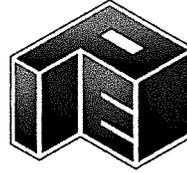


SUPPLEMENTAL PACKET



PLOWE
ENGINEERING, INC.

6776 Lake Drive, Suite 110
Lino Lakes, Minnesota 55014
Office (651) 361-8210
Fax (651) 361-8701

J.P. BUSH HOMES
LAKELAND, MINNESOTA

March 3, 2017

ACCESS ROAD ENTRANCE LOCATION

Per MnDOT Road Design Manual table 2-5.08B (Stopping Sight Distance on Grades), the desired stopping distance for roads with 35mph design speed is 257 feet for a 3% downgrade, and 230 feet for a 6% upgrade.

The location of the access road entrance as shown on the Preliminary sketch of the Preservation & Land Conservation development revision dated (March 1, 2017) is 260 feet from the intersection of 60th street south and Trading Post Trail South which provide safe stopping distance for vehicles heading south on Trading Post Trail and Turning right on to 60th Street which have a downgrade of about 3% at this location, and it also provides safe stopping distance (230 feet) for vehicles heading west on 60th Street at an upgrade of about 6%, considering MnDot requirements that calls for eye height of a driver at 3.5 feet above ground and looking at an object 2 feet above the ground.

Reabar K. Abdullah, PE

Plowe Engineering, Inc.

5821 Humboldt Avenue North, Brooklyn Center, MN 55430 (612) 802-6619 Cell
Email: jacobsonenv@msn.com

March 2, 2017

Joe Bush
President
J.P. Bush Homes
1980 Quasar Avenue South
Lakeland, MN 55043

Re: Bush Afton EAW Comment Response to February 3 Memo from Neighbors
218.6 Acres

Comm. No. 2017-10

Dear Joe:

As requested, we are submitting a comment response to the February 3 memo from the project neighbors which you forwarded to me.

In the first section entitled, Detailed Legal Objections and Minimum Conditions for Approval, the following substantive comments are offered by number in the memo:

1. We have modified the access road with a highly experienced professional engineer to reflect better road design standards as promulgated by professional engineering societies and MNDOT. According to the EQB cited 2008 MNDOT Access Manual, a Traffic Impact Study is not warranted in this case since the traffic generated would be less than 250 peak-hour vehicle trips. Our development has 200 peak-hour vehicle trips.
2. The development will not cause unreasonable flooding, erosion or deposit of minerals on adjacent properties or water bodies. The runoff from the development is required to be modeled with various standard storm events by a professional engineer to ensure there are no flooding concerns. A SWPPP erosion control plan is required for the development and must be approved by the MPCA to ensure there are no erosion concerns. Additionally, special vegetative buffers are planned on lots with erosion concerns which have been designed in cooperation with the SWWD.
3. Typically when a PLCD Type plat is completed, old land subdivisions are changed to reflect the PLCD design. This is done routinely all over America on many projects on a daily basis. The development is not attempting to avoid Sec. 12-2377 paragraph C which states "Parcels which contain their maximum permitted density or have been previously subdivided to their permitted density

may not be joined to a PLCD." The development is using the same 5 acre lot size as on the former Schuster homestead, it is simply that the development requires an alternate configuration of that same 5 acre lot size, so the proposed development is in accordance with the spirit of the rule.

We also are responding to the following comments in this section:

6. All septic systems have on site soil and design considerations which must be followed according to MPCA septic rules which have been refined many times in recent years and which will be enforced by the City of Afton.

7. The conservation overlay district shown on City of Afton maps are general area outlines and they do not reflect a specific resource or landform boundary. Also, the conservation easements proposed by the development meet the requirements of the conservation overlay district, and, when combined with the special vegetative lot buffers they are making many natural resource aspects of the project better than they were before in the current pre-developed condition.

8. Our goal is to decrease the amount of agricultural land in the Trout Brook Watershed. This will reduce erosion and stream contamination from animal waste, and large amount of herbicides and pesticides used in the current agricultural land which has resulted in higher than normal Escherichia coli and unwanted chemical levels.

11. The alleged spill of Atrazine which may have occurred near the year 2000 was not documented properly and therefore cannot be treated as fact unless documentation is produced. If documentation exists, please provide it to the City of Afton. If Atrazine has been spilled as has been suggested about 17 years ago it is likely the chemical may have been washed through the shallow groundwater and/or soils into the St. Croix River by now.

In the section minimum conditions for approval we have the following comments:

11. Requiring stream bed and riparian area rehabilitation by the developer on the project site is vastly inadequate to address the problems of improving the streams trout habitat. Improving the stream would take a collaborative effort by DNR, SWWD, and private landowners in order to improve stream habitat on a large enough stretch that would actually make a significant improvement possible. The University of Minnesota Department of Fisheries and Wildlife did improve the Valley Creek stream locally under the direction of Dr. Tom Waters when I attended the University of Minnesota in years past. However, this effort, again, was a collaborative effort with multiple partners which is what stream restoration takes.

12. I, Wayne Jacobson, state that I am available for project monitoring in this case.

5821 Humboldt Avenue North, Brooklyn Center, MN 55430
Email: jacobsonenv@msn.com

(612) 802-6619 Cell

13. Joe Bush, as the developer, is willing to clean up the brush from the ravine adjacent to Trout Brook in the area of Lot 4 and install erosion control BMP's along the slopes of the ravine.

19. Use of four wheelers, dirt bikes, and snowmobiles should be restricted in the project area.

21. The developer wants to ensure that exposed soils are seeded as soon as possible to prevent any damaging erosion events from occurring on the project site during and after construction.

23. An environmental impact statement is not necessary for this small project. All concerns should be able to be addressed through the EAW process which provides comments from over 30 agencies and highly experienced natural resource professionals.

Thank you for the opportunity to provide environmental services on this important project.

Sincerely,



Wayne Jacobson, P.S.S., W.D.C., P.W.S., A.F.S.
Senior Scientist

5821 Humboldt Avenue North, Brooklyn Center, MN 55430 (612) 802-6619 Cell
Email: jacobsonenv@msn.com

March 2, 2017

Joe Bush
President
J.P. Bush Homes
1980 Quasar Avenue South
Lakeland, MN 55043

Re: Bush Afton EAW Pre-Draft
 218.6 Acres

 Comm. No. 2017-10

Dear Joe:

As requested, we are submitting one electronic copy of the Pre-Draft EAW for the site referenced above in Afton, Minnesota. Based upon our findings on this site, it is the opinion of Jacobson Environmental, PLLC. (JE) that the potential for environmental concern at the subject property is controlled and at a low level. It is our opinion that the project can go forward with help from the City of Afton.

The observations and findings presented in this report are based on reasonably ascertainable information compiled by JE during the preliminary EAW. Should additional information be made available concerning past or present practices or events that were not previously reviewed, additional or alternate suggestions may be rendered.

Thank you for the opportunity to provide environmental services on this important project.

Sincerely,



Wayne Jacobson, P.S.S., W.D.C., P.W.S., A.F.S.
Senior Scientist

ENVIRONMENTAL ASSESSMENT WORKSHEET

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

<http://www.egb.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: Bush Afton EAW

2. Proposer: J.P. Bush Homes

Contact person: Joe Bush
Title: President
Address: 1980 Quasar Avenue South
City, State, ZIP: Lakeland, MN 55043
Phone: 651-775-4222
Email: joe@josebushmn.com

3. RGU

Contact person: Ronald Moore
Title: City Administrator
Address: 3033 St. Croix Trail S
City, State, ZIP: Afton, MN 55001
Phone: 651-436-5090
Email: administrator@ci.afton.mn.us

4. Reason for EAW Preparation: (check one)

Required:

EIS Scoping
Mandatory EAW

Discretionary:

Citizen petition
 RGU discretion
Proposer initiated

The City of Afton Zoning Code calls for a mandatory EAW for actions resulting in the permanent conversion of 80 or more acres of agricultural, forest, or naturally vegetated land to a more intensive, developed land use.

5. Project Location:

County: Washington
City/Township: Afton
PLS Location (1/4, 1/4, Section, Township, Range): T28N, R20W, SE 1/4 of Sec. 32
T28N, R20W, W1/2 of SW 1/4 Sec. 33
Watershed (81 major watershed scale): #37 St. Croix River - Stillwater
GPS Coordinates: 44.866030, -92.858220
Tax Parcel Numbers: 3202820420004, 3202820430001, 3202820410002, 3302820320001,
3302820330004, 3302820330005, 3302820330002

List of Figures

Figure 1	USGS Map
Figure 2	Pre-Construction Site Plan
Figure 3	Post-Construction Site Plan
Figure 4	National Wetland Inventory Map
Figure 5	Hydric Soil Rating Map
Figure 6	Farmland Classification Map
Figure 7	Erosion Hazard Map
Figure 8	DNR NHIS Habitat Area Map

List of Appendices

Appendix A	Afton Zoning Map
Appendix B	Lot Buffer Plans
Appendix C	State Historic Preservation Office Inquiry
Appendix D	EDR Radius and Geocheck Report
Appendix E	DNR NHIS Letter

6. Project Description:

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

The Bush Afton project is a 20 lot single family clustered development on 218.6 acres with 109.7 acres of conservation easement to protect Trout Brook. The development will have individual wells and septic systems, and special vegetative buffers protecting steep slopes against erosion. Currently no wetland impacts are planned and over 50% of the area will remain in open space.

- 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.

The Bush Afton project is a 20 lot single family clustered development on 218.6 acres with 109.7 acres of conservation easement to protect Trout Brook. Each lot is 5 acres and has a minimum of 2.5 acres of buildable area on each lot. The history of the site included farming, pasture, hay land and forest land, and Trout Brook. This was confirmed in an interview with the property owner and by a review of the 1938, 1957, 1987, and 2010 aerial photos. The development will have individual wells and septic systems. Currently no wetland impacts are planned and over 50% of the area will remain in open space. Grading activities are scheduled to begin in September 2017 and to be complete as lots are purchased. The project will be carried out using an array of best management practices including special native grass, wildflower, and shrub vegetative buffer strips to protect steep slopes from erosion, as well as silt fence and wildlife friendly erosion biomat for maximized erosion control.

- c. Project magnitude:

Total Project Acreage	218.6
Linear project length	4,090' of 24' roads
Number and type of residential units	20 single family
Commercial building area (in square feet)	---
Industrial building area (in square feet)	---
Institutional building area (in square feet)	---
Other uses – specify (in square feet)	109.7 ac. Conservation Areas
Structure height(s)	35 feet max house height

- 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 project will be carried out by J.P. Bush Homes and the purpose is to provide single family housing for the Afton area. Also included are two large conservation easements and an array of erosion controlling best management practices which will enhance the natural habitat of the area.

- e. Are future stages of this development including development on any other property planned or likely to happen? Yes X 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 X 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:

	Before	After		Before	After
Wetlands-use NWI acreages	13.1	13.1	Lawn/landscaping	6.6	21.9
Deep water/streams	8.7	8.7	Impervious surface	0.4 acres	5.9 acres
Wooded/forest	21.9	32.8	Stormwater Pond	0.0	0.0
Brush/Grassland	21.9	59.0	Residential	8.3	77.2
Cropland	137.7	0.0			
			TOTAL	218.6	218.6

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.*

<u>Unit of government</u>	<u>Type of application</u>	<u>Status</u>
City of Afton	Plat approval	pending
City of Afton	Septic system approval	pending
Washington County	Plat approval	pending
Washington County Highway	Plan review	pending
South Washington Watershed	WCA approval	pending
MPCA	NPDES permit	pending
MDH	Well permit	pending
U.S. Army COE	Section 404 permit	pending

In this case the RGU is addressing all cumulative potential effects in response to 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 is as follows as described by the current land use map of Afton as shown in the Comprehensive Plan:

Mixed Tree Cover	10%
Cultivated	45%
Pasture	12%
Grassland	10%
Residential	4%
Bluff Areas	9%
Streams	4%
Wetlands	6%

Some of the prime farmland to be lost is on lots 1, 2, 5-8, and 15-20, or 60% of the lots according to Figure 6. However, the western conservation easement will preserve a large portion of prime farmland.

- 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.

Future planned land use as described by the future land use map of Afton as shown in the Comprehensive Plan:

Agriculture	77%
Rural Residential	4%
Streams	4%
Wetlands	6%
Bluff Areas	9%

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

The area is zoned on the Afton Zoning Map in Appendix A as 71% agriculture, 4% rural residential, and 25% in conservation overlay areas of which 6% are mixed tree cover, 9% bluff areas, 4% streams, and 6% wetlands. The main stream on the south is Trout Brook, a DNR protected watercourse which is a trout stream which has a shoreland management area of 300 feet on either side of its banks. In the project plan, Trout Brook is protected with conservation easements on both sides of the stream, as are all wetlands along the stream.

- 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 area's zoning would change from existing to 45% PLCD, 50% conservation easement, and 5% bluff area. This zoning change is in concert with the growth plans of the City of Afton and its comprehensive plan.
- c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.

The project desires to improve erosion effects in the area by placing special vegetative buffer strips on the back portions of lots 1-10 and lots 16-17 to ensure that any yard overland sheet flow is intercepted by these buffers and infiltrated into the soils, causing a reduction in sheet flow erosion caused by rainfall. The plans for these buffer strips are contained in Appendix B and were developed in cooperation with the South Washington Watershed District who has had good experience with these buffers in similar landscapes in the County in the recent past.

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.

The Jordan Sandstone is the bedrock in the project area and it consists of friable quartzose sandstone. In the bluff areas bedrock is exposed. The glacial till above the bedrock is generally between 5 and 25 feet thick. The soils are thin and they reflect the parent material.

- 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 is addressed in Item 11.b.ii.

The soils of the site are as follows:

Soil#	Soil Name	Erosion Rating
49C	Antigo silt loam, 6 to 15% slopes	Severe
100B	Copaston loam, 0 to 6% slopes	Moderate
100C	Copaston loam, 6 to 12% slopes	Severe
174C	Gale silt loam, 6 to 15% slopes	Severe
174F	Gale silt loam, 25 to 50% slopes	Severe
301B	Lindstrom silt loam, 2 to 4% slopes	Moderate
340C	Whalan silt loam, 6 to 12% slopes	Severe
367B	Campia silt loam, 0 to 8% slopes	Moderate
411B	Waukegan silt loam, 2 to 6% slopes	Moderate
411C	Waukegan silt loam, 6 to 12% slopes	Severe
449	Crystal Lake silt loam, 1 to 3% slopes	Slight
460B	Baytown silt loam, 1 to 6% slopes	Moderate
460C	Baytown silt loam, 6 to 12% slopes	Severe
468	Otter silt loam, 0 to 4% slopes	Slight
488F	Brodale flaggy loam, 20 to 50% slopes	Severe
W	Water	Not rated

Based on the project area soils, we estimate that less than 20% of the lot soils would be affected by erosion limitations. We intend to improve these erosion conditions through establishment of

vegetative buffer strips in areas which could be prone to erosion which will improve the site's capacity to reduce erosion from the undeveloped current state.

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/lakes, wildlife lakes, migratory waterfowl feeding/resting lakes, 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.

Streams on or near the Site

A-Intermittent Stream on Northwest to Trout Brook

B-Trout Brook Main Channel-DNR Protected Watercourse and Designated Trout Stream #070-30005-568 is listed as a MPCA 303d Impaired Water affecting aquatic recreation due to Escherichia coli bacteria arising from farm animal waste.

C-Intermittent Stream East of Site

NWI Wetland Areas in Conservation Easement shown on Figure 4

- 1-PEM1A Basin 1
- 2-PEM1A Basin 2
- 3-PEM1A Basin 3
- 4-PEM1A Basin 4
- 5-PFO1A Basin 5 along Trout Brook
- 6-PEM1A Basin 6 along Trout Brook
- 7-PEM1C Basin 7 along Trout Brook
- 8-PUBGx Basin 8 along Trout Brook
- 9-PEM1A Basin 9 along Trout Brook
- 10-PFO1A Basin 10 along Trout Brook
- 11-PEM1A Basin 11 along Trout Brook
- 12-PEM1A Basin 12
- 13-PEM1A Basin 13
- 14-PEM1A Basin 14
- 15-PEM1A Basin 15

- 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.

Depth to groundwater near wetlands is near or at the surface. There are no wells on site. According to the EDR Geocheck Report in Appendix D, wells in the area have been drilled to 200-275 foot depths. The project is not near any MDH wellhead protection areas.

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. 1) 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.

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.

Domestic waste will be produced from 20 single family homes, the wastewater will be treated via individual septic systems on site, soils are loam and silt loam, soil tests will be required for septic system design. Septic design information is required for permit approval by the City of Afton according to MPCA design standards. All proposed house pad locations are 10 feet or more above the existing intermittent streams in the area and all house pads are 200 feet or more away.

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 site runoff flows to existing wetland and streams. Proposed swales, buffers, and infiltration areas will manage proposed site runoffs to provide stormwater management for rate and erosion control.

In addition, as mentioned in item 9.iii.c above, special vegetative buffer strips will be placed in the back portions of lot 1-10 and lots 16-17 to ensure that any yard overland sheet flow is intercepted by these buffers and infiltrated into the soils, causing a reduction in sheet flow erosion during rainfalls.

Runoff quality impacts should be negligible due in part to the new statewide lawn fertilizer laws that remove phosphorus from the runoff, as well as the buffers and best management practices employed on the site.

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.

No DNR water appropriation is proposed for the project. Each of the proposed 20 lots will have its own residential well installed on the lot.

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.

There are 8 wetlands shown on the Figure 4 NWI Map plus the 7 wetland complexes along Trout Brook. All of the wetlands are protected by the 1991 Minnesota Wetlands Conservation Act and will remain undisturbed by the project. All of the wetlands are located in the conservation easement areas set aside by the project. Additionally, these wetlands will be protected from erosion and sedimentation by best management practices required by the site's MPCA NPDES permit and by special vegetative lot buffers designed in cooperation with the South Washington Watershed District.

- 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.

Lots developed adjacent to the intermittent streams including lots 16 and 17 will have special backyard buffer strips designed to improve site erosion control as in Item 9.c. The project will not change the amount of watercraft on any water body.

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.

According to the EDR Radius Map report dated January 20, 2017 there are no sites mapped which could affect the soil and/or groundwater of the project site. There was a residential leaky underground storage tank site which was closed by MPCA in 2008, but this site was over 0.3 miles to the east of the site and

would not affect the project site. In this case, no records exist of pre-project conditions which would be environmentally unfavorable per the EDR Radius Map report found in Appendix D.

- 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.

Solid wastes produced during construction will be typical of municipal solid wastes (MSW) and will be disposed of at a local permitted facility. Tree and brush waste will be removed during construction and will be disposed of properly. Construction waste will be removed in dumpsters and disposed of properly.

- 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.

The construction of homes may require the use of hazardous products such as paints, mineral spirits, stains, varnishes, polyurethane, and other building products. All of these hazardous products will be disposed of in the proper manner by licensed MSW haulers to properly permitted facilities.

- 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 project will not generate hazardous wastes. Any small amounts of hazardous products used during home construction will be stored and disposed of properly by licensed MSW haulers to properly permitted facilities.

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.

Fish

A DNR protected watercourse, Trout Brook #07030005-568 is found along the south boundary of the site. According to 2013 records, the stream had cold water and adequate oxygen for trout, and some were observed in the stream survey. Fish species collected included Brook Stickleback, Burbot, Logperch, Johnny Darter, Brook Trout, and Brown Trout. Brook Stickleback, Brook Trout, Brown Trout, and Logperch are all pollution intolerant species. The fish habitat was measured by DNR in 1999 and found to have a IBI rating of 44, which means the fish habitat was fair according to the methodology. Problems to address with Trout Brook include high temperature from impounded areas, perched culverts, a debris jam within Afton State Park, and high sediment load. Trout Brook could be improved with a collaborative effort.

Wildlife

The Ecological Subsection of the project area is the St. Paul Baldwin Plains and Moraines according to MDNR. In the project area, there are mesic oak forests, northern hardwood forests, bluff areas, prairies, old fields, cropland, and pasture. Streams include an intermittent stream and Trout Brook. Wetlands include floodplain forests, seasonally flooded basins, shallow marshes, and an open water pond.

Upland Forest Species

Northern Red Oak
Bur Oak
Paper Birch
Black Cherry
Basswood
Red Maple
Ironwood

American Hazelnut
Red Berried Elder
Red Raspberry
Sweet Cicely
Lady Fern
Wood Nettle
White Snakeroot

Wetland Species

Silver Maple
Black Willow
Cottonwood
Virginia Wild Rye
Rice Cut Grass
Lake Sedge
Tussock Sedge
Narrowleaf Cattail

Prairie and Bluff Species

Big Bluestem
Little Bluestem
Side Oats Grama
Stiff Sunflower
Gray Goldenrod

Dotted Blazing Star
Sky Blue Aster
Prairie Smoke
Hoary Puccoon
Purple Prairie Clover

The wildlife in the area is limited by available cover. Possible wildlife species in the area are as follows:

Mammals

Shrews
Mice
Raccoon
Squirrels
Cottontail
Woodchuck
Chipmunk

Big Game

White-tailed Deer
Coyote

Waterfowl

Mallard
Blue-winged Teal
Canada Goose
Wood Duck

Furbearers

Muskrat

Skunk

Red Fox

Birds

Flycatcher

Wood Thrush

Vireos

Ovenbird

Scarlet Tanager

Raptors

Owls

Falcons

Hawks

Game Birds

Ring-necked Pheasant

Wild Turkey

Amphibians & Reptiles

Turtles

Snakes

Salamander

Frogs

Toads

- 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 correspondence number (ERDB 20170269) 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 DNR NHIS Letter is found in Appendix E. The letter says that according to the Figure 8 map a few of the north lots may disturb a MCBS moderate ranking small area of Red Oak-White Oak forest which now has a mostly closed canopy. However, the building plan for these lots will strive to avoid these areas, and wooded or added prairie buffers of 60 foot average width on lots will be preserved or installed to protect any bluff areas of over 18% slopes.

Three state listed species were cited by the NHIS letter as follows:

Timber Rattlesnake (*Crotalus horridus*) is a state threatened species and has been documented in the project vicinity, but this is a historical record and there have been no recent sightings, so the species probably is no longer in the area.

Gopher Snake (*Pituophis catenifer*) is a state special concern species and has been documented recently in the project vicinity. The DNR is recommending wildlife friendly erosion control mesh as attached in Appendix E and the developer agrees to use these materials.

Bell's Vireo (*Vireo bellii*) is a state special concern species and has been documented in the project vicinity. The bird prefers shrub thickets near open grasslands or wetlands. The project will strive to avoid removing trees and shrubs between May 15 through August 15 to avoid disturbing nesting birds during that period to the extent possible.

- 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.

We think that because of our buffer lot plans the erosion and sedimentation issues facing Trout Brook and the Intermittent Stream will be improved over the current condition of the site. We think also

because of infiltration of most of the runoff the thermal condition of Trout Brook will be preserved as a coldwater stream.

We think also that wildlife will be enhanced with the buffer additions and the two large conservation easements. The moderate quality forested areas along the north fringe will also be protected to a large extent. Plant communities will thrive through protection and management of invasive species in disturbed areas.

The three state listed species will have their habitat protected and enhanced by the buffers and the wildlife friendly erosion control materials used during construction per DNR recommendations.

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

Some measures have been discussed in Items 13.a., b., and c. above. Additionally, invasive species such as the following will be managed per BMP's by the developer in disturbed areas:

European Buckthorn	Hybrid Cattail
Tartarian Honeysuckle	Spotted Knapweed
Siberian Elm	Garlic Mustard
Black Locust	Sweet Clover
Prickly Ash	Leafy Spurge
Purple Loosestrife	Giant Reed

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.

Cultural and historic resources were investigated. Review by the Minnesota State Historical Preservation Office (SHPO) revealed no historic properties in the project area per their response in Appendix C. Also, in the City of Afton 2008 Comprehensive Plan no historic areas were found by the City in the project area as well.

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.

There are no significant visual effects which would be produced by the project. The single family homes will be constructed in a manner in concert with the natural surroundings and habitat.

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.

There will be no measurable impacts on air quality resulting from the project. Temporary emissions from construction equipment will occur but will be controlled as equipment will be maintained within manufacturer's recommendations. New home construction will use high efficiency heating systems.

- 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.

There will be no measurable increase in vehicle related air emissions resulting from the project.

- 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.

The construction of the proposed project is anticipated to temporarily generate dust and odors. Dust will be minimized by adherence to MN/DOT, MPCA regulations, and use of onsite watering equipment.

Dust control measures may include watering. Odor will be mitigated by maintenance of the construction equipment to manufacturers specifications and by using the appropriate fuel additives. No serious pollutant or particulate emissions will exist for this project since the construction equipment will be dispersed on site and it will not be concentrated near any sensitive receptors.

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 noise includes a residential home surrounded by the project site in the center non-project area, and the house to remain on Lot 3. There are no sensitive noise receptors in the area, and the project will conform to State noise standards including during construction. The rural residential quality of life will be preserved by this project.

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.

- 1) No additional parking spaces are proposed.
- 2) The total average daily traffic is very small and less than 250 trips.
- 3) The maximum peak hour traffic is estimated to be 30 and is generated around 7:30 am.
- 4) Estimated 10 trips per house per day.
- 5) No public or other transportation modes are available.

- 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 effect on traffic congestion is very minimal on the affected roads, and can be easily handled by the existing traffic control signs on 60th street south.

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

There will be no measurable effect on transportation related issues.

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.

At this point the lots are planned to be developed in a phased manner as they are marketed and sold. Each lot will have a custom buffer plan which may be partially preserved and managed woodland in combination potentially with a native prairie and wildflower buffer of 60 feet in average width to protect against erosion and facilitate infiltration of runoff.

- 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.

No future projects have been discussed which would add infrastructure to the project.

- 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.

The project does not appear to have any negative cumulative effects.

There is a DNR Fisheries plan to remove the open water pond and remove the water control structure to improve the thermal condition and natural stream profile of Trout Brook. The project developer supports this plan, but he has no direct control over this because the water control structure is off the project property.

- 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.

There do not appear to be any other potential environmental effects resulting from the project.

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.

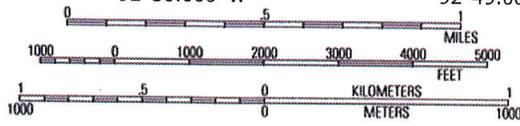
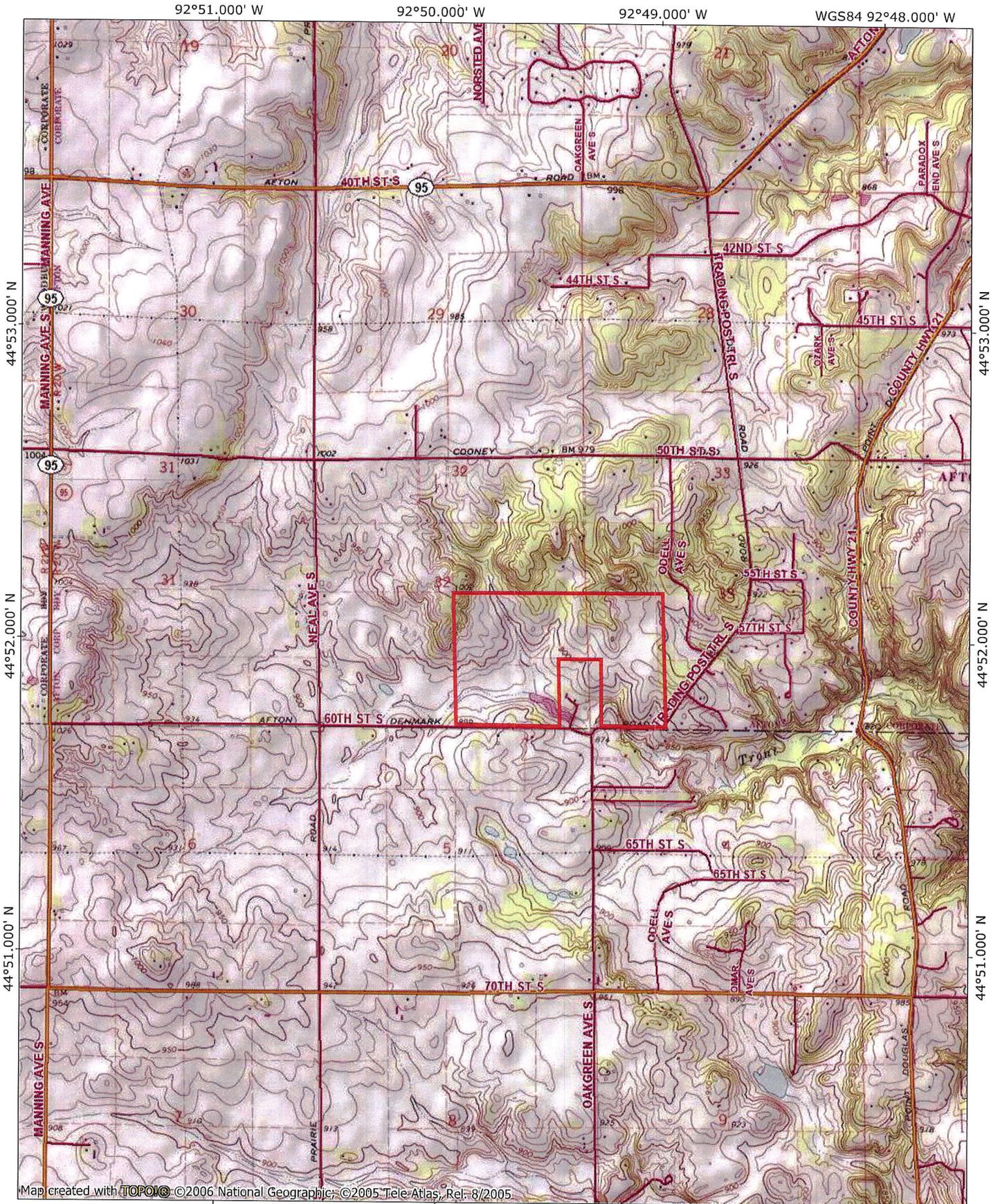
Signature _____

Date _____

Title _____

FIGURES

Figure 1 - USGS Map



TN MN
0 1/2°
02/15/17

Figure 2 - Pre-Construction Site Plan

Google Maps

Located in the SE Quarter of Section 32
and the SW Quarter of Section 33
in T28N, R20W



Imagery ©2017 Google, Map data ©2017 Google 500 ft 

Figure 3 - Post-Construction Site Plan

PRESERVATION & LAND CONSERVATION DEVELOPMENT - SKETCH

Part of the Southeast Quarter of Section 32 and part of the Southwest Quarter of Section 33,
all in Township 28 North, Range 20 West, City of Afton, Washington County, Minnesota

Developer:



J.P. Bush
HOMES
Lakeland, Minnesota

Property Owner: Will Carlson

TOTAL PARCEL AREA = 218.6 acres

Proposed Conservation Easements
OPEN SPACE = 109.7 acres
(50.2% gross parcel area)

Proposed Lots (20 total) = 100.6 acres

Proposed Road Right of Way = 8.3 acres

Proposed Road Right of Way Width = 60 feet

Proposed Road Right of Way Width (60th Street South) = 33 feet from center line

Proposed Length of Cul-De-Sac - Point A to Point B = 3,400 lineal feet

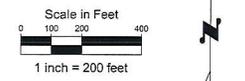
Proposed Road Type - 24 foot wide rural section

All proposed lots have a minimum of 2.5 acres of buildable area.

Legend

- Denotes slopes 12% to 17.9%
- Denotes slopes over 18%
- Denotes wetland location
- Denotes stream
- Denotes general surface water flow
- Denotes proposed culvert location
- Denotes proposed house site
- Denotes proposed septic area
- Denotes proposed driveway location

Contours are at two foot intervals and are based on data provided by the Minnesota Department of Natural Resources.
Wetland, Shoreland and stream locations are approximate and are based on data obtained through the National Wetlands Inventory - V2 online maps and the City of Afton zoning Map (M1811).

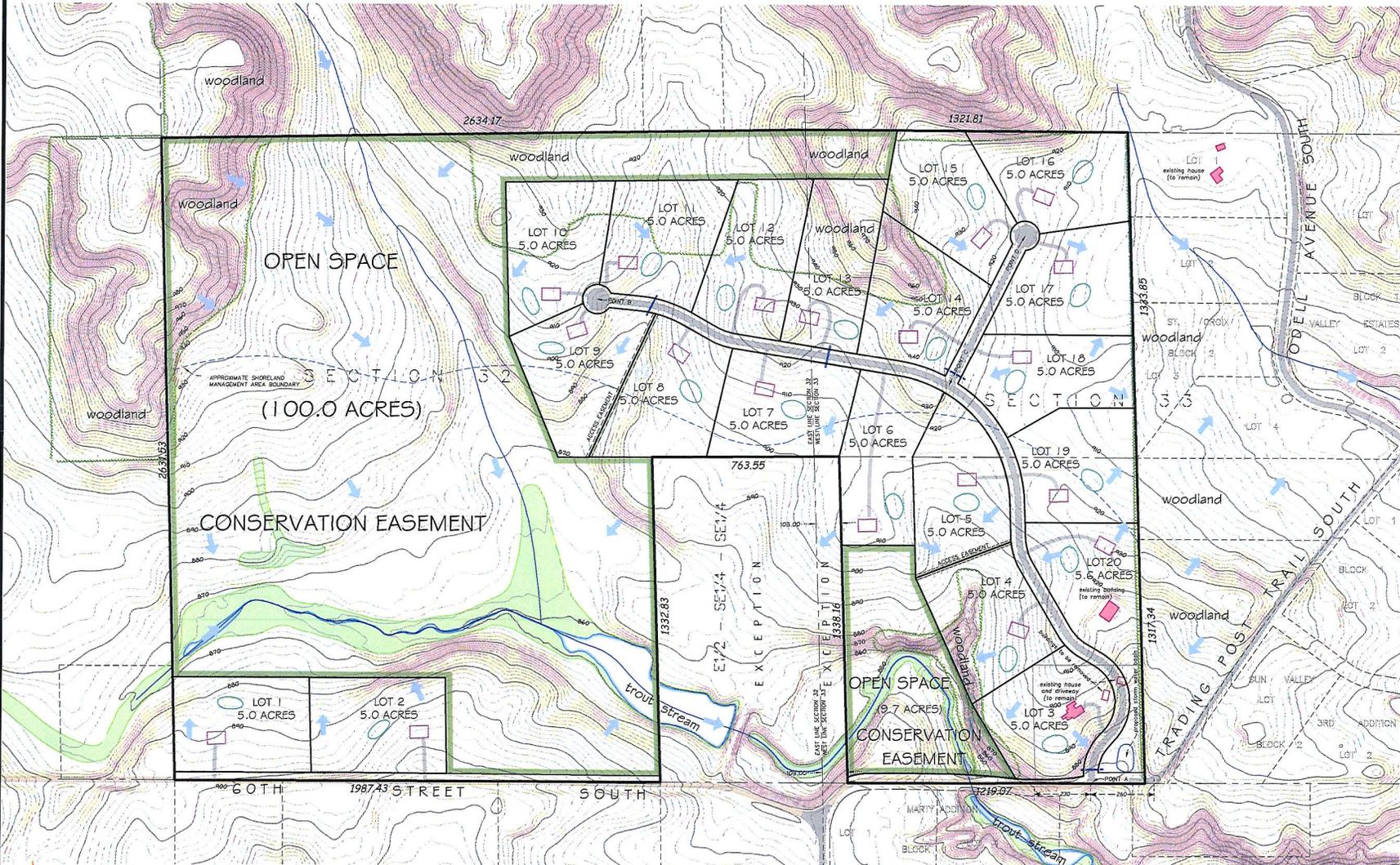


OFFICIAL COPIES OF THIS MAP ARE CRIMP SEALED

I hereby certify that this survey, plan or report was prepared by me or under my direct supervision and that I am a duly Licensed Land Surveyor under the laws of the State of Minnesota.

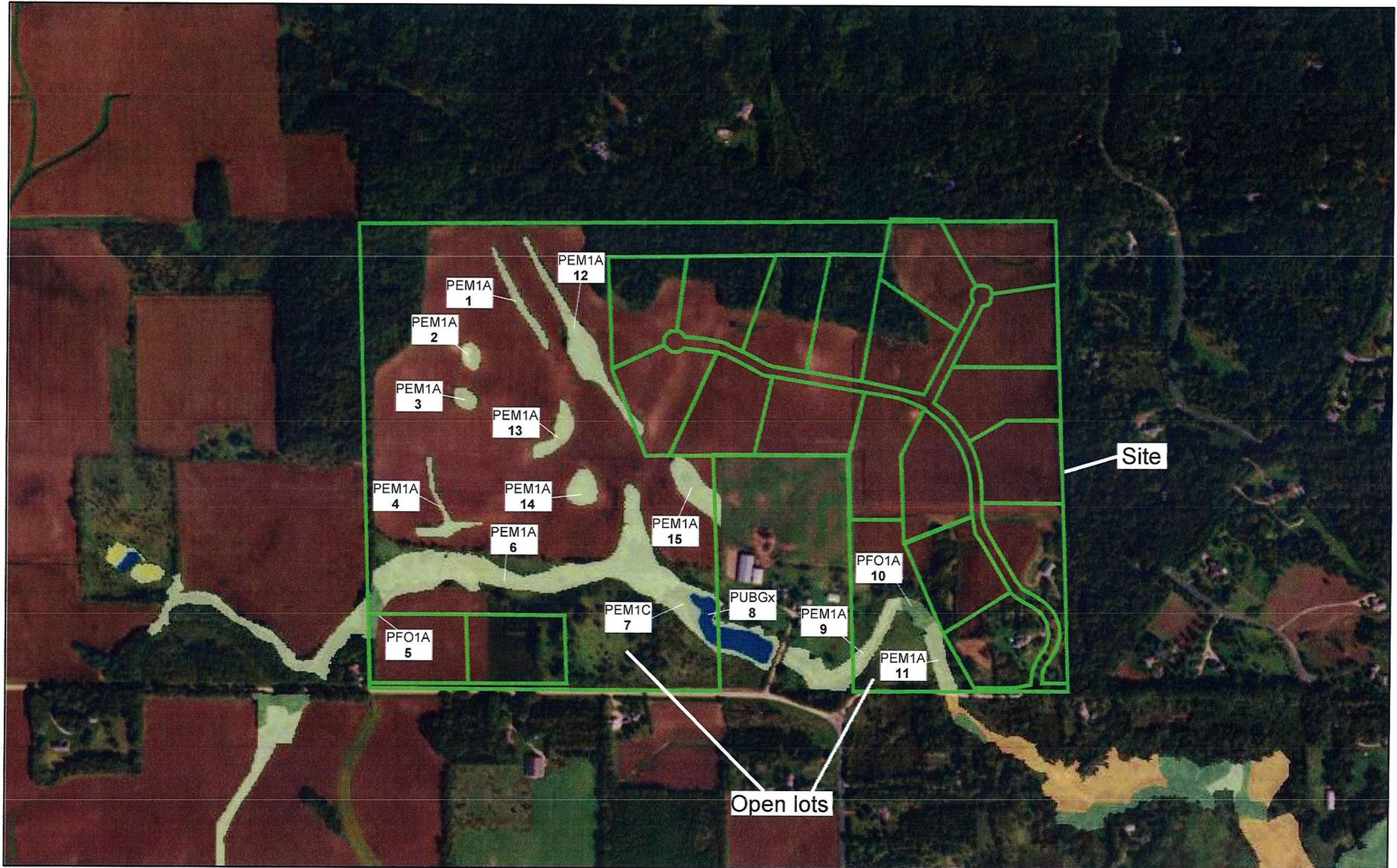
Landmark Surveying, Inc.
miho
Milo B. Horak, Minnesota License No. 52577
Date: January 18, 2017

REVISED MARCH 01, 2017: Revised main road entrance location

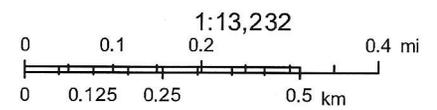


Landmark Surveying, Inc.
21090 Omega Trail North
P.O. Box 65
Scandia, Minnesota 55073
Office number: 651-433-3421
Cell number: 651-755-5760
Email: mitchell@frontier.net

Figure 4
National Wetland Inventory Map



January 18, 2017



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Hydric Rating by Map Unit—Washington County, Minnesota
(Figure 6 - Hydric Soil Rating Map)

MAP LEGEND

Area of Interest (AOI)
 Area of Interest (AOI)

Soils
Soil Rating Polygons
 Hydric (100%)
 Hydric (66 to 99%)
 Hydric (33 to 65%)
 Hydric (1 to 32%)
 Not Hydric (0%)
 Not rated or not available

Soil Rating Lines
 Hydric (100%)
 Hydric (66 to 99%)
 Hydric (33 to 65%)
 Hydric (1 to 32%)
 Not Hydric (0%)
 Not rated or not available

Soil Rating Points
 Hydric (100%)
 Hydric (66 to 99%)
 Hydric (33 to 65%)
 Hydric (1 to 32%)
 Not Hydric (0%)
 Not rated or not available

Water Features
 Streams and Canals

Transportation
 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads
Background
 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.
 Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washington County, Minnesota
 Survey Area Data: Version 11, Sep 19, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 16, 2012—Apr 26, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydric Rating by Map Unit

Hydric Rating by Map Unit— Summary by Map Unit — Washington County, Minnesota (MN163)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
49C	Antigo silt loam, 6 to 15 percent slopes	0	0.6	0.3%
100B	Copaston loam, 0 to 6 percent slopes	0	0.1	0.1%
100C	Copaston loam, 6 to 12 percent slopes	0	6.8	3.1%
174C	Gale silt loam, 6 to 15 percent slopes	0	41.6	19.0%
174F	Gale silt loam, 25 to 50 percent slopes	0	8.1	3.7%
301B	Lindstrom silt loam, 2 to 4 percent slopes	4	10.7	4.9%
340C	Whalan silt loam, 6 to 12 percent slopes	0	2.9	1.3%
367B	Campia silt loam, 0 to 8 percent slopes	2	0.4	0.2%
411B	Waukegan silt loam, 2 to 6 percent slopes	0	18.7	8.5%
411C	Waukegan silt loam, 6 to 12 percent slopes	0	24.8	11.3%
449	Crystal Lake silt loam, 1 to 3 percent slopes	3	1.8	0.8%
460B	Baytown silt loam, 1 to 6 percent slopes	0	60.7	27.7%
460C	Baytown silt loam, 6 to 12 percent slopes	0	25.6	11.7%
468	Otter silt loam	93	11.4	5.2%
488F	Brodale flaggy loam, 20 to 50 percent slopes	0	4.4	2.0%
W	Water	0	0.9	0.4%
Totals for Area of Interest			219.4	100.0%

Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

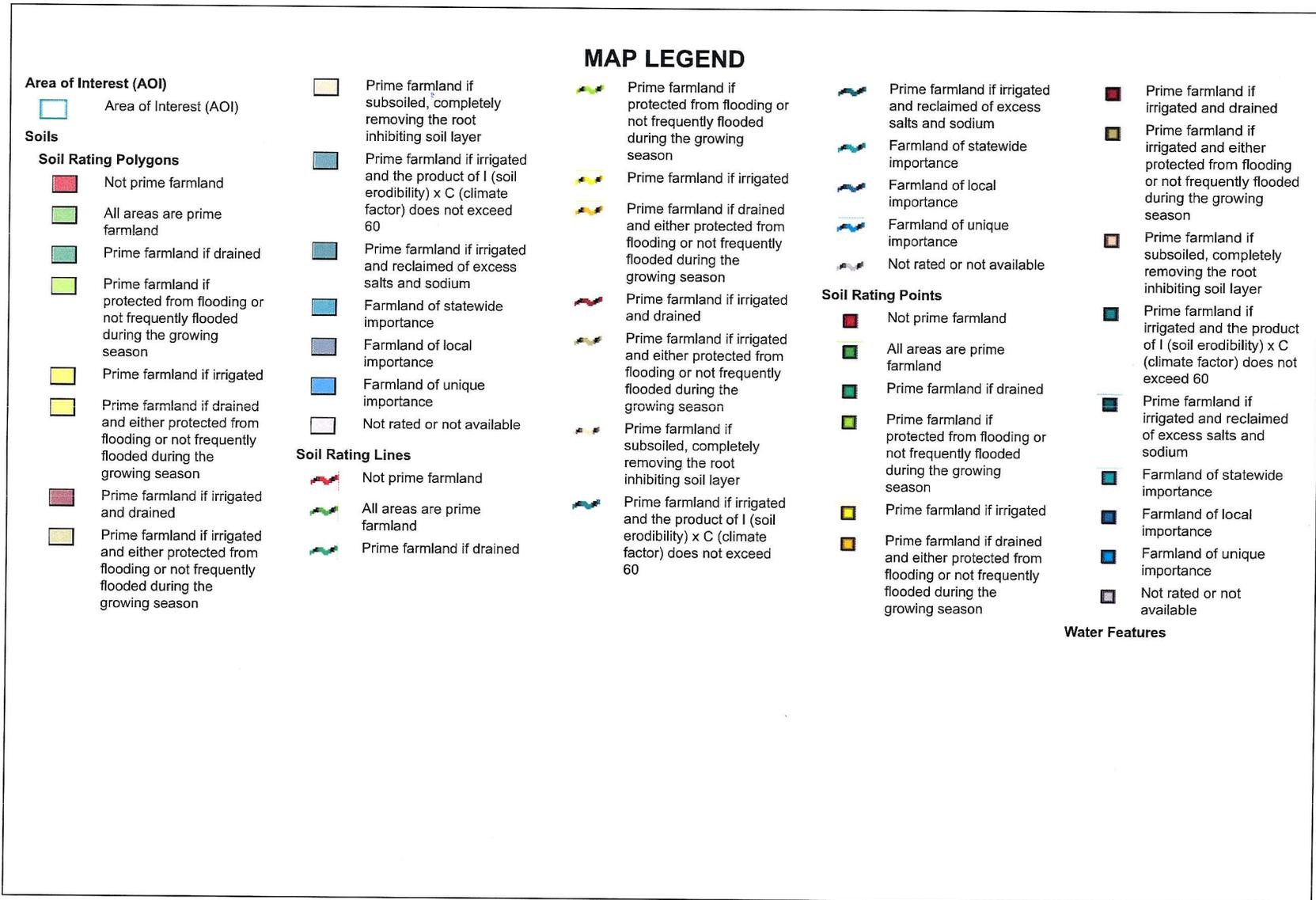
Rating Options

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Farmland Classification—Washington County, Minnesota
(Figure 7 - Farmland Classification Map)



Farmland Classification—Washington County, Minnesota
(Figure 7 - Farmland Classification Map)

MAP INFORMATION

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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Soil Survey Area: Washington County, Minnesota
Survey Area Data: Version 11, Sep 19, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 16, 2012—Apr 26, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Farmland Classification

Farmland Classification— Summary by Map Unit — Washington County, Minnesota (MN163)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
49C	Antigo silt loam, 6 to 15 percent slopes	Farmland of statewide importance	0.6	0.3%
100B	Copaston loam, 0 to 6 percent slopes	Farmland of statewide importance	0.1	0.1%
100C	Copaston loam, 6 to 12 percent slopes	Not prime farmland	6.8	3.1%
174C	Gale silt loam, 6 to 15 percent slopes	Farmland of statewide importance	41.6	19.0%
174F	Gale silt loam, 25 to 50 percent slopes	Not prime farmland	8.1	3.7%
301B	Lindstrom silt loam, 2 to 4 percent slopes	All areas are prime farmland	10.7	4.9%
340C	Whalan silt loam, 6 to 12 percent slopes	Farmland of statewide importance	2.9	1.3%
367B	Campia silt loam, 0 to 8 percent slopes	All areas are prime farmland	0.4	0.2%
411B	Waukegan silt loam, 2 to 6 percent slopes	All areas are prime farmland	18.7	8.5%
411C	Waukegan silt loam, 6 to 12 percent slopes	Farmland of statewide importance	24.8	11.3%
449	Crystal Lake silt loam, 1 to 3 percent slopes	All areas are prime farmland	1.8	0.8%
460B	Baytown silt loam, 1 to 6 percent slopes	All areas are prime farmland	60.7	27.7%
460C	Baytown silt loam, 6 to 12 percent slopes	Farmland of statewide importance	25.6	11.7%
468	Otter silt loam	Prime farmland if drained	11.4	5.2%
488F	Brodale flaggy loam, 20 to 50 percent slopes	Not prime farmland	4.4	2.0%
W	Water	Not prime farmland	0.9	0.4%
Totals for Area of Interest			219.4	100.0%

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Erosion Hazard (Road, Trail)—Washington County, Minnesota
(Figure 8 - Erosion Hazard (Road, Trail) Map)

MAP LEGEND

- Area of Interest (AOI)**
 Area of Interest (AOI)
- Soils**
- Soil Rating Polygons**
-  Very severe
 -  Severe
 -  Moderate
 -  Slight
 -  Not rated or not available
- Soil Rating Lines**
-  Very severe
 -  Severe
 -  Moderate
 -  Slight
 -  Not rated or not available
- Soil Rating Points**
-  Very severe
 -  Severe
 -  Moderate
 -  Slight
 -  Not rated or not available
- Water Features**
-  Streams and Canals
- Transportation**
-  Rails
 -  Interstate Highways
-  US Routes
 -  Major Roads
 -  Local Roads
- Background**
-  Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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 Survey Area Data: Version 11, Sep 19, 2016

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Date(s) aerial images were photographed: Mar 16, 2012—Apr 26, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Erosion Hazard (Road, Trail)

Erosion Hazard (Road, Trail)— Summary by Map Unit — Washington County, Minnesota (MN163)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
49C	Antigo silt loam, 6 to 15 percent slopes	Severe	Antigo (85%)	Slope/erodibility (0.95)	0.6	0.3%
100B	Copaston loam, 0 to 6 percent slopes	Moderate	Copaston (100%)	Slope/erodibility (0.50)	0.1	0.1%
100C	Copaston loam, 6 to 12 percent slopes	Severe	Copaston (100%)	Slope/erodibility (0.95)	6.8	3.1%
174C	Gale silt loam, 6 to 15 percent slopes	Severe	Gale (90%)	Slope/erodibility (0.95)	41.6	19.0%
174F	Gale silt loam, 25 to 50 percent slopes	Severe	Gale (90%)	Slope/erodibility (0.95)	8.1	3.7%
301B	Lindstrom silt loam, 2 to 4 percent slopes	Moderate	Lindstrom (90%)	Slope/erodibility (0.50)	10.7	4.9%
340C	Whalan silt loam, 6 to 12 percent slopes	Severe	Whalan (90%)	Slope/erodibility (0.95)	2.9	1.3%
367B	Campia silt loam, 0 to 8 percent slopes	Moderate	Campia (90%)	Slope/erodibility (0.50)	0.4	0.2%
411B	Waukegan silt loam, 2 to 6 percent slopes	Moderate	Waukegan (90%)	Slope/erodibility (0.50)	18.7	8.5%
411C	Waukegan silt loam, 6 to 12 percent slopes	Severe	Waukegan (90%)	Slope/erodibility (0.95)	24.8	11.3%
449	Crystal Lake silt loam, 1 to 3 percent slopes	Slight	Crystal Lake (90%)		1.8	0.8%
460B	Baytown silt loam, 1 to 6 percent slopes	Moderate	Baytown (90%)	Slope/erodibility (0.50)	60.7	27.7%
460C	Baytown silt loam, 6 to 12 percent slopes	Severe	Baytown (90%)	Slope/erodibility (0.95)	25.6	11.7%
468	Otter silt loam	Slight	Otter (85%)		11.4	5.2%
488F	Brodale flaggy loam, 20 to 50 percent slopes	Severe	Brodale (100%)	Slope/erodibility (0.95)	4.4	2.0%
W	Water	Not rated	Water (100%)		0.9	0.4%

Erosion Hazard (Road, Trail)— Summary by Map Unit — Washington County, Minnesota (MN163)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI

Totals for Area of Interest					219.4	100.0%
------------------------------------	--	--	--	--	--------------	---------------

Erosion Hazard (Road, Trail)— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI

Severe	114.8	52.3%
Moderate	90.6	41.3%
Slight	13.2	6.0%
Null or Not Rated	0.9	0.4%
Totals for Area of Interest	219.4	100.0%

Description

The ratings in this interpretation indicate the hazard of soil loss from unsurfaced roads and trails. The ratings are based on soil erosion factor K, slope, and content of rock fragments.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," or "severe." A rating of "slight" indicates that little or no erosion is likely; "moderate" indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and "severe" indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

**Figure 8 - DNR NHIS Habitat Area Map
ERDB# 20170268 - Bush Afton Development
T28N R20W Sections 32 & 33
Washington County**

GIS shapefiles of MBS Sites of Biodiversity Significance & DNR Native Plant Communities can be downloaded from the MN Geospatial Commons at <https://gisdata.mn.gov/>



- Legend**
- Project Line
 - DNR Native Plant Communities**
 - Dry Bedrock Bluff Prairie (Southern)
 - Oak - (Red Maple) Woodland
 - Red Oak - White Oak - (Sugar Maple) Forest
 - MBS Sites of Biodiversity Significance**
 - Outstanding
 - High
 - Moderate
 - Below
 - PLS Section



Copyright 2017, State of Minnesota, DNR
Rare Feature, Prairie Railroad Survey, Native Plant Community, and Sites of Biodiversity Significance data are from the Natural Heritage Information System. The absence of rare features for a particular location should not be construed to mean that the DNR is confident rare features are absent from that location.

0 0.275 0.55 Miles

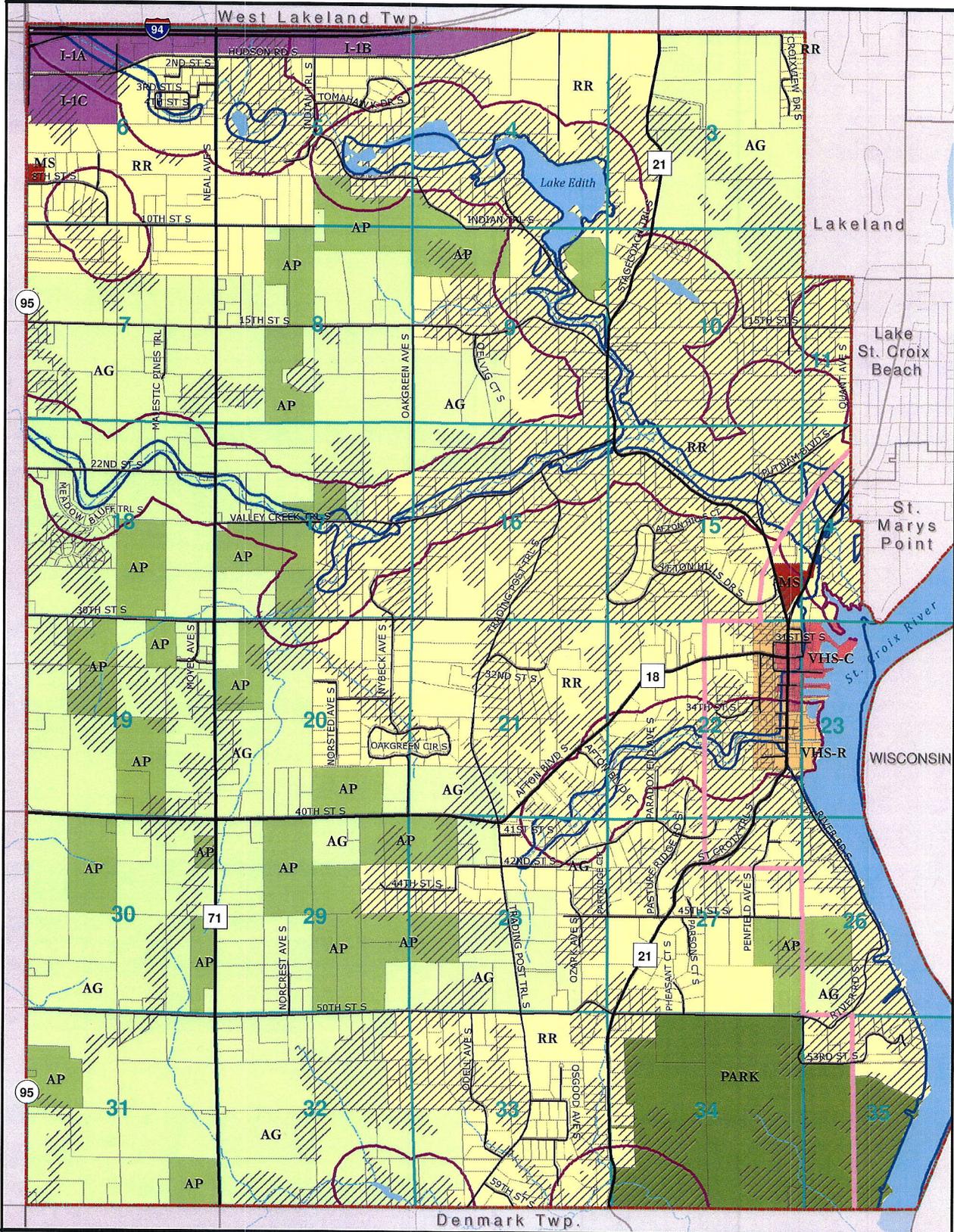


APPENDIX A

Afton Zoning Map

Zoning Map

MAP 11



- Zoning Districts**
- Agriculture
 - Ag Preserve
 - Village Historic Site- Commercial
 - Industrial
 - Village Historic Site- Residential
 - Rural Residential

- State Park
- Marina Services
- Conservancy Overlay
- St. Croix River Bluffland
- Floodplain Overlay (100 Year)
- Shoreland Management Areas

- City of Afton
- Parcel Boundaries
- Section Lines
- Major Road
- Local Road

Streams 0 0.5 1 Miles

Lakes & Rivers

Floodplain Overlay (100 Year)

Shoreland Management Areas

St. Croix River Bluffland

Conservancy Overlay

City of Afton

Parcel Boundaries

Section Lines

Major Road

Local Road

Lakes & Rivers



APPENDIX B

Lot Buffer Plans

Appendix B Lot Buffer Plan

Each homeowner will be directed to plant the following in their 60 foot average width backyard lot buffer:

1. Plant 12-24 trees of at least 4 species from the list below.
 - a. Northern red oak
 - b. Red maple
 - c. Ironwood
 - d. Basswood
 - e. Hackberry
 - f. Paper-birch
 - g. Black cherry
2. Plant 8-12 shrubs of at least 3 species from the list below.
 - a. Pagoda dogwood
 - b. American hazelnut
 - c. Chokecherry
 - d. Red-berried elder
 - e. Gray dogwood
3. Prior to planting the above trees and shrubs the buffer area that is **not** preserved wooded buffer with invasive buckthorn removed will be prepared and planted with the Mid Diversity Mesic to Dry Buffer South & West BWSR plant mix.

NOTE: See buffer seed mix attached.

This plan was prepared by,

Wayne Jacobson PSS, WDC, AFS
Senior Scientist
Jacobson Environmental, PLLC

Pilot

Mid Diversity Mesic to Dry Buffer South & West

Function: Buffers

Intent: Mid diversity mesic prairie buffer establishment

Planting Area: S & W

Specialization: NRCS 643 & NRCS 327

	Scientific Name	Common Name	Seeds/ sq ft	Rate (lb/ac)	% Mix (by sqft)	% Mix (by wt)
Cover	Avena sativa	Oats* (See Cover crop note)	11.14	37.91		
		Total Guild:	11.14	37.91	20.88%	82.1%
Forb	Asclepias tuberosa	Butterfly Milkweed	0.05	0.03		
	Liatris aspera	Rough Blazing Star	0.18	0.03		
	Monarda fistulosa	Wild Bergamot	1.61	0.06		
	Oligoneuron rigidum	Stiff Goldenrod	1	0.07		
	Phlox pilosa	Prairie Phlox	0.065	0.01		
	Rudbeckia hirta	Black-eyed Susan	6	0.18		
	Symphotrichum ericoides	Heath Aster	1.5	0.02		
	Verbena stricta	Hoary Vervain	1.45	0.14		
	Zizia aurea	Golden Alexanders	0.23	0.06		
		Total Guild:	12.085	0.60	22.65%	1.3%
Graminoid	Andropogon gerardii	Big Bluestem	6	1.63		
	Bouteloua curtipendula	Side-oats Grama	3	1.36		
	Elymus canadensis	Canada Wild Rye	0.5	0.26		
	Elymus trachycaulus	Slender Wheatgrass	1.2	0.59		
	Panicum virgatum	Switchgrass	6	1.17		
	Schizachyrium scoparium	Little Bluestem	7	1.27		
	Sorghastrum nutans	Indian Grass	5	1.13		
		Total Guild:	28.7	7.42	53.80%	16.1%
Legume	Astragalus canadensis	Canada Milk Vetch	0.39	0.06		
	Dalea purpurea	Purple Prairie Clover	1.03	0.19		
		Total Guild:	1.42	0.25	2.66%	0.5%
	Total Seed Mix:	53.345	46.18			

APPENDIX C

State Historic Preservation Office Inquiry

Re: 2017-10 Bush Afton EAW SHPO FileReview Request

Thomas Cinadr <thomas.cinadr@mnhs.org>

Thu 1/19/2017 9:00 AM

Inbox

To: WAYNE JACOBSON <jacobsonenv@msn.com>;

1 attachments (3 KB)

Historic.rtf;

THIS EMAIL IS NOT A PROJECT CLEARANCE.

This message simply reports the results of the cultural resources database search you requested. The database search produced results for only previously known archaeological sites and historic properties. Please read the note below carefully.

No archaeological sites were identified in a search of the Minnesota Archaeological Inventory and Historic Structures Inventory for the search area requested. A report containing the history/architecture properties identified is attached.

The result of this database search provides a listing of recorded archaeological sites and historic architectural properties that are included in the current SHPO databases. Because the majority of archaeological sites in the state and many historic architectural properties have not been recorded, important sites or structures may exist within the search area and may be affected by development projects within that area. Additional research, including field survey, may be necessary to adequately assess the area's potential to contain historic properties.

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. The following codes on the reports you received are:

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

CEF – Certified Eligible to the National Register findings are usually made during the federal review process, these properties have been evaluated as being eligible for listing in the National Register.

SEF – Staff eligible findings to the National Register are properties that have been determined eligible by SHPO staff.

DOE – Determination of Eligibility is made by the National Park Service and typically refers to properties deemed eligible but the owner objects to the listing.

CNEF – Certified Not Eligible to the National Register. SHPO has begun to record properties that have been evaluated as not eligible for listing in the National Register. If the box on the form has a check the property has been determined to be not eligible.

Properties without NR, CEF, SEF, DOE, or CNEF designations in the reports you received may not have been evaluated and therefore no assumption to their eligibility can be made.

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 in Review and Compliance @ 651-259-3455 or by email at kelly.graggjohnson@mnhs.org.

The Minnesota SHPO Survey Manuals and Database Metadata can be found at <http://www.mnhs.org/shpo/survey/inventories.htm>

SHPO research hours are 8:30 AM – 4:00 PM Tuesday-Friday.

The Office is closed on Mondays.

Tom Cinadr

Survey and Information Management Coordinator
Minnesota Historic Preservation Office
Minnesota Historical Society
345 Kellogg Blvd. West
St. Paul, MN 55102

651-259-3453

On Wed, Jan 18, 2017 at 10:18 AM, WAYNE JACOBSON <jacobsonenv@msn.com> wrote:

Tom,

I have not done a EAW for a few years. We need a SHPO file review for our EAW,
the draft is due February 8. A address on the site is 14220 60th Street South, Afton, MN 55001.

I have attached a DNR form with other location information.

Our project is on 218.6 acres, map attached for 20 single family homes with wells and septic, and including several large conservation areas, map attached.

Project is in the City of Afton in Washigton County, and the area is 75% farmland, 20% woodland, and 5% wetlands and streams. The Trout Stream on the south is protected by two conservation areas.

Thanks for your help,

Wayne Jacobson, P.S.S., W.D.C., A.F.S.

Senior Scientist

Jacobson Environmental, PLLC.

5821 Humboldt Avenue North

Brooklyn Center, MN 55430

jacobsonenv@msn.com

www.jacobsonenvironmental.com

612-802-6619 - cell

History/Architecture Inventory

PROPERTY NAME	ADDRESS	Twp	Range	Sec	Quarters	USGS	Report	NRHP	CEF	DOE	Inventory Number
COUNTY:	Washington										
CITY/TOWNSHIP:	Afton										
Pt. Douglas-Superior Military Rd.: Afton Segment	Trading Post Rd.	28	20	33	N	Hudson	xx-89-4H				WA-AFC-032
Pt. Douglas-Superior Military Rd.: Afton Segment		28	20	33	N	Hudson	WA-2009-1H				WA-AFC-032

APPENDIX D

EDR Radius and Geocheck Report

14220 60th Street South
14220 60th Street South
Afton, MN 55001

Inquiry Number: 4830569.2s
January 20, 2017

The EDR Radius Map™ Report with GeoCheck®



6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
Executive Summary	ES1
Overview Map	2
Detail Map	3
Map Findings Summary	4
Map Findings	8
Orphan Summary	12
Government Records Searched/Data Currency Tracking	GR-1
 <u>GEOCHECK ADDENDUM</u>	
Physical Setting Source Addendum	A-1
Physical Setting Source Summary	A-2
Physical Setting Source Map	A-9
Physical Setting Source Map Findings	A-10
Physical Setting Source Records Searched	PSGR-1

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

14220 60TH STREET SOUTH
AFTON, MN 55001

COORDINATES

Latitude (North): 44.8660260 - 44° 51' 57.69"
Longitude (West): 92.8252170 - 92° 49' 30.78"
Universal Transverse Mercator: Zone 15
UTM X (Meters): 513808.0
UTM Y (Meters): 4967865.5
Elevation: 880 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map: 5951401 PRESCOTT, WI
Version Date: 2013

North Map: 5951707 HUDSON, WI
Version Date: 2013

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from: 20150927, 20150929
Source: USDA

MAPPED SITES SUMMARY

Target Property Address:
14220 60TH STREET SOUTH
AFTON, MN 55001

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	MELVIN PICT	6363 OAKGREEN AVE S	WIMN	Lower	1536, 0.291, SE
2	JIM FOX RESIDENCE	14601 55TH ST S	LUST, Financial Assurance, WIMN	Higher	2019, 0.382, ENE

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL..... National Priority List
Proposed NPL..... Proposed National Priority List Sites
NPL LIENS..... Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL..... National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY..... Federal Facility Site Information listing
SEMS..... Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE..... Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS..... Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF..... RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG..... RCRA - Large Quantity Generators
RCRA-SQG..... RCRA - Small Quantity Generators
RCRA-CESQG..... RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS..... Land Use Control Information System
US ENG CONTROLS..... Engineering Controls Sites List

EXECUTIVE SUMMARY

US INST CONTROL Sites with Institutional Controls

Federal ERNS list

ERNS..... Emergency Response Notification System

State- and tribal - equivalent NPL

MN PLP..... Permanent List of Priorities

State- and tribal - equivalent CERCLIS

SHWS..... Superfund Site Information Listing

State and tribal landfill and/or solid waste disposal site lists

SWF/LF..... Permitted Solid Waste Disposal Facilities

UNPERM LF..... Unpermitted Facilities

LCP..... Closed Landfills Priority List

State and tribal leaking storage tank lists

LAST..... Leaking Aboveground Storage Tanks

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

FEMA UST..... Underground Storage Tank Listing

UST..... Underground Storage Tank Database

AST..... Aboveground Storage Tanks

INDIAN UST..... Underground Storage Tanks on Indian Land

State and tribal institutional control / engineering control registries

INST CONTROL..... Site Remediation Section Database

State and tribal voluntary cleanup sites

VIC..... Voluntary Investigation and Cleanup Program

INDIAN VCP..... Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS..... Petroleum Brownfields Program Sites

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY..... Recycling Facilities

EXECUTIVE SUMMARY

INDIAN ODI.....	Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9.....	Torres Martinez Reservation Illegal Dump Site Locations
ODI.....	Open Dump Inventory
IHS OPEN DUMPS.....	Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL.....	Delisted National Clandestine Laboratory Register
SRS.....	Site Remediation Section Database
CDL.....	Clandestine Drug Labs
MN DEL PLP.....	Delisted Permanent List of Priorities
US CDL.....	National Clandestine Laboratory Register

Local Land Records

LIENS.....	Environmental Liens
LIENS 2.....	CERCLA Lien Information

Records of Emergency Release Reports

HMIRS.....	Hazardous Materials Information Reporting System
SPILLS.....	Spills Database
AGSPILLS.....	Department of Agriculture Spills
SPILLS 90.....	SPILLS 90 data from FirstSearch
SPILLS 80.....	SPILLS 80 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR.....	RCRA - Non Generators / No Longer Regulated
FUDS.....	Formerly Used Defense Sites
DOD.....	Department of Defense Sites
SCRD DRYCLEANERS.....	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR.....	Financial Assurance Information
EPA WATCH LIST.....	EPA WATCH LIST
2020 COR ACTION.....	2020 Corrective Action Program List
TSCA.....	Toxic Substances Control Act
TRIS.....	Toxic Chemical Release Inventory System
SSTS.....	Section 7 Tracking Systems
ROD.....	Records Of Decision
RMP.....	Risk Management Plans
RAATS.....	RCRA Administrative Action Tracking System
PRP.....	Potentially Responsible Parties
PADS.....	PCB Activity Database System
ICIS.....	Integrated Compliance Information System
FTTS.....	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS.....	Material Licensing Tracking System
COAL ASH DOE.....	Steam-Electric Plant Operation Data
COAL ASH EPA.....	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER.....	PCB Transformer Registration Database
RADINFO.....	Radiation Information Database
HIST FTTS.....	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS.....	Incident and Accident Data
CONSENT.....	Superfund (CERCLA) Consent Decrees
INDIAN RESERV.....	Indian Reservations

EXECUTIVE SUMMARY

FUSRAP.....	Formerly Utilized Sites Remedial Action Program
UMTRA.....	Uranium Mill Tailings Sites
LEAD SMELTERS.....	Lead Smelter Sites
US AIRS.....	Aerometric Information Retrieval System Facility Subsystem
US MINES.....	Mines Master Index File
FINDS.....	Facility Index System/Facility Registry System
DOCKET HWC.....	Hazardous Waste Compliance Docket Listing
UXO.....	Unexploded Ordnance Sites
AGVIC.....	Agricultural Voluntary Investigation & Cleanup Listing
AIRS.....	Permit Contact List
BULK.....	Bulk Facilities Database
COAL ASH.....	Coal Ash Disposal Site Listing
DRYCLEANERS.....	Registered Drycleaning Facilities
ENF.....	Generators Associated with Enforcement Logs
Financial Assurance.....	Financial Assurance Information Listing
MN HWS Permit.....	Active TSD Facilities
MANIFEST.....	Hazardous Waste Manifest Data
MDA LIS.....	Licensing Information System Database Listing
MN LS.....	List of Sites
TIER 2.....	Tier 2 Facility Listing
NPDES.....	Wastewater Permits Listing
FUELS PROGRAM.....	EPA Fuels Program Registered Listing
ECHO.....	Enforcement & Compliance History Information
ABANDONED MINES.....	Abandoned Mines

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP.....	EDR Proprietary Manufactured Gas Plants
EDR Hist Auto.....	EDR Exclusive Historic Gas Stations
EDR Hist Cleaner.....	EDR Exclusive Historic Dry Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS.....	Recovered Government Archive State Hazardous Waste Facilities List
RGA LF.....	Recovered Government Archive Solid Waste Facilities List
RGA LUST.....	Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.

Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

STANDARD ENVIRONMENTAL RECORDS

State and tribal leaking storage tank lists

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Minnesota Pollution Control Agency's Leak Sites list.

A review of the LUST list, as provided by EDR, and dated 08/01/2016 has revealed that there is 1 LUST site within approximately 0.5 miles of the target property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
<i>JIM FOX RESIDENCE</i> Complete Site Closed Date: 01/24/2008 00:00:00 Site Id: 253593 MNPCA ID: 416297	<i>14601 55TH ST S</i>	<i>ENE 1/4 - 1/2 (0.382 mi.)</i>	<i>2</i>	<i>8</i>

ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

WIMN: Since 2003, the PCA's "What's in My Neighborhood?" database provides information about air quality, hazardous waste, remediation, solid waste, tanks and leaks, and water quality around Minnesota.

A review of the WIMN list, as provided by EDR, and dated 06/08/2015 has revealed that there are 2 WIMN sites within approximately 0.5 miles of the target property.

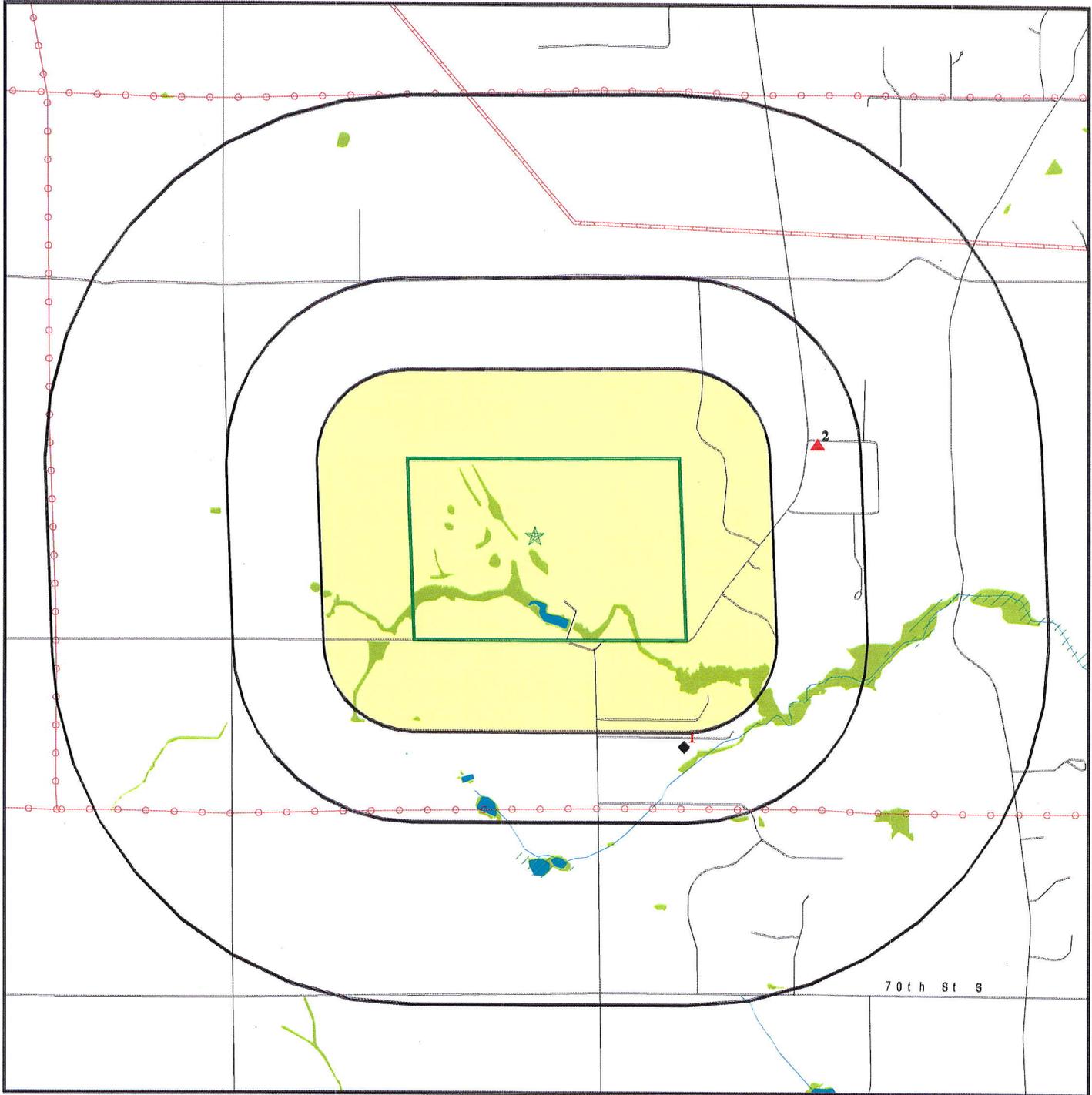
<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
<i>JIM FOX RESIDENCE</i> MPCA Id: 16723 Status: Active	<i>14601 55TH ST S</i>	<i>ENE 1/4 - 1/2 (0.382 mi.)</i>	<i>2</i>	<i>8</i>

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction / Distance</u>	<u>Map ID</u>	<u>Page</u>
MELVIN PICHT MPCA Id: MNNONGEN711 Status: Inactive	6363 OAKGREEN AVE S	SE 1/4 - 1/2 (0.291 mi.)	1	8

EXECUTIVE SUMMARY

There were no unmapped sites in this report.

OVERVIEW MAP - 4830569.2S



-  Target Property
-  Sites at elevations higher than or equal to the target property
-  Sites at elevations lower than the target property
-  Manufactured Gas Plants
-  National Priority List Sites
-  Dept. Defense Sites



-  Indian Reservations BIA
-  Power transmission lines
-  Pipelines
-  100-year flood zone
-  500-year flood zone
-  National Wetland Inventory
-  State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: 14220 60th Street South
ADDRESS: 14220 60th Street South
 Afton MN 55001
LAT/LONG: 44.866026 / 92.825217

CLIENT: Jacobson Environmental, PLLC
CONTACT: Wayne Jacobson
INQUIRY #: 4830569.2s
DATE: January 20, 2017 10:39 am

DETAIL MAP - 4830569.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites

- Indian Reservations BIA
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands



This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: 14220 60th Street South
 ADDRESS: 14220 60th Street South
 Afton MN 55001
 LAT/LONG: 44.866026 / 92.825217

CLIENT: Jacobson Environmental, PLLC
 CONTACT: Wayne Jacobson
 INQUIRY #: 4830569.2s
 DATE: January 20, 2017 10:40 am

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
<u>STANDARD ENVIRONMENTAL RECORDS</u>								
<i>Federal NPL site list</i>								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	0.001		0	NR	NR	NR	NR	0
<i>Federal Delisted NPL site list</i>								
Delisted NPL	1.000		0	0	0	0	NR	0
<i>Federal CERCLIS list</i>								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
<i>Federal CERCLIS NFRAP site list</i>								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
<i>Federal RCRA CORRACTS facilities list</i>								
CORRACTS	1.000		0	0	0	0	NR	0
<i>Federal RCRA non-CORRACTS TSD facilities list</i>								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
<i>Federal RCRA generators list</i>								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
<i>Federal institutional controls / engineering controls registries</i>								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
<i>Federal ERNS list</i>								
ERNS	0.001		0	NR	NR	NR	NR	0
<i>State- and tribal - equivalent NPL</i>								
MN PLP	1.000		0	0	0	0	NR	0
<i>State- and tribal - equivalent CERCLIS</i>								
SHWS	1.000		0	0	0	0	NR	0
<i>State and tribal landfill and/or solid waste disposal site lists</i>								
SWF/LF	0.500		0	0	0	NR	NR	0
UNPERM LF	0.500		0	0	0	NR	NR	0
LCP	0.500		0	0	0	NR	NR	0
<i>State and tribal leaking storage tank lists</i>								
LUST	0.500		0	0	1	NR	NR	1

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LAST	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
INST CONTROL	0.500		0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
VIC	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
SWRCY	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
SRS	0.500		0	0	0	NR	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
MN DEL PLP	1.000		0	0	0	0	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
Local Land Records								
LIENS	0.001		0	NR	NR	NR	NR	0
LIENS 2	0.001		0	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
SPILLS	0.001		0	NR	NR	NR	NR	0
AGSPILLS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SPILLS 80	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	0.001		0	NR	NR	NR	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
AGVIC	0.500		0	0	0	NR	NR	0
AIRS	0.001		0	NR	NR	NR	NR	0
BULK	0.250		0	0	NR	NR	NR	0
COAL ASH	0.500		0	0	0	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
ENF	0.001		0	NR	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
MN HWS Permit	1.000		0	0	0	0	NR	0
MANIFEST	0.250		0	0	NR	NR	NR	0
MDA LIS	0.250		0	0	NR	NR	NR	0
MN LS	0.500		0	0	0	NR	NR	0
TIER 2	0.001		0	NR	NR	NR	NR	0
WIMN	0.500		0	0	2	NR	NR	2
NPDES	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

<u>Database</u>	<u>Search Distance (Miles)</u>	<u>Target Property</u>	<u>< 1/8</u>	<u>1/8 - 1/4</u>	<u>1/4 - 1/2</u>	<u>1/2 - 1</u>	<u>> 1</u>	<u>Total Plotted</u>
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
ABANDONED MINES	0.001		0	NR	NR	NR	NR	0
<u>EDR HIGH RISK HISTORICAL RECORDS</u>								
<i>EDR Exclusive Records</i>								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
<u>EDR RECOVERED GOVERNMENT ARCHIVES</u>								
<i>Exclusive Recovered Govt. Archives</i>								
RGA HWS	0.001		0	NR	NR	NR	NR	0
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	0	0	3	0	0	3

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Map ID
 Direction
 Distance
 Elevation

MAP FINDINGS

Site

Database(s) EDR ID Number
 EPA ID Number

1 **MELVIN PICTH**
SE **6363 OAKGREEN AVE S**
1/4-1/2 **HASTINGS, MN 55033**
0.291 mi.
1536 ft.

WIMN **S110216534**
N/A

Relative:
Lower

WIMN:
 Legislative District: 54B
 Status: Inactive
 Actual: Latitude: 44.85603909
871 ft. Longitude: -92.82156924
 Coordinate Collection Method: Address Matching House Number
 Activity: Hazardous Waste, Small to Minimal QG
 MPCA Id: MNNONGEN711
 Major Watershed: Lower St. Croix River

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2 **JIM FOX RESIDENCE**
ENE **14601 55TH ST S**
1/4-1/2 **AFTON, MN 55001**
0.382 mi.
2019 ft.

LUST **S108412233**
Financial Assurance **N/A**
WIMN

Relative:
Higher

LUST:
 Leak ID: 16723
 MNPCA ID: 416297
 Site ID: 253593
 Source: CORE
 Interest Type: Leak Site
 Interest Phone: NO CORE PI PH.
 Interest Start Date: 02/01/2007 00:00:00
 Interest End Date: Not reported
 Release Discovered Date: 01/30/2007
 Leak Reported Date: 01/31/2007
 Leak Site: Leak Site - Tank and Petroleum Contamination
 File Archive Box: Not reported
 File Archive Lot: Not reported
 Soil Digout Date: Not reported
 Cubic Yards Excavated: Not reported
 Conditional Closure Date: Not reported
Complete Site Closure Date: 01/24/2008 00:00:00
 Contaminated Soils Remaining: Unknown
 Enforcement Action Begin Date: 02/05/2007
 Lust Trust Eligible: No
 Offsite Contamination: Unknown
 Reimbursement Awarded: No
 Std Letter Response Date: 02/07/2007
 Surface Water Impact: Unknown
 Utility Project Flag: No
 TMSP Added: 02/01/2007 15:54:27
 TMSP Last Update: 08/26/2008 15:21:23
 Staff Id Last Update: CMCLAIN
 Release From AST: No
 Release From UST: Yes
 Tank Registration Status Code: N
 VPIC Application Date: Not reported
 VPIC Acres: Not reported
 Addr Id: 300106
 Township Name: Not reported

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s) EDR ID Number
EPA ID Number

JIM FOX RESIDENCE (Continued)

S108412233

Active Flag: Yes
Country Code: USA
Foreign State: Not reported
Foreign Zone: Not reported
State County Code: MN
Vapor Intrusion Checked Flag: Yes
Soil Gas Data Collected Flag: No
Soil Gas Action Level Flag: Not reported
Sub Slab Sample Collected Flag: Not reported
Indoor Air Collected Flag: Not reported
Vapor Intrusion Action Flag: Not reported
Vapor Intrusion Comments: Not reported
Soil Gas Data Comments: Not reported
Comments: Not reported

Leak GW Info:

MN PCA ID: 416297
Dw Supply Contam: Not reported
Free Product Observed: Not reported
Free Product Thickness: Not reported
Ground Water Contam: No
GW Cleanup Goal: Not reported
Gw Exceeds Cleanup Goal: Not reported
Cleanup Goal Achieved: Not reported
Water Supply Exceeds Ral: Not reported
Well Type Code: Not reported
Impacted Aquifer Code: Not reported
TMSP Added: 01/23/2008 09:59:43
TMSP Last Update: 01/23/2008 10:02:18
Staff Id Last Update: AEDDY
Mtbe Present Now: Not reported
Mtbe Present Historically: Not reported
Mtbe High Ug Per Liter Char: Not reported
Mtbe High Ug Per Liter Numb: Not reported
Mtbe High Level Date: Not reported
Free Product At Close: No
Staff Id Ass: 7874
PWS Well: N
Prot Flag: No
Sens Flag: No

Leak Product Released:

MN PCA ID: 416297
Prod Released Sequence Id: 110891
Leak Product: Fuel Oil 1 and 2
Tmsp Added: 11/27/2007 11:00:56
Tmsp Last_updt: 11/27/2007 11:00:56
Staff Id Last Updt: AEDDY

MN Financial Assurance 1:

PROGRAM ID: 416297
Township Name: Not reported
Region: 1
Interest Type: Leak Site
ADDR ID: 300106
Interest Telephone: NO CORE PI PH.
Preferred ID: 16723
Interest Start Date: 02/01/2007

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s) EDR ID Number
EPA ID Number

JIM FOX RESIDENCE (Continued)

S108412233

Interest End Date: Not reported
Activity Flag: Y
TMSP Added: 02/01/2007
TMSP Last Update: 02/01/2007 15:05:44
Staff ID Last Update: SVANPAT
Source: CORE
Source ID: 253593
Country Code: USA
FOR State: Not reported
FOR Zone: Not reported
FIPS County Code: 163
Comments: Not reported

Latitude Longitude:
Program Id: 416297
Lat/Long ID: 0
Latitude Degrees: Not reported
Latitude Minutes: Not reported
Latitude Seconds: Not reported
Longitude Degrees: Not reported
Longitude Minutes: Not reported
Longitude Seconds: Not reported
Collection Date: Not reported
Lat/Long Description: Site Center
TMSP Added: 01/10/2008 09:39:52
TMSP Last Update: 01/10/2008 09:39:52
Staff ID Last Update: SCHILD
Coord Source Type: Not reported
Org Name Source: Not reported
Coord Coll Meth: Not reported
Map Scale Code: Not reported
Source: TALES
Site ID: 253593
Spatial ID: 52311092

Program Id: 416297
Lat/Long ID: 138328
Latitude Degrees: 44
Latitude Minutes: 52
Latitude Seconds: 10.25
Longitude Degrees: -92
Longitude Minutes: 48
Longitude Seconds: 33.04
Collection Date: 01/10/2008 09:38:56
Lat/Long Description: Not reported
TMSP Added: 01/10/2008 09:32:19
TMSP Last Update: 01/10/2008 09:38:56
Staff ID Last Update: MAPTOOL
Coord Source Type: Not reported
Org Name Source: Not reported
Coord Coll Meth: DM
Map Scale Code: Not reported
Source: CORE
Site ID: 253593
Spatial ID: 52311092

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s) EDR ID Number
EPA ID Number

JIM FOX RESIDENCE (Continued)

S108412233

Staff Name:

Program Id: 416297
Staff Sequence ID: 105689
Staff Type: Not reported
Staff Name: Not reported
TMSP Added: 02/01/2007 15:54:27
TMSP Last Update: 01/20/2012 10:39:38
Staff ID Last Update: RSUCHAN
Last Name: Not reported
First Name: Not reported
Middle Initial: Not reported
Functional Area Code: LPM
Staff ID Number: 7874

WIMN:

Legislative District: 54B
Status: Active
Latitude: 44.86951434
Longitude: -92.80917805
Coordinate Collection Method: Digitized - Map Tool
Activity: Leak Site
MPCA Id: 16723
Major Watershed: Lower St. Croix River

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GEOCHECK® - PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

14220 60TH STREET SOUTH
14220 60TH STREET SOUTH
AFTON, MN 55001

TARGET PROPERTY COORDINATES

Latitude (North):	44.866026 - 44° 51' 57.69"
Longitude (West):	92.825217 - 92° 49' 30.78"
Universal Transverse Mercator:	Zone 15
UTM X (Meters):	513808.0
UTM Y (Meters):	4967865.5
Elevation:	880 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5951401 PRESCOTT, WI
Version Date:	2013
North Map:	5951707 HUDSON, WI
Version Date:	2013

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

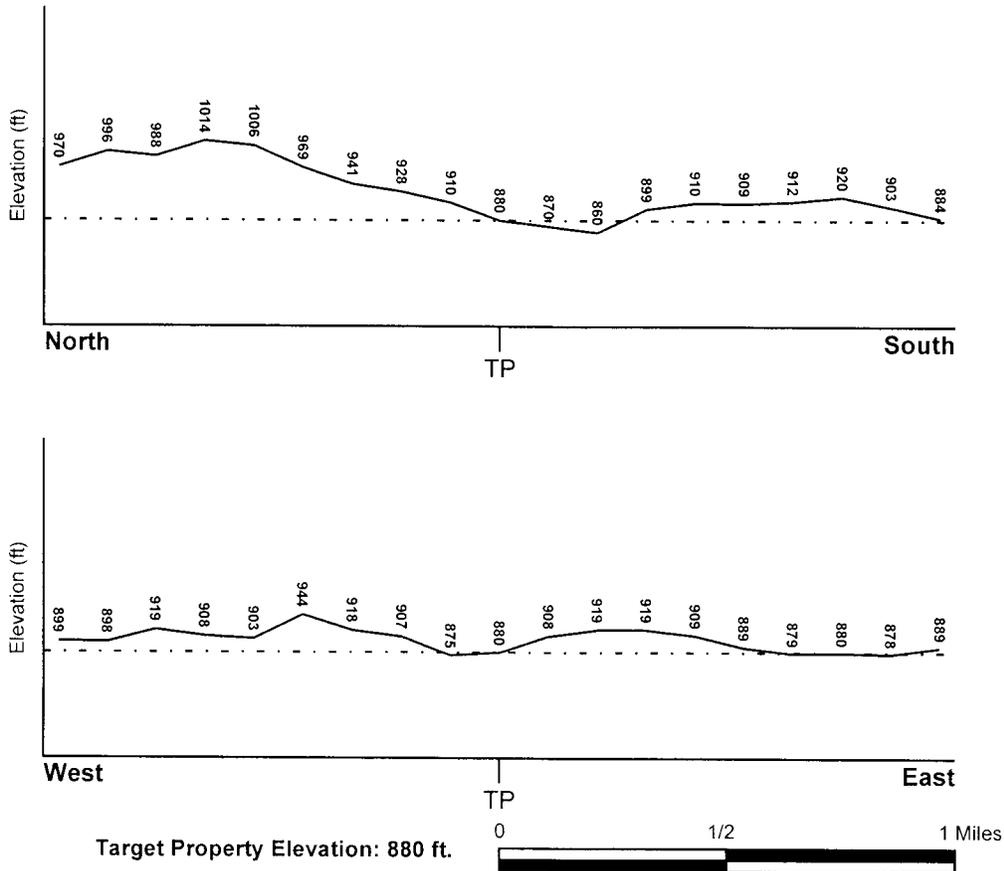
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General SSW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

<u>Flood Plain Panel at Target Property</u>	<u>FEMA Source Type</u>
27163C0430E	FEMA FIRM Flood data
<u>Additional Panels in search area:</u>	<u>FEMA Source Type</u>
27163C0365E	FEMA FIRM Flood data
27163C0368E	FEMA FIRM Flood data
55093C0085E	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

<u>NWI Quad at Target Property</u>	<u>NWI Electronic Data Coverage</u>
PRESCOTT	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

<u>MAP ID</u>	<u>LOCATION FROM TP</u>	<u>GENERAL DIRECTION GROUNDWATER FLOW</u>
Not Reported		

* ©1996 Site-specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era: Paleozoic
System: Ordovician
Series: Lower Ordovician (Canadian)
Code: O1 (decoded above as Era, System & Series)

GEOLOGIC AGE IDENTIFICATION

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name: WAUKEGAN

Soil Surface Texture: silt loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained. Soils have intermediate water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: LOW

Depth to Bedrock Min: > 60 inches

Depth to Bedrock Max: > 60 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
Layer	Boundary		Soil Texture Class	Classification		Permeability Rate (in/hr)	Soil Reaction (pH)
	Upper	Lower		AASHTO Group	Unified Soil		
1	0 inches	15 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 2.00 Min: 0.60	Max: 7.30 Min: 5.60
2	15 inches	33 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 2.00 Min: 0.60	Max: 7.30 Min: 5.10
3	33 inches	60 inches	gravelly - coarse sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 20.00 Min: 6.00	Max: 7.80 Min: 5.60

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: flaggy - loam
loam

Surficial Soil Types: flaggy - loam
loam

Shallow Soil Types: silty clay loam
loam
fine sandy loam

Deeper Soil Types: unweathered bedrock
loam
weathered bedrock
stratified
fine sand
silt loam

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

<u>DATABASE</u>	<u>SEARCH DISTANCE (miles)</u>
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 0.001 miles
State Database	1.000

FEDERAL USGS WELL INFORMATION

<u>MAP ID</u>	<u>WELL ID</u>	<u>LOCATION FROM TP</u>
1	USGS40000505896	1/4 - 1/2 Mile NE
3	USGS40000505690	1/4 - 1/2 Mile ESE
A5	USGS40000505432	1/4 - 1/2 Mile SSE
B8	USGS40000505650	1/2 - 1 Mile ESE
B10	USGS40000505632	1/2 - 1 Mile ESE
C12	USGS40000505385	1/2 - 1 Mile SSE
D16	USGS40000505493	1/2 - 1 Mile SE
25	USGS40000506196	1/2 - 1 Mile NNE
F26	USGS40000505895	1/2 - 1 Mile ENE
G32	USGS40000505423	1/2 - 1 Mile SE
H34	USGS40000506244	1/2 - 1 Mile NNW
I36	USGS40000505870	1/2 - 1 Mile East
J38	USGS40000505798	1/2 - 1 Mile East
39	USGS40000506195	1/2 - 1 Mile NE
J42	USGS40000505821	1/2 - 1 Mile East
K47	USGS40000506271	1/2 - 1 Mile NW
L49	USGS40000505970	1/2 - 1 Mile ENE
M55	USGS40000505869	1/2 - 1 Mile East
N56	USGS40000505797	1/2 - 1 Mile East
O58	USGS40000506159	1/2 - 1 Mile NE
L62	USGS40000505969	1/2 - 1 Mile ENE
N66	USGS40000505796	1/2 - 1 Mile East
P67	USGS40000506375	1/2 - 1 Mile NNE
Q70	USGS40000505795	1/2 - 1 Mile East
R72	USGS40000505738	1/2 - 1 Mile East
S74	USGS40000506095	1/2 - 1 Mile WNW
T76	USGS40000506313	1/2 - 1 Mile NE
U82	USGS40000506019	1/2 - 1 Mile ENE
W84	USGS40000506286	1/2 - 1 Mile NE
Q88	USGS40000505794	1/2 - 1 Mile East
X89	USGS40000506461	1/2 - 1 Mile NNW
Y90	USGS40000505579	1/2 - 1 Mile ESE
X92	USGS40000506462	1/2 - 1 Mile NNW
Z97	USGS40000506358	1/2 - 1 Mile NW
V99	USGS40000505882	1/2 - 1 Mile East
AB101	USGS40000505737	1/2 - 1 Mile East

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
AB106	USGS40000505776	1/2 - 1 Mile East
AC107	USGS40000505967	1/2 - 1 Mile ENE
AC108	USGS40000505968	1/2 - 1 Mile ENE
Z111	USGS40000506406	1/2 - 1 Mile NW
AD112	USGS40000506357	1/2 - 1 Mile NE
AE113	USGS40000506080	1/2 - 1 Mile ENE
AC116	USGS40000506018	1/2 - 1 Mile ENE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

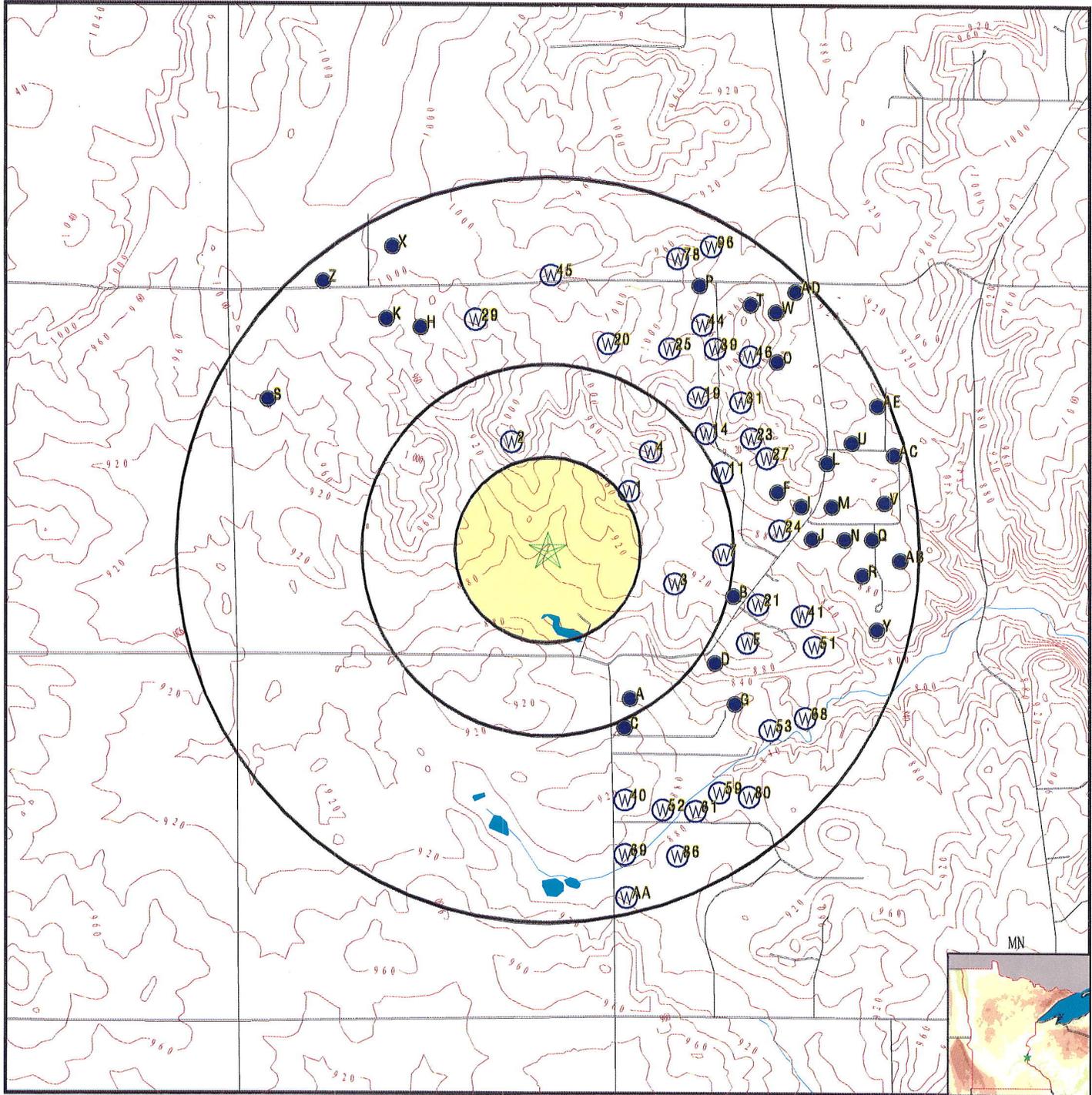
MAP ID	WELL ID	LOCATION FROM TP
2	MN5000000176653	1/4 - 1/2 Mile NNW
4	MN5000000033465	1/4 - 1/2 Mile NE
A6	MN5000000081054	1/4 - 1/2 Mile SSE
7	MN5000000038830	1/4 - 1/2 Mile East
B9	MN5000000039164	1/2 - 1 Mile ESE
11	MN5000000066436	1/2 - 1 Mile ENE
C13	MN5000000139739	1/2 - 1 Mile SSE
14	MN5000000247340	1/2 - 1 Mile NE
B15	MN5000000062894	1/2 - 1 Mile East
D17	MN5000000130005	1/2 - 1 Mile SE
E18	MN5000000139591	1/2 - 1 Mile ESE
19	MN5000000097588	1/2 - 1 Mile NE
20	MN5000000098831	1/2 - 1 Mile NNE
21	MN5000000067834	1/2 - 1 Mile ESE
E22	MN5000000047206	1/2 - 1 Mile ESE
23	MN5000000015181	1/2 - 1 Mile ENE
24	MN5000000122788	1/2 - 1 Mile East
27	MN5000000024484	1/2 - 1 Mile ENE
F28	MN5000000012801	1/2 - 1 Mile ENE
29	MN5000000177442	1/2 - 1 Mile NNW
G30	MN5000000065536	1/2 - 1 Mile SE
31	MN5000000251748	1/2 - 1 Mile NE
H33	MN5000000031775	1/2 - 1 Mile NNW
I35	MN5000000058304	1/2 - 1 Mile East
J37	MN5000000185592	1/2 - 1 Mile East
40	MN5000000140176	1/2 - 1 Mile SSE
41	MN5000000044525	1/2 - 1 Mile ESE
J43	MN5000000032479	1/2 - 1 Mile East
44	MN5000000121796	1/2 - 1 Mile NE
45	MN5000000035853	1/2 - 1 Mile North

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
46	MN5000000054059	1/2 - 1 Mile NE
K48	MN5000000047690	1/2 - 1 Mile NW
L50	MN5000000025388	1/2 - 1 Mile ENE
51	MN5000000243557	1/2 - 1 Mile ESE
52	MN5000000149485	1/2 - 1 Mile SSE
53	MN5000000037223	1/2 - 1 Mile SE
M54	MN5000000028591	1/2 - 1 Mile East
N57	MN5000000130189	1/2 - 1 Mile East
59	MN5000000179962	1/2 - 1 Mile SE
O60	MN5000000162325	1/2 - 1 Mile NE
61	MN5000000158765	1/2 - 1 Mile SSE
P63	MN5000000000562	1/2 - 1 Mile NNE
L64	MN50000000057140	1/2 - 1 Mile ENE
N65	MN5000000176003	1/2 - 1 Mile East
68	MN5000000137842	1/2 - 1 Mile ESE
69	MN5000000251174	1/2 - 1 Mile SSE
R71	MN5000000130240	1/2 - 1 Mile East
Q73	MN5000000021968	1/2 - 1 Mile East
R75	MN5000000039574	1/2 - 1 Mile East
S77	MN5000000165176	1/2 - 1 Mile WNW
78	MN5000000243556	1/2 - 1 Mile NNE
T79	MN5000000190783	1/2 - 1 Mile NE
80	MN5000000132833	1/2 - 1 Mile SE
U81	MN5000000052563	1/2 - 1 Mile ENE
V83	MN5000000133715	1/2 - 1 Mile East
W85	MN5000000002915	1/2 - 1 Mile NE
86	MN5000000101363	1/2 - 1 Mile SSE
Q87	MN5000000159652	1/2 - 1 Mile East
Y91	MN5000000182082	1/2 - 1 Mile ESE
X93	MN5000000089764	1/2 - 1 Mile NNW
Z94	MN5000000155030	1/2 - 1 Mile NW
X95	MN5000000184996	1/2 - 1 Mile NNW
96	MN5000000165706	1/2 - 1 Mile NNE
V98	MN5000000080792	1/2 - 1 Mile East
AA100	MN5000000098480	1/2 - 1 Mile SSE
AB102	MN5000000002355	1/2 - 1 Mile East
AB103	MN5000000054176	1/2 - 1 Mile East
Z104	MN5000000132616	1/2 - 1 Mile NW
AC105	MN5000000120538	1/2 - 1 Mile ENE
AC109	MN5000000036498	1/2 - 1 Mile ENE
AD110	MN5000000002053	1/2 - 1 Mile NE
AE114	MN5000000006925	1/2 - 1 Mile ENE
AA115	MN5000000008133	1/2 - 1 Mile SSE
AC117	MN5000000006204	1/2 - 1 Mile ENE

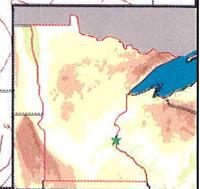
PHYSICAL SETTING SOURCE MAP - 4830569.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons



- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location
- Closest Hydrogeological Data



<p>SITE NAME: 14220 60th Street South ADDRESS: 14220 60th Street South Afton MN 55001 LAT/LONG: 44.866026 / 92.825217</p>	<p>CLIENT: Jacobson Environmental, PLLC CONTACT: Wayne Jacobson INQUIRY #: 4830569.2s DATE: January 20, 2017 10:41 am</p>
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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
 Direction
 Distance
 Elevation

Database EDR ID Number

1
NE
 1/4 - 1/2 Mile
 Higher

FED USGS USGS40000505896

Org. Identifier:	USGS-MN		
Formal name:	USGS Minnesota Water Science Center		
Monloc Identifier:	MN040-445206092491401		
Monloc name:	028N20W33CBB 01	0000479691	
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	07030005	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	44.8683006
Longitude:	-92.8207609	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	Not Reported
Vert measure units:	Not Reported	Vertacc measure val:	Not Reported
Vert accmeasure units:	Not Reported		
Vertcollection method:	Not Reported		
Vert coord refsys:	Not Reported	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19920811	Welldepth:	220
Welldepth units:	ft	Wellholedepth:	220
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 0

2
NNW
 1/4 - 1/2 Mile
 Higher

MN WELLS MN5000000176653

Relateid:	0000546297	County c:	Washington
Unique no:	00546297	Wellname:	MIKELSON, ROY
Township:	28	Range:	20
Range dir:	W	Section:	32
Subsection:	ADCBCC	Mgsquad c:	Prescott
Elevation:	1012		
Elev mc:	T3		
Status c:	Active		
Use c:	Domestic	Loc mc:	Address matching w/par boundary
Loc src:	CE/H	Data src:	Mantyla Well Co.
Depth drill:	270		
Depth comp:	270		
Date drill:	19950612		
Case diam:	4		
Case depth:	250		
Grout:	Well grouted, type unknown	Pollut dst:	50
Pollut dir:	SE	Pollut typ:	SDF
Strat date:	0		
Strat upd:	20040212		
Strat src:	Minnesota Geological Survey	Strat geol:	John Mossler
Strat mc:	Geologic study 1:24k to 1:100k		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Depth2bdrk:	12	Last strat:	Franconia
First bdrk:	CJDN	Ohbotunit:	CFRN
Ohtopunit:	CFRN	Cuttings:	Not Reported
Aquifer:	CFRN	Bhgeophys:	Not Reported
Core:	Not Reported	Waterchem:	Not Reported
Geochem:	Not Reported	Swl:	Y
Obwell:	Not Reported	Input src:	Minnesota Geological Survey
Igwis:	Not Reported		
Unused:	N		
Entry date:	19970106		
Updt date:	20140214		
Geoc type:	VWV	Gcm code:	DS2
Geoc src:	C82	Geoc prg:	PHE
Utme:	513649		
Utmn:	4968548		
Geoc entry:	2205001		
Geoc date:	20031212		
Geocupd en:	2205001		
Geocupd da:	20031219		
Rcvd date:	0		
Well label:	546297	Swlcount:	1
Swldate:	19950612		
Swlavgmeas:	200		
Swlavgelev:	812		
Site id:	MN5000000176653		

Address Information:

Relateid:	0000546297	Name:	Not Reported
Addtype c:	Well address	House no:	13787
Street:	50TH	Road type:	Street
Road dir:	South	City:	AFTON
State:	MN	Zipcode:	55001
Entry date:	19970106		
Updt date:	20040212		
Other:	Not Reported		

Construction 1 Information:

Relateid:	0000546297	Drill meth:	Non-specified Rotary
Drill fluid:	Foam	Hydrofrac:	Not Reported
Hffrom:	Not Reported		
Hfto:	Not Reported		
Case mat:	Steel (black or low carbon)	Case joint:	W
Case top:	Not Reported		
Drive shoe:	Y	Case type:	Single casing
Screen:	N		
Ohtopfeet:	250		
Ohbotfeet:	270		
Screen mfg:	Not Reported	Screen typ:	Not Reported
Ptlss mfg:	MAASS	Ptlss mdl:	4J1
Bsmt offst:	Not Reported	Csg top ok:	Not Reported
Csg at grd:	Not Reported	Plstc prot:	Not Reported
Disinfectd:	Y	Pump inst:	Not Reported
Pump date:	19950622		
Pump mfg:	GPM	Pump model:	10G101313
Pump hp:	1		
Pump volts:	230		
Drapp len:	240		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Dropp mat: Not Reported
 Pump cpcty: 10
 Pump type: Submersible Variance: Not Reported
 Drllr name: SANDERS, G.
 Entry date: 20031211
 Updt date: Not Reported

Historic Water Level Information:

Relateid: 0000546297 Meas type: Well installation
 Meas date: 19950612
 Meas time: Not Reported
 M pt code: Land surface
 Meas point: 0
 Measurement: 200
 Meas elev: 812
 Data src: Mantyla Well Co. Program: CWI
 Entry date: 19970106
 Updt date: 0

Pump Test Information:

Relateid: 0000546297
 Pumptestid: 1
 Test date: 19950612
 Start meas: 200
 Flow rate: 30
 Duration: 1
 Pump meas: 240

Remarks Information:

Relateid: 0000546297
 Seq no: 1
 Remarks: 50 FEET NW AND NE CORNER OF HOUSE

3
ESE
1/4 - 1/2 Mile
Higher

FED USGS USGS40000505690

Org. Identifier: USGS-MN
 Formal name: USGS Minnesota Water Science Center
 Monloc Identifier: MN040-445153092490501
 Monloc name: 028N20W33CCA 01 0000420334
 Monloc type: Well
 Monloc desc: Not Reported
 Huc code: 07030005 Drainagearea value: Not Reported
 Drainagearea Units: Not Reported Contrib drainagearea: Not Reported
 Contrib drainagearea units: Not Reported Latitude: 44.8646895
 Longitude: -92.8182607 Sourcemap scale: 24000
 Horiz Acc measure: 1 Horiz Acc measure units: seconds
 Horiz Collection method: Interpolated from map
 Horiz coord refsys: NAD83 Vert measure val: Not Reported
 Vert measure units: Not Reported Vertacc measure val: Not Reported
 Vert accmeasure units: Not Reported
 Vertcollection method: Not Reported
 Vert coord refsys: Not Reported Countrycode: US
 Aquifername: Not Reported
 Formation type: Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Aquifer type:	Not Reported	Welldepth:	175
Construction date:	19901020	Wellholedepth:	175
Welldepth units:	ft		
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 0

4
NE
1/4 - 1/2 Mile
Higher

MN WELLS MN5000000033465

Relateid:	0000470364	County c:	Washington
Unique no:	00470364	Wellname:	FORBES, DOUGLAS
Township:	28	Range:	20
Range dir:	W	Section:	33
Subsection:	BCDCBC	Mgsquad c:	Prescott
Elevation:	995		
Elev mc:	7.5 minute topographic map (+/- 5 feet)		
Status c:	Active		
Use c:	Domestic	Loc mc:	Address verification
Loc src:	Minnesota Geological Survey	Data src:	Mantyla Well Co.
Depth drll:	295		
Depth comp:	295		
Date drll:	19901002		
Case diam:	4		
Case depth:	250		
Grout:	Well grouted, type unknown	Pollut dst:	70
Pollut dir:	S	Pollut typ:	SDF
Strat date:	19970925		
Strat upd:	19970925		
Strat src:	Minnesota Geological Survey	Strat geol:	Bruce Bloomgren
Strat mc:	Geologic study 1:24k to 1:100k		
Depth2bdrk:	5		
First bdrk:	CJDN	Last strat:	Franconia
Ohtopunit:	CFRN	Ohbotunit:	CFRN
Aquifer:	CFRN	Cuttings:	Not Reported
Core:	Not Reported	Bhgeophys:	Not Reported
Geochem:	Not Reported	Waterchem:	Not Reported
Obwell:	Not Reported	Swl:	Y
Igwis:	Not Reported	Input src:	Minnesota Geological Survey
Unused:	N		
Entry date:	19910819		
Updt date:	20140214		
Geoc type:	VVV	Gcm code:	DS1
Geoc src:	MGS	Geoc prg:	CWI
Utme:	514252		
Utmn:	4968507		
Geoc entry:	619008		
Geoc date:	20020501		
Geocupd en:	619008		
Geocupd da:	20140128		
Rcvd date:	0		
Well label:	470364	Swlcount:	1
Swldate:	19901002		
Swlavgmeas:	220		
Swlavgelev:	775		
Site id:	MN5000000033465		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Address Information:

Relateid:	0000470364	Name:	FORBES, DOUGLAS
Addtype c:	Both	House no:	5460
Street:	ODELL	Road type:	Avenue
Road dir:	South	City:	AFTON
State:	MN	Zipcode:	55001
Entry date:	19910819		
Updt date:	19970925		
Other:	Not Reported		

Construction 1 Information:

Relateid:	0000470364	Drill meth:	Air Rotary
Drill fluid:	Foam	Hydrofrac:	Not Reported
Hffrom:	Not Reported		
Hfto:	Not Reported		
Case mat:	Steel (black or low carbon)	Case joint:	W
Case top:	1		
Drive shoe:	Y	Case type:	Single casing
Screen:	N		
Ohtopfeet:	250		
Ohbotfeet:	295		
Screen mfg:	Not Reported	Screen typ:	Not Reported
Ptlss mfg:	MAASS	Ptlss mdl:	4J1
Bsmt offst:	Not Reported	Csg top ok:	Y
Csg at grd:	Not Reported	Plstc prot:	Not Reported
Disinfectd:	Y	Pump inst:	Y
Pump date:	19901002		
Pump mfg:	GPM	Pump model:	23D9P
Pump hp:	1.5		
Pump volts:	230		
Dropp len:	240		
Dropp mat:	G		
Pump cpcty:	10		
Pump type:	Submersible	Variance:	Not Reported
Drllr name:	SANDERS, G.		
Entry date:	19910819		
Updt date:	19970925		

Historic Water Level Information:

Relateid:	0000470364	Meas type:	Well installation
Meas date:	19901002		
Meas time:	Not Reported		
M pt code:	Land surface		
Meas point:	0		
Measuremt:	220		
Meas elev:	775		
Data src:	Mantyla Well Co.	Program:	CWI
Entry date:	19910819		
Updt date:	20140128		

Pump Test Information:

Relateid:	0000470364
Pumptestid:	1
Test date:	19901002
Start meas:	220
Flow rate:	25
Duration:	1
Pump meas:	240

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Remarks Information:
 Relateid: 0000470364
 Seq no: 1
 Remarks: NORTH 0.5 SECT.

A5
SSE
 1/4 - 1/2 Mile
 Lower

FED USGS USGS40000505432

Org. Identifier:	USGS-MN		
Formal name:	USGS Minnesota Water Science Center		
Monloc Identifier:	MN040-445137092491401		
Monloc name:	027N20W04BBCBAA01	0000427039	
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	07030005	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	44.8602451
Longitude:	-92.8207608	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	878
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	Franconia Sandstone		
Aquifer type:	Not Reported		
Construction date:	19871012	Welldepth:	225
Welldepth units:	ft	Wellholedepth:	225
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 0

A6
SSE
 1/4 - 1/2 Mile
 Lower

MN WELLS MN500000081054

Relateid:	0000427039	County c:	Washington
Unique no:	00427039	Wellname:	GROVE, JOE
Township:	27	Range:	20
Range dir:	W	Section:	4
Subsection:	BBCBAA	Mgsquad c:	Prescott
Elevation:	878		
Elev mc:	7.5 minute topographic map (+/- 5 feet)		
Status c:	Active		
Use c:	Domestic	Loc mc:	Information from owner
Loc src:	Minnesota Geological Survey	Data src:	Maier Well Co.
Depth drill:	225		
Depth comp:	225		
Date drill:	19871012		
Case diam:	4		
Case depth:	210		
Grout:	Well grouted, type unknown	Pollut dst:	100
Pollut dir:	E	Pollut typ:	SDF
Strat date:	19960109		
Strat upd:	19960109		
Strat src:	Minnesota Geological Survey	Strat geol:	Bruce Bloomgren
Strat mc:	Geologic study 1:24k to 1:100k		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Depth2bdrk:	140	Last strat:	Franconia
First bdrk:	CFRN	Ohbotunit:	CFRN
Ohtopunit:	CFRN	Cuttings:	Not Reported
Aquifer:	CFRN	Bhgeophys:	Not Reported
Core:	Not Reported	Waterchem:	Not Reported
Geochem:	Not Reported	Swl:	Y
Obwell:	Not Reported	Input src:	Minnesota Geological Survey
Igwis:	Not Reported		
Unused:	N		
Entry date:	19900626		
Updt date:	20140214		
Geoc type:	VWV	Gcm code:	A
Geoc src:	MGS	Geoc prg:	CWI
Utme:	514170		
Utmn:	4967434		
Geoc entry:	0		
Geoc date:	19900101		
Geocupd en:	0		
Geocupd da:	0		
Rcvd date:	0		
Well label:	427039	Swlcount:	1
Swldate:	19871012		
Swlavgmeas:	110		
Swlavgelev:	768		
Site id:	MN5000000081054		

Address Information:

Relateid:	0000427039	Name:	GROVE, JOE
Addtype c:	Both	House no:	6111
Street:	OAKGREEN	Road type:	Avenue
Road dir:	Not Reported	City:	HASTINGS
State:	MN	Zipcode:	55033
Entry date:	19900626		
Updt date:	19960109		
Other:	Not Reported		

Construction 1 Information:

Relateid:	0000427039	Drill meth:	Non-specified Rotary
Drill fluid:	Bentonite	Hydrofrac:	Not Reported
Hffrom:	Not Reported		
Hfto:	Not Reported		
Case mat:	Steel (black or low carbon)	Case joint:	W
Case top:	1	Case type:	Single casing
Drive shoe:	Y		
Screen:	N		
Ohtopfeet:	210		
Ohbotfeet:	225		
Screen mfg:	Not Reported	Screen typ:	Not Reported
Ptlls mfg:	Not Reported	Ptlls mdl:	Not Reported
Bsmt offst:	Not Reported	Csg top ok:	Y
Csg at grd:	Not Reported	Plstc prot:	Not Reported
Disinfectd:	Y	Pump inst:	Y
Pump date:	19871012		
Pump mfg:	GOULD	Pump model:	4D7511
Pump hp:	.75		
Pump volts:	230		
Dropp len:	147		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Dropp mat: G
 Pump cpcty: 10
 Pump type: Submersible Variance: Not Reported
 Drllr name: GAHLER, J.
 Entry date: 19900626
 Updt date: 19960109

Historic Water Level Information:

Relateid: 0000427039 Meas type: Well installation
 Meas date: 19871012
 Meas time: Not Reported
 M pt code: Land surface
 Meas point: 0
 Measurement: 110
 Meas elev: 768
 Data src: Maher Well Co. Program: CWI
 Entry date: 19900626
 Updt date: 0

Pump Test Information:

Relateid: 0000427039
 Pumptestid: 1
 Test date: 19871012
 Start meas: 110
 Flow rate: 15
 Duration: 24
 Pump meas: 110

7
East
1/4 - 1/2 Mile
Higher

MN WELLS MN5000000038830

Relateid: 0000575711 County c: Washington
 Unique no: 00575711 Wellname: BRENDENBERG, DAVE
 Township: 28 Range: 20
 Range dir: W Section: 33
 Subsection: CACCDA Mgsquad c: Prescott
 Elevation: 895
 Elev mc: 7.5 minute topographic map (+/- 5 feet)
 Status c: Active
 Use c: Domestic Loc mc: Information from owner
 Loc src: Minnesota Geological Survey Data src: Mantyla Well Co.
 Depth drll: 225
 Depth comp: 225
 Date drll: 19960614
 Case diam: 4
 Case depth: 210
 Grout: Well grouted, type unknown Pollut dst: 50
 Pollut dir: E Pollut typ: SDF
 Strat date: 19980106
 Strat upd: 19980106
 Strat src: Minnesota Geological Survey Strat geol: Bruce Bloomgren
 Strat mc: Geologic study 1:24k to 1:100k

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Depth2bdrk:	15	Last strat:	Cambrian,Undifferentiated
First bdrk:	CJDN	Ohbotunit:	CFRN
Ohtopunit:	CFRN	Cuttings:	Not Reported
Aquifer:	CFRN	Bhgeophys:	Not Reported
Core:	Not Reported	Waterchem:	Not Reported
Geochem:	Not Reported	Swl:	Y
Obwell:	Not Reported	Input src:	Minnesota Geological Survey
Igwis:	Not Reported		
Unused:	N		
Entry date:	19960925		
Updt date:	20140214		
Geoc type:	VVV	Gcm code:	DS1
Geoc src:	MGS	Geoc prg:	CWI
Utme:	514569		
Utmn:	4968063		
Geoc entry:	619008		
Geoc date:	20020501		
Geocupd en:	0		
Geocupd da:	0		
Rcvd date:	0		
Well label:	575711	Swlcount:	1
Swldate:	19960614		
Swlavgmeas:	130		
Swlavgelev:	765		
Site id:	MN5000000038830		

Address Information:

Relateid:	0000575711	Name:	BRENDENBERG, DAVE
Addtype c:	Both	House no:	5680
Street:	ODELL	Road type:	Avenue
Road dir:	South	City:	AFTON
State:	MN	Zipcode:	55001
Entry date:	19960925		
Updt date:	19980106		
Other:	Not Reported		

Construction 1 Information:

Relateid:	0000575711	Drill meth:	Non-specified Rotary
Drill fluid:	Foam	Hydrofrac:	Not Reported
Hffrom:	Not Reported		
Hfto:	Not Reported		
Case mat:	Steel (black or low carbon)	Case joint:	W
Case top:	Not Reported		
Drive shoe:	Y	Case type:	Single casing
Screen:	N		
Ohtopfeet:	210		
Ohbotfeet:	225		
Screen mfg:	Not Reported	Screen typ:	Not Reported
Ptiss mfg:	MAASS	Ptiss mdl:	4J1
Bsmt offst:	Not Reported	Csg top ok:	Y
Csg at grd:	Not Reported	Plstc prot:	Not Reported
Disinfectd:	Y	Pump inst:	Y
Pump date:	19960621		
Pump mfg:	GPM	Pump model:	10G101313
Pump hp:	1		
Pump volts:	230		
Drapp len:	178		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Dropp mat: Not Reported
 Pump cpcty: 10
 Pump type: Submersible Variance: N
 Drllr name: SANDERS, G.
 Entry date: 19960925
 Updt date: 19980106

Historic Water Level Information:

Relateid: 0000575711 Meas type: Well installation
 Meas date: 19960614
 Meas time: Not Reported
 M pt code: Land surface
 Meas point: 0
 Measurement: 130
 Meas elev: 765
 Data src: Mantyla Well Co. Program: CWI
 Entry date: 19960925
 Updt date: 0

Pump Test Information:

Relateid: 0000575711
 Pumpstetid: 1
 Test date: 19960614
 Start meas: 130
 Flow rate: 30
 Duration: 1
 Pump meas: 178

Remarks Information:

Relateid: 0000575711
 Seq no: 1
 Remarks: SOUTH 0.5 SECT.

B8
ESE
1/2 - 1 Mile
Higher

FED USGS USGS40000505650

Org. Identifier: USGS-MN
 Formal name: USGS Minnesota Water Science Center
 Monloc Identifier: MN040-445151092485401
 Monloc name: 028N20W33CDBDCB01 0000182982
 Monloc type: Well
 Monloc desc: Not Reported
 Huc code: 07030005 Drainagearea value: Not Reported
 Drainagearea Units: Not Reported Contrib drainagearea: Not Reported
 Contrib drainagearea units: Not Reported Latitude: 44.864134
 Longitude: -92.815205 Sourcemap scale: 24000
 Horiz Acc measure: 1 Horiz Acc measure units: seconds
 Horiz Collection method: Interpolated from map
 Horiz coord refsys: NAD83 Vert measure val: 921
 Vert measure units: feet Vertacc measure val: 5
 Vert accmeasure units: feet
 Vertcollection method: Interpolated from topographic map
 Vert coord refsys: NGVD29 Countrycode: US
 Aquifername: Not Reported
 Formation type: Franconia Sandstone

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Aquifer type:	Not Reported	Welldepth:	136
Construction date:	19811001	Wellholeddepth:	136
Welldepth units:	ft		
Wellholeddepth units:	ft		

Ground-water levels, Number of Measurements: 0

B9
ESE
1/2 - 1 Mile
Higher

MN WELLS MN5000000039164

Relateid:	0000133484	County c:	Washington
Unique no:	00133484	Wellname:	TEETERS, RICHARD
Township:	28	Range:	20
Range dir:	W	Section:	33
Subsection:	CDBDCD	Mgsquad c:	Prescott
Elevation:	930		
Elev mc:	7.5 minute topographic map (+/- 5 feet)		
Status c:	Active		
Use c:	Domestic	Loc mc:	Address verification
Loc src:	Minnesota Geological Survey	Data src:	Mantyla Well Co.
Depth drll:	140		
Depth comp:	140		
Date drll:	19771003		
Case diam:	4		
Case depth:	126		
Grout:	Well grouted, type unknown	Pollut dst:	85
Pollut dir:	S	Pollut typ:	SDF
Strat date:	19960219		
Strat upd:	19960219		
Strat src:	Minnesota Geological Survey	Strat geol:	Bruce Bloomgren
Strat mc:	Geologic study 1:24k to 1:100k		
Depth2bdrk:	5		
First bdrk:	CJDN	Last strat:	Franconia
Ohtopunit:	CFRN	Ohbotunit:	CFRN
Aquifer:	CFRN	Cuttings:	Not Reported
Core:	Not Reported	Bhgeophys:	Not Reported
Geochem:	Not Reported	Waterchem:	Y
Obwell:	Not Reported	Swl:	Y
Igwis:	Not Reported	Input src:	Minnesota Geological Survey
Unused:	Not Reported		
Entry date:	19890731		
Updt date:	20140214		
Geoc type:	VVV	Gcm code:	A
Geoc src:	MGS	Geoc prg:	CWI
Utme:	514595		
Utmn:	4967852		
Geoc entry:	0		
Geoc date:	19900101		
Geocupd en:	0		
Geocupd da:	0		
Rcvd date:	0		
Well label:	133484	Swlcount:	0
Swldate:	0		
Swlavgmeas:	0		
Swlavgelev:	0		
Site id:	MN5000000039164		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Address Information:

Relateid:	0000133484	Name:	TEETERS, RICHARD
Addtype c:	Both	House no:	5912
Street:	TRADING POST	Road type:	Trail
Road dir:	South	City:	AFTON
State:	MN	Zipcode:	55001
Entry date:	19890731		
Updt date:	19960219		
Other:	Not Reported		

Construction 1 Information:

Relateid:	0000133484	Drill meth:	Non-specified Rotary
Drill fluid:	Not Reported	Hydrofrac:	Not Reported
Hffrom:	Not Reported		
Hfto:	Not Reported		
Case mat:	Steel (black or low carbon)	Case joint:	W
Case top:	1		
Drive shoe:	Y	Case type:	Single casing
Screen:	N		
Ohtopfeet:	126		
Ohbotfeet:	140		
Screen mfg:	Not Reported	Screen typ:	Not Reported
Ptlss mfg:	Not Reported	Ptlss mdl:	Not Reported
Bsmt offst:	Not Reported	Csg top ok:	Y
Csg at grd:	Not Reported	Plstc prot:	Not Reported
Disinfectd:	Y	Pump inst:	Y
Pump date:	19771014		
Pump mfg:	REDA	Pump model:	12D9P071
Pump hp:	.75		
Pump volts:	230		
Dropp len:	105		
Dropp mat:	G		
Pump cpcty:	12		
Pump type:	Submersible	Variance:	Not Reported
Drllr name:	SANDERS, G.		
Entry date:	19890731		
Updt date:	19960219		

Historic Water Level Information:

Relateid:	0000133484	Meas type:	Well installation
Meas date:	19771003		
Meas time:	Not Reported		
M pt code:	Land surface		
Meas point:	0		
Measuremt:	85		
Meas elev:	845		
Data src:	Mantyla Well Co.	Program:	CWI
Entry date:	19890731		
Updt date:	0		

Historic Water Level Information:

Relateid:	0000133484	Meas type:	Well installation
Meas date:	19771003		
Meas time:	Not Reported		
M pt code:	Land surface		
Meas point:	0		
Measuremt:	0		
Meas elev:	930		
Data src:	Mantyla Well Co.	Program:	CWI
Entry date:	19890731		
Updt date:	0		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Historic Water Level Information:

Relateid:	0000133484	Meas type:	Well installation
Meas date:	19771003		
Meas time:	Not Reported		
M pt code:	Land surface		
Meas point:	0		
Measuremt:	0		
Meas elev:	930		
Data src:	Mantyla Well Co.	Program:	CWI
Entry date:	19890731		
Updt date:	0		

Pump Test Information:

Relateid:	0000133484
Pumptestid:	1
Test date:	19771003
Start meas:	85
Flow rate:	15
Duration:	2
Pump meas:	90

Remarks Information:

Relateid:	0000133484
Seq no:	1
Remarks:	HARD 310; 830830

Remarks Information:

Relateid:	0000133484
Seq no:	2
Remarks:	HARDNESS: -3.00MG/L

**B10
ESE
1/2 - 1 Mile
Higher**

FED USGS USGS40000505632

Org. Identifier:	USGS-MN		
Formal name:	USGS Minnesota Water Science Center		
Monloc Identifier:	MN040-445150092485401		
Monloc name:	028N20W33CDBDCD01	0000133484	
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	07030005	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	44.8638562
Longitude:	-92.815205	Sourcemap scale:	24000
Horiz Acc measure:	1	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	930
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	Not Reported		
Formation type:	St Lawrence-Franconia Formations		

APPENDIX E

DNR NHIS Letter

DEPARTMENT OF NATURAL RESOURCES

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

February 6, 2017

Correspondence # ERDB 20170269

Mr. Wayne Jacobson
Jacobson Environmental
5821 Humboldt Avenue N
Brooklyn Center, MN 55430

RE: Natural Heritage Review of the proposed Bush - Afton Development,
T28N R20W Sections 32 & 33; Washington County

Dear Mr. Jacobson,

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

- The proposed development is within areas Minnesota Biological Survey (MBS) has identified as a Site of *Moderate* and a Site of *Below* 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 *Moderate* contain occurrences of rare species and/or moderately disturbed native plant communities, and/or landscapes that have a strong potential for recovery. Sites ranked as *Below* do not meet the minimum biodiversity threshold for statewide significance. These sites, however, may have conservation value at the local level as habitat for native plants and animals, corridors for animal movements, buffers surrounding higher quality natural areas, or as areas with high potential for restoration of native habitat.

In 1971, these Sites contained Dry Bedrock Bluff Prairie (Southern), Oak – (Red Maple) Woodland, both considered vulnerable to extirpation in Minnesota, and Red Oak – White Oak (Sugar Maple) Forest, considered uncommon but not rare in the state (see attached map). However, according to aerial photography of the area, it appears the tree canopy has closed and prairie conditions are no longer present where previously documented. Given the project details, it appears most of the Moderate Site will not be impacted. While native plant communities are not specifically protected by state laws and rules, they are resources meriting consideration in management decisions and we encourage you to

consider project alternatives that would avoid or minimize disturbance to this ecologically significant area. Indirect impacts from surface runoff or the spread of invasive species should also be considered during project design and implementation.

- The project site is also within a Central Region Regionally Significant Ecological Area (RSEA) that is ranked Moderate. The DNR Central Region (in partnership with the Metropolitan Council for the 7-county metro area), identified these ecologically significant terrestrial and wetland areas by conducting a landscape-scale assessment based on the size and shape of the ecological area, land cover within the ecological area, adjacent land cover/use, and connectivity to other ecological areas. The purpose of the data is to inform regional scale land use decisions, especially as it relates to balancing development and natural resource protection. A GIS shapefile of this data layer can be downloaded from the MN Geospatial Commons at <https://gisdata.mn.gov/>. Additional information, including pdf versions of the RSEA maps, is available at <http://www.dnr.state.mn.us/rsea/index.html>.

State-listed Species

- Timber rattlesnakes (*Crotalus horridus*), a state-listed threatened species, historically has been documented in the vicinity the proposed project. Given this is a historical record and there have not been any recent sightings, it is unlikely this species is still present in the area. However, the gopher snake (*Pituophis catenifer*), a state-listed species of special concern, has recently been documented in the vicinity of the project. If erosion control mesh will be used, the DNR recommends the mesh be limited to wildlife-friendly materials (see enclosed fact sheet). Crews working in the area should be advised, if they encounter any snakes, the snakes should not be disturbed.
- The Bell's vireo, (*Vireo bellii*), a state listed bird species of special concern, has been documented in the vicinity of the project. In Minnesota, Bell's vireo prefers shrub thickets within or bordering open habitats such as grasslands or wetlands. This bird suspends its nests from forks of low branches of small trees or shrubs in riparian areas. If feasible, tree & shrub removal should be avoided from May 15th through August 15th to avoid disturbance of nesting birds.

Environmental Review and Permitting

- The Environmental Assessment Worksheet should address whether the proposed project has the potential to adversely affect the above rare features and, if so, it should identify specific measures that will be taken to avoid or minimize disturbance.
- 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 you have not done so already, please contact your DNR Regional Environmental Assessment Ecologist to determine whether there are other natural resource concerns associated with the proposed project (contact information available at http://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html). 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

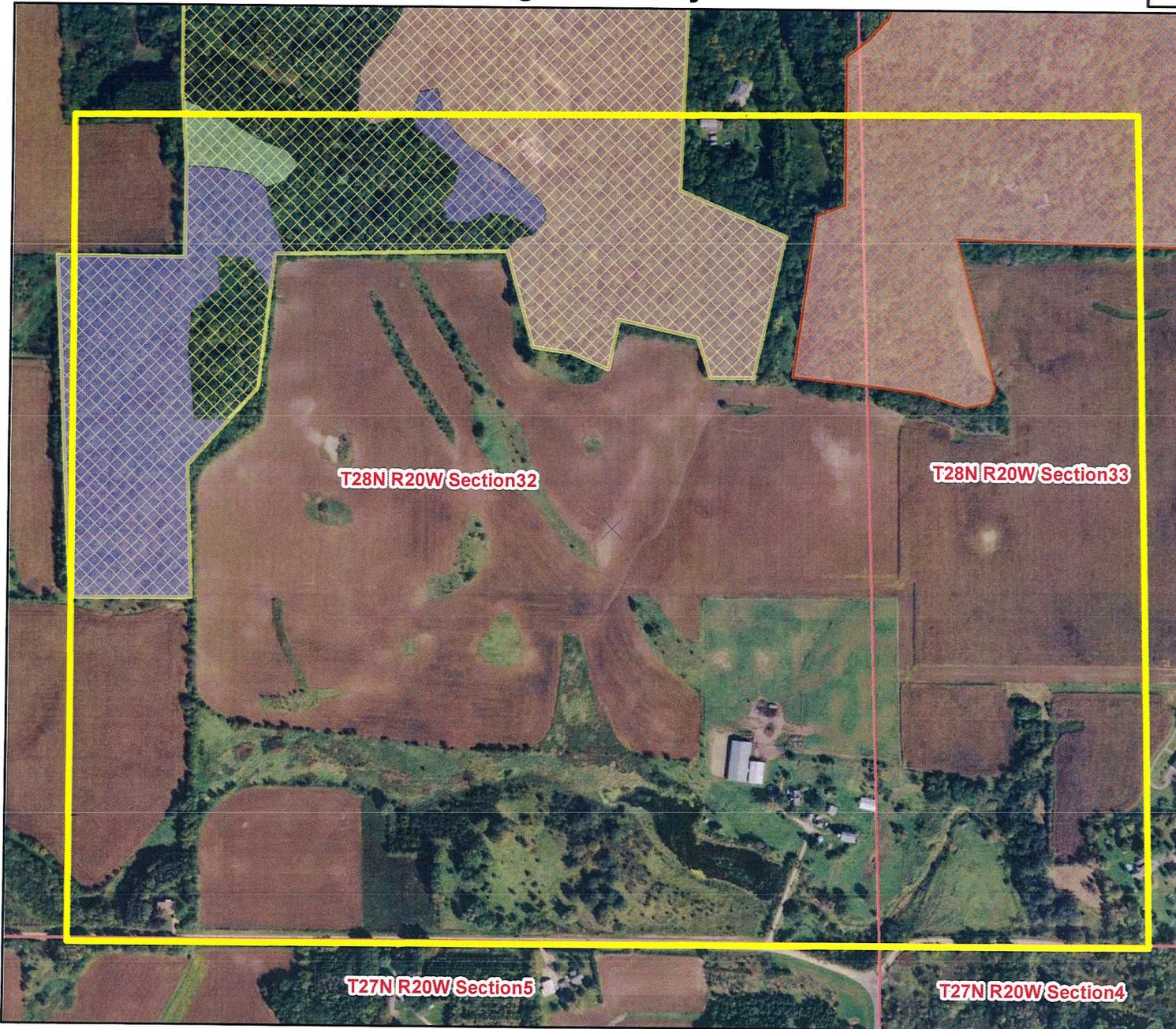
Enc. Map
Wildlife Friendly Erosion Control

Links: 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>

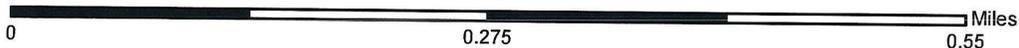
Cc: Becky Horton, Leslie Parris

**ERDB# 20170268 - Bush Afton Development
T28N R20W Sections 32 & 33
Washington County**

GIS shapefiles of MBS Sites of Biodiversity Significance & DNR Native Plant Communities can be downloaded from the MN Geospatial Commons at <https://gisdata.mn.gov/>



- Legend**
- Project Line
 - DNR Native Plant Communities**
 - Dry Bedrock Bluff Prairie (Southern)
 - Oak - (Red Maple) Woodland
 - Red Oak - White Oak - (Sugar Maple) Forest
 - MBS Sites of Biodiversity Significance**
 - Outstanding
 - High
 - Moderate
 - Below
 - PLS Section



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Rare Feature, Prairie Railroad Survey, Native Plant Community, and Sites of Biodiversity Significance data are from the Natural Heritage Information System. The absence of rare features for a particular location should not be construed to mean that the DNR is confident rare features are absent from that location.

Preventing Entanglement by Erosion Control Blanket

Plastic mesh netting is a common component in erosion control blanket. It is utilized to hold loose fibrous materials in place (EG straw) until vegetation is established. Erosion control blanket is being utilized extensively and is effective for reducing soil erosion, benefitting both soil health and water quality. Unfortunately there is a negative aspect of the plastic mesh component: It is increasingly being documented that its interaction with reptiles and amphibians can be fatal (Barton and Kinkead, 2005; Kapfer and Paloski, 2011). Mowing machinery is also susceptible to damage due to the long lasting plastic mesh.

Potential Problems:

- Plastic netting remains a hazard long after other components have decomposed.
- Plastic mesh netting can result in entanglement and death of a variety of small animals. The most vulnerable group of animals are the reptiles and amphibians (snakes, frogs, toads, salamanders, turtles). Ducklings, small mammals, and fish have also been observed entangled in the netting.
- Road maintenance machinery can snag the plastic mesh and pull up long lengths into machinery, thus binding up machinery and causing damage and/or loss of time cleaning it out.

Suggested Alternatives:

- Do not use in known locations of reptiles or amphibians that are listed as Threatened or Endangered species.
- Limit use of blanket containing welded plastic mesh to areas away from where reptiles or amphibians are likely (near wetlands, lakes, watercourses, or rock outcrops) or habitat transition zones (prairie – woodland edges, rocky outcrop – woodland edges, steep rocky slopes, etc.)
- Select products with biodegradable netting (preferably made from natural fibers, though varieties of biodegradable polyesters also exist on the market). Biodegradable products will degrade under a variety of moisture and light conditions.
- DO NOT use products that require UV-light to degrade (also called “photodegradable”) as they do not degrade properly when shaded by vegetation.

Solution: Most categories of erosion control blanket and sediment control logs are available in natural net options.

- Specify ‘Natural Netting’ for rolled erosion control products, per MnDOT Spec 3885. See Table 3885-1.
- Specify ‘Natural Netting’ for sediment control logs, per MnDOT Spec 3897



The plastic mesh component of erosion control blanket becomes a net for entrapment.

Literature Referenced

Barton, C. and K. Kinkead. 2005. Do erosion control and snakes mesh? *Soil and Water Conservation Society* 60:33A-35A.
Kapfer, J.M., and R.A. Paloski. 2011. On the threat to snakes of mesh deployed for erosion control and wildlife exclusion. *Herpetological Conservation and Biology* 6:1-9.