive species tend to occur along field edges and within wetlands.

- d. *Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to fish, wildlife, plant communities, and sensitive ecological resources.*

Several minimization measures will be implemented to reduce the risk of impact to animal species that may travel through the project area or the potential rare plants identified by the DNR. These measures are described below.

Wildlife

The NHIS review revealed the records of Blanding's turtles near the site. If Blanding's turtles are found on site, they will be left undisturbed unless they are in imminent danger, at which point they will be moved to safety. Construction silt fence will be used to keep turtles and other reptiles and amphibians out of construction areas; proposed erosion control blanket is a 'natural netting' type (Category 3N), and trenches used for utility installation will be inspected prior to backfilling to avoid animal entrapment. In addition, all mulch materials will be reviewed to ensure they do not contain synthetic (plastic) fiber additives as these can suspend in water and enter wetlands and other waters. Roadways will use surmountable curbing to avoid entrapment of turtles.

Though the DNR's township map does not indicate any maternity roosts or hibernacula in the township, tree clearing will occur and should be completed between August – April to minimize the potential for impacts bat.

Some impacts to wildlife resources in general will occur through tree clearing and conversion of open space. To minimize effects, best management practices to prevent erosion and control sediment during construction will be installed prior to land disturbing activities per the NPDES/SDS requirements to protect resources that will not be disturbed. This includes use of wildlife-friendly erosion control netting. Impacts to wetlands will be reviewed by regulating agencies and measures to avoid and minimize impacts during the planning phase of the development will be required, which will help to preserve habitat.

During the wetland permitting process, the US Army Corps of Engineers will coordinate with the Fish and Wildlife Service for a Section 7 consultation and provide recommendations about whether the project will impact rare wildlife. Avoidance of the larger wetlands and contiguous wooded areas will reduce impacts to wildlife.

Plants

The NHIS review revealed rare plant species near the project. The developer will conduct a rare plant survey for these species using an approved surveyor to determine the presence and extent of any populations within the project. If rare plant species are documented, the developer will consult with the DNR on any further minimization measure that may be needed.

A woodland preservation plan will be required by the city to minimize damage to significant trees and woodlands.

Invasive species

Project phasing of soil disturbance will be used to prevent the spread of invasive species if they exist on site. The US Department of Agriculture's National Invasive Species Information Center, Minnesota Department of Agriculture (MDA), and the DNR provide information regarding BMPs to prevent the spread of noxious weeds and invasive species. Appropriate actions such as cleaning equipment, destroying existing invasive species, and limiting soil disturbance in areas of known invasive species will limit the spread and contamination of other areas of the project site. If necessary, spraying invasive species with an herbicide may be necessary for control, especially in locations of soil grading and stockpiling between project phases.

14. Historic properties:

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.

A database search conducted by the State Historic Preservation Office (SHPO) found no historic or archaeological records for the project area. Correspondence from SHPO is included in **Appendix B**.

15. Visual:

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

The development is located near wetland features surrounded by woodland, which provide some natural aesthetics. These features will remain, at least in part, unaltered by construction at the site while the remaining landscape will be changing from a mostly flat farmed field to a residential development. The development will result in increased lighting and noise associated with a typical housing development, consistent with surrounding land uses.

16. Air:

a. *Stationary source emissions - Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.*

The proposed project will not have stationary source emissions.

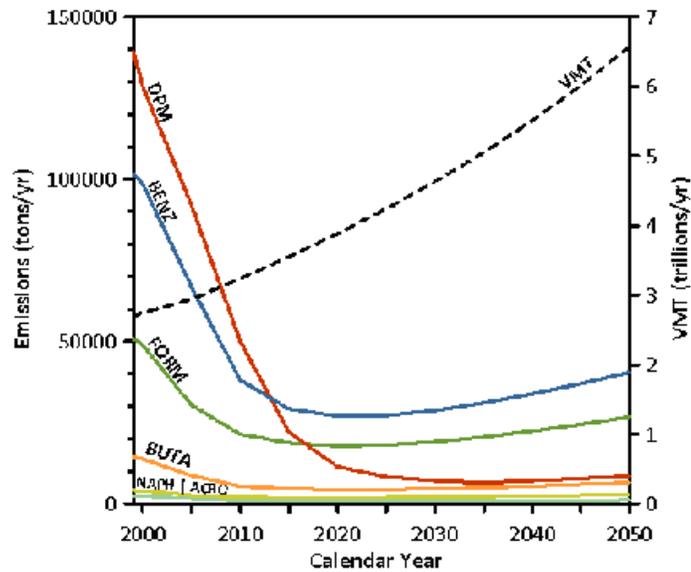
b. *Vehicle emissions - Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.*

The EPA has identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS). In addition, the EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers. These are acrolein, benzene, 1, 3-butadiene, diesel particulate matter, plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While Federal Highway Administration (FHWA) considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules. EPA rule requires controls that will dramatically decrease Mobile Source Air Toxin (MSAT) emissions through cleaner fuels and cleaner engines.

For this EAW, the amount of MSAT emitted would be proportional to the average daily traffic (ADT). The ADT estimated for the proposed site development is higher than that for the no build condition, because the project involves new development that produces additional trips. This increase in ADT means MSAT under the build scenarios would probably be higher than the no build condition in the project area. There could also be localized differences in MSAT from indirect effects of the project such as associated access traffic, emissions of evaporative MSAT (e.g., benzene) from parked cars, and emissions of diesel particulate matter from delivery trucks. Travel to other destinations would be reduced with subsequent decreases in emissions at those locations.

For the proposed site development, emissions are virtually certain to be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72 percent from 1999 to 2050, as shown in the following graph. The magnitude of the EPA-projected reductions is so great (even after accounting for ADT growth) that MSAT emissions in the project area are likely to be lower in the future than they are today.

**NATIONAL MSAT EMISSION TRENDS 1999 - 2050
FOR VEHICLES OPERATING ON ROADWAYS
USING EPA'S MOBILE6.2 MODEL**



Note:

- (1) Annual emissions of polycyclic organic matter are projected to be 561 tons/yr for 1999, decreasing to 373 tons/yr for 2050.
- (2) Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors

Source: U.S. Environmental Protection Agency. MOBILE6.2 Model run 20 August 2009.

In summary, it is expected there will be slightly higher MSAT emissions in the project area with the project relative to the no build condition due to increased ADT. There also could be increases

in MSAT levels in a few localized areas where ADT increases. However, the EPA's vehicle and fuel regulations will bring about lower MSAT levels in the future when compared to today.

- c. *Dust and odors - Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 16a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.*

During construction, particulate emissions will temporarily increase due to generation of fugitive dust. The nearest and most sensitive receptors to the construction activity are the residential properties that immediately surround the property. Construction dust control is required to be in conformance with City ordinances and the NPDES Construction Stormwater permit. The construction and operation of the proposed site development is not anticipated to involve processes that would generate odors.

17. Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

Existing sources of noise including surrounding roadways. Interstate 35 is adjacent to the project area to the east and is a source of existing noise in the area. Traffic volumes on Kettle River Blvd. and city streets through surrounding neighborhoods have traffic volumes low enough that noise impacts are not significant. Nearby sensitive receptors include existing adjacent housing to the north and south and Carlos Avery WMA that is located approximately 0.5 miles west of the project area.

During construction, noise levels will temporarily increase and vary in intensity based on the types of construction equipment being used (**Table 9**). To minimize the effects of this noise, construction will be limited to daytime hours consistent with the City's construction and noise ordinances. In addition, construction equipment will be fitted with mufflers that would be maintained throughout the construction process.

Table 9: Typical Roadway Construction Equipment Noise Levels at 50 Feet

Equipment Type	Manufacturers Sampled	Total Number of Models in Sample	Peak Noise Level	
			Range	Average
Backhoe	5	6	74-92	83
Front Loader	5	30	75-96	85
Dozer	8	41	65-95	85
Grader	3	15	72-92	84
Scraper	2	27	76-98	87
Pile Driver	N/A	N/A	95-105	101

Source: United States Environmental Protection Agency and Federal Highway Administration

Following construction, noise in the area will be typical of a suburban housing development. Additional traffic added to surrounding roadways is not expected to generate noise to a degree which would exceed noise standards or diminish quality of life for people living or working nearby. In addition, noise attenuating features are being proposed to further reduce noise from Interstate 35. These features are likely to include berms and privacy fencing along the east side of the project area, adjacent to I-35.

18. Transportation

- a. Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

No parking spaces exist on the site. The proposed development will include off-street parking spaces for two vehicles per unit.

The proposed development is expected to generate 1,236 trips daily, so a traffic study was not required. The estimated traffic generation is outlined in **Table 10**.

Table 10: Trip Generation

Trip Generation											
					AM Trips			PM Trips			Weekday Trips
Site	Future Use	# of Units	Unit Type	Description	In	Out	Total	In	Out	Total	
Moxness Development, Wyoming	Single Family Homes	72	Dwelling Unit	210 – Single Family Detached Housing	14	40	54	45	27	72	680
	Townhomes	76	Dwelling Unit	220 – Multifamily Housing (Low-Rise)	9	27	36	27	16	43	556
				Total	23	67	90	72	43	115	1,236

There are no public transit routes on Kettle River Blvd within the project area. Sidewalks are available along Euclid and Edison Avenues in the existing development to the north, but no sidewalk or trail is provided along Kettle River Blvd.

- b. *Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system. If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW. Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 (available at: <http://www.dot.state.mn.us/accessmanagement/resources.html>) or a similar local guidance,*

The proposed project is not expected to impact traffic or cause increased traffic congestion. A number of the proposed single-family lots will have frontage along an extension of Euclid Avenue from the north. The remainder of these lots will have frontage along a new public street that originates from Kettle River Boulevard and ends in a cul-de-sac. Traffic leaving the site is expected to primarily travel to the north along Kettle River Boulevard, toward Wyoming and Interstate 35.

- c. *Identify measures that will be taken to minimize or mitigate project related transportation effects.*

Traffic-related impacts are not expected. The concept plan does not depict sidewalks as it is not necessarily required at this stage of review. The Comprehensive Plan states that a 5-foot concrete sidewalk should be constructed along at least one side of each future Local or Collector residential street in the areas planned as Suburban Neighborhoods. Within the project area, this would apply to Euclid Ave and proposed "Street A." The existing section of improved 258th Street right-of-way does not have sidewalk. Should future sidewalks be constructed up to the intersection of Kettle River Boulevard, the City and County could coordinate potential pedestrian safety improvements, such as crosswalk markings, for residential land uses on the east side of the roadway. The potential for a controlled crosswalk on Kettle River Boulevard was considered but given the volume and speed of traffic and curve of the roadway to the north of the site this was determined to not be a feasible alternative.

19. Cumulative potential effects: *(Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items)*

- a. *Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.*

Project disturbance will be limited to the project area currently proposed for development. Phase 1 of the project is expected to begin in Summer 2020, with full build-out of the remaining phases by 2022, or as required by housing needs. No other projects are proposed in the area that could combine with this one to cause cumulative potential effects.

- b. *Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.*

The City has not received concept plans or proposed plats for other development in the surrounding area.

- c. *Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.*

Project disturbance will be limited to the project area currently proposed for development. Grading for each phase will occur as the phase begins, minimizing the effects of impacts related to land disturbance.

Wetland impacts occurring as a result of the project will be replaced at a 1:2 ratio, resulting in a net increase in wetland area overall. The siting of replacement will follow the Wetland Conservation Act and US Army Corps of Engineers requirements.

Grading and erosion potential from the site will be minimized through erosion control measures. Overall, site erosion is expected to decrease given that much of the existing agricultural areas will be converted to housing and vegetated landscapes.

Rare features have been identified near the project area. A rare plant survey will be conducted to document the presence and extent of cross-leaved milkwort, tubercled rein-orchid, and hidden-fruit bladderwort. Several minimization measures will also be put in place to minimize risk to Blanding's turtles, such as installing surmountable curbing and using natural erosion control netting.

Development and tree removal within an area identified as a site of high biodiversity significant is proposed. A woodland preservation plan will be required by the city to minimize damage to significant trees and woodlands.

The potential for decreased water quality and increased volume as a result of the proposed impervious will be reviewed and permitted through the City. Implementation of these rules will ensure that water quality, volume, and rate control are managed. Negative impacts to water quality are not expected.

As a result of project phasing and additional regulatory oversight, the project will not cause any known or reasonably expected cumulative potential effects.

- 20. Other potential environmental effects:** If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss the how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

The project will not cause any additional environmental effects that have not been addressed in this assessment.

RGU CERTIFICATION. *(The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.)*

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature 

Date 6/29/2020

Title Zoning Administrator

Appendix A

Figures

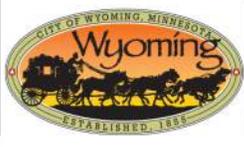
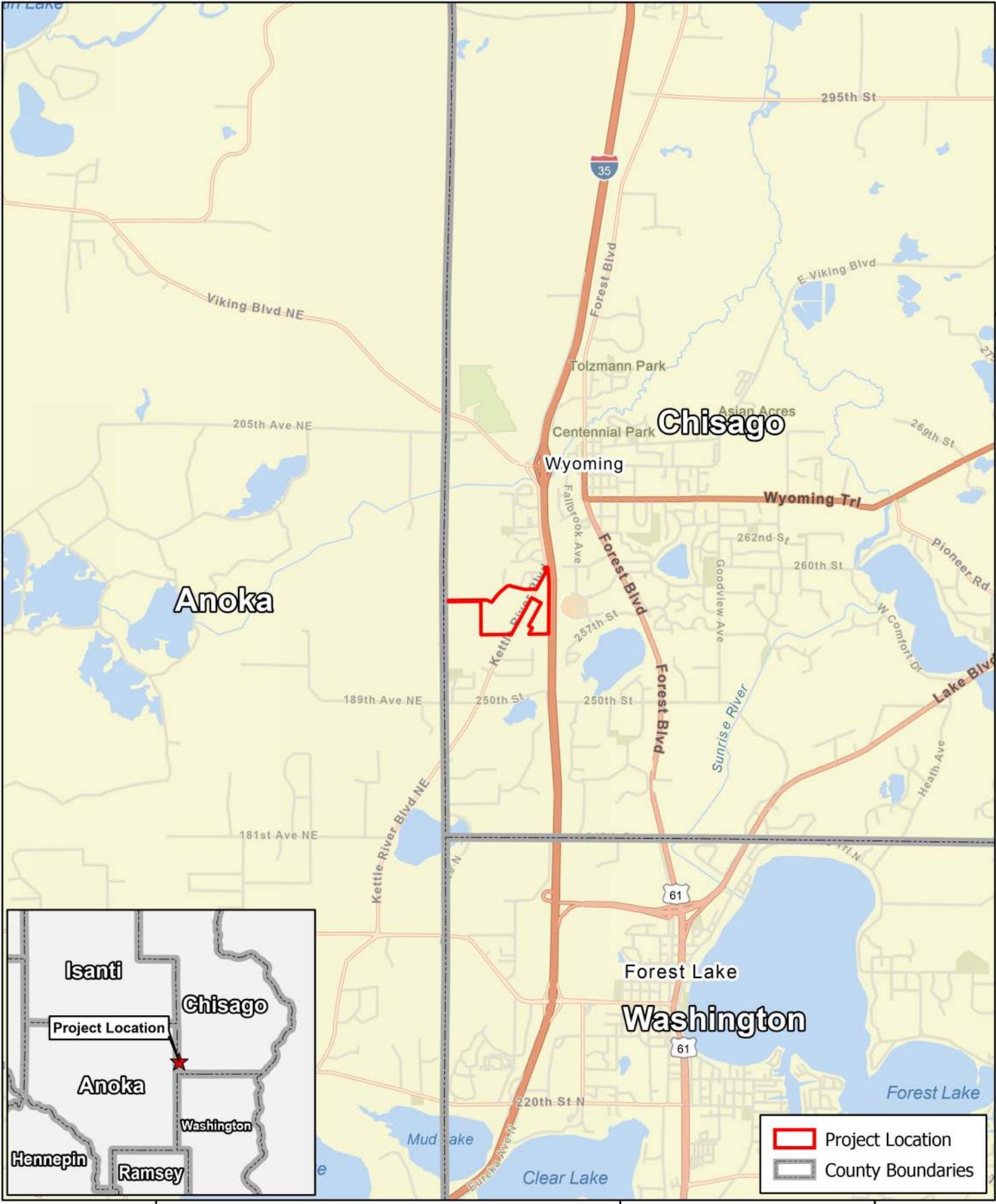
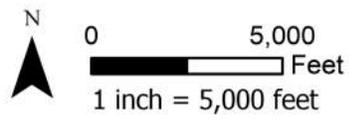
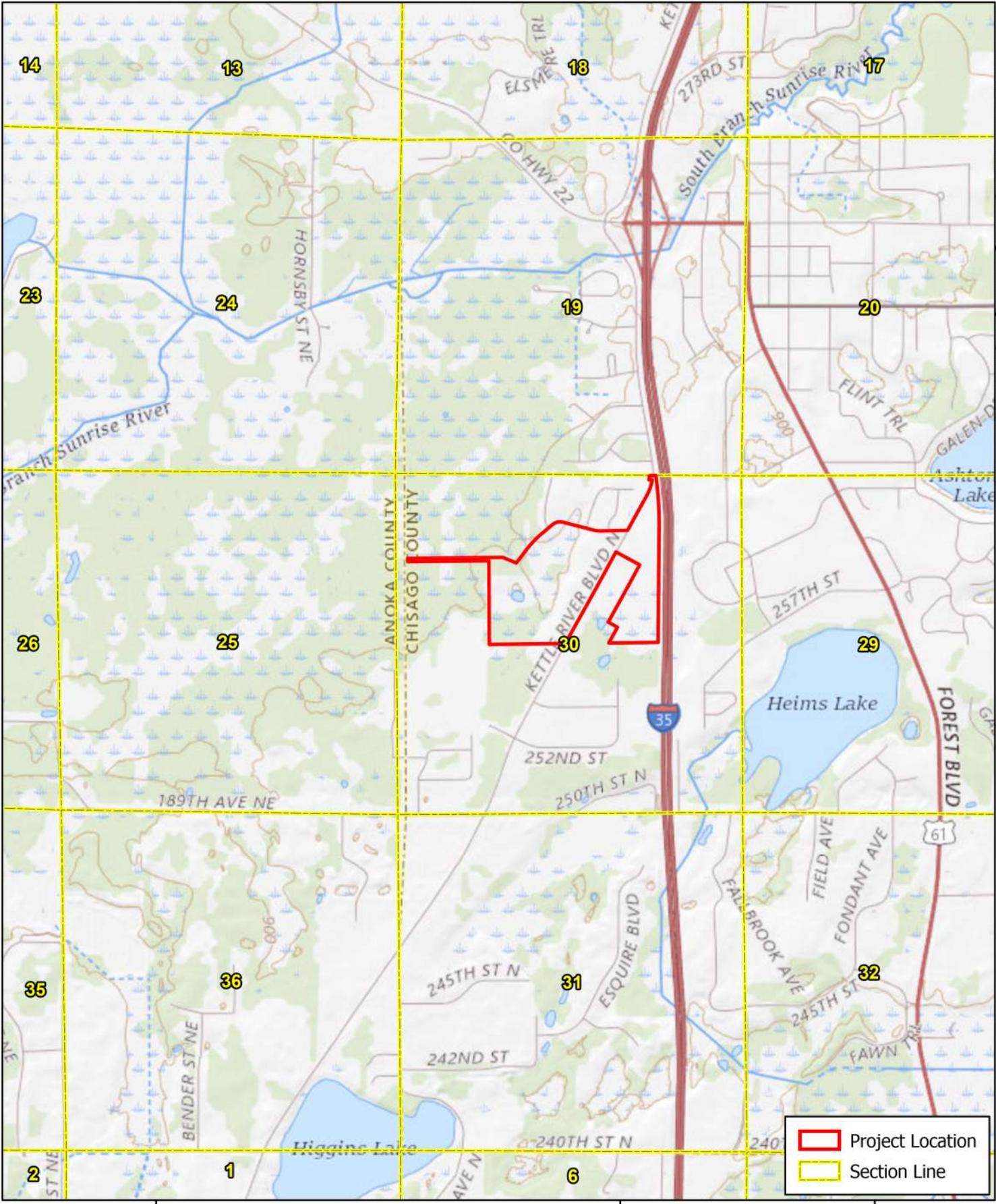


Figure 1 - County Location
 Moxness Kettle River EAW
 City of Wyoming, MN





	Project Location
	Section Line

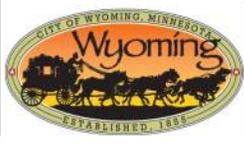


Figure 2 - USGS Topographic Map
 Moxness Kettle River EAW
 City of Wyoming, MN

N



0 2,000
 Feet
 1 inch = 2,000 feet





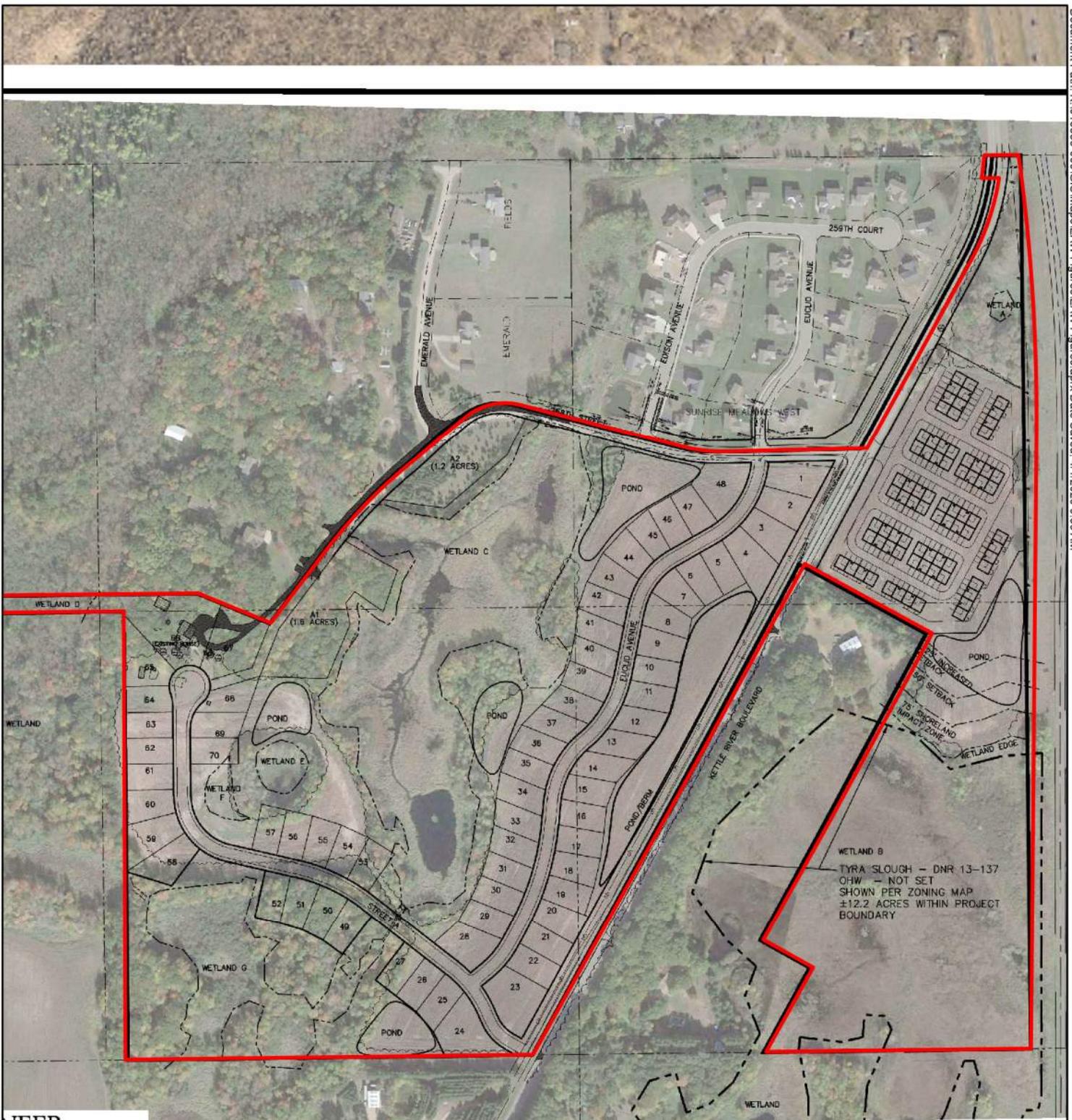
Figure 3 - Pre-Construction Site Map

Moxness Kettle River EAW
City of Wyoming, MN



0 600
Feet
1 inch = 600 feet





NEER Engineering
 PROFESSIONAL ENGINEERS - LICENSED IN MINNESOTA
 4500 W. WYOMING AVE. SUITE 100
 WYOMING, MN 55092
 Phone: (507) 831-1914
 Fax: (507) 831-9485
 www.neereng.com

Title: _____ Drawn by: _____ Date: _____	Revision: _____ By: _____ Date: _____	Date: 5.5.19 Drawn by: VAD Date: VAD	CONCEPT PLAN	MO... CH...
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Project Location

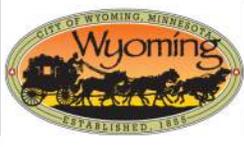
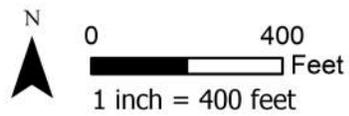


Figure 4 - Post-Construction Site Map
 Moxness Kettle River EAW
 City of Wyoming, MN



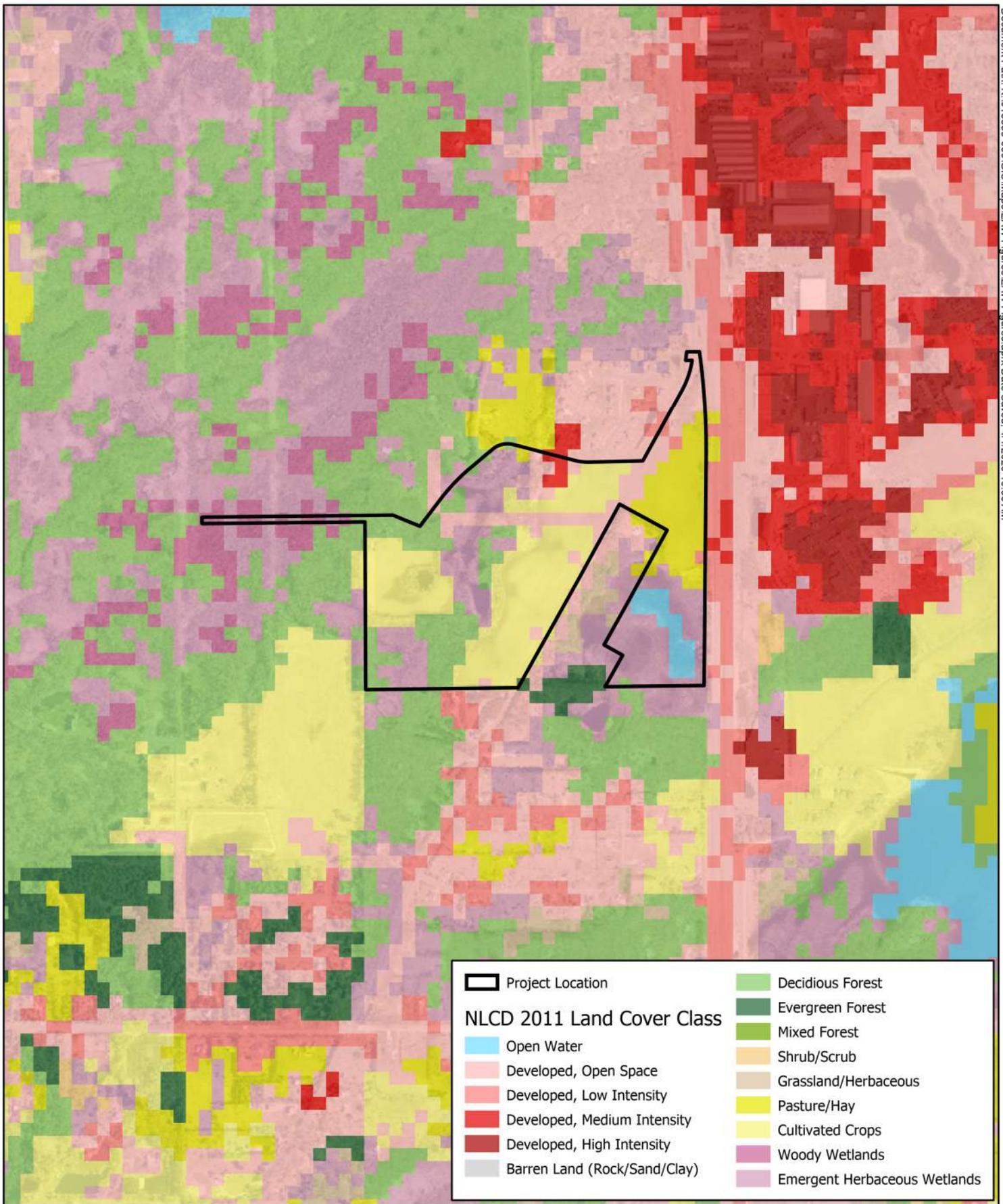


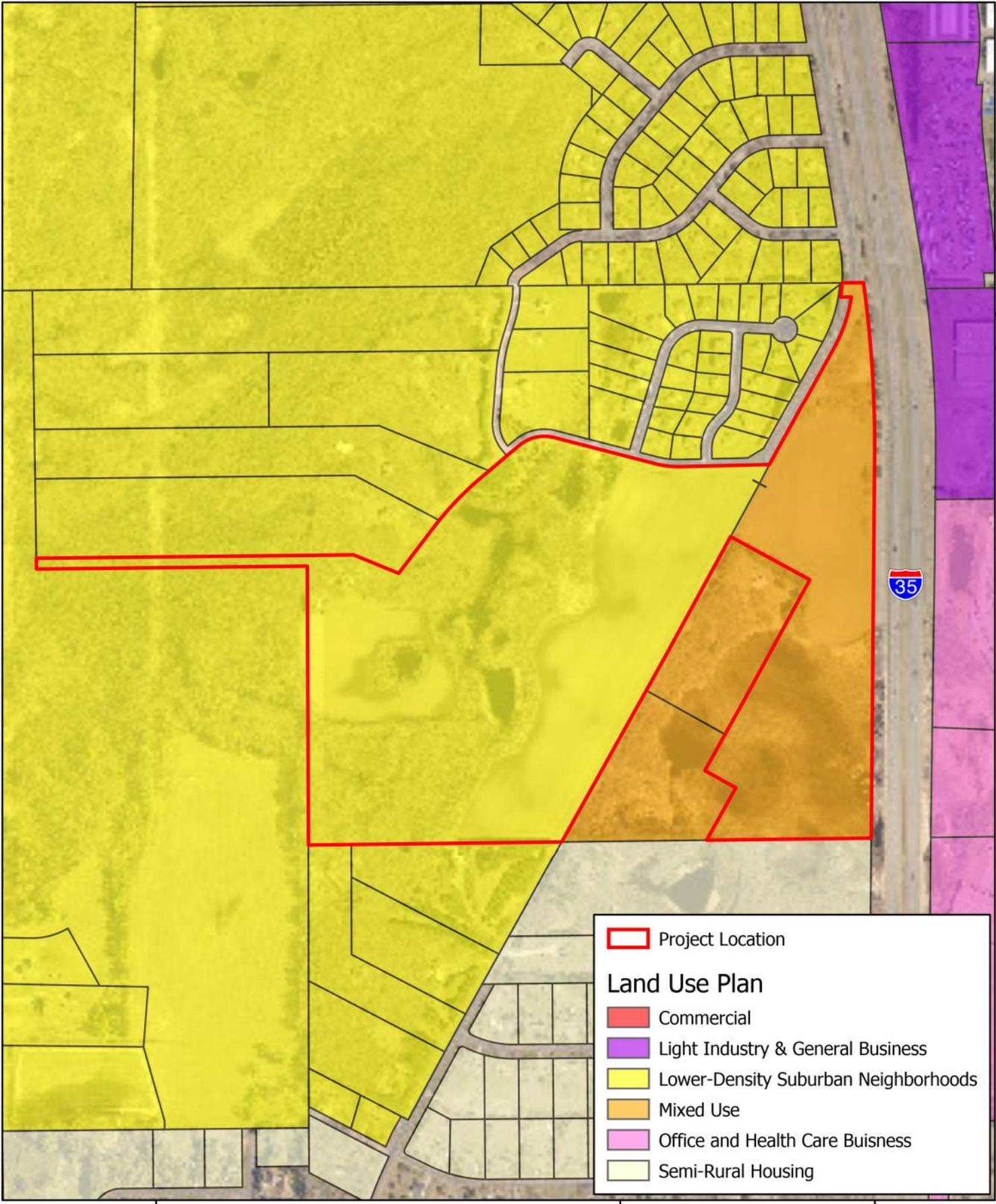
Figure 5 - NLCD Cover Type

Moxness Kettle River EAW
City of Wyoming, MN



0 1,000
Feet
1 inch = 1,000 feet





Project Location

Land Use Plan

- Commercial
- Light Industry & General Business
- Lower-Density Suburban Neighborhoods
- Mixed Use
- Office and Health Care Business
- Semi-Rural Housing

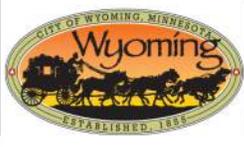


Figure 6 - Land Use Map
Moxness Kettle River EAW
City of Wyoming, MN

N

0 600
Feet

1 inch = 600 feet



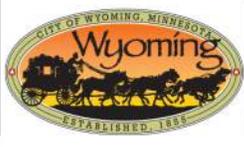
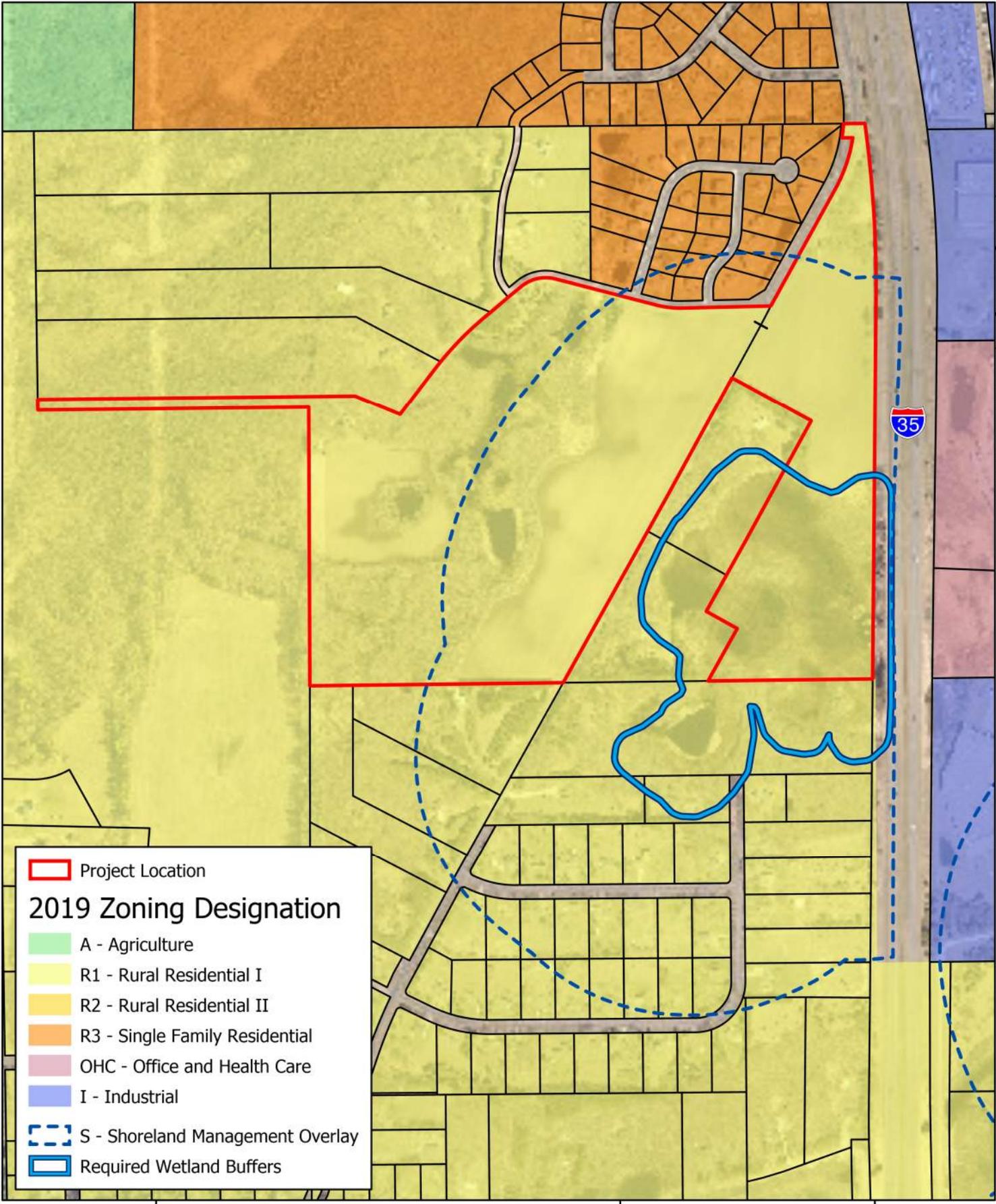
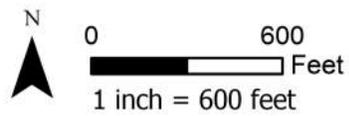


Figure 7 - Current Zoning
Moxness Kettle River EAW
City of Wyoming, MN



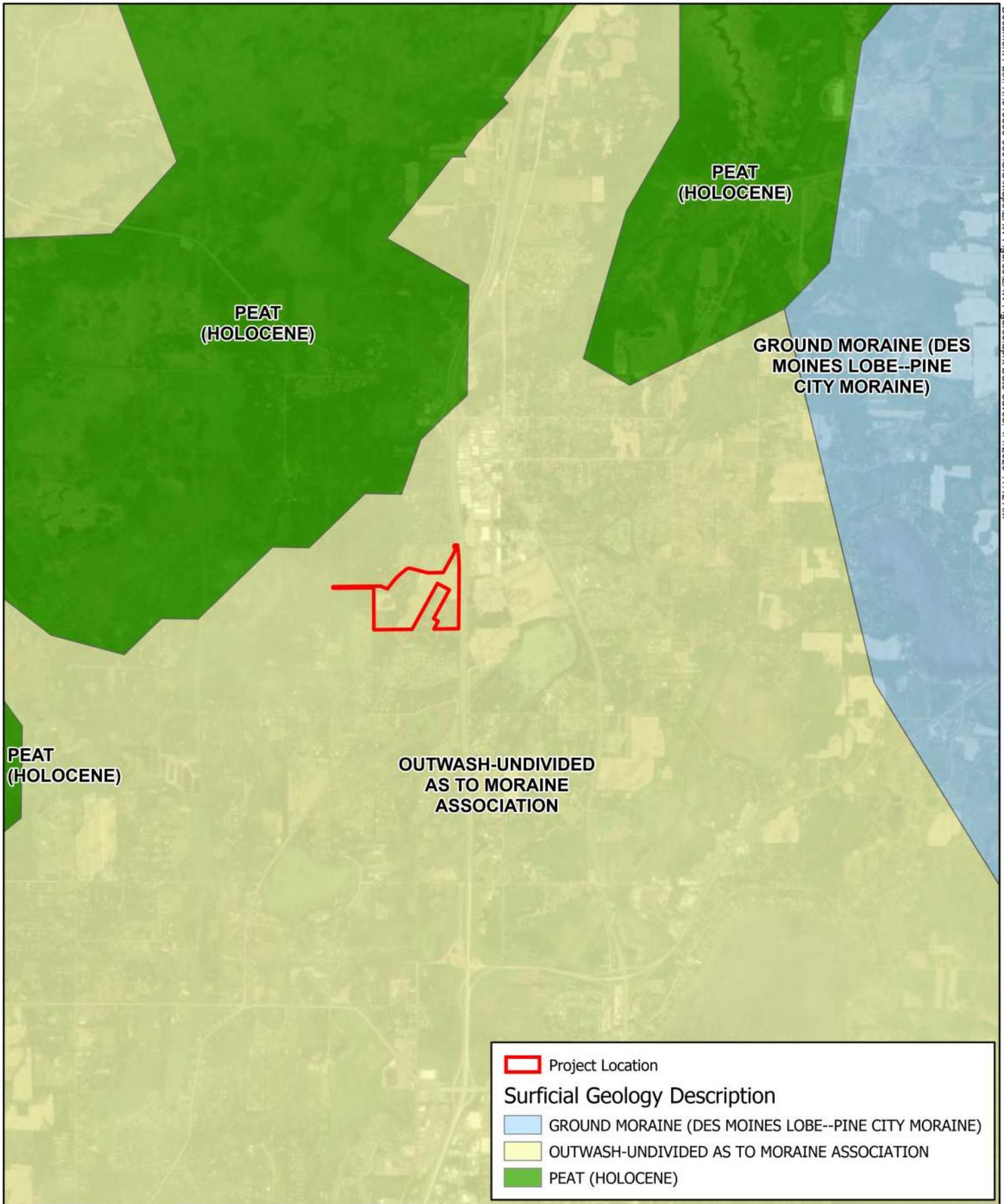


Figure 8 - Surficial Geology

Moxness Kettle River EAW
City of Wyoming, MN



0 4,000
Feet
1 inch = 4,000 feet



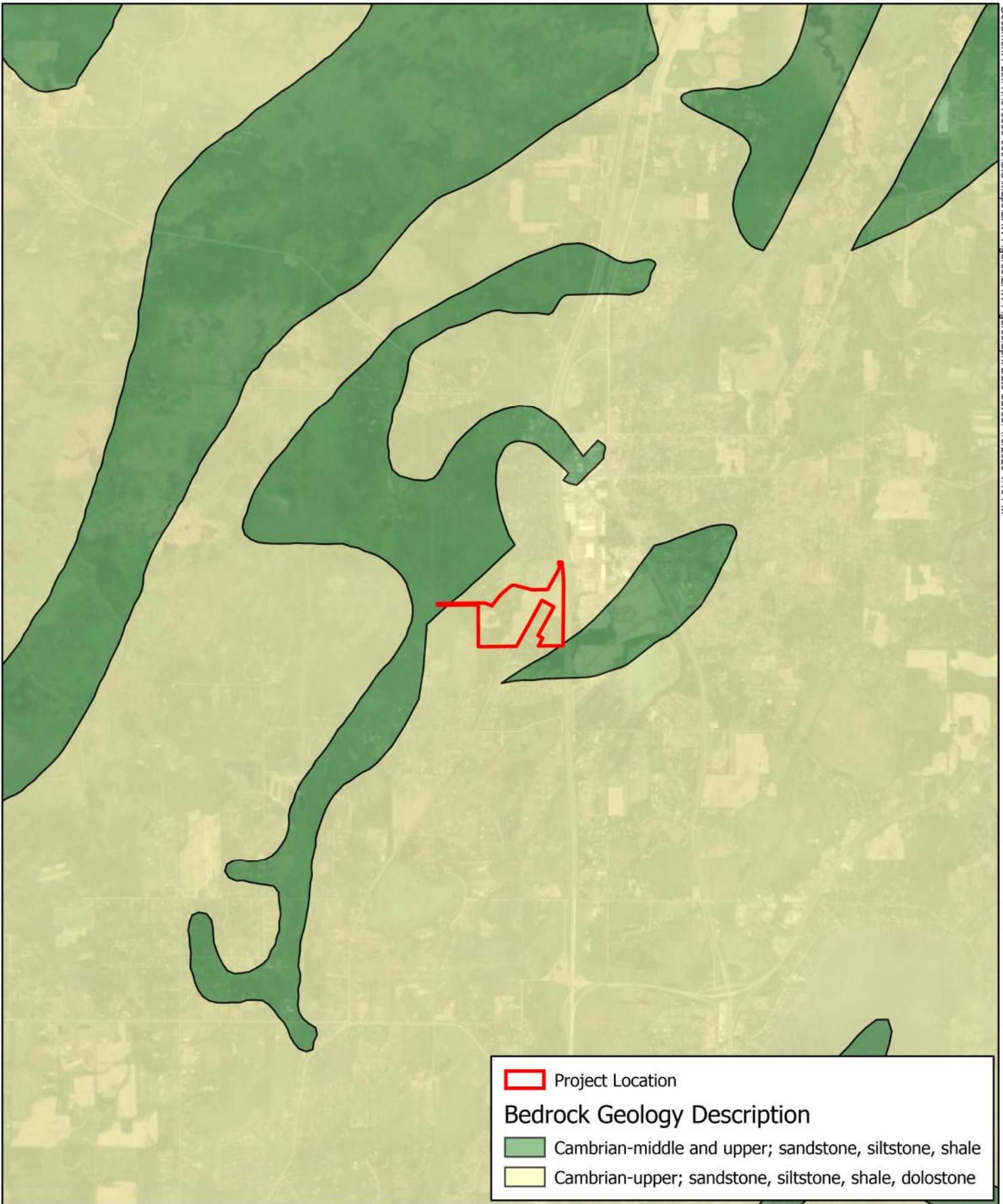


Figure 9 - Bedrock Geology

Moxness Kettle River EAW
City of Wyoming, MN



0 4,000
Feet
1 inch = 4,000 feet



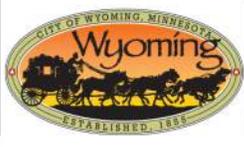
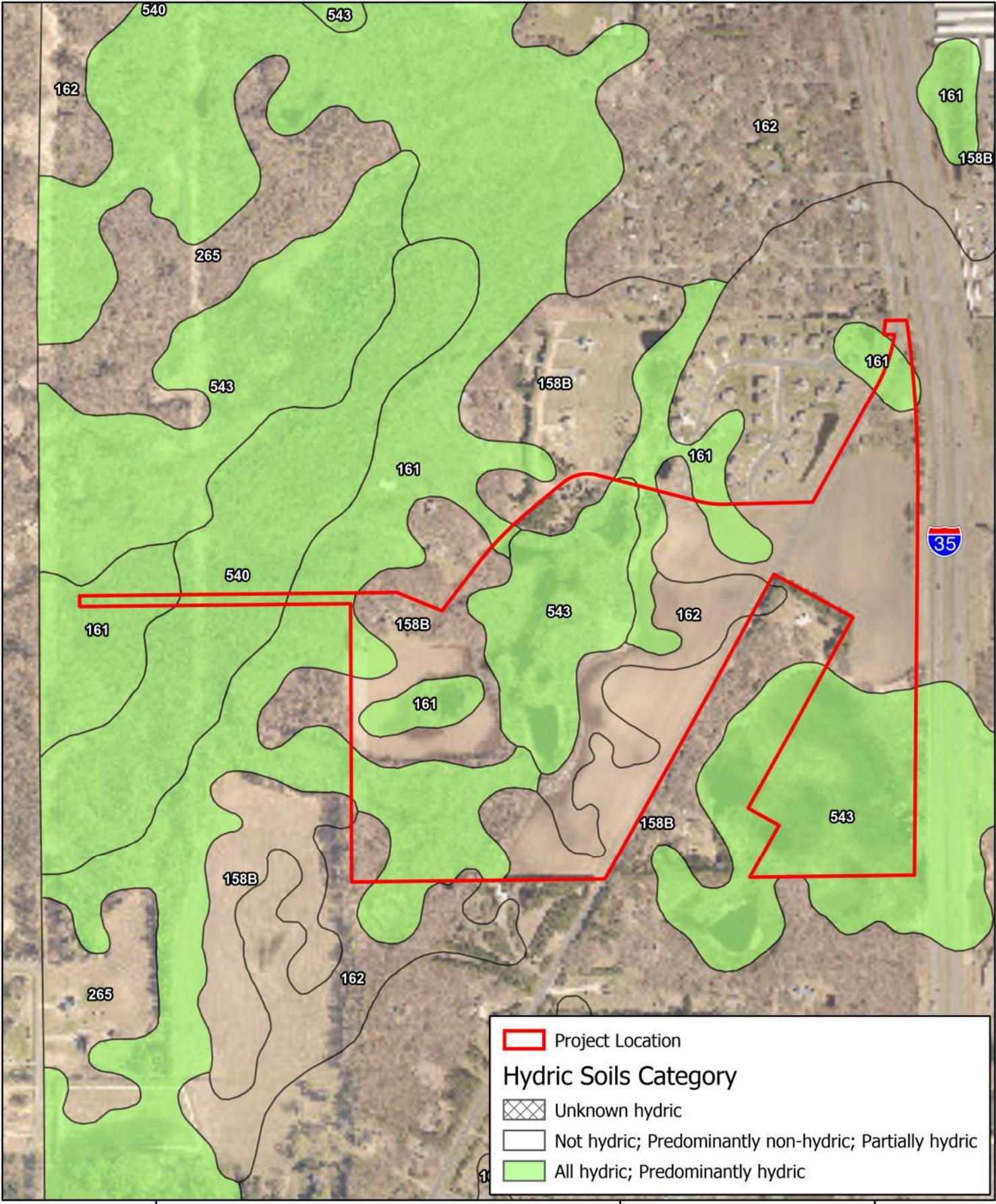
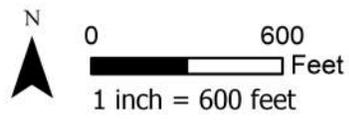


Figure 10 - Chisago County Soil Survey

Moxness Kettle River EAW
City of Wyoming, MN



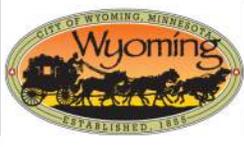
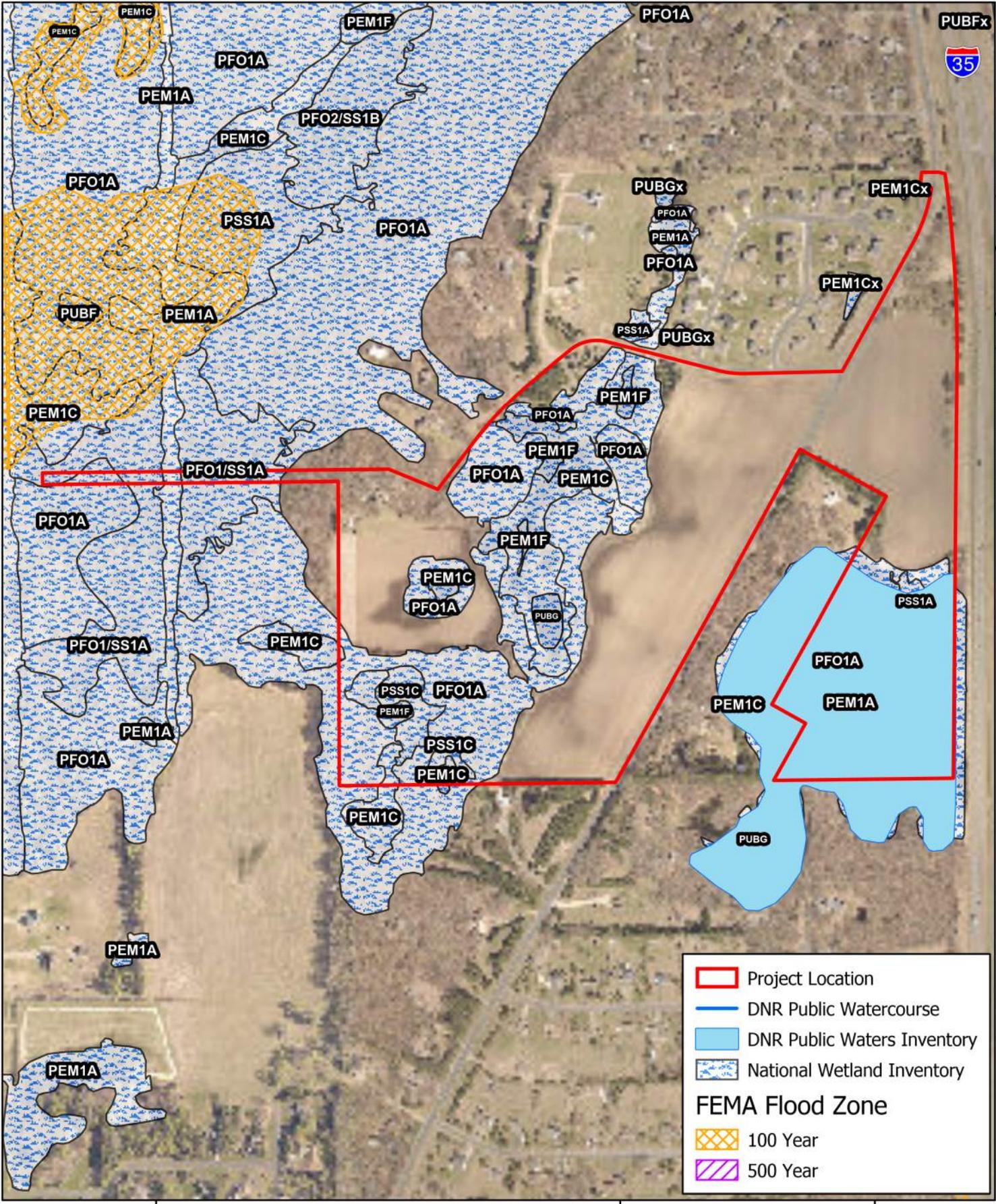
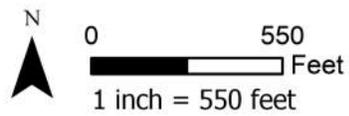


Figure 11 - Surface Waters
 Moxness Kettle River EAW
 City of Wyoming, MN



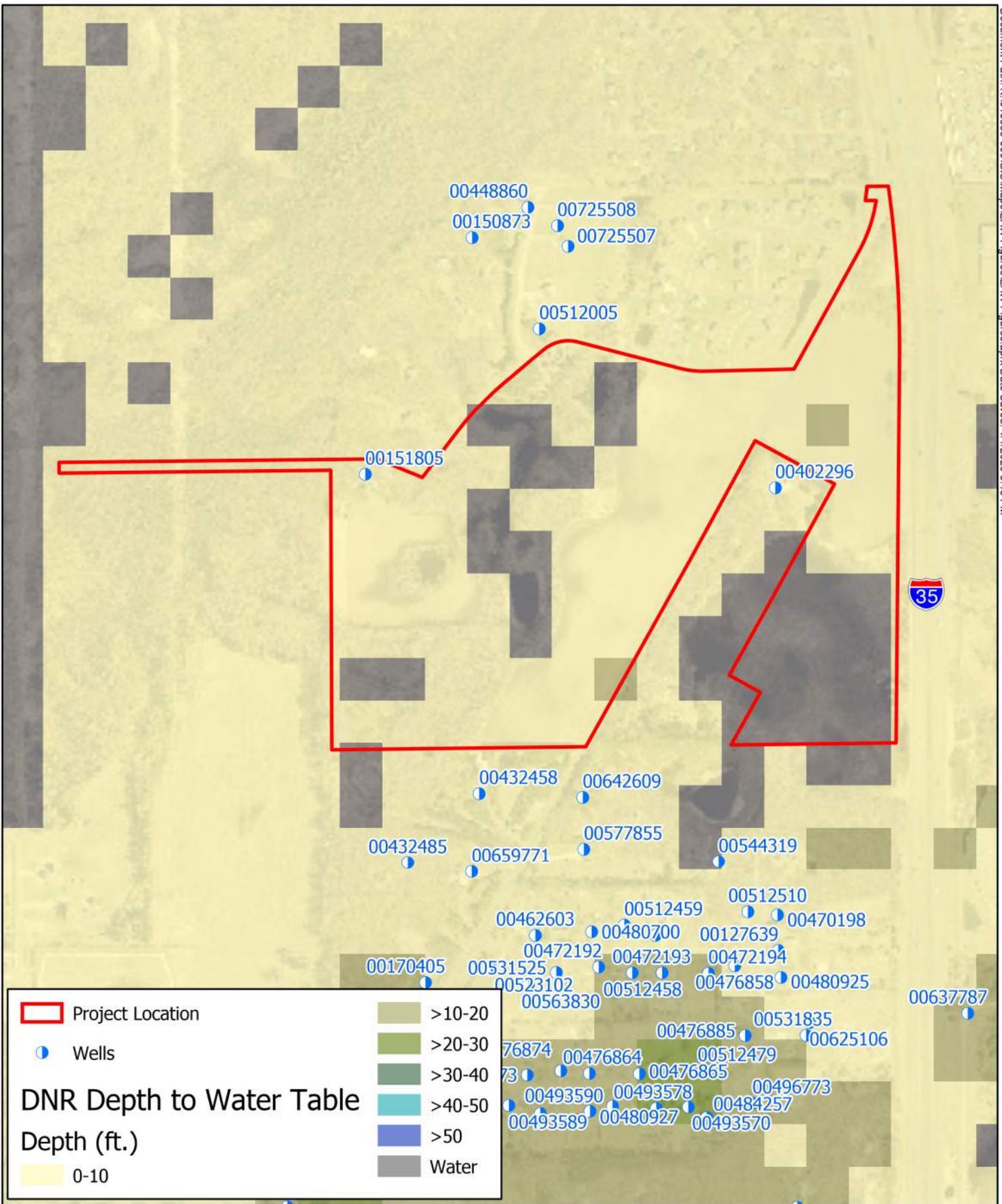
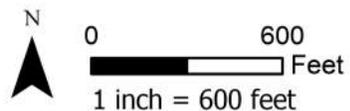


Figure 12 - Well Location and Depth to Groundwater
 Moxness Kettle River EAW
 City of Wyoming, MN



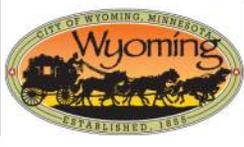
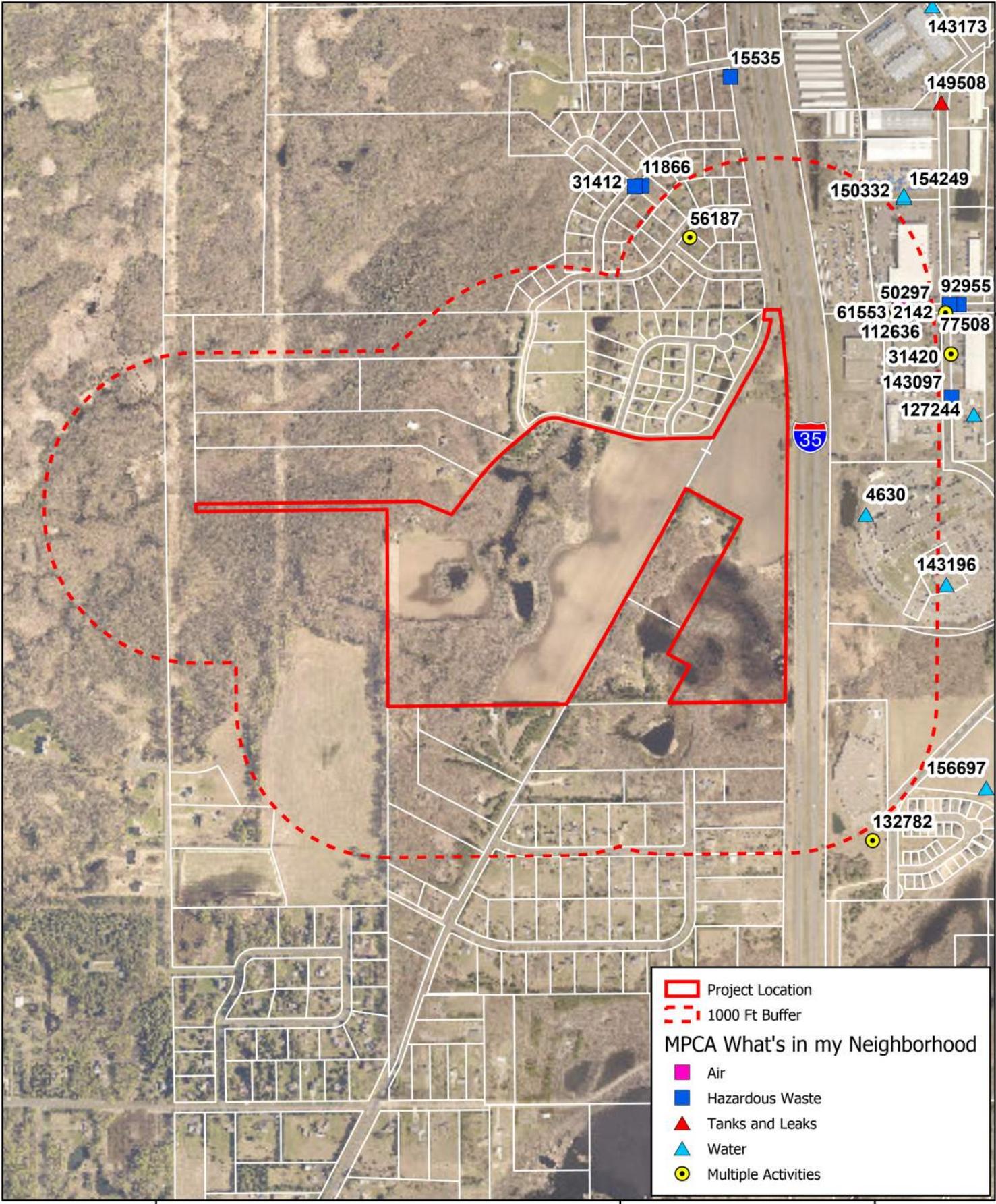
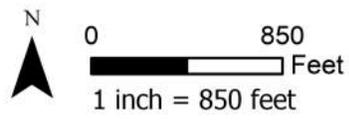


Figure 13 - MPCA-Potential Contamination

Moxness Kettle River EAW
 City of Wyoming, MN



Appendix B

Agency Correspondence

Alison Harwood

From: MN_MNIT_Data Request SHPO <DataRequestSHPO@state.mn.us>
Sent: Thursday, April 2, 2020 5:07 PM
To: Mary Newman
Subject: RE: Data Request: Kettle River Blvd Development

Hello Mary,

Our database has no historic or archaeological records for the given project area.

Jim



SHPO Data Requests
Minnesota State Historic Preservation Office
50 Sherburne Avenue, Suite 203
Saint Paul, MN 55155
(651) 201-3299
datarequestshpo@state.mn.us

Notice: This email message simply reports the results of the cultural resources database search you requested. The database search is only for previously known archaeological sites and historic properties. **IN NO CASE DOES THIS DATABASE SEARCH OR EMAIL MESSAGE CONSTITUTE A PROJECT REVIEW UNDER STATE OR FEDERAL PRESERVATION LAWS** – please see our website at <https://mn.gov/admin/shpo/protection/> for further information regarding our Environmental Review Process.

Because the majority of archaeological sites in the state and many historic/architectural properties have not been recorded, important sites or properties may exist within the search area and may be affected by development projects within that area. Additional research, including field surveys, may be necessary to adequately assess the area's potential to contain historic properties or archaeological sites.

Properties that are listed in the National Register of Historic Places (NRHP) or have been determined eligible for listing in the NRHP are indicated on the reports you have received, if any. The following codes may be on those reports:

NR – National Register listed. The properties may be individually listed or may be within the boundaries of a National Register District.

CEF – Considered Eligible Findings are made when a federal agency has recommended that a property is eligible for listing in the National Register and MN SHPO has accepted the recommendation for the purposes of the Environmental Review Process. These properties need to be further assessed before they are officially listed in the National Register.

SEF – Staff eligible Findings are those properties the MN SHPO staff considers eligible for listing in the National Register, in circumstances other than the Environmental Review Process.

DOE – Determination of Eligibility is made by the National Park Service and are those properties that are eligible for listing in the National Register, but have not been officially listed.

CNEF – Considered Not Eligible Findings are made during the course of the Environmental Review Process. For the purposes of the review a property is considered not eligible for listing in the National Register. These properties may need to be reassessed for eligibility under additional or alternate contexts.

Properties without NR, CEF, SEF, DOE, or CNEF designations in the reports may not have been evaluated and therefore no assumption to their eligibility can be made. Integrity and contexts change over time, therefore any eligibility determination made ten (10) or more years from the date of the current survey are considered out of date and the property will need to be reassessed. If you require a comprehensive assessment of a project's potential to impact archaeological sites or historic/architectural properties, you may need to hire a qualified archaeologist and/or historian. If you need assistance with a project review, please contact Kelly Gragg-Johnson, Environmental Review Specialist @ 651-201-3285 or by email at kelly.graggjohnson@state.mn.us.

The Minnesota SHPO Archaeology and Historic/Architectural Survey Manuals can be found at <https://mn.gov/admin/shpo/identification-evaluation/>.

Given the Governor's announcement of [Stay Home MN](#), the SHPO office will be closed to visitors and unable to accommodate in-person research and deliveries after 4 p.m. Friday, March 27, 2020 continuing through Friday, April 10, 2020. Our office will continue to take file search requests via DataRequestSHPO@state.mn.us. SHPO staff will continue to work remotely and be available via [phone and email](#). Check [SHPO's webpage](#) for the latest updates and we thank you for your continued patience.



From: Mary Newman
Sent: Thursday, April 2, 2020 2:31 PM
To: MN_MNIT_Data Request SHPO
Subject: Data Request: Kettle River Blvd Development

This message may be from an external email source.

Do not select links or open attachments unless verified. Report all suspicious emails to Minnesota IT Services Security Operations Center.

Good afternoon,

I am requesting historic and archeological resources for a site in Wyoming MN that is proposed to be developed into residential housing.

The site is located in Section 30, Township 033, Range 021 in Chisago County, Wyoming MN. (see attached topographic map)

Please let me know if you need additional information to complete this request.

Thank you,

Mary

Mary Newman
Environmental Scientist
763.762.2858 (o) | 612.418.5187 (m)
WSB | wsbeng.com



This email, and any files transmitted with it, is confidential and is intended solely for the use of the addressee. If you are not the addressee, please delete this email from your system. Any use of this email by unintended recipients is strictly prohibited.



Minnesota Department of Natural Resources
Division of Ecological & Water Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155-4025

June 12, 2020

Correspondence # ERDB 20200340

Ms. Mary Newman
WSB & Associates, Inc.
178 9th Street East #200
St. Paul, MN 55101

RE: Natural Heritage Review of the proposed Kettle River Development,
T33N R21W Section 30; Chisago County

Dear Ms. Newman,

As requested, the Minnesota Natural Heritage Information System has been queried to determine if any rare species or other significant natural features are known to occur within an approximate one-mile radius of the proposed project. Based on this query, rare features have been documented within the search area (for details, please visit the [Rare Species Guide Website](#) for more information on the biology, habitat use, and conservation measures of these rare species). Please note that the following rare features may be adversely affected by the proposed project:

Ecologically Significant Areas

- A portion of the project boundary is within an area the Minnesota Biological Survey (MBS) has identified as a Site of *High* Biodiversity Significance. Sites of Biodiversity Significance have varying levels of native biodiversity and are ranked based on the relative significance of this biodiversity at a statewide level. Sites ranked as *High* contain very good quality occurrences of the rarest species, high-quality examples of the rare native plant communities, and/or important functional landscapes. This particular Site contains Black Ash – Yellow Birch – Red Maple – Basswood Swamp (East-central) native plant community, which is considered vulnerable to extirpation. (GIS shapefiles of MBS Sites of Biodiversity Significance and DNR Native Plant Communities can be downloaded from the [MN Geospatial Commons](#). Please contact me if you do not have access to the appropriate mapping services.)

We encourage you to consider project alternatives that would avoid or minimize disturbance to this ecologically significant site. Actions to minimize disturbance may include, but are not limited to, the following recommendations:

- Minimize vehicular disturbance in the MBS Site (allow only vehicles/equipment necessary for construction activities);
 - Do not park equipment or stockpile supplies in the MBS Site;
 - Do not place spoil within MBS Site or other sensitive areas;
 - Retain a buffer between proposed activities and the MBS Site;
 - Use effective erosion prevention and sediment control measures;
 - Inspect and clean all equipment before bringing it to the site to prevent the introduction and spread of invasive species;
 - As much as possible, operate within already-disturbed areas;
 - Revegetate disturbed soil with [native species suitable to the local habitat](#) as soon after construction as possible; and
 - Use only weed-free mulches, topsoils, and seed mixes. Of particular concern are birdsfoot trefoil (*Lotus corniculatus*) and crown vetch (*Coronilla varia*), two invasive species that are sold commercially and are problematic in prairies and disturbed open areas.
- If the Wetland Conservation Act (WCA) is applicable to this project, please note that wetlands within High or Outstanding MBS Sites of Biodiversity Significance may qualify as “rare natural communities” under this Act. Minnesota Rules, part 8420.0515, subpart 3 states that a wetland replacement plan for activities that modify a rare natural community must be denied if the local government unit determines the proposed activities will permanently adversely affect the natural community.

State-listed Species

- Blanding’s turtles (*Emydoidea blandingii*), a state-listed threatened species, have been documented in the direct vicinity of the proposed project. Blanding’s turtles use upland areas up to and over a mile distant from wetlands, water bodies, and watercourses. Uplands are used for nesting, basking, periods of dormancy, and traveling between wetlands. Factors believed to contribute to the decline of this species include collisions with vehicles, wetland drainage and degradation, and the development of upland habitat. Any added mortality can be detrimental to populations of Blanding’s turtles, as these turtles have a low reproduction rate that depends upon a high survival rate to maintain population levels.

This project has the potential to impact this rare turtle through direct fatalities and habitat disturbance/destruction due to excavation, fill, and other construction activities associated with the project. Minnesota’s Endangered Species Statute (*Minnesota Statutes*, section 84.0895) and associated Rules (*Minnesota Rules*, part 6212.1800 to 6212.2300 and 6134) prohibit the take of

threatened or endangered species without a permit. As such, **the following avoidance measures are required:**

- Avoid wetland impacts during hibernation season, between October 15th and April 15th, unless the area is unsuitable for hibernation:
 - less than 14 inches deep,
 - anoxic conditions, or
 - not a suitable substrate.
- The [Blanding's turtle flyer](#) must be given to all contractors working in the area.
- The use of [erosion control](#) blanket shall be limited to 'bio-netting' or 'natural netting' types, and specifically not products containing plastic mesh netting or other plastic components.
 - Also, be aware that hydro-mulch products may contain small synthetic (plastic) fibers to aid in its matrix strength. These loose fibers could potentially re-suspend and make their way into Public Waters. As such, please review mulch products and not allow any materials with synthetic (plastic) fiber additives in areas that drain to Public Waters.
- Monitor for turtles during construction and report any sightings to the DNR Nongame Specialist, Erica Hoaglund at 651-259-5772 or Erica.Hoaglund@state.mn.us.
- If turtles are in imminent danger they must be moved by hand out of harm's way, otherwise, they are to be left undisturbed.

If the above avoidance measures are not possible, please contact me as further action may be needed.

For additional information, see the [Blanding's turtle fact sheet](#), which describes the habitat use and life history of this species. The fact sheet also provides two lists of recommendations for avoiding and minimizing impacts to this rare turtle. **Please refer to both lists of recommendations for your project.** For further assistance regarding the Blanding's turtle, please contact the DNR Regional Nongame Specialist, Erica Hoaglund.

- Cross-leaved milkwort (*Polygala cruciata*), a state-listed endangered plant species, tubercled rein-orchid (*Platanthera flava* var. *herbiola*), and hidden-fruit bladderwort (*Utricularia geminiscapa*), both state-listed threatened plant species, have been documented in the vicinity of the proposed project. Cross-leaved milkwort is a small purplish-pink flowering plant that is found on wet, sandy areas along shores of lakes, emergent wetlands, and low depressions. Tubercled rein-orchid is found in wet, sunny meadows, swales, or along the edges along swamps, marshes, or lakeshores. Hidden-fruit bladderwort was documented in the direct vicinity of the project; this floating aquatic species is found in bog pools and fens with little disturbance from waves or currents.

Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of threatened or endangered species without a permit. Given the presence of state-protected species in the direct vicinity of the proposed project and the likely presence of potential habitat for other state-listed species, **a qualified surveyor will need to conduct a botanical survey in any potential habitat that will be impacted by the proposed project.** A habitat assessment can be conducted to determine potential habitat and avoidance areas. If impacts to potential habitat can be avoided, a survey is not needed. Surveys must follow the standards contained in the attached Rare Species Survey Process and Rare Plant Guidance. Project planning should take into account that any botanical survey needs to be conducted during the appropriate time of the year, which may be limited. Please consult with the Endangered Species Environmental Review Coordinator, Lisa Joyal (lisa.joyal@state.mn.us), regarding this process.

Environmental Review and Permitting

- Please include a copy of this letter in any state or local license or permit application. Please note that measures to avoid or minimize disturbance to the above rare features may be included as restrictions or conditions in any required permits or licenses.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location (noted above) and the project description provided on the NHIS Data Request Form. Please contact me if project details change or for an updated review if construction has not occurred within one year.

The Natural Heritage Review does not constitute review or approval by the Department of Natural Resources as a whole. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. If needed, please contact your [DNR Regional Environmental Assessment Ecologist](#) to determine whether there are other natural resource concerns associated with the proposed project. Please be aware that additional site assessments or review may be required.

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources. An invoice will be mailed to you under separate cover.

Sincerely,



Samantha Bump
Natural Heritage Review Specialist
Samantha.Bump@state.mn.us

Enc. Rare Species Survey Protocol

Links: Rare Species Guide

<http://www.dnr.state.mn.us/rsg/index.html>

DNR Regional Environmental Assessment Ecologist Contact Info

http://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html

Blanding's Turtle Fact Sheet

http://files.dnr.state.mn.us/natural_resources/animals/reptiles_amphibians/turtles/blandings_turtle/factsheet.pdf

Blanding's Turtle Flyer

http://files.dnr.state.mn.us/natural_resources/animals/reptiles_amphibians/turtles/blandings_turtle/flyer.pdf

Wildlife Friendly Erosion Control

<http://files.dnr.state.mn.us/eco/nongame/wildlife-friendly-erosion-control.pdf>

MBS Sites of Biodiversity Significance

http://www.dnr.state.mn.us/eco/mcbs/biodiversity_guidelines.html

DNR Native Plant Communities

<http://www.dnr.state.mn.us/npc/index.html>

MN Geospatial Commons

<https://gisdata.mn.gov/>

BWSR Native Vegetation/Seed Mixes

http://www.bwsr.state.mn.us/native_vegetation/

Cc: Mellissa Collins
Leslie Parris
Erica Hoaglund

Appendix C

Well Logs

150873

County Chisago
 Quad Linwood
 Quad ID 135D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
 Minnesota Statutes Chapter 1031

Entry Date 04/07/1988
 Update Date 02/14/2014
 Received Date

Well Name LUND, CLINTON 33	Township 33	Range 21	Dir Section W 30	Subsection BAABCC	Well Depth 263 ft.	Depth Completed 263 ft.	Date Well Completed 08/19/1978
Elevation 900 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)				Drill Method Non-specified Rotary	Drill Fluid	
Address					Use domestic	Status Active	
Contact BOX 427 WYOMING MN 55092					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/> From To		
Well KETTLE RIVER BL WYOMING MN 55092					Casing Type Single casing Joint Threaded		
Stratigraphy Information					Drive Shoe? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Above/Below 1 ft.		
Geological Material	From	To (ft.)	Color	Hardness	Casing Diameter Weight		
SAND & GRAVEL	0	6			4 in. To 260 ft. 11 lbs./ft.		
CLAY	6	160					
GRAVEL	160	165					
CLAY	165	200					
GRAVEL	200	209					
CLAY	209	255					
GRAVEL	255	263					
					Open Hole From 260 ft. To 263 ft.		
					Screen? <input type="checkbox"/> Type Make		
					Static Water Level		
					15 ft. land surface Measure 08/19/1978		
					Pumping Level (below land surface)		
					100 ft. 2 hrs. Pumping at 60 g.p.m.		
					Wellhead Completion		
					Pitless adapter manufacturer Model		
					<input type="checkbox"/> Casing Protection <input checked="" type="checkbox"/> 12 in. above grade		
					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information Well Grouted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Specified		
					Nearest Known Source of Contamination		
					124 feet Northwest Direction Septic tank/drain field Type		
					Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
					Pump <input type="checkbox"/> Not Installed Date Installed 08/23/1978		
					Manufacturer's name GOULDS		
					Model Number 10EX07 HP 0.75 Volt 220		
					Length of drop pipe 100 ft Capacity 15 g.p. Typ Submersible		
					Abandoned		
					Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Variance		
					Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Miscellaneous		
					First Bedrock Aquifer Quat. buried		
					Last Strat gravel (+larger) Depth to Bedrock ft		
					Located by Minnesota Geological Survey		
					Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)		
					System UTM - NAD83, Zone 15, Meters X 499087 Y 5019056		
					Unique Number Verification Information from Input Date 01/01/1990		
					Angled Drill Hole		
					Well Contractor		
					McCullough & Sons 82054 MCCULLOUGH, D		
					Licensee Business Lic. or Reg. No. Name of Driller		
Remarks							
Minnesota Well Index Report					150873		
					Printed on 04/01/2020 HE-01205-15		

151805County Chisago
Quad Linwood
Quad ID 135DMINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031Entry Date 04/07/1988
Update Date 02/14/2014
Received Date

Well Name ZARUBA,	Township 33	Range 21	Dir Section W 30	Subsection BDBBAB	Well Depth 140 ft.	Depth Completed 140 ft.	Date Well Completed 07/28/1978
Elevation 911 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)	Drill Method Cable Tool		Drill Fluid			
Address Well 4624 258TH ST WYOMING MN					Use domestic		Status Active
Stratigraphy Information					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/> From To		
Geological Material From To (ft.) Color Hardness					Casing Type Single casing Joint Threaded		
SAND 0 60					Drive Shoe? Yes <input type="checkbox"/> No <input type="checkbox"/> Above/Below 1 ft.		
CLAY 60 116					Casing Diameter Weight		
MUDDY SAND 116 130					4 in. To 135 ft. 11 lbs./ft.		
GRAVEL 130 140					Open Hole From ft. To ft.		
					Screen? <input checked="" type="checkbox"/> Type stainless Make JOHNSON		
					Diameter Slot/Gauze Length Set		
					2 in. 10 4 ft. ft. ft.		
					Static Water Level		
					20 ft. land surface Measure 07/28/1978		
					Pumping Level (below land surface)		
					40 ft. 3 hrs. Pumping at 30 g.p.m.		
					Wellhead Completion		
					Pitless adapter manufacturer Model		
					<input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade		
					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information Well Grouted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Specified		
					Nearest Known Source of Contamination		
					50 feet South Direction Septic tank/drain field Type		
					Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
					Pump <input type="checkbox"/> Not Installed Date Installed 09/16/1978		
					Manufacturer's name MCDONAQLD		
					Model Number 16050G3B HP 0.5 Volt 230		
					Length of drop pipe 63 ft Capacity 12 g.p. Typ Submersible		
					Abandoned		
					Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Variance		
					Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Miscellaneous		
					First Bedrock Aquifer Quat. buried		
					Last Strat gravel (+larger) Depth to Bedrock ft		
					Located by Minnesota Geological Survey		
					Locate Method Digitization (Screen) - Map (1:24,000) (15 meters or		
					System UTM - NAD83, Zone 15, Meters X 498936 Y 5018720		
					Unique Number Verification Name on mailbox Input Date 02/13/2008		
					Angled Drill Hole		
					Well Contractor		
					Ludwig Well Co. 30096 PITTMAN, H		
					Licensee Business Lic. or Reg. No. Name of Driller		
Remarks							
Minnesota Well Index Report					151805		
					Printed on 04/01/2020 HE-01205-15		

402296

County Chisago
 Quad Linwood
 Quad ID 135D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
 Minnesota Statutes Chapter 1031

Entry Date 12/02/1990
 Update Date 06/02/2014
 Received Date

<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>Well Name</td> <td>Township</td> <td>Range</td> <td>Dir Section</td> <td>Subsection</td> </tr> <tr> <td>REED, GLEN</td> <td>33</td> <td>21</td> <td>W 30</td> <td>ACABAC</td> </tr> <tr> <td>Elevation</td> <td>910 ft.</td> <td>Elev. Method</td> <td colspan="2">7.5 minute topographic map (+/- 5 feet)</td> </tr> <tr> <td colspan="5">Address</td> </tr> <tr> <td>C/W</td> <td colspan="4">25783 KETTLE RIVER BL WYOMING MN</td> </tr> <tr> <td colspan="5">Stratigraphy Information</td> </tr> <tr> <td>Geological Material</td> <td>From</td> <td>To (ft.)</td> <td>Color</td> <td>Hardness</td> </tr> <tr> <td>FINE SAND</td> <td>0</td> <td>33</td> <td></td> <td></td> </tr> <tr> <td>BLUE CLAY & ROCKS</td> <td>33</td> <td>36</td> <td>BLUE</td> <td></td> </tr> <tr> <td>RED SANDY CLAY</td> <td>36</td> <td>100</td> <td>RED</td> <td></td> </tr> <tr> <td>CLAY</td> <td>100</td> <td>110</td> <td>RED</td> <td></td> </tr> <tr> <td>RED CLAY & GRAVEL</td> <td>110</td> <td>156</td> <td>RED</td> <td></td> </tr> <tr> <td>BOULDERS</td> <td>156</td> <td>180</td> <td></td> <td></td> </tr> <tr> <td>MUDDY SAND &</td> <td>180</td> <td>192</td> <td></td> <td></td> </tr> <tr> <td>SAND (FINE TO</td> <td>192</td> <td>221</td> <td></td> <td></td> </tr> </table>	Well Name	Township	Range	Dir Section	Subsection	REED, GLEN	33	21	W 30	ACABAC	Elevation	910 ft.	Elev. Method	7.5 minute topographic map (+/- 5 feet)		Address					C/W	25783 KETTLE RIVER BL WYOMING MN				Stratigraphy Information					Geological Material	From	To (ft.)	Color	Hardness	FINE SAND	0	33			BLUE CLAY & ROCKS	33	36	BLUE		RED SANDY CLAY	36	100	RED		CLAY	100	110	RED		RED CLAY & GRAVEL	110	156	RED		BOULDERS	156	180			MUDDY SAND &	180	192			SAND (FINE TO	192	221			<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>Well Depth</td> <td>Depth Completed</td> <td>Date Well Completed</td> </tr> <tr> <td>221 ft.</td> <td>221 ft.</td> <td>08/09/1985</td> </tr> <tr> <td>Drill Method</td> <td>Non-specified Rotary</td> <td>Drill Fluid</td> </tr> <tr> <td>Use</td> <td>domestic</td> <td>Status</td> </tr> <tr> <td></td> <td></td> <td>Active</td> </tr> <tr> <td>Well Hydrofractured?</td> <td>Yes <input type="checkbox"/> No <input type="checkbox"/></td> <td>From</td> </tr> <tr> <td></td> <td></td> <td>To</td> </tr> <tr> <td>Casing Type</td> <td>Single casing</td> <td>Joint</td> </tr> <tr> <td></td> <td></td> <td>Threaded</td> </tr> <tr> <td>Drive Shoe?</td> <td>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></td> <td>Above/Below</td> </tr> <tr> <td>Casing Diameter</td> <td>Weight</td> <td></td> </tr> <tr> <td>4 in. To</td> <td>216 ft. 11 lbs./ft.</td> <td></td> </tr> <tr> <td>Open Hole</td> <td>From</td> <td>ft. To</td> </tr> <tr> <td></td> <td></td> <td>ft.</td> </tr> <tr> <td>Screen?</td> <td><input checked="" type="checkbox"/></td> <td>Type stainless</td> </tr> <tr> <td>Diameter</td> <td>Slot/Gauze</td> <td>Length</td> </tr> <tr> <td>4 in.</td> <td>40</td> <td>5 ft.</td> </tr> <tr> <td></td> <td></td> <td>Set</td> </tr> <tr> <td></td> <td></td> <td>216 ft. 221 ft.</td> </tr> <tr> <td>Static Water Level</td> <td>19 ft.</td> <td>land surface</td> </tr> <tr> <td></td> <td></td> <td>Measure</td> </tr> <tr> <td></td> <td></td> <td>08/09/1985</td> </tr> <tr> <td>Pumping Level (below land surface)</td> <td>ft.</td> <td>hrs. 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Typ Submersible</td> </tr> <tr> <td>Abandoned</td> <td colspan="2">Does property have any not in use and not sealed well(s)?</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Yes</td> <td><input type="checkbox"/> No</td> </tr> <tr> <td>Variance</td> <td colspan="2">Was a variance granted from the MDH for this well?</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Yes</td> <td><input type="checkbox"/> No</td> </tr> <tr> <td>Miscellaneous</td> <td>First Bedrock</td> <td>Aquifer Quat. buried</td> </tr> <tr> <td></td> <td>Last Strat sand</td> <td>Depth to Bedrock ft</td> </tr> <tr> <td>Located by</td> <td colspan="2">Minnesota Geological Survey</td> </tr> <tr> <td>Locate Method</td> <td colspan="2">Digitized - scale 1:24,000 or larger (Digitizing Table)</td> </tr> <tr> <td>System</td> <td>UTM - NAD83, Zone 15, Meters</td> <td>X 499516 Y 5018701</td> </tr> <tr> <td>Unique Number Verification</td> <td>Information from</td> <td>Input Date</td> </tr> <tr> <td></td> <td></td> <td>01/01/1990</td> </tr> <tr> <td>Angled Drill Hole</td> <td colspan="2"></td> </tr> <tr> <td>Well Contractor</td> <td>Johnson G. Well Co.</td> <td>13539 JOHNSON, G.</td> </tr> <tr> <td></td> <td>Licensee Business</td> <td>Lic. or Reg. No. Name of Driller</td> </tr> </table>	Well Depth	Depth Completed	Date Well Completed	221 ft.	221 ft.	08/09/1985	Drill Method	Non-specified Rotary	Drill Fluid	Use	domestic	Status			Active	Well Hydrofractured?	Yes <input type="checkbox"/> No <input type="checkbox"/>	From			To	Casing Type	Single casing	Joint			Threaded	Drive Shoe?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Above/Below	Casing Diameter	Weight		4 in. To	216 ft. 11 lbs./ft.		Open Hole	From	ft. To			ft.	Screen?	<input checked="" type="checkbox"/>	Type stainless	Diameter	Slot/Gauze	Length	4 in.	40	5 ft.			Set			216 ft. 221 ft.	Static Water Level	19 ft.	land surface			Measure			08/09/1985	Pumping Level (below land surface)	ft.	hrs. Pumping at			50 g.p.m.	Wellhead Completion	Pitless adapter manufacturer	WHITEWATER Model		<input type="checkbox"/> Casing Protection	<input type="checkbox"/> 12 in. above grade		<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		Grouting Information	Well Grouted?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Specified	Nearest Known Source of Contamination	feet	Direction			Type	Well disinfected upon completion?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Pump	<input type="checkbox"/> Not Installed	Date Installed			08/15/1985	Manufacturer's name	WEBTROL		Model Number	102S57B	HP 0.5 Volt 230	Length of drop pipe	42 ft	Capacity 10 g.p. 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Remarks

432458

County Chisago
 Quad Linwood
 Quad ID 135D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
 Minnesota Statutes Chapter 1031

Entry Date 12/02/1990
 Update Date 06/02/2014
 Received Date

Well Name DELLOU, BOB	Township 33	Range 21	Dir Section W 30	Subsection CAABCA	Well Depth 185 ft.	Depth Completed 185 ft.	Date Well Completed 05/14/1987	
Elevation 910 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)	Drill Method Non-specified Rotary		Drill Fluid Other				
Address C/W 25480 KETTLE RIVER BL MN 55025					Use domestic	Status Active		
Stratigraphy Information					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/> From To			
Geological Material	From	To (ft.)	Color	Hardness	Casing Type Single casing Joint			
SAND	0	45	BROWN		Drive Shoe? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Above/Below 1 ft.			
CLAY	45	80	GRAY		Casing Diameter Weight			
CLAY	80	122	RED		in. To	181 ft.	lbs./ft.	
CLAY & STONE	122	172	GRAY		Open Hole From ft. To ft.			
WATERSAND	172	185	BROWN		Screen? <input checked="" type="checkbox"/>	Type stainless	Make JOHNSON	
					Diameter	Slot/Gauze	Length	Set
					2 in.	10	4 ft.	181 ft. 185 ft.
					Static Water Level			
					25 ft.	land surface	Measure	05/14/1987
					Pumping Level (below land surface)			
					45 ft.	2 hrs.	Pumping at	25 g.p.m.
					Wellhead Completion			
					Pitless adapter manufacturer	SNAPPY	Model	
					<input type="checkbox"/> Casing Protection	<input type="checkbox"/> 12 in. above grade		
					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)			
					Grouting Information Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified			
					Material	Amount	From	To
					neat cement		6 ft.	30 ft.
					Nearest Known Source of Contamination			
					100 feet	West Direction	Septic tank/drain field	Type
					Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
					Pump <input type="checkbox"/> Not Installed Date Installed 05/28/1987			
					Manufacturer's name	RED JACKET		
					Model Number	HP	0.5	Volt 230
					Length of drop pipe	60 ft	Capacity	12 g.p. Typ Submersible
					Abandoned			
					Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
					Variance			
					Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No			
					Miscellaneous			
					First Bedrock	Aquifer	Quat. buried	
					Last Strat sand-brown	Depth to Bedrock		ft
					Located by Minnesota Geological Survey			
					Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)			
					System	UTM - NAD83, Zone 15, Meters	X 499097	Y 5018268
					Unique Number Verification	Information from	Input Date	01/01/1990
					Angled Drill Hole			
					Well Contractor			
					A-well Co.	02484	WOLTERS, P.	
					Licensee Business	Lic. or Reg. No.	Name of Driller	

432485

County Chisago
 Quad Linwood
 Quad ID 135D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
 Minnesota Statutes Chapter 1031

Entry Date 12/02/1990
 Update Date 06/02/2014
 Received Date

Well Name DELLUO, LARRY 33	Township 21	Range W 30	Dir Section CABDCA	Subsection CABDCA	Well Depth 145 ft.	Depth Completed 145 ft.	Date Well Completed 07/30/1987
Elevation 909 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)				Drill Method Non-specified Rotary	Drill Fluid Other	
Address C/W 25360 KETTLE RIVER BL MN					Use domestic	Status Active	
Stratigraphy Information					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/>	From	To
Geological Material	From	To (ft.)	Color	Hardness	Casing Type Single casing	Joint	
SAND	0	16	BROWN		Drive Shoe? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Above/Below	1 ft.
SANDY CLAY	16	35	BROWN		Casing Diameter	Weight	
CLAY & STONES	35	75	RED		in. To 141 ft.	lbs./ft.	
CLAY	75	130	RED		Open Hole		
WATERSAND	130	145	DARK		From	ft.	To
					Screen? <input checked="" type="checkbox"/>	Type stainless	Make JOHNSON
					Diameter	Slot/Gauze	Length
					2 in.	10	4 ft.
						Set	141 ft.
							145 ft.
					Static Water Level		
					14 ft.	land surface	Measure
							07/30/1987
					Pumping Level (below land surface)		
					34 ft.	3 hrs.	Pumping at
							25 g.p.m.
					Wellhead Completion		
					Pitless adapter manufacturer	SNAPPY	Model
					<input type="checkbox"/> Casing Protection	<input type="checkbox"/> 12 in. above grade	
					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information		
					Well Grouted?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
						<input type="checkbox"/> Not Specified	
					Material	Amount	From To
					neat cement		6 ft. 30 ft.
					Nearest Known Source of Contamination		
					100 feet	North Direction	Septic tank/drain field Type
					Well disinfected upon completion?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
					Pump		
					<input type="checkbox"/> Not Installed	Date Installed	07/31/1987
					Manufacturer's name	RED JACKET	
					Model Number	HP	0.5 Volt
					Length of drop pipe	60 ft	Capacity
						12 g.p.	Typ
							Submersible
					Abandoned		
					Does property have any not in use and not sealed well(s)?		
						<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
					Variance		
					Was a variance granted from the MDH for this well?		
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					Miscellaneous		
					First Bedrock	Aquifer	Quat. buried
					Last Strat	sand	Depth to Bedrock
							ft
					Located by Minnesota Geological Survey		
					Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)		
					System	UTM - NAD83, Zone 15, Meters	X 498996 Y 5018170
					Unique Number Verification	Information from	Input Date
							01/01/1990
					Angled Drill Hole		
					Well Contractor		
					A-well Co.	02484	WOLTERS, P.
					Licensee Business	Lic. or Reg. No.	Name of Driller
Remarks							
Minnesota Well Index Report					432485		
					Printed on 04/01/2020 HE-01205-15		

448860County Chisago
Quad Linwood
Quad ID 135DMINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031Entry Date 12/02/1990
Update Date 06/02/2014
Received Date

Well Name SANDAHL,	Township 33	Range 21	Dir Section W 30	Subsection BAAABB	Well Depth 200 ft.	Depth Completed 200 ft.	Date Well Completed 08/26/1988
Elevation 904 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)				Drill Method Non-specified Rotary	Drill Fluid	
Address C/W 25950 EMERALD					Use domestic	Status Active	
Stratigraphy Information					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/>	From	To
Geological Material	From	To (ft.)	Color	Hardness	Casing Type Single casing	Joint Threaded	
SAND	0	11	BROWN	SOFT	Drive Shoe? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Above/Below 1 ft.	
SAND	11	38	GRAY	SOFT	Casing Diameter 4 in.	Weight 196 ft. 11 lbs./ft.	Hole Diameter 6.2 in. To 200 ft.
CLAY	38	132	RED	SOFT	Open Hole From ft. To ft.		
CLAY & GRAVEL	132	158	BROWN	SFT-HRD	Screen? Diameter 4 in.	<input checked="" type="checkbox"/> Slot/Gauze 30	Type Length 4 ft.
SAND (FINE)	158	190	BROWN	SOFT	Make JOHNSON		
SAND (COARSE)	190	200	BROWN	SOFT	Set 196 ft. 200 ft.		
					Static Water Level 18 ft. land surface Measure 08/26/1988		
					Pumping Level (below land surface) 22 ft. 4 hrs. Pumping at 30 g.p.m.		
					Wellhead Completion Pitless adapter manufacturer MASS Model 4J1 <input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified Material bentonite Amount From To ft. ft.		
					Nearest Known Source of Contamination 80 feet Northeast Direction Septic tank/drain field Type Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
					Pump <input type="checkbox"/> Not Installed Date Installed 08/26/1988 Manufacturer's name WEBTROL Model Number HP 0.5 Volt 230 Length of drop pipe 40 ft Capacity 10 g.p. Typ Submersible		
					Abandoned Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Miscellaneous First Bedrock Aquifer Quat. buried Last Strat sand-brown Depth to Bedrock ft Located by Minnesota Geological Survey Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table) System UTM - NAD83, Zone 15, Meters X 499166 Y 5019099 Unique Number Verification Information from Input Date 01/01/1990		
Remarks					Angled Drill Hole		
					Well Contractor Sampson Bros. Well 02088 SAMPSON, C. Licensee Business Lic. or Reg. No. Name of Driller		
Minnesota Well Index Report					448860		Printed on 04/01/2020 HE-01205-15

512005County Chisago
Quad Linwood
Quad ID 135DMINNESOTA DEPARTMENT OF HEALTH
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Minnesota Statutes Chapter 1031Entry Date 12/02/1990
Update Date 06/02/2014
Received Date

Well Name ZARUBA, MARK	Township 33	Range 21	Dir Section W 30	Subsection BADABB	Well Depth 187 ft.	Depth Completed 187 ft.	Date Well Completed 10/31/1989
Elevation 905 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)				Drill Method Non-specified Rotary	Drill Fluid Bentonite	
Address C/W 25869 EMERALD AV WYOMING MN 55092					Use domestic	Status Active	
Stratigraphy Information					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/>	From	To
Geological Material	From	To (ft.)	Color	Hardness	Casing Type Single casing	Joint Threaded	
VERY FINE LOAMY	0	29	BROWN	SOFT	Drive Shoe? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Above/Below 1 ft.	
VERY FINE SAND	29	47	GRAY	SOFT	Casing Diameter 4 in.	Weight 11 lbs./ft.	
CLAY	47	120	RED	HARD	Open Hole From ft. To ft.		
ROCK, CLAY, GRAVEL	120	161	RED	HARD	Screen? Diameter 4 in.	Type Slot/Gauze 20	Make H SMITH
MEDIUM COARSE	161	187	BROWN	SOFT	Static Water Level 30 ft.	land surface	Measure 11/15/1989
					Pumping Level (below land surface) 40 ft.	1 hrs.	Pumping at 25 g.p.m.
					Wellhead Completion Pitless adapter manufacturer SNAPPY Model JIFFY		
					<input type="checkbox"/> Casing Protection	<input type="checkbox"/> 12 in. above grade	
					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified		
					Nearest Known Source of Contamination 75 feet Southeast Direction		
					Septic tank/drain field Type		
					Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Pump Manufacturer's name GRUNDFOS	<input type="checkbox"/> Not Installed	Date Installed 11/03/1989
					Model Number 10S05-9	HP 0.5	Volt 230
					Length of drop pipe 60 ft	Capacity	g.p. Typ Submersible
					Abandoned Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Miscellaneous First Bedrock Aquifer Quat. buried		
					Last Strat gravel (+larger)-brown	Depth to Bedrock	ft
					Located by Minnesota Geological Survey		
					Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)		
					System UTM - NAD83, Zone 15, Meters	X 499182	Y 5018927
					Unique Number Verification	Address verification	Input Date 01/01/1990
					Angled Drill Hole		
					Well Contractor Husnik Well Co. 13525 HUSNIK, M. Licensee Business Lic. or Reg. No. Name of Driller		
Remarks							

544319County Chisago
Quad Linwood
Quad ID 135DMINNESOTA DEPARTMENT OF HEALTH
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Minnesota Statutes Chapter 1031Entry Date 07/12/1994
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Received Date

Well Name JAEB, DUANE &	Township 33	Range 21	Dir Section W 30	Subsection DBBDDDB	Well Depth 163 ft.	Depth Completed 163 ft.	Date Well Completed 04/19/1994			
Elevation 909 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)				Drill Method Non-specified Rotary	Drill Fluid Bentonite				
Address C/W 25374 EUREKA AV WYOMING MN					Use domestic	Status Active				
Stratigraphy Information					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/>	From To				
Geological Material	From	To (ft.)	Color	Hardness	Casing Type Single casing	Joint				
SAND	0	54			Drive Shoe? Yes <input type="checkbox"/> No <input type="checkbox"/>	Above/Below				
CLAY	54	150			Casing Diameter 4 in. To 153 ft. 2 lbs./ft.					
WATERSAND	150	163			Hole Diameter 8 in. To 36 ft. 6.2 in. To 163 ft.					
					Open Hole	From	ft.	To	ft.	
					Screen? <input checked="" type="checkbox"/>	Type plastic		Make		
					Diameter	Slot/Gauze	Length	Set		
					4 in.	16	10 ft.	153 ft.	163 ft.	
					Static Water Level					
					15 ft.	land surface		Measure	04/19/1994	
					Pumping Level (below land surface)					
					50 ft.	2 hrs.	Pumping at		30 g.p.m.	
					Wellhead Completion					
					Pitless adapter manufacturer		MONITOR	Model 8PL410		
					<input type="checkbox"/>	Casing Protection		<input checked="" type="checkbox"/> 12 in. above grade		
					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)					
					Grouting Information					
					Well Grouted?		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Not Specified	
					Material	Amount	From	To		
					bentonite	2 Sacks	6 ft.	36 ft.		
					Nearest Known Source of Contamination					
					80 feet	West Direction		Septic tank/drain field Type		
					Well disinfected upon completion?		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		
					Pump <input type="checkbox"/>	Not Installed		Date Installed	05/04/1994	
					Manufacturer's name MYERS					
					Model Number	S2N52-N510	HP	0.5	Volt	
					Length of drop pipe	60 ft	Capacity	g.p.	Typ Submersible	
					Abandoned					
					Does property have any not in use and not sealed well(s)?				<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
					Variance					
					Was a variance granted from the MDH for this well?				<input type="checkbox"/> Yes	<input type="checkbox"/> No
					Miscellaneous					
					First Bedrock	sand		Aquifer	Quat. buried	
					Last Strat	sand		Depth to Bedrock	ft	
					Located by Minnesota Geological Survey					
					Locate Method	Digitization (Screen) - Map (1:24,000) (15 meters or				
					System	UTM - NAD83, Zone 15, Meters	X	499436	Y 5018171	
					Unique Number Verification	Address verification		Input Date	02/13/2008	
					Angled Drill Hole					
					Well Contractor					
					Lauren McCullough Well		82443	OTTEN, D.		
					Licensee Business		Lic. or Reg. No.	Name of Driller		

577855County Chisago
Quad Linwood
Quad ID 135DMINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031Entry Date 06/09/1997
Update Date 02/14/2014
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Well Name TORGERSON,	Township 33	Range 21	Dir Section W 30	Subsection CAADAC	Well Depth 110 ft.	Depth Completed 110 ft.	Date Well Completed 01/09/1997
Elevation 913 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)				Drill Method Non-specified Rotary	Drill Fluid Bentonite	
Address Well 25409 KETTLE RIVER BL MN					Use domestic	Status Active	
Stratigraphy Information					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/>	From To	
Geological Material From To (ft.) Color Hardness					Casing Type Single casing	Joint	
SAND 0 47					Drive Shoe? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Above/Below	
CLAY 47 98					Casing Diameter 4 in. To 100 ft. lbs./ft. Hole Diameter 6.7 in. To 110 ft.		
SAND 98 110					Open Hole From ft. To ft.		
					Screen? Diameter Slot/Gauze Length	Type slotted pipe Set	
					4 in. 10 10 ft.	100 ft. 110 ft.	
					Static Water Level 25 ft. land surface Measure 01/09/1997		
					Pumping Level (below land surface) 60 ft. 1 hrs. Pumping at 15 g.p.m.		
					Wellhead Completion Pitless adapter manufacturer MONITOR Model SNAPPY <input type="checkbox"/> Casing Protection <input checked="" type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified Material Amount From To high solids bentonite 2 Sacks 10 ft. 35 ft.		
					Nearest Known Source of Contamination 75 feet South Direction Septic tank/drain field Type Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
					Pump Manufacturer's name Not Installed Date Installed Model Number HP Volt Length of drop pipe ft Capacity g.p. Typ		
					Abandoned Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Miscellaneous First Bedrock Aquifer Quat. buried Last Strat sand Depth to Bedrock ft Located by Minnesota Geological Survey Locate Method Digitization (Screen) - Map (1:24,000) (15 meters or System UTM - NAD83, Zone 15, Meters X 499245 Y 5018189 Unique Number Verification Address verification Input Date 02/13/2008		
Remarks					Angled Drill Hole		
					Well Contractor Zuercher Well Co. 62028 ZUERCHER, A Licensee Business Lic. or Reg. No. Name of Driller		

642609

County Chisago
 Quad Linwood
 Quad ID 135D

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
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Entry Date 06/09/2000
 Update Date 04/07/2008
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Well Name JAEB, DANIEL	Township 33	Range 21	Dir Section W 30	Subsection CAAADB	Well Depth 124 ft.	Depth Completed 124 ft.	Date Well Completed 02/28/2000
Elevation 912 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)				Drill Method Non-specified Rotary	Drill Fluid Bentonite	
Address					Use domestic	Status Active	
Well 25497 KETTLE RIVER BL WYOMING MN					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/> From To		
Stratigraphy Information					Casing Type Single casing Joint		
Geological Material	From	To (ft.)	Color	Hardness	Drive Shoe? Yes <input type="checkbox"/> No <input type="checkbox"/> Above/Below		
SAND	0	27			Casing Diameter 4 in. To 114 ft. lbs./ft. Hole Diameter 6.7 in. To 124 ft.		
CLAY	27	56					
CLAY/GRAVEL	56	110					
WATER SAND	110	124					
					Open Hole From ft. To ft.		
					Screen? <input checked="" type="checkbox"/> Type slotted pipe Make PVC		
					Diameter Slot/Gauze Length Set		
					4 in. 12 10 ft. 114 ft. 124 ft.		
					Static Water Level 40 ft. land surface Measure null		
					Pumping Level (below land surface) 60 ft. 1 hrs. Pumping at 20 g.p.m.		
					Wellhead Completion Pitless adapter manufacturer YES Model SNAPPY		
					<input type="checkbox"/> Casing Protection <input checked="" type="checkbox"/> 12 in. above grade		
					<input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified		
					Material Amount From To		
					high solids bentonite 1 Sacks 0 ft. 31 ft.		
					Nearest Known Source of Contamination 60 feet East Direction Septic tank/drain field Type		
					Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
					Pump <input checked="" type="checkbox"/> Not Installed Date Installed		
					Manufacturer's name		
					Model Number HP Volt		
					Length of drop pipe ft Capacity g.p. Typ		
					Abandoned Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Miscellaneous First Bedrock Aquifer Quat. buried		
					Last Strat sand Depth to Bedrock ft		
					Located by Minnesota Geological Survey		
					Locate Method Digitization (Screen) - Map (1:24,000) (15 meters or		
					System UTM - NAD83, Zone 15, Meters X 499243 Y 5018263		
					Unique Number Verification Address verification Input Date 02/13/2008		
					Angled Drill Hole		
					Well Contractor Zuercher Well Drilling 13490 ZUERCHER, A. Licensee Business Lic. or Reg. No. Name of Driller		

659771County Chisago
Quad Linwood
Quad ID 135DMINNESOTA DEPARTMENT OF HEALTH
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Well Name MUNSON, RON	Township 33	Range 21	Dir Section W 30	Subsection CAACCB	Well Depth 185 ft.	Depth Completed 185 ft.	Date Well Completed 07/13/2001
Elevation 913 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)				Drill Method Non-specified Rotary	Drill Fluid Bentonite	
Address					Use domestic	Status Active	
C/W 25384 KETTLE RIVER BL WYOMING MN 55092					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/> From To		
Stratigraphy Information					Casing Type Single casing Joint		
Geological Material	From	To (ft.)	Color	Hardness	Drive Shoe? Yes <input type="checkbox"/> No <input type="checkbox"/> Above/Below		
SAND	0	35			Casing Diameter 4 in. To 175 ft. lbs./ft. Hole Diameter 6.7 in. To 185 ft.		
CLAY & GRAVEL	35	165					
GRAVEL	165	185					
					Open Hole From ft. To ft.		
					Screen? <input checked="" type="checkbox"/> Type slotted pipe Make (PVC)		
					Diameter Slot/Gauze Length Set		
					in. 20 ft. 175 ft. 185 ft.		
					Static Water Level 25 ft. land surface Measure 07/13/2001		
					Pumping Level (below land surface) 60 ft. 1 hrs. Pumping at 25 g.p.m.		
					Wellhead Completion Pitless adapter manufacturer YES Model SNAPPY <input type="checkbox"/> Casing Protection <input checked="" type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified		
					Material Amount From To		
					high solids bentonite 2 Sacks 0 ft. 32 ft.		
					Nearest Known Source of Contamination 70 feet West Direction Septic tank/drain field Type		
					Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
					Pump <input type="checkbox"/> Not Installed Date Installed		
					Manufacturer's name		
					Model Number HP 0.5 Volt 220		
					Length of drop pipe ft Capacity g.p. Typ Submersible		
					Abandoned Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Miscellaneous First Bedrock Aquifer Quat. buried Last Strat gravel (+larger) Depth to Bedrock ft Located by Minnesota Geological Survey Locate Method Digitization (Screen) - Map (1:24,000) (15 meters or System UTM - NAD83, Zone 15, Meters X 499086 Y 5018157 Unique Number Verification Address verification Input Date 02/12/2008		
					Angled Drill Hole		
					Well Contractor Zuercher Well Drilling 13490 ZUERCHER, A. Licensee Business Lic. or Reg. No. Name of Driller		

725508County Chisago
Quad Linwood
Quad ID 135DMINNESOTA DEPARTMENT OF HEALTH
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Minnesota Statutes Chapter 1031Entry Date 08/25/2005
Update Date 03/10/2010
Received Date 06/09/2005

Well Name WOODLUND	Township 33	Range 21	Dir Section W 30	Subsection BAAACA	Well Depth 230 ft.	Depth Completed 230 ft.	Date Well Completed 04/29/2005
Elevation 908 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)				Drill Method Non-specified Rotary	Drill Fluid Bentonite	
Address Well EMERALD AV WYOMING MN 55025					Use domestic	Status Active	
Stratigraphy Information					Well Hydrofractured? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	From To	
Geological Material	From	To (ft.)	Color	Hardness	Casing Type Single casing	Joint Welded	
SAND	0	48	TAN	SOFT	Drive Shoe? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Above/Below	
CLAY	48	119	BROWN	MEDIUM	Casing Diameter 4 in.	Weight 220 ft. lbs./ft.	Hole Diameter 8.7 in. To 30 ft. 6.2 in. To 230 ft.
CLAY/ROCKS	119	184	BROWN	HARD	Open Hole From ft. To ft.		
SANDY CLAY	184	209	BROWN	MEDIUM	Screen? Diameter 4 in.	<input checked="" type="checkbox"/> Slot/Gauze 10	Type slotted pipe Length 10 ft.
					Static Water Level 20 ft.	land surface	Measure 04/29/2005
					Pumping Level (below land surface) 200 ft. 3 hrs. Pumping at 30 g.p.m.		
					Wellhead Completion Pitless adapter manufacturer WHITEWATER Model <input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information Well Grouted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified Material high solids bentonite Amount 6 Sacks From ft. To ft. 60 ft.		
					Nearest Known Source of Contamination 50 feet <u>Northeas</u> Direction Sewer Type Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
					Pump <input type="checkbox"/> Not Installed Date Installed 04/29/2005 Manufacturer's name RED JACKET Model Number HP 0.5 Volt 220 Length of drop pipe 60 ft Capacity 12 g.p. Typ Submersible		
					Abandoned Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
					Miscellaneous First Bedrock clay+sand-brown Aquifer Quat. buried Last Strat Depth to Bedrock ft Located by Minnesota Department of Health Locate Method GPS SA Off (averaged) (15 meters) System UTM - NAD83, Zone 15, Meters X 499208 Y 5019073 Unique Number Verification Input Date 03/23/2005		
Remarks LOT 1					Angled Drill Hole		
					Well Contractor Bergerson-Caswell 27058 LESTER, T. Licensee Business Lic. or Reg. No. Name of Driller		