



Minnesota Pollution Control Agency

520 Lafayette Road North
St. Paul, MN 55155-4194

City copy

Notice of Availability of an Environmental Assessment Worksheet (EAW)

City of Afton Wastewater Collection and Treatment System

Doc Type: Public Notice

FILE
3-3-15

Public Comment Information

EAW Public comment period begins: March 2, 2015
EAW Public comment period ends: 4:30 p.m. on April 1, 2015
Notice published in the EQB Monitor: March 2, 2015
Permit public comment period begins: March 2, 2015
Permit public comment period ends: April 1, 2015

RECEIVED

MAR 3 2015

CITY OF AFTON

Facility Specific Information

Facility name and location:
City of Afton Wastewater Collection and Treatment System
County: Washington
City of Afton
PLS Location (1/4, 1/4, Section, Township, Range): (1/4, , Section, Township, Range):

Facility contact:
City of Afton
Ron Moore
City Administrator
Address: 3033 St. Croix Trail S.
P.O. Box 219
Afton, MN 55001
Phone: 651-436-5090
Fax: 651-436-1453
Email: administrator@ci.afton.mn.us

MPCA Contact Information

MPCA EAW contact person:
Kevin Kain
Resource Management and Assistance Division
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155
Phone: 651-757-2482
Fax: 651-297-2343
Email: kevin.kain@state.mn.us
Admin staff phone: 651-757-2100

MPCA Permit contact person:
Shauna Bendt
Municipal Division
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155
Phone: 651-757-2282
Fax: 651-297-2343
Email: shauna.bendt@state.mn.us

General Information

The Minnesota Pollution Control Agency (MPCA) is distributing this Environmental Assessment Worksheet (EAW) for a 30-day review and comment period pursuant to the Environmental Quality Board (EQB) rules. The MPCA uses the EAW and any comments received to evaluate the potential for significant environmental effects from the project and decide on the need for an Environmental Impact Statement (EIS).

p-ear2-71a

An electronic version of the EAW is available on the MPCA Environmental Review webpage at <http://www.pca.state.mn.us/oxpg691>. If you would like a copy of the EAW or Permit or have any questions on the EAW or Permit, contact the appropriate person(s) listed above.

Description of Proposed Project

The city of Afton is proposing to install a wastewater collection system and Large Subsurface Sewage Treatment System (LSTS) that would resolve the wastewater treatment issues within the Old Village district of Afton.

The proposed treatment system is designed for an average wet weather design flow of 50,550 gallons per day. The treatment system will be designed based on 77 homes and 25 commercial connections.

To Submit Written Comments on the EAW and the State Disposal System Permit

Written comments on the EAW must be received by the MPCA EAW contact person within the comment period listed above.

For information on how to comment on the State Disposal System Permit, contact the MPCA Permit contact person listed above, Shauna Bendt.

NOTE: *All comment letters are public documents and will be part of the official public record for this project.*

Need for an EIS

- (1) A final decision on the need for an EIS will be made after the end of the comment period.
- (2) If a request for an EIS is received during the comment period, or if the MPCA Commissioner (Commissioner) recommends the preparation of an EIS, the MPCA Citizens' Board (Board) will make the final decision.
- (3) If a request for an EIS is not received, the final decision will be made by the Commissioner.

The Board meets once a month, usually the fourth Tuesday of each month, at the MPCA office in St. Paul. Meetings are open to the public and interested persons may offer testimony on Board agenda items. Information on the Board is available at: <http://www.pca.state.mn.us/nwqgh406>.

ENVIRONMENTAL ASSESSMENT WORKSHEET

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

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

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

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

1. **Project Title:** City of Afton Wastewater Collection and Treatment System

2. **Proposer:** City of Afton
Contact person: Ron Moore
Title: City Administrator
Address: 3033 St. Croix Trail S.
P.O. Box 219
City, State, ZIP: Afton, MN 55001
Phone: 651-436-5090
Fax: 651-436-1453
Email: administrator@ci.afton.mn.us

3. **RGU:** Minnesota Pollution Control Agency
Contact person: Kevin Kain
Title: Project Manager
Address: 520 Lafayette Rd. N.
City, State, ZIP: St. Paul, MN 55155
Phone: 651-757-2482
Fax: 651-296-2343
Email: kevin.kain@state.mn.us

4. **Reason for EAW Preparation:** (check one)

Required:

- EIS Scoping
 Mandatory EAW

Discretionary:

- Citizen Petition
 RGU Discretion
 Proposer Initiated

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s): Minn. R. 4410.1000 subp. 3.D.

5. **Project Location:**

County: Washington

City/Township: City of Afton

PLS Location (¼, ¼, Section, Township, Range): (¼, ¼, Section, Township, Range):

Portions of Sections 14, 15, 22, 23, 26, and 27 Township: 28 Range: 20

Watershed (81 major watershed scale): Lower St. Croix Watershed

GPS Coordinates to center of LSTS site...

UTM: X:517542.3 Y:4973887.9

Latitude: 44° 55' 5.531" N Longitude: 92° 46' 39.865" W

Tax Parcel Number: numerous

List of Figures:

- Figure 1 - County Map
- Figure 2 – USGS Topographic Map
- Figure 3 – Project Location and Proximity to Adjoining Communities
- Figure 4 – Collection System Service Area Layout
- Figure 5 - LSTS Property and Adjacent Parcel Map
- Figure 6 – LSTS Site & Water Supply Well Setback Distances
- Figure 7 – LSTS Site Plan
- Figure 8 – Proximity of Nearby Septic Systems to LSTS site
- Figure 9 – Farmland of Importance
- Figure 10 - Valley Branch Creek Watershed
- Figure 11 – Afton Zoning Map
- Figure 12 – Minnesota Karst Lands
- Figure 13 – LSTS Site Monitoring Wells and Potentiometric Surface November 26, 2013
- Figure 14 – Water Table Sensitivity to Pollution
- Figure 15 – LSTS Site Soils Map
- Figure 16 - National Wetlands Inventory (NWI) and Public Waters Inventory (PWI)

List of Tables

- Table 1 - Listing of Nearby ISTS Permits Downgradient of LSTS Site
- Table 2 – Summary of Nearby Wells
- Table 3 - Summary of Hydraulic and Organic Loading in the Project Service Area
- Table 4 - Historic and Architectural Resources within Project Area

Appendices

- Appendix A – State Historic Preservation Office Information
- Appendix B – MDNR Natural Heritage and Nongame Research Program Information

6. Project Description:

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

The city of Afton is proposing to install a wastewater collection system and Large Subsurface Sewage Treatment System (LSTS) that would resolve the wastewater treatment issues within the Old Village district of Afton.

- 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.**

Existing Conditions

The city of Afton is located along the St. Croix River in Washington County, Minnesota. The northern portion of Afton is bounded on the east by the communities of St. Mary's Point, Lake St. Croix Beach, and Lakeland (Figures 1-3). The Old Village district of Afton is protected by a

levee that has been susceptible to annual flooding of various magnitudes and is proposed to be re-constructed. The community is unsewered and wastewater is currently managed by individual subsurface treatment systems (ISTS or 'septic system') or cluster subsurface sewage treatment systems (SSTS) many of which are in need of replacement. Some of the ISTS are located within the levee which is scheduled to be replaced.

Proposed Project

The proposed Project would include a conventional gravity wastewater collection system for the service area, a lift station with pressure force main, and an LSTS to treat the collected wastewater, as described below.

Collection System

The proposed collection system is a conventional gravity sanitary sewer comprised of 8-inch diameter trunk lines that would run underground along St. Croix Trail with 8-inch diameter branch lines that would run underground along the side streets. Individual sewer services would connect residential and commercial properties to the trunk sewer and branch lines. The trunk lines on St. Croix Trail would run to a main lift station located at the intersection of St. Croix Trail and Upper 34th Street. The lift station would be an approximately 6 foot diameter concrete underground structure with only the aluminum hatch and vents visible at ground level. Electrical service would be provided to the lift station to power the pump(s). Figure 4 illustrates the proposed layout of the service area collection system. From the lift station, wastewater would be pumped to the LSTS through the below grade force main along the route (Figure 2).

Construction

Collectively, the proposed Project would include the installation of 12,600 feet of new 8-inch sewer line in the service area. Some city streets would require excavation to install the proposed collection system. Streets would be reconstructed shortly after installation is complete. Sewer lines would be constructed of PVC piping. The force main pipe from the lift station to the LSTS site would be 4-inch high density polyethylene (HDPE) that is well suited to the directional drilling method of installation of the force main. Minimum burial depth of the force main would be 7.5 feet underground, and excavations for pipe joints would be approximately 30 feet long by 8 to 10 feet deep. Such excavations are typically open and closed within one working day.

Wastewater would gravity drain from the collection service area to the lift station at St. Croix Trail and Upper 34th Street. Construction of the lift station would require an excavation of approximately 30 feet square to a depth of approximately 17 feet for installation of an approximately 6 foot diameter concrete underground structure. Only the lift station aluminum hatch and vents would be visible at ground level.

From the lift station the force main would be installed through horizontal directional drilling to the LSTS. Horizontal directional drilling (HDD) greatly limits excavation required along St Croix Trail because excavation is limited to pipe connections. Pipe connections would occur at intervals of approximately 500 feet along the 0.6 mile route from the lift station to the LSTS. In general, an individual pipe connection excavation is opened, the pipe connection made, and the

excavation backfilled within a single work day, minimizing the disturbance to individual residents and local traffic. An estimated eight connections would be required to connect the collection area from the lift station to the LSTS site.

The force main would cross beneath the main stem of Valley Branch Creek, and an unnamed tributary to Valley Branch Creek, both of which are identified as designated trout streams by the Minnesota Department of Natural Resources (MDNR). Such crossings require a MDNR License to Cross Public Lands and Waters. The MDNR licensing process encourages low impact crossings that do not disturb the water resource. One of the methods encouraged by the MDNR is horizontal directional drilling. The proposed Project would use horizontal directional drilling to install the force main approximately five feet below the stream beds of Valley Branch Creek and its unnamed tributary. Using the horizontal directional drilling method eliminates temporary or permanent physical or hydrologic alteration of either water body crossing.

Horizontal directional drilling (also known as HDD, directional boring, guided horizontal drilling or slant drilling) is a trenchless technology with a number of advantages over traditional cut and fill trenching for pipe installations, including the following:

- reduces soil/land surface disturbance
- reduces construction stormwater issues
- minimizes safety concerns associated with open excavations
- limits weather related delays
- reduces potential traffic congestion
- minimizes obstructions that otherwise effect trenching

Horizontal directional drilling uses a hydraulically powered machine to rotate, push and pull hollow drill pipe into the trough at variable angles. The bore head is guidable (steerable) by changing its rotation and boring fluid pressures. Prior to initiating work, a bore hole path is surveyed, buried utilities are located, and the site is prepared for the boring equipment. Then, a pilot hole is completed, followed by reaming the borehole to a diameter approximately 25% larger than the pipe to be installed. Upon reaming the bore hole, pull-back operations commence to pull the pipe through the bore hole. Finally, equipment is de-mobilized and site restoration is completed.

Treatment System (LSTS)

The proposed site for the LSTS would consist of a 25 acre parcel located at 2318 St. Croix Trail South. Approximately 3.5 acres of the 25 acre parcel would be used for the actual treatment system and constitute the LSTS site. The remaining acreage provides for buffer to adjacent properties. Access for LSTS facility operations would be provided by extending the existing driveway to the LSTS site near the center of the property.

The LSTS is an underground system with communal septic tanks, recirculation tank, recirculating gravel filter, anoxic denitrification component, and eight soil dispersal drainfield adsorption beds. All of these components are at or below grade. The design wastewater flow criteria for the LSTS followed the MPCA *Design Guidance for Large Subsurface Wastewater Treatment Systems* (November 2013) to accommodate the existing and future residential and commercial

properties within the service area based on the service area's 77 residential dwellings (66 existing and 11 vacant parcels) and 25 commercial establishments (22 existing and 3 vacant parcels).

Construction

Above grade facilities would be limited to a control building (approximately 16 ft. x 16 ft.). The control building would house various valves and controls and store miscellaneous items pertinent to system operation and maintenance. Two yard lights would be affixed to the control building, each with on/off controls. Other above grade appurtenances to the LSTS would be limited to 24 drainfield adsorption bed vent/observation pipes, each consisting of 4 inch diameter PVC extending approximately 12 to 18 inches above grade. Concrete tank manway covers would extend approximately 4-inches above grade.

The LSTS site would be fenced and gated. Fencing would include installation of a new four-foot high woven wire fence around that portion of the LSTS that includes the control building, subsurface septic tanks, denitrification units, and recirculating gravel filter. Existing fencing exists around the perimeter of the 25 acre LSTS site. Some of the existing fencing is in poor condition and would be replaced as necessary. At the conclusion of construction the LSTS area would be seeded to establish upland prairie native plant communities consistent with the oak openings and barrens habitat of pre-settlement times. Such seed mixes include pollinator-friendly species used by birds, butterflies and bees.

The LSTS site plan provided as Figure 7 illustrates the location of the access road, building, recirculating gravel filter, drainfield absorption beds and the proximity of these operations to the boundaries.

Site Selection – LSTS

Preliminary assessment of potential LSTS sites included the evaluation of soil, wetland, and groundwater characteristics. Other important considerations included available acreage, proximity to the service area, and location outside of the St. Croix River floodplain and St. Croix Bluff Land. The proposed LSTS site provides the desired locational and physical characteristics as it offers the favorable characteristics of being in close proximity to the service area, is outside of the St. Croix River floodplain and St. Croix Bluff Land District, is of appropriate acreage for the needed LSTS, offers a buffer from adjacent properties, has the needed soil characteristics for proper LSTS treatment and operation, and was available for purchase by the city of Afton.

The LSTS site provides for a reserve drainfield area. This matches both Afton's specific need to address ISTS on small lots in the Old Village District, and Afton's Comprehensive Plan which calls for rural development with private wells and septic. Minnesota design criteria for this type of wastewater treatment system require a minimum 3-foot separation between the drainfield adsorption beds and the groundwater. At the LSTS site the separation distance is more than 30 feet.

Both the Minnesota Department of Health (MDH) Well Code (Administrative Code Chapter 4725) and the Minnesota Groundwater Protection Act of 1989 regulate the placement of potential sources of contamination near an existing water supply well. The standard well

isolation distance (set-back distance) is 300 feet from a subsurface dispersal drainfield with design flow greater than 10,000 gallons per day. If the well has less than 50 feet of watertight casing, it is considered to be a sensitive well. The required setback distance to sensitive wells is increased to 600 feet. The proposed Project is greater than 10,000 gallons per day and the proposed LSTS plan accommodates the appropriate isolation distances as defined in Minn. R. 4725. The distance of wells to the LSTS drain field is illustrated on Figure 6.

The city of Afton would employ a licensed wastewater treatment plant operator to oversee LSTS system operations and related monitoring and reporting in accordance with Minnesota Pollution Control Agency (MPCA) regulations and permits.

Construction Schedule

Construction of the collection system and LSTS for the Project is targeted for 2015 and is estimated to last approximately three-five months depending on weather conditions. Construction of the remaining portion of the collection system is targeted for 2016 and is estimated to last approximately three-five months. During construction of the proposed Project, the existing ISTS within the service area would continue to serve properties until the new system is operational. Individual properties would be connected to the collection system sewer line through a pipe that would be extended from the sewer line to an individual home. This would be accomplished through excavation of yards, and installation of new pipe to the existing sewer line at each property. Individual hookups would occur after the proposed Project is fully operational. Abandonment of ISTS would follow system abandonment requirements contained in Minn. R. 7080.2500. Each existing ISTS septic tank would be located, the top would be removed and the contents pumped out and disposed of properly. The bottom of the tank would be crushed, left in place, and then filled with sand or other acceptable backfill material to prevent ground settlement.

The sewer line that serves individual properties is anticipated to be installed using open cut excavations. Open cutting would temporarily disturb existing streets and properties by removing the surface to install the pipe.

It is anticipated that the proposed LSTS would be constructed initially and/or concurrently with the proposed collection system and force main. Residential and commercial hookups would not occur until the proposed Project is operational.

c. Project magnitude:

Total Project Acreage Inclusive of service area and 25 acre LSTS property	287 acres
Linear project length: Installation of new 8-inch sewer line in service area and 0.6 mile 4-inch force main	12,600 feet
Number and type of residential units: Project would serve existing and future residential properties in the Old Village District of the city of Afton	See Note
Commercial building area (in square feet): Project would serve existing and future commercial	See Note

properties in the Old Village District of the city of Afton	
Industrial building area (in square feet)	0
Institutional building area (in square feet)	0
Other uses – specify (in square feet): LSTS Site control building	256 sq. ft.
Structure height(s)	Approx. 10 ft.

- 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 city of Afton is protected by a levee susceptible to annual St. Croix River flooding of various magnitudes. The levee is not Federal Emergency Management Agency (FEMA) accredited and deficiencies have been identified by U.S. Army Corps of Engineers inspections. Substantial flooding has occurred within the City in 1965, 1969, 1993, 1997, and 2001 with smaller flooding events occurring other years. These flooding events have caused considerable damage. Associated expenses and impacts have caused a significant financial burden to not only the City and its Old Village, but its residents and other businesses.

ISTS/SSTS currently serve residential dwellings and commercial establishments within the Old Village district of Afton and some of these systems are located within the levee. Each homeowner and business is currently responsible for maintenance and upkeep of their own ISTS/SSTS and these systems are operated and maintained in variable conditions. During flooding events and high groundwater periods, inadequately treated wastewater from non-compliant systems assimilates with ground and surface water, potentially exposing the public to infectious diseases caused by pathogenic organisms. The proposed Project would replace noncompliant ISTS/SSTS and prevent potential contamination from levee associated flooding events. In addition, the elimination of ISTS/SSTS currently located within the levee, would allow for necessary levee improvements. This would reduce potential flood damage and financial, health and sanitation impacts to the City, residents, businesses, and the general public.

- e. **Are future stages of this development including development on any other property planned or likely to happen? Yes No**
If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

The proposed Project design is specific to a defined service area and the LSTS has been designed to meet the existing needs of the service area.

- f. **Is this project a subsequent stage of an earlier project? Yes No**
If yes, briefly describe the past development, timeline and any past environmental review.

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

	Before	After		Before	After
Wetlands	65.0	65.0	Lawn/landscaping	0	0
Deep water/streams	0	0	Impervious surface	93.9	93.97
Wooded/forest	107.9	107.9	Stormwater Pond	0	0
Brush/Grassland	20.5	20.15	Other (describe): Gravel	0	0.28
Cropland	0.2	0.2			
			TOTAL	287.5	287.5

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

Table 1. Listing of Nearby ISTS Permits Downgradient of LSTS Site

Unit of Government	Type of Application	Status
Minnesota Pollution Control Agency	NPDES Stormwater Construction Permit	To be acquired
	SDS Operating permit	To be acquired
Minnesota Department of Natural Resources	License to Cross Public Lands and Waters	To be acquired
	Public Waters Work Permit	To be acquired
Valley Branch Watershed District	Valley Branch Watershed District Permit	To be acquired
Washington County	Septic Tank Abandonment Form	To be submitted for each individual property
Washington County	Utility Crossing Permit	To be acquired

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

9. Land Use:

a. Describe:

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

The area of the proposed Project is within portions of the city of Afton, located along the St. Croix River. This community is characterized as a small, historic river town, surrounded by rural large lot homes, farmsteads and open areas.

The proposed Project service area would include the developed Old Village district of Afton and its 77 residential properties and 25 commercial properties.

Designated Parks, Recreation Areas or Trails

The St. Croix Trail runs through the center of the proposed service area, along St. Croix Trail South road. The portion of the St. Croix Trail that runs along County Road 21 through Afton may be temporarily impacted during construction of the proposed Project. An alternative trail route would need to be used during construction. Measures to minimize construction impacts would be used, and use of the trail would be restored upon completion of construction in that area. The Afton Bluffs Trail is located along Afton Boulevard and would not be impacted by the proposed Project.

Afton's Town Square Park is located along St. Croix Trail in the central portion of the proposed service area. There would be no impacts to the park from the proposed Project.

The Belwin Conservancy currently owns 1,364 acres that is managed as a nature preserve with oak savannas, woodlands, tallgrass prairie, and wetlands. The Conservancy properties are not all contiguous and extend from near Interstate Highway 94 on the north to parcels that are located approximately one-third mile west of the proposed LSTS site. The Belwin Conservancy would not be impacted by construction or operation of the proposed Project.

Prime or Unique Farmlands

The proposed Project area soils were evaluated to determine whether prime or unique farmland exists. Based on the soils review, there are approximately 12 acres of soils classified as farmland of statewide importance in the 25 acre LSTS property (see Figure 9). This 25-acre property is currently the location of a vacated residence with the remaining portion of the property undeveloped and not currently used for the agricultural purposes. Of the 12 acres, approximately two acres would be converted from the current land cover by the proposed LSTS.

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

The city of Afton's most recent Comprehensive Plan was adopted in 2008. This plan outlines goals and policies for wastewater in the community as listed below.

- Protect ground and surface waters to the greatest extent practicable by improving the quality of wastewater effluent.
- Explore the possibility of a municipal wastewater collection and treatment system to serve properties within the Old Village, conditioned on users and potential users paying for both the construction and ongoing operating costs.
- Protect the groundwater from chemical or hazardous waste introduced from wastewater systems.
- Reduce the volume of wastewater that is discharged to the soils of Afton in the floodplain.

The proposed Project is consistent with the stated goals of the 2008 City's Comprehensive Plan.

The proposed force main and LSTS portion of the proposed Project is also within the Valley Branch Watershed District (VBWD) (Figure 10). The VBWD Management Plan for 2005 – 2015 outlines goals and policies for surface water quality, stream management and restoration, stormwater runoff management, water level and floodplain management, groundwater management, wetland management, and erosion prevention and sediment control. The VBWD also recognizes the importance of properly designed and functioning wastewater systems to protect surface water from wastewater contaminants most notably coliform bacteria.

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

The proposed Project includes several different City zoning districts as illustrated by Figure 11. Within the wastewater collection service area there are three zoning districts:

- Village Historic Site – Residential (VHS-R)
- Village Historic Site – Commercial (VHS-C)
- Rural Residential (RR)

The LSTS site is solely in a Rural Residential zoning district.

Due to the proximity of the proposed Project to the Lower St. Croix River, the wastewater collection service area portion of the proposed Project is also located within overlay zoning for shoreland management (i.e., the area within 1,000 feet of public waters), 100-year floodplain, and St. Croix River Bluffland (i.e., Lower St. Croix Wild and Scenic Riverway).

The Lower St. Croix River is designated as a National Scenic Riverway as part of the National Wild and Scenic Rivers program, which was implemented by Congress in 1972. The Lower St. Croix River is jointly managed by the National Park Service, Wisconsin Department of Natural Resources, and Minnesota Department of Natural Resources. The lower 42 miles of the St. Croix River is classified as recreational, which is described as rivers that are generally free flowing but have undergone some form of impoundment or diversion and may have adjacent lands that have been considerably developed. Management of the river includes specific development regulations that are enforced through local planning and zoning ordinances.

- 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 proposed Project coincides with the goals identified in the city of Afton's 2008 Comprehensive Plan and is also compatible with the existing zoning regulations. The proposed Project would contribute directly to accomplishing the stated goals of the plan, including the protection of surface and ground waters by improving the quality of wastewater effluent and the creation of a collection and treatment system for the Old Village. The proposed Project would also be consistent with the VBWD plan by helping to reduce bacteria loads to surface waters by eliminating existing systems that are non-compliant and replacing them with a new LSTS system capable of tertiary treatment of wastewater.

The proposed Project is compatible with current overlay zoning requirements for shoreland management, 100-year floodplain, and St. Croix River Blufflands. Overlay zoning requirements are enforced by the City. The ground surface elevations associated with the proposed LSTS operations range from approximately 720 to 730 feet and are thus significantly above the 500-year, 100-year, 50-year, and 10-year floodplain elevations of the St. Croix River that are approximately 695 ft., 691.5 ft., 690 ft., and 686.5 ft., respectively.

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

The proposed Project is compatible with existing plans and zoning regulations. The purpose of the Project is to improve currently inadequate wastewater treatment to protect water quality and public health. Measures have been taken in the proposed design and construction methods to minimize potential environmental impacts.

There are no City permits or special zoning provisions required for construction and operation of the proposed Project. A National Pollutant Discharge Elimination System (NPDES) stormwater construction permit and VBWD permit would be required to provide for erosion and sediment control measures and a surface water runoff plan. These construction stormwater requirements coincide with provisions of Article IV of the City's ordinance for the work completed in the Lower St. Croix River Bluffland and Shoreland Management overlay zoning districts. The VBWD Watershed District permit would also include stormwater runoff requirements through volume control.

For the proposed Project, all current septic and pump tanks on residential and commercial properties within the service area would be abandoned following environmental protection standards as set forth in Minn. R. 7080.2500-System Abandonment.

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.**

There are no known geologic site hazards (i.e., sinkholes, shallow limestone formations or karst conditions) in the vicinity of the proposed Project. According to the *Geologic Atlas, Washington County, Minnesota* (Swanson & Meyer, Minnesota Geological Survey, 1990) the LSTS site lies on lower terrace deposits of fine to coarse sands and gravels overlying bedrock of the Eau Claire Formation and Mount Simon Sandstone.

Based on the review of the geologic references, caves and sinkhole features (karst features) may be common in the carbonate bedrock formations within the southeastern portion of Washington County; however, due to the absence of carbonate bedrock (limestone and dolostone) in the immediate vicinity of the proposed Project, karst features are very unlikely to exist or develop. Figure 12 illustrates the proximity of the proposed Project to potential karst areas.

Actual site geologic conditions were evaluated through the completion of an investigation in October 2013. The investigation included four soil borings, each of which was converted to a monitoring well. The monitoring well locations are illustrated on Figure 13 and identified as MW-1 through MW-4. Each boring was advanced to approximately 7 feet below the observed shallow unconfined groundwater table and a 2-inch diameter monitoring well installed. Boring depths ranged from 47 to 60 feet below grade.

The results of the investigation were documented in the *Detailed Hydrogeologic Characterization and Evaluation - Proposed Wastewater Treatment Site City of Afton* (Wenck Associates, January 2014). The borings confirmed the geologic conditions suggested by regional information. At all four drilling locations fine to coarse sands and gravels typical of outwash and alluvial deposits were encountered. Beneath the northern portion of the Site at MW-2, Eau Claire Formation bedrock was encountered, at approximately 50 feet below grade. Bedrock was not encountered at the other three locations.

The water table beneath the LSTS site has a 'High' sensitivity to pollution because of the relatively high permeability of the alluvial deposits that allow for rapid infiltration of water. It is noted that the entire area in the vicinity of the collection system service area and LSTS site has either a 'High' or 'Very High' sensitivity classification as illustrated on Figure 14.

To address the sensitivity of the receiving environment to potential groundwater impacts, the State Disposal System (SDS) (wastewater) permit for the proposed LSTS would require an end-of-pipe effluent limit of 10 mg/L total nitrogen. The proposed LSTS includes advanced treatment with primary, secondary, and tertiary treatment components designed to meet this limit, which is notably lower than typical septic tank effluent total nitrogen concentrations that range from 25 – 60 mg/L, but can be up to 80 mg/L (U.S. EPA)

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

Soil information for the LSTS site was obtained using the Natural Resources Conservation Service (NRCS) web-based interactive mapping tool that provides information related to soils, slope, and site use suitability and limitations. There is several soil complexes located on the LSTS site with the similarity of being generally deep, well-drained soils deposited in outwash or alluvial environments. The most common being the Burkhardt complex that makes up approximately 49% of the LSTS site including the 3.5 acres in which the LSTS operations would be located. The Burkhardt is described as a sandy loam with shallow (0 to 3%) slopes that are not prone to erosion.

Soils existing at the proposed drainfield location are well suited for a soil-based absorption bed system. According to the USDA –NRCS Washington County Soil Survey, soils at the site are mapped as the Burkhardt and Mahtomedi soil series. A soil and site investigation completed in October 2011 and October 2013 confirmed these soils are present at the drainfield site. Both soil series are well drained featuring sandy loam/loamy sand over sandy outwash material allowing for moderate to rapid infiltration. No signs of seasonal groundwater or bedrock were observed. The depth to groundwater is 40 – 49 feet below ground surface.

Soils at the proposed site are highly permeable and granular in nature; therefore, the site is not susceptible to compaction or plugging which would limit the sites useful life. Fundamentally, these conditions could allow the drainfield to last in perpetuity. In addition, the permeable nature would facilitate infiltration and final treatment of highly pretreated effluent while maintaining adequate isolation distances to nearby potable wells. Because of the granular nature of the soils, the site is well-drained and would limit ponding from rainfall events; this in turn would limit construction delays and overall project costs.

The proposed absorption bed system consists of eight zones of equal size. Each zone would be pressurized by a submersible pump within the dose tank. Pressure distribution provides equal distribution to the bed and would allow aerobic conditions to perpetuate. Maintaining an aerobic environment is important as these conditions would allow bacteria within the soil to remove remaining pathogens and viruses from the treated effluent. A majority of the 25 acre LSTS property would remain undisturbed including those areas with slightly steeper slopes.

Disturbance Area

For the proposed Project, installation of the new sewer line in the service area includes approximately 12,600 feet of new 4 to 8-inch sewer and 4-inch force main that would cumulatively require approximately 3.5 acres of ground disturbance through excavation and grading. This would result in approximately 45,000 cubic yards of soil moved, most of which would be backfilled into the excavated areas.

Force main installation would largely be completed with horizontal directional drilling. Horizontal directional drilling reduces the need for excavation to pipe connections that are required at intervals from 300 to 500 feet. Each pipe connection excavation is opened, the pipe connection made, and the excavation backfilled within a single work day. An estimated 8 to 10 connections would be required to connect the force main from the lift station to the LSTS site over the 0.6 mile length of the force main. An estimated 100 cubic yards (CY) of soil would be excavated (and backfilled) for each connection. Lift station construction would also require an excavation of approximately 30 feet square to a depth of approximately 17 feet (567 CY).

Construction of the LSTS portion of the proposed Project would require approximately 3.5 acres of ground disturbance through excavation, grading, installation of the below grade components, backfilling, final grading, and seeding to re-establish groundcover. The excavation work would result in approximately 12,000 CY of soil moved, most of which would be backfilled into the excavation areas or graded into final contours at the LSTS site.

Potential Soil Impacts

Construction of the proposed Project is anticipated to cause temporary impacts to soils through excavation. Permits for erosion and sediment control are discussed under Item 11.b.ii. These impacts would be temporary and limited to construction. A portion of proposed Project's construction would occur through horizontal directional drilling which would reduce the need for excavation and ground disturbance.

Operation of the proposed Project would result in discharge of treated wastewater into the soil on the LSTS site. The proposed LSTS would address nitrogen treatment by supplemental components to treat total nitrogen to less than or equal to 10 mg/L. Due to the sandy textured soils present across the LSTS site, there would be minimal nitrogen uptake within the soil. Water movement within the soil would be dominantly vertical as it recharges groundwater approximately 40 feet or more below grade. The proposed LSTS would effectively treat wastewater to reduce nitrogen levels and remove other wastewater constituents.

Bacteria present in the wastewater attach themselves to the filter surface and as more wastewater passes over, aerobic bacteria extract nutrients, organic matter, and pathogens by utilizing the dissolved oxygen within the filtrate. Ambient oxygen is readily available within the filter and promotes various chemical and biological reactions. To meet the LSTS total nitrogen 10 mg/L end-of-pipe limit, supplemental denitrification components would be provided.

Recirculating media filters require routine operation and maintenance responsibilities. Typical tasks include monitoring and logging flows, rotating cells, inspecting pumps and controls, examining the media filter, field flushing distribution laterals, inspecting filtrate quality, and checking treatment tanks for sludge. The tanks must be pumped periodically, as required by MPCA. These measures would avoid potential for groundwater contamination from the proposed Project by maintaining system efficiency.

The proposed Project would improve groundwater quality within the city of Afton as it would eliminate existing ISTS within the Old Village district. The 2010 evaluation of ISTS within the Old Village district identified 27% of the ISTS were non-compliant because of surfacing effluent or a drainfield that fails to protect groundwater.

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

11. Water Resources:

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

The proposed Project would serve residential and commercial properties located within the 100-year floodplain of the Lower St. Croix River; many of which currently have noncompliant ISTS. The public waters and wetlands in the vicinity of the proposed Project include the St. Croix River, Valley Branch Creek, an unnamed tributary to Valley Branch Creek and an unnamed tributary to the St. Croix River (Figure 16). Identified wetlands include the riparian areas of the St. Croix River, Valley Branch Creek, and an Unnamed Tributary, none of which would be impacted by the proposed Project. Smaller wetlands are also located west of the LSTS site (Figure 16).

Valley Branch Creek is a designated trout stream with a naturally reproducing population of brook trout as well as brown trout and rainbow trout. The St. Croix River is listed as impaired for phosphorus and the unnamed tributary to the St. Croix River in the southern portion of the proposed wastewater collection service area is impaired for coliform (*Escherichia Coli* or *E. Coli*). Phosphorus impairment is typically associated with agricultural runoff and wastewater, while *E. Coli* impairment can arise from combined sewer overflows, leaking septic tanks, sewer malfunctions, animal feedlots, and other sources.

The proposed Project directly addresses non-compliant ISTS currently located in the Old Village district that have surfacing effluent or drainfields that fail to protect groundwater. During flood events inadequately treated wastewater from non-compliant ISTS may discharge directly to surface waters introducing *E. Coli* and other impacts to those surface waters. Removal of ISTS from the Old Village district would eliminate that impact to surface waters. The city of Afton is also constructing stormwater improvements in conjunction with the proposed Project that will substantially reduce the amount of phosphorus loading to the St. Croix River. The LSTS would manage wastewater collected from the Old Village district. Treated effluent from the LSTS would infiltrate the ground through the drainfield adsorption beds; there would be no discharge of treated (or untreated) wastewater to surface waters associated with the proposed Project.

A review of the National Wetlands Inventory (NWI) coverage for the LSTS site identified one potential wetland basin. The basin is classified as a Type 3/Type 4 shallow/deep marsh complex. The NWI coverage indicates this wetland is approximately 1.7 acres in size none of which would be affected by the proposed Project. A field investigation of the 25 acre LSTS

property was conducted by a certified wetland delineator in the fall of 2012. The investigation revealed one type 2/3 wet meadow wetland basin on the LSTS site. The wetland basin is located on the southern portion of the 25 acre site and is characterized as a marsh complex with a vegetation community dominated by reed canary grass, cattails and willow shrub species. This wetland is at the headwaters of the unnamed tributary south of the LSTS site. There were no other wetland basins identified on the LSTS site (see Figure 16). The proposed Project would not disturb or impact the wetland on the LSTS site.

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

The hydrogeologic conditions at the LSTS site were evaluated by the completion of the October 2013 investigation that installed four groundwater monitoring wells. The depth to groundwater as measured at these monitoring wells ranged from approximately 40 to 49 feet below grade. Groundwater elevation data collected from the monitoring wells has identified groundwater flow to be from west-southwest to east-northeast. This flow direction, toward the St. Croix River, is generally consistent with regional information presented by Swanson & Meyer (Minnesota Geological Survey, 1990). Figure 13 illustrates groundwater elevations and flow direction as measured at the LSTS site.

There are no known springs or seeps located in the immediate vicinity of the LSTS site. Groundwater discharge in the form of springs, seeps or base flow is expected to occur within Valley Branch Creek south of the LSTS site and the locations of springs along Valley Branch Creek are shown on Figure 14. There would be no discharge of wastewater or LSTS effluent to surface waters. The LSTS site and service area are not located within a MDH wellhead protection area. The nearest such area is that associated with the cities of Lakeland and Lake St. Croix Beach.

Currently there are five wells on the LSTS site. These include the four monitoring wells installed in 2013 for site evaluation and the water supply well at the currently vacant residence as listed below. In addition to the wells located at the LSTS site, records of a number of wells in the LSTS site vicinity were identified through a search of the Minnesota Geological Survey's online County Well Index (CWI). That database search was completed for the Hydrogeological Investigation Work Plan for the LSTS site (Wenck, June 2013) and revealed 10 field verified wells within 600 feet of the LSTS drain field. It appears that most of these wells are private domestic water supply wells. The summary of wells on the LSTS property and within 600 feet of the LSTS drain field site is provided as Table 2. Well locations, including nearby wells that are not recorded on the CWI, are identified on Figure 6.

Table 2. Summary of nearby wells

Minnesota Unique Well No.	Well Owner's Name	Approximate Surface Elevation (ft above MSL)	Well Completion Depth (ft below grade)	Date Drilled	Casing Diameter (in)	Casing Depth (ft below grade)	Depth to Bedrock (ft below grade)	Static Water Level at time of Installation (ft below grade)	Static Water Level at time of Installation (ft above MSL)
110406 *	ECKERSTROM, TY	725	75	3/5/1975	4	69	59	35	690
139290 *	--	731	120	2/13/1987	4	87	56	45	686
154454 *	KOHLER, CRAIG	720	89	4/6/1979	4	81	62	15	705
185781 *	BELZ, ROBERT	729	200	8/19/1982	4	188	120	50	679
208028 *	--	720	147	11/5/1958	10	43	43	40	680
263117 *	BEACH BAR	708	No Information	No Information	No Information	No Information	No Information	No Information	No Information
410957 *	--	729	120	2/27/1987	4	90	58	--	--
457687 *	--	728	97	1/26/1989	4	84	31	55	673
511750 *	EASTWOOD, DAVID A	710	261	9/4/1990	4	230	220	65	645
599981 *	HOLMES, MARK	702	169	6/19/1998	4	166	--	30	672
649686 *	KITTLESON, KIP	702	165	2/26/2001	4	162	--	40	662
665332 *	PEARSON, ROGER	701	165	9/19/2001	4	162	--	30	671
665333 *	CHAVES, MICHELLE	701	165	10/9/2001	4	162	--	30	671
Unknown	City of Afton (LSTS Property dwelling supply well)	715	to be verified	unknown	to be verified	to be verified	--	unknown	unknown
797973	City of Afton (monitoring well MW-1)	726	55	10/15/2013	2	45.5	--	48	678
797974	City of Afton (monitoring well MW-2)	730	56.5	10/15/2013	2	47	--	50	680

797975	City of Afton (monitoring well MW-3)	719	45	10/15/2013	2	35.7	--	38	674
802701	City of Afton (monitoring well MW-4)	724	46.5	10/16/2013	2	37	--	42	682

* Well within 600 feet of LSTS property boundary from Minnesota Department of Health County Well Index records

-- not established

- b. Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.
- i. Wastewater - For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.
- 1) If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.

There is currently no publicly-owned wastewater treatment facility that serves Afton. The proposed Project would result in a publicly-owned treatment facility and has been designed to handle current and projected future wastewater treatment needs in the community. See Item 6.b. for a detailed description of the proposed Project.

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

Wastewater currently generated by residential and commercial properties in the city of Afton is treated by ISTS on each property. The proposed Project provides for the construction of a wastewater collection system for a defined service area within Afton, and a LSTS to treat the wastewater. The individual residential and commercial properties within the service area would connect to the collection system and their ISTS properly abandoned. There are no industrial users in the city of Afton.

The *Facility Plan* completed for the proposed Project evaluated current and estimated future quantities of wastewater generated by the city of Afton. Table 3 provides a summary of hydraulic and organic loading in the community. The evaluation of wastewater treatment designs and alternatives used this data to determine the sizing of the force main and LSTS portions of the proposed Project.

Table 3: Summary of hydraulic and organic loading in the Project service area

Parameter	Units	Value	Comments
Hydraulic Loading			
Residential Flow (77 households)	Gallons per day ("gpd")	18,394	Includes vacant parcels (11) in service area
Commercial Flow (22 establishments)	gpd	27,353	Includes vacant parcels (3) in service area
Inflow/Infiltration Allowance	gpd	4,800	200 gpd/in. diameter piping/mile
Total Peak Wastewater Flow	gpd	50,550	Peak Wet Weather Flow
Organic Loading			
Biochemical Oxygen Demand (CBOD)	lb/day	154.3	Residential & Commercial
Total Suspended Solids (TSS)	lb/day	126.7	Residential & Commercial
Ammonia Nitrogen (NH ₃ -N)	lb/day	14.4	Residential & Commercial
Phosphorus (P)	lb/day	5.5	Residential & Commercial

Source: *Wastewater Collection & Treatment System Facility Plan* (Wenck Associates and WSB & Associates March, 2014)

The proposed LSTS would include necessary tertiary equipment and be designed to meet LSTS end-of pipe effluent constituent limitations of 10 mg/L total nitrogen. This would be accomplished through use of septic tanks, a recirculating gravel filter and a denitrification unit. Duplex pumps within the recirculation tank would dose a specified volume of filtrate to one gravel filter cell. Wastewater pumped to the filter would flow downward through the gravel media where it would undergo various physical, chemical, and biological treatment processes. After denitrification treated wastewater would flow to the below-grade drainfield adsorption beds for final dispersal into the ground.

The LSTS site was selected in part because of its favorable soil conditions and separation distance to the seasonal high groundwater elevation. The LSTS design would treat wastewater such that it would meet end of pipe effluent limitations and be less than or equal to 10 mg/L total nitrogen. Most wastewater pollutants would be removed in the initial phases of the treatment system and disposed of upon pumping of sludge from the septic tanks which would occur on approximately an annual basis as needed. Further treatment using the recirculation tank, recirculating gravel filter and anoxic denitrification filter, would occur prior to final dispersal to the drainfield.

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

There would be no direct discharge of stormwater from the proposed LSTS operations. The LSTS site is well drained and stormwater will infiltrate thus limiting and ponding concerns. The proposed Project's purpose is to protect and improve water quality by replacing ISTS in the service area with a community collection and treatment system designed to meet MPCA standards for management of wastewater. None of the nearby water bodies, including the on-site wetland, Valley Branch Creek, the St. Croix River, or the unnamed tributaries would receive surface water discharge from the LSTS operations. The drainfield adsorption beds would allow treated wastewater to gradually infiltrate through the soil and disperse down to groundwater. The nearest surface water is Valley Creek which is located 1,550 feet southerly of the proposed LSTS.

- 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.**

Upon completion of construction, streets and pervious surfaces would be restored to their pre-construction conditions and overall, quantities and quality of runoff from the proposed Project area would not change due to the proposed Project.

Similarly, the LSTS site would undergo minimal changes to stormwater post construction. Only approximately 3.5 acres of the 25 acre LSTS property would be affected and only the small portion associated with the gravel service road and control building would be impermeable and all stormwater would follow existing site drainage.

Because the proposed Project would disturb more than one acre of land, it would require a NPDES stormwater construction permit, as well as the development of a Stormwater Pollution Prevention Plan (SWPPP). The City's SWPPP would include erosion control measures, as well as construction BMPs to control sediment runoff and erosion at the work sites during construction. Erosion and sediment control measures, including bio-rolls/silt fence, would be installed prior to any surface disturbance and all exposed soil areas would be stabilized as soon as possible to limit soil erosion. The SWPPP would also identify an inspection schedule to ensure erosion control BMPs are functioning properly during construction. BMPs would include coordinating work such that excavations are opened to coincide with the timing of pipe connections and lift station construction. Restoration in a timely manner includes backfilling to existing grade, seeding, mulching, paving, and performing follow-up inspection.

A permit from the VBWD would also be needed for the proposed Project and include a requirement of an erosion control plan for construction. VBWD has rules regarding new impervious surface. Based on current VBWD rules, the excavation and reconstruction of the city streets would be considered new impervious surface, and therefore would be required to meet the VBWD volume control rule standards. The erosion control

measures would include the installation of silt fencing, bio-rolls and other measures around the areas where soil would be disturbed to avoid impacts to the identified wetland basin.

During construction, erosion and sedimentation control measures would be used to minimize the potential for surface water runoff impacts from proposed Project construction.

With the implementation of the stormwater erosion control measures and BMPs sedimentation impacts to the wetland basin at the LSTS site would not occur nor would there be sedimentation impacts to Valley Branch Creek, its tributary or the St. Croix

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

The proposed Project would not require appropriations of water. Dewatering activities may be required on a temporary basis during installation of the lift station for the force main. The quantity of water for construction dewatering is unlikely to be significant and would only be temporary during construction that may extend to a few weeks. In the event that dewatering is required, temporary dewatering permits would be obtained from the MDNR.

Startup of the LSTS would require approximately 250,000 gallons of water that would be obtained from the Lakeland water utility hydrant along Quant Avenue adjacent to the LSTS site. The water would be used to perform the recirculating gravel filter water balance testing according to MPCA Prefill and Water Balance Criteria. Upon completion of the water balance testing, the water would be used to fill the tanks and perform startup activities.

Water use at the LSTS facility would be minimal and limited to such things as hand washing and rinsing of sample containers. For this limited water use, a 100-gallon cistern would be installed within the control building and filled from off-site sources as needed.

As noted in Item 11.a.ii there are four monitoring wells currently located at the LSTS site that were used to properly evaluate hydrogeologic conditions. Well MW-1 is centrally located to the proposed LSTS facility and would need to be properly sealed. In addition, it is anticipated that the existing well at the vacant residence would also be sealed unless its depth and construction can be confirmed to document it is not a 'sensitive' well (less than 50 feet of watertight casing). Well sealing would be completed by a licensed well contractor in accordance with the MDH Well Code.

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.**

Riparian wetlands are located along Valley Branch Creek and its unnamed tributary and at the southern portion of the LSTS site. None of the wetlands would be affected by the proposed Project during or after construction. There is no work that would be conducted within the riparian area of the St. Croix River.

The installation of the force main between the proposed collection area and the LSTS site would require the crossing of Valley Branch Creek and the unnamed tributary north of Valley Branch Creek and their riparian wetlands (see Figure 16). As discussed in Item 6.b. such crossings require a MDNR License to Cross Public Lands and Waters. The MDNR licensing process encourages low impact crossings such as that provided by horizontal directional drilling. This method would be used to install the force main beneath Valley Branch Creek and the unnamed tributary. Using the horizontal directional drilling method eliminates temporary or permanent physical or hydrologic alteration of either water body crossing.

The Type 2/3 wet meadow wetland identified at the LSTS site is located in the southern portion of that property. The wetland boundary is located approximately 200 feet south of the south edge of the proposed LSTS drainfield. The construction and operation of the LSTS drainfield, control building, access road and incoming wastewater force main would not impact the wetland on the LSTS site.

No wetland impacts would occur within the collection area, along the force main route, or at the LSTS site, as a result of the proposed Project; therefore, wetland permitting, replacement or mitigation would not be required.

- 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.**

The proposed Project would not physically alter surface waters in the area or effect watercraft usage. The majority of pipe and force main installation would be completed using horizontal directional drilling or open excavation within city streets and adjacent properties. None of the work would be completed in immediate proximity to the St. Croix River. The force main crossing beneath Valley Branch Creek, and its unnamed tributary, would be completed by horizontal directional drilling, in accordance with a MDNR License to Cross Public Lands and Waters.

Overall proposed Project construction would include development of a construction stormwater management plan, NPDES stormwater construction permit, VBWD permit and erosion control plan for construction. A SWPPP would be prepared to define erosion control measures, construction BMPs, and inspection schedule. Through the implementation of these storm water control measures, impacts to stormwater runoff and adjacent surface waters would be minimal and temporary.

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.**

The LSTS site is largely open undeveloped land without any structures that require removal or demolition for the proposed LSTS facilities. The existing and currently vacant residence, garage and shed would remain at the property would not be disturbed by the proposed Project.

Phase I and Phase II environmental site assessments were conducted on the LSTS site. The Phase I identified one Recognized Environmental Condition, an abandoned underground fuel oil storage tank (UST) at the southeastern portion of the residence just outside the basement furnace room wall. According to the former property owner, the tank contents were removed and the tank filled with sand when the dwelling was connected to natural gas. The dwelling is currently vacant. The Phase II site assessment collected soil samples in the vicinity of the storage tank for analyses of potential fuel related constituents (volatile organic compounds and diesel range organics). The laboratory results did not detect evidence of a release from the fuel tank. Outside of the above mentioned abandoned UST there are no chemicals or hazardous materials known on the proposed LSTS site nor are there any known pipelines on the property.

- 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.**

Operation of the LSTS would generate septage (sludge) within its pretreatment components particularly the precast concrete tanks. There would be regular monitoring of septage buildup

and periodic removal of the solids would be required approximately once per year for the first compartment of the first septic tank. Septage removal from remaining septic tanks would occur less frequently on a rotating two to eight year schedule. All septage activities, including removal and disposal, would follow Minn. R. ch. 7080 and ch. 7083 for operation and maintenance responsibilities. Septage disposal would be completed by a licensed contractor and occur at a MPCA permitted treatment plant and/or land application site following MPCA Septage Management Guidelines and Federal Land Application of Septage Regulations – 40 CFR, part 503. Specific monitoring and management requirements would be outlined in the LSTS Minnesota state permit. Outside of septage, only minimal quantities of waste (small containers, paper waste, sampling supply materials, etc.) would be generated by the facility operator during LSTS operations. The LSTS would not accept any wastewater delivery via trucks, nor is it designed for that capability.

Solid waste generated during construction of the proposed collection system would include approximately 230 square yards of bituminous pavement from publicly owned roadways that would be removed and recycled or disposed of at a licensed solid waste disposal facility. Upon completion of the collection system, force main and LSTS, the current septic and pump tanks on residential and commercial properties within the Project area would be abandoned following environmental protection standards as set forth in Minn. R. 7080.2500-System Abandonment. Sludge removed from the septic tanks would be managed by a licensed contractor for off-site disposal.

- 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.**

Outside of the abandoned underground fuel oil storage tank associated with the residential dwelling, there are no other below ground storage tanks associated with the 25 acre LSTS property. Operation of the proposed Project would include backup generators at both the LSTS site and Lift Station. The generators would be fueled by diesel and a storage tank of approximately 50 gallons would be provided for each generator. All fuel tanks will comply with applicable above ground fuel tank rules. This volume does not require a Spill Prevention, Control and Countermeasures (SPCC) plan which are required for facilities with volumes of oil related material of 1,320 gallons or more.

During construction within the service area, force main route and at the LSTS site, contractor equipment would be present. Such equipment does contain limited quantities of fuels and oils and maybe serviced during the proposed Project by the contractor. The relatively short duration of construction (estimated at 3 – 5 months) would not require semi-permanent fuel storage or equipment maintenance areas. Fueling and servicing of contractor equipment would be provided by a mobile service at the contractor's direction.

All septage activities, including removal and disposal, would follow Minn. R. ch. 7080 and ch. 7083 for operation and maintenance responsibilities. Septage disposal would occur at a

MPCA permitted treatment plant and/or land application following MPCA Septage Management Guidelines and Federal Land Application of Septage Regulations – 40 CFR, part 503. Specific monitoring and management requirements for the proposed Project would be outlined in the LSTS's SDS permit. The LSTS would not accept any wastewater delivery via truck, nor is it designed with this capability.

Raw wastewater contains ammonia which is converted to nitrate by bacteria in an aerobic treatment environment. Nitrate is then converted to nitrogen gas in an anoxic, anaerobic environment; a process known as denitrification. At this stage in the nitrogen treatment process, denitrifying bacteria utilize nitrates as the final electron acceptor in metabolism. Denitrifying bacteria can utilize many common external energy sources during the process including raw wastewater, methanol, and acetic acid. The proposed Afton LSTS has included acetic acid as the carbon energy source.

Two denitrification units are proposed to provide an attached-growth environment exclusively for denitrification. A carbon feed system would supply acetic acid to the units. Flow proportional carbon feed pumps would be located within the control building and controlled by the main panel. An established amount of acetic acid would be supplied to the units and mixed with the nitrified effluent. Buried flexible piping within rigid PVC conduit would be routed from the control building to the denitrification units. The below ground units consist of the treatment module equipped with two recirculation pumps housed in an insulated precast concrete tank. The recirculation pumps mix nitrates and acetic acid throughout the media in a quiescent environment promoting denitrification.

The acetic acid would be contained within two 55-gallon drums located within an isolated, vented chemical feed room of the control building. All fittings, piping, and pumps would be acid compatible. Each acetic acid drum would be positioned within a secondary containment trough with capacity to hold the entire drum contents. Acetic acid itself is classified as a weak acid (other than water it is the main component of vinegar). A SPCC plan is not required for the LSTS facility. However, the facility would have an operation and maintenance plan. Handling of acetic acid would follow manufacturer guidelines and the material safety data sheet. All acetic acid is consumed in the treatment process and there is no waste. Empty acetic acid drums are rotated out by the supplier.

- 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.**

Hazardous wastes are not generated by the proposed Project.

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.**

The proposed collection system service area is within the city of Afton, which includes residential and commercial properties and limited wildlife habitat. The city of Afton is located on the banks of the St Croix River which is a major recreational resource for the residents of the

City and tourists. The St Croix River provides habitat for a variety of fish and wildlife species, but none of the work would be completed in immediate proximity to the St. Croix River. The force main route would connect the wastewater collection area with the LSTS site follows existing road right-of-way.

The two streams located between the collection site and the LSTS site, Valley Branch Creek and the tributary, are identified as designated trout streams by the MDNR. Valley Branch Creek is monitored by the MDNR for trout and the MDNR website indicates that the stream contains three species of trout including brook, brown and rainbow trout. The MDNR lists the species as being present in average to above average size and numbers within Valley Branch Creek. The MDNR also notes that Valley Branch Creek has little to no public access, providing recreational opportunities only to private property owners who own parcels along the creek.

An unnamed tributary is approximately one half mile long and flows from just south of the proposed treatment system site south to Valley Branch Creek. Review of the aerial photograph for the area around Valley Branch Creek and the unnamed tributary reveals that there likely are wetland habitats in the riparian areas around Valley Branch Creek. The riparian wetland areas provide habitat for bird and wildlife species.

The LSTS site is mainly comprised of some grass and forest cover with a wetland basin on the south side of the parcel. The cover types present on the parcel provide some habitat to bird and wildlife species. Only approximately 3.5 acres of the 25 acre LSTS property site would be disturbed for the proposed Project (see Figure 5).

- b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-____) and/or correspondence number (ERDB 20130291) 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.**

A Natural Heritage Information System (NHIS) database query request was submitted to the MDNR. The query results indicate a number of plant and animal species with legal status under the Minnesota Endangered Species Law that are within a one mile radius of the proposed Project area (Township 28 N, Range 20 W, Sections 14, 15, 22, 23, 26 and 27). At this time, no other site specific studies have been conducted for the proposed Project area.

The MDNR review indicates that the proposed Project has the potential to impact rare features and recommends that the Project be designed to avoid these impacts which the City intends to follow (see Appendix B). The proposed Project boundary overlaps with a few areas that the Minnesota Biological Survey has identified as Sites of Biodiversity Significance. The boundary also overlaps with a few Central Region Regionally Significant Ecological Areas (RSEA). The MDNR Central Region (in partnership with the Metropolitan Council for the seven-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 MDNR results also indicate that Blanding's turtles (*Emydoidea blandingii*), a state-listed

threatened species, rare snakes, and several species of rare plants have been documented within or near the proposed Project area, as well as rare fish and mussels in the St. Croix River. The project proposer will take appropriate steps to mitigate any potential impacts to these species as discussed below.

- 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.**

There are no anticipated significant impacts expected to fish, wildlife and plant communities as a result of this proposed Project, nor would invasive species be introduced or spread because of this proposed Project. Construction activities include excavation of existing city streets and previously disturbed areas to install the collection system. The proposed LSTS drainfield treatment area would also require excavation of undeveloped grassy and wooded area, and would avoid the wetland area at that site.

Installation of the proposed collections system would be conducted within the existing road right-of-way and would not impact the St Croix River or the fish and wildlife species that utilize the river. Force main installation in the area of Valley Branch Creek, the unnamed tributary and the riparian wetland habitat would be installed by horizontal directional drilling to avoid disturbance and potential impacts to water bodies, other potential fish and wildlife habitat, and fish and wildlife species. The pipe would be drilled from an area outside of the riparian wetland and pushed through the underground soil at approximately 5 feet below the creek bottom to a point on the other side of the creek outside of the riparian area. Construction areas would be restored to its existing conditions upon construction completion.

The proposed LSTS is a below ground system on approximately 3.5 acres of the 25 acre LSTS property. Excavation would be required to install the precast concrete tanks, drainfield adsorption beds, and recirculating gravel filter. Additional grading would be completed for the gravel entrance road and for the control building. Once the proposed LSTS is constructed, the area would be seeded to establish upland prairie native plant communities consistent with the oak openings and barrens habitat of pre-settlement times. Such seed mixes include pollinator friendly species used by birds, butterflies and bees. A small quantity of brush, bushes and small trees would be removed for the LSTS system; the existing tree and brush cover is visible on Figure 5. The wetland and forest cover on the south side of the parcel would not be disturbed. Overall, the amount of habitat alteration on the LSTS site would total less than one acre. Bird and wildlife species that currently utilize the parcel may be temporarily displaced during construction but would be able to continue to utilize the LSTS site after construction is complete.

Based on the map that was provided by the MDNR, which showed the Sites of Biodiversity Significance and RSEA, the proposed Project is expected to avoid these sites. Further, the majority of construction and excavation of the proposed Project would occur in previously disturbed areas, which include city streets, road right-of-way, and residential yards. Potential indirect impacts from surface water runoff would be minimized and a NPDES permit would be required, as further discussed below and under Item 11.b.ii.

Information provided by the MDNR on Blanding's turtles indicates that this species uses both wetland and upland habitat to complete its life cycle. In Minnesota, Blanding's turtles are primarily marsh and pond inhabitants. Calm, shallow water bodies (Type 1-3 wetlands) with mud bottoms and abundant aquatic vegetation are preferred. Nesting occurs during June in open (grassy and brushy) sandy uplands up to one mile from water bodies. Based on the information from the MDNR, any Blanding's turtles in the vicinity of the proposed Project, are most likely to be found near the shoreland and wetland areas, which would be avoided by the proposed Project. Nearby upland areas may provide some turtle nesting areas, but the majority of construction and ground disturbance would occur under existing city streets and residential yards and a very limited portion of the 25 acre LSTS property.

The proposed Project construction activities would temporarily disturb the land surface, but are not anticipated to disturb Blanding's turtle habitat. If Blanding's turtles do inhabit the area, temporary construction impacts are not anticipated to have a substantial effect on this species as measures to avoid impacts to the Blanding's turtle would be taken, as further discussed in Item 13.d.

A number of state-listed species have been documented within the vicinity of the proposed Project. However, impacts to these species are anticipated to be avoided and minimized by using appropriate measures as described in Item 13.d. Significant, if any, impacts from the proposed Project to state-listed species are not anticipated.

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

As further described in Item 15, a NPDES stormwater construction permit would be required for the proposed Project. As part of that permit, a SWPPP would be developed. The SWPPP would include erosion control measures and would also identify an inspection schedule for the site to ensure erosion control BMPs are functioning properly. A Valley Branch Watershed District (VBWD) permit is also required for the proposed Project, which would outline additional surface water runoff control requirements. Erosion and sedimentation control measures used as part of the NPDES permit and VBWD permit would also minimize potential impacts from surface water runoff to Valley Creek and the St. Croix River. This would avoid and minimize potential impacts to rare fish and mussel species in the St. Croix River.

The MDNR provided recommendations for avoiding and minimizing impacts to Blanding's turtles. The proposed Project would incorporate measures recommended by the MDNR that are appropriate for the conditions of the proposed Project, which could include:

- Provide a flyer to contractors working in the area, so they can recognize and avoid turtles
- Do not disturb turtle nests
- Use silt fence to keep turtles out of construction areas and remove fencing after construction
- Check trenches for turtles prior to backfilling and return sites to original grade
- Re-vegetating graded areas with native grasses and forbs

If Blanding's turtles are observed during proposed Project construction activities, construction would cease; MDNR would be notified; and a protection plan to avoid or minimize Blanding's turtle impacts would be implemented prior to continuing construction.

Erosion control measures would be used, as needed, for construction of the proposed Project. If erosion control in the form of groundcover materials is necessary, biodegradable netting, such as natural fiber or biodegradable polyesters, with a rectangular shaped, flexible mesh would be used at the proposed Project site. This would help minimize potential impacts to wildlife, such as snakes and small animals, from getting entangled in the more traditional erosion control netting.

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.

The Minnesota State Historic Preservation Office (SHPO) was contacted regarding known historic or archaeological sites within the vicinity of the proposed Project area. The Minnesota Archaeological Inventory and Historic Structures Inventory were queried, which identified a number of historic and archaeological sites within proximity of the proposed Project area. Fourteen properties from the Historic and Architecture Inventory were identified within the proposed collection system area. These are listed in Table 4. There were no historic properties on the LSTS site. There were no archaeological sites identified within the proposed Project area in the current SHPO database.

Table 4: Historic and Architectural Resources Within Project Area

Inventory Number	Property Type	Address
WA-AFC-005	Cushing Hotel	St. Croix Trail S.
WA-AFC-006	House	St. Croix Trail S.
WA-AFC-007	Paulson House	Perrot Ave.
WA-AFC-009	House	9 th Ave.
WA-AFC-010	House	St. Croix Trail S.
WA-AFC-011	District School No. 24	34 th Street
WA-AFC-012	Afton Congregational Church	St. Croix Trail S.
WA-AFC-013	St. Croix Academy	10 th Avenue
WA-AFC-014	House	St. Croix Trail S.
WA-AFC-015	House	St. Croix Trail S.
WA-AFC-016	House	St. Croix Trail S.
WA-AFC-049	Evergreen Cemetery	Afton Blvd. S.
WA-AFC-051	Peterson House	Afton Blvd. S.
WA-AFC-052	St. Croix Trail, South Drainage Structures	St. Croix Trail S.

Source: SHPO, 2013.

The proposed Project would involve excavation. If cultural resources are uncovered during construction of the proposed Project, construction would cease until SHPO could be notified and proper measures taken to ensure that potentially significant historic or archaeological resources are not impacted.

15. Visual:

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

The proposed Project includes the Old Village district of Afton along the St. Croix River, a designated Wild and Scenic River, and its adjacent bluffland. These are unique resources to the state of Minnesota and were considered for potential impacts from the proposed Project. Construction would entail excavation of small areas in stages to install sewer piping and to construct the proposed LSTS. Construction would require some excavation of existing streets. This would be temporary and occur in specific locations as the proposed Project gradually progresses. Once construction is completed, the excavated areas would be restored. With very minor exceptions, the majority of proposed Project components would be located underground. Above grade components are essentially limited to the control building at the LSTS site and vent piping at the drainfield. The LSTS would be centrally located on a 25 acre property with buffer areas to surrounding property. Potential visual impacts associated with the construction work would be isolated to work areas, be temporary, and have no long-term effects on the scenic character and unique resources in the area.

16. Air:

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

The proposed Project would not produce stationary source air emissions, and therefore would not impact air quality. An air emissions permit is not expected to be applicable due to the size of emission sources, type of emission sources, and quantity of potential air emissions. The primary emission sources at the facility are expected to include small emergency generator engines, wastewater treatment processes, and potentially some ancillary heating equipment. The emergency generators would only be used during emergency situations and routine testing of each generator engine. Diesel would be used to fuel the emergency generator engines and would result in air emissions from internal combustion. New certified emergency generator engines would be purchased to meet the applicable requirements of New Source Performance Standards, 40 CFR Part 60, Subpart IIII. An evaluation would be completed prior to starting construction of the proposed facility to determine applicable air quality regulation requirements, and confirm an air emissions permit is not applicable. If applicable, an air emissions permit application would be submitted to the MPCA and the applicable permit would be obtained prior to starting construction.

- 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.**

Upon completion, the proposed Project would not produce additional traffic that would cause congestion, idling or require any traffic management improvements to adjacent roadways. Vehicle use related to the completed system would be limited to routine service visits to the LSTS by a licensed operator, and the occasional (approximately once per year) use of a vacuum truck to remove septage from the first compartment of the first septic tank. Periodic septage removal from remaining septic tanks would occur much less frequently on a rotating two to eight year schedule. The LSTS would not accept any wastewater delivery via truck, nor is it designed with this capability.

During the three to five month construction period, some heavy equipment would be used for excavation and site preparation. This would have temporary, localized effects that are anticipated to be minimal. Proper maintenance of construction equipment minimizes emissions from the contractor's equipment. In addition, the method of horizontal directional drilling to install the force main minimizes potential traffic issues that could be associated with traffic delays, congestion, idling vehicles. Air quality in the proposed Project area would not be impacted by vehicle-related air emissions.

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

During construction there is the potential for limited dust as directional drilling is completed and excavations are dug and subsequently backfilled. Adverse impacts during construction would be mitigated by limiting open excavations and soil stockpiling to active construction areas only. Backfilling and restoration of excavations in a timely manner limit potential dust. Properly maintained construction equipment also minimizes exhaust generation during the construction work which is estimated to last approximately three to five months. These impacts are anticipated to be minimal and isolated to the immediate area that construction is occurring at the various stages of the proposed Project.

Odors may occur briefly when individual septic tanks are uncovered and septage pumping and abandonment occurs. The odors generated from this process would be temporary (one time per property) and affect only the immediate area.

Operation of the proposed Project would, with minor exceptions, not generate impacts from odors or dust. The service area collection system, force main, and majority of the LSTS would all be underground. Because the proposed LSTS would use an aerobic treatment process, there would be minimal to no odor generated. This area is located in the center of the site, following parcel boundary set-back distances which ensures distance from nearby residences is maximized and the potential for odors at adjacent properties is minimized.

LSTS wastewater would discharge into underground septic tanks that would allow solids to settle out before the wastewater flows into the denitrification and recirculation tanks. After passing through the underground tanks, wastewater would flow into the recirculating gravel filter and be recirculated several times for further treatment prior to dispersal into the underground drainfield adsorption beds. The recirculating gravel filter would be below grade, but open to the atmosphere in order to allow for oxygenation of the wastewater. At this point in the treatment process, the wastewater would be considered treated/cleaned, and therefore would not generate odors.

Accumulation of septage (sludge) would periodically be pumped from the LSTS tanks and removed from the site for disposal at a permitted treatment plant and/or land application site following MPCA Septage Management Guidelines and Federal Land Application of Septage Regulations – 40 CFR, part 503. Pumping of the septic tanks could cause temporary odors, but impacts are anticipated to minimal and isolated to the immediate area where pumping occurs.

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.

During proposed Project construction there is the potential for noise as directional drilling is completed and excavations are dug and subsequently backfilled. Adverse noise impacts during construction would be mitigated through construction equipment that is maintained and properly equipped with mufflers and other appropriate sound minimizing equipment. Localized construction noise would be temporary and would be consistent with the existing noise associated with this community, such as light traffic along city streets, and county road traffic through town, including some large trucks. Part of the construction would occur in residential areas for removal of existing septic tanks and installation of collection system pipe. Construction hours would be limited by the City Ordinance for construction activities (7:00 a.m. to 10:00 p.m.). In some instances construction near a residence would be completed within a single day, minimizing potential construction noise impacts at each residential property. The temporary construction noise is not anticipated to significantly affect the quality of life in the community.

Operation of the completed LSTS would not generate audible noise. The force main, proposed collection system, individual connection pipes, and the majority of the proposed LSTS would all be located underground.

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. The proposed Project is not anticipated to generate traffic. There would be periodic maintenance and monitoring occurring at the treatment site, but this is anticipated to be one maintenance vehicle.
2. Limited portions of certain streets may be temporarily detoured during a three to five month construction timeframe. It is anticipated that approximately one vehicle would periodically visit the LSTS site during its operation.
3. The proposed Project is not anticipated to generate measurable traffic.
4. Options for transit are not applicable to this proposed Project.

- b. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system.**

If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW. Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 (available at: <http://www.dot.state.mn.us/accessmanagement/resources.html>) or a similar local guidance,

The proposed Project would not affect the regional transportation system within the vicinity of the city of Afton. Temporary parking impacts and traffic detours would occur for limited portions of certain streets within the service area as sewer main construction activities take place during the three to five month construction window.

The installation of the force main would be completed within the road right of way along St. Croix Trail (County Road 18) approximately 0.6 mile to the LSTS site. This installation of the force main would not impact traffic on St. Croix Trail as it would be completed within the existing right of way. The construction of the proposed LSTS, new access road and control building on the 25-acre LSTS property would not impact traffic patterns for adjacent residential properties.

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

Sewer main construction within the service area would be conducted in stages with approximately one block of a street closed for excavation and installation at one time. Local residences and business owners would be able to access their properties during installation of the sewer main and during individual property hookups. Once the proposed sewer main is installed, traffic would be allowed through a particular area. Impacts would be temporary in nature. The City is not subject to high volumes of traffic along city streets, and therefore temporary impacts to traffic are not anticipated to be significant.

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.**

No cumulative potential effects from construction and operation of the proposed Project have been identified. The proposed Project service area is limited to a well-defined service area within the Old Village district and its 77 residential dwellings (66 existing and 11 vacant parcels) and 25 commercial establishments (22 existing and 3 vacant parcels). Completion of the

proposed Project would provide environmental benefits by eliminating ISTS and preventing inadequately treated wastewater from entering soil, groundwater, and surface water resources especially during flood events. Construction of the proposed Project is estimated at 3 to 5 months during 2015.

Adjacent properties to the LSTS site are currently served by similar soil-based ISTS. However, when compared to the proposed LSTS, the majority of ISTS on adjacent properties does not provide an equivalent level of treatment, and discharge an effluent to the soil with a total nitrogen level greater than 10 mg/L. The LSTS is designed to meet a total nitrogen limit 10 mg/L prior to discharge to the drainfield adsorption beds. Within an area of approximately 60 acres, to a distance of approximately one-third mile downgradient of the LSTS site there are 65 ISTS permits listed according to Washington County records that indicate an aging ISTS infrastructure. Because of LSTS design and MPCA permit requirements the LSTS would not have any cumulative effect on the groundwater or surface water resources of the area. The permit would require a treatment level below that accomplished by existing ISTS in the Old Village district. The older non-compliant ISTS have surfacing effluent or drainfields that fail to protect groundwater. During flood events inadequately treated wastewater from non-compliant ISTS may discharge to surface waters. Removal of ISTS from the Old Village district would improve surface and groundwater quality.

- 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.**

There are no foreseeable future projects. The proposed Project is specific to the well-defined service area of the Old Village district of Afton, and the LSTS site is not large enough for future expansion that could potentially promote large scale community growth.

- 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.**

Not applicable

- 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.**

Alternatives

Alternatives to address the wastewater management needs of Afton were evaluated in 2012 with the completion of a MPCA Unsewered Area Needs Documentation form and a Community Assessment Report. These documents, and other collected information, were incorporated into the *Wastewater Collection & Treatment System Facility Plan* (March, 2013). The *Facility Plan* was prepared in accordance with Minnesota Administrative Code 7077.0272 for approval by the MPCA to obtain both proposed Project funding, and an MPCA permit for system design and construction of

the recommended alternative. The *Facility Plan* considered the following four long-term wastewater management alternatives for Afton: 1) no action; 2) ISTS replacement; 3) cluster LSTS; and, 4) regionalization.

The no action alternative is untenable as it would not protect area water resources; no action would also compromise the levee replacement project that is needed to protect Afton from flooding. Similarly, ISTS replacement was also excluded as a viable alternative because many properties (approximately 63 percent) do not have suitable area to install a standard ISTS.

Regionalization would entail connecting to a Metropolitan Council Environmental Services (MCES) sewer interceptor that would convey wastewater to the MCES Eagle's Point Wastewater Treatment Facility. The regionalization alternative would address the environmental inadequacies of the current ISTS in Afton; however, the Eagles Point wastewater treatment plant is located in Cottage Grove, Minnesota over 10 miles away from Afton. Due to the length construction of new sewer interceptor could potentially have significant environmental impacts. The new sewer interceptor would also take several years longer to design and construct compared to the other alternatives, resulting in continued operation of the existing non-compliant systems for an extended period. Additionally, the magnitude of the new interceptor project would result in significantly increased costs to design, permit and construct this alternative compared to other alternatives explored.

Based on the alternatives evaluation in the *Facility Plan*, the selected alternative was the construction of a cluster LSTS. This alternative would address the environmental inadequacies of existing ISTS, is cost-effective, and can be located and sized to address the needs for the Old Village district of Afton.

No other potential environmental impacts have been identified.

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

I hereby certify that:

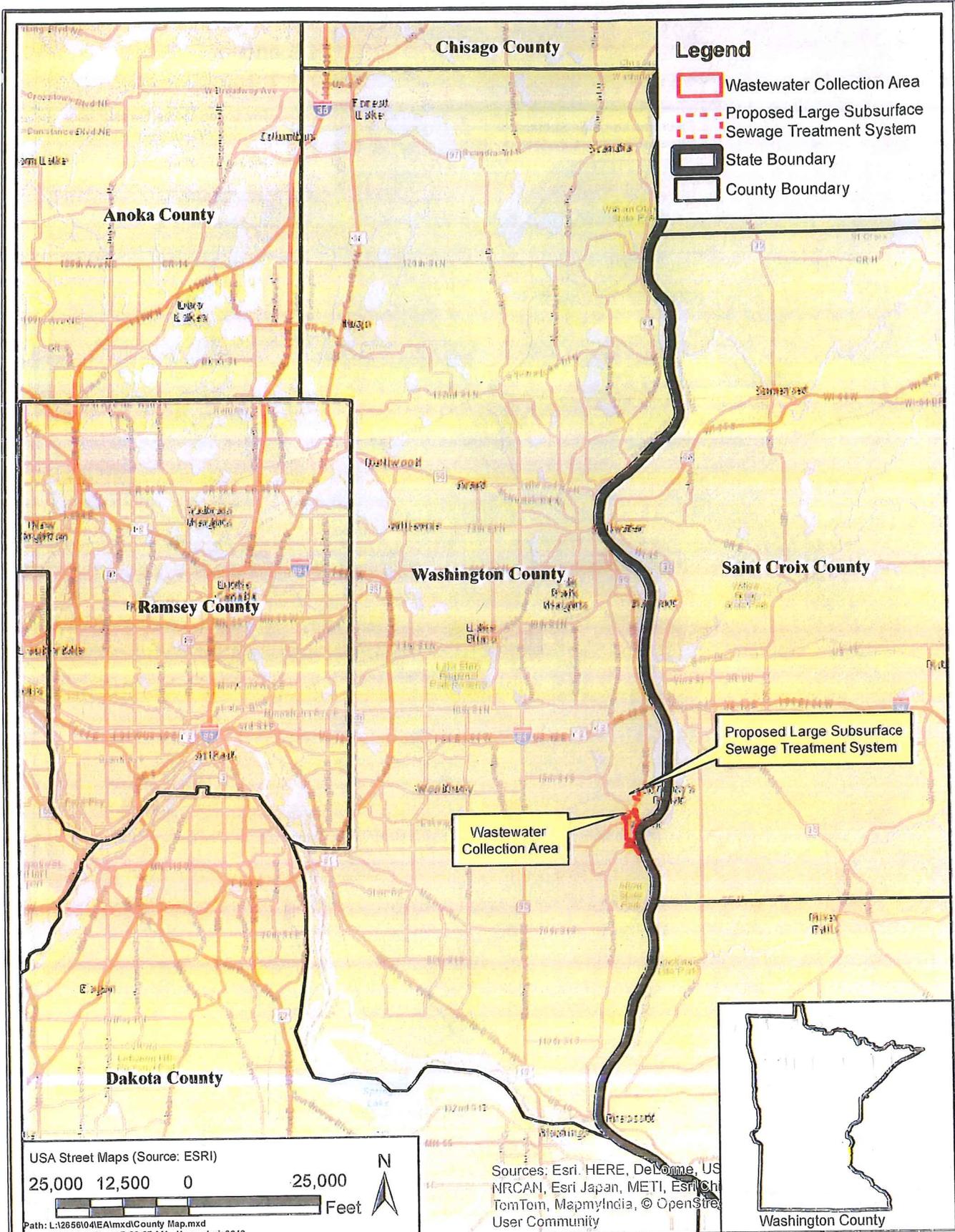
- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, 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: 

for

**Dan R. Card, P.E., Supervisor
Environmental Review Unit
St. Paul Office
Resource Management and Assistance Division**

Date: 2-27-2015

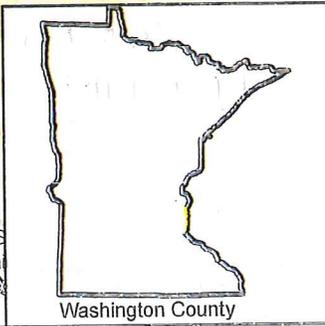


Legend

- Wastewater Collection Area
- Proposed Large Subsurface Sewage Treatment System
- State Boundary
- County Boundary

USA Street Maps (Source: ESRI)
 25,000 12,500 0 25,000
 Feet

Sources: Esri, HERE, DeLorme, US
 NRCAN, Esri Japan, METI, Esri China
 TomTom, MapmyIndia, © OpenStreet
 User Community



Path: L:\2656\04\EA\mxd\County Map.mxd
 Date: 12/11/2014 Time: 7:23:27 AM User: shujie0243

CITY OF AFTON

County Map

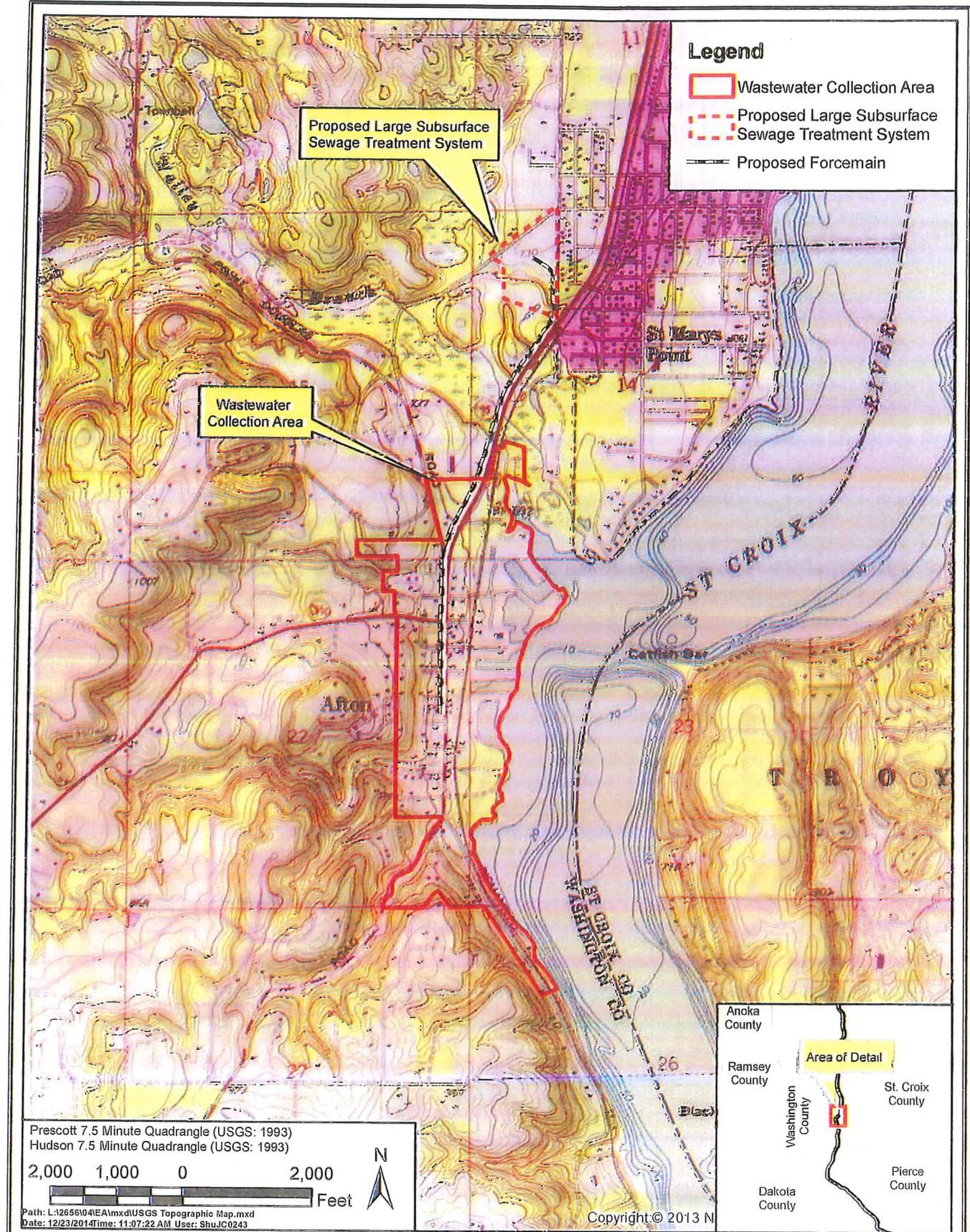
Wenck

Engineers - Scientists
 Business Professionals
 www.wenck.com

1800 Pioneer Creek Center
 Maple Plain, MN 55359-0429
 1-800-472-2232

DEC 2014

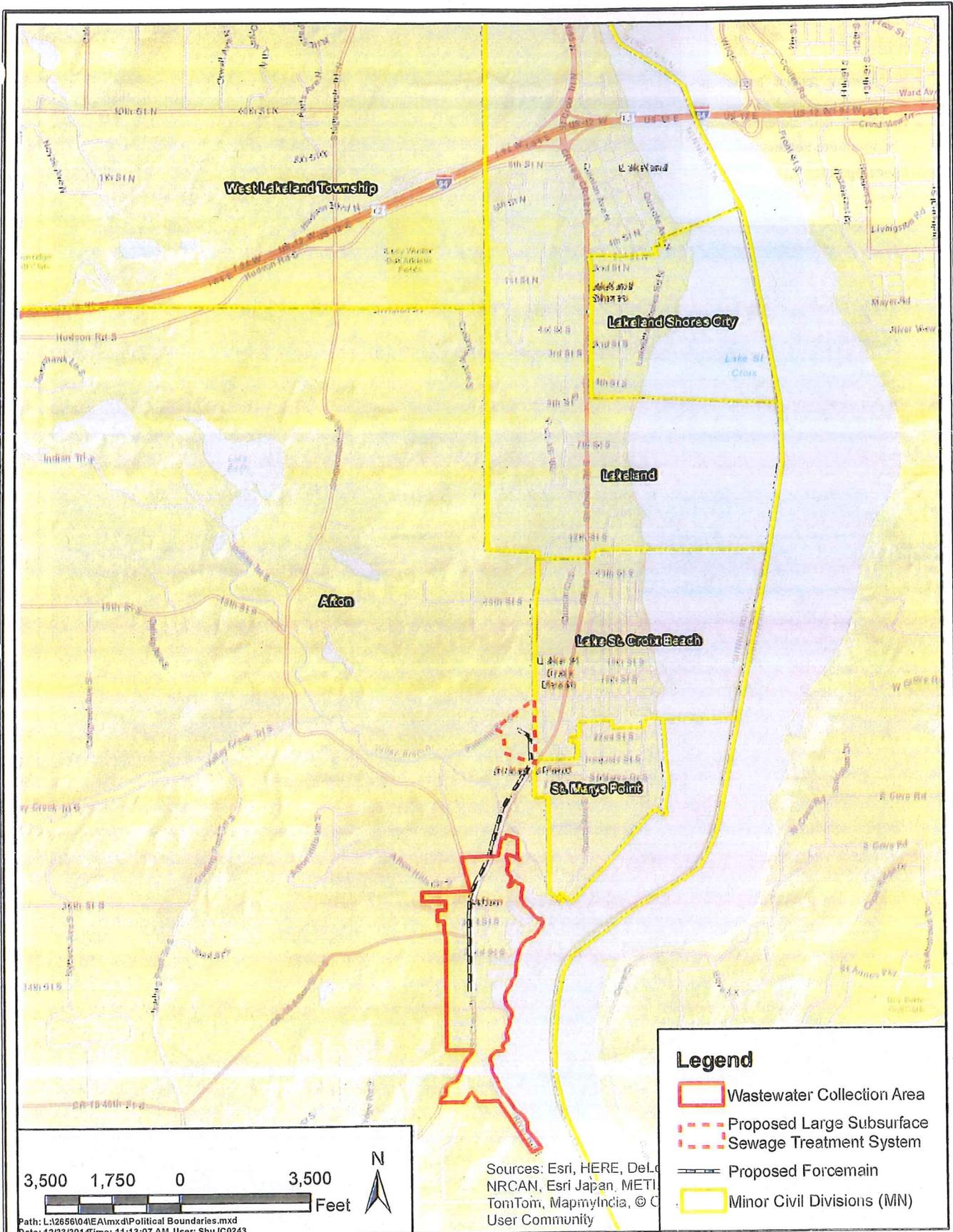
Figure 1



CITY OF AFTON
USGS Topographic Map

Wenck
Engineers - Scientists
Business Professionals
www.wenck.com
1800 Pioneer Creek Center
Maple Plain, MN 55359-0429
1-800-472-2232

DEC 2014
Figure 2



CITY OF AFTON
Project Location and Proximity
to Adjoining Communities

Wenck
 Engineers - Scientists
 Business Professionals
 www.wenck.com
 1800 Pioneer Creek Center
 Maple Plain, MN 55359-0429
 1-800-472-2232

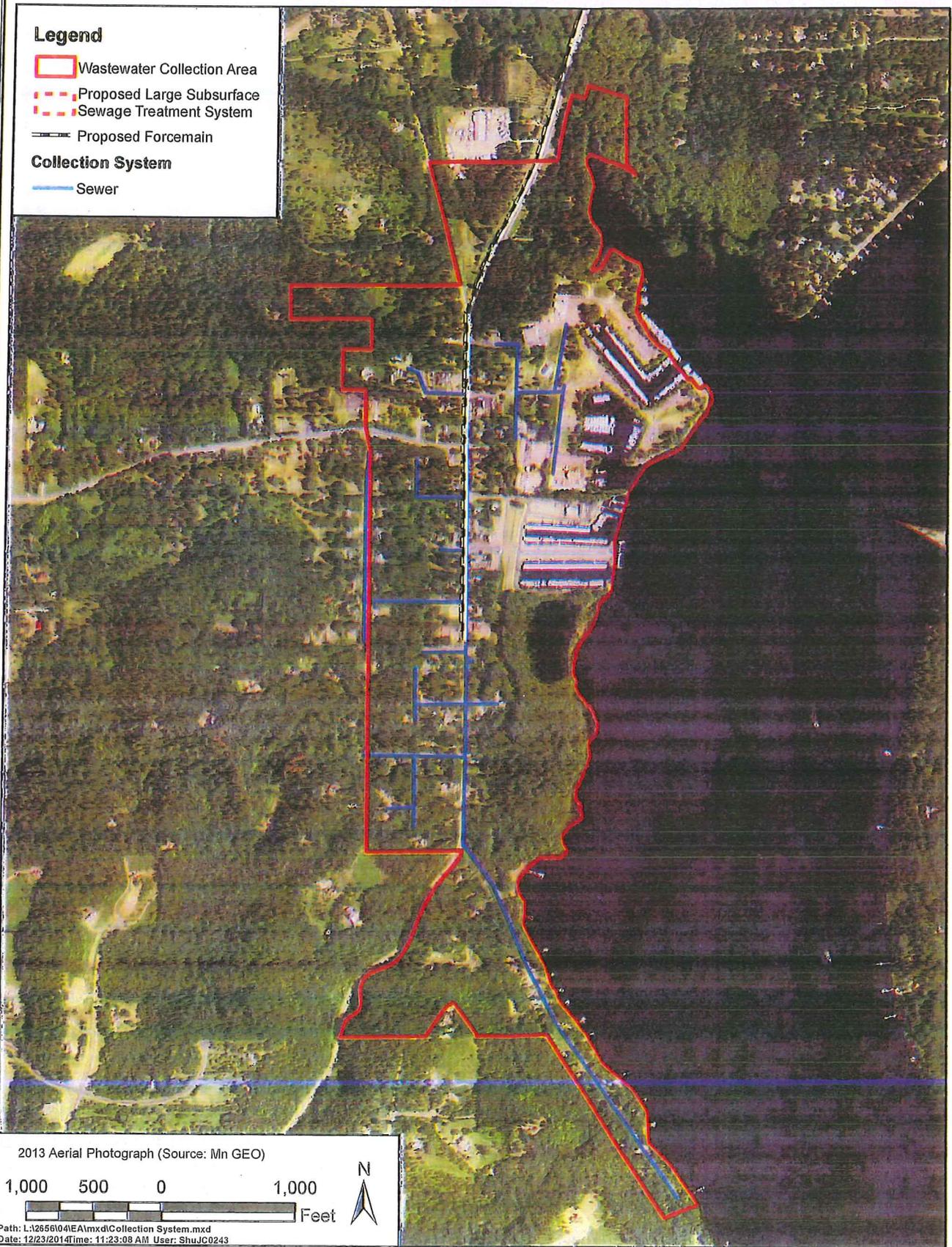
DEC 2014
Figure 3

Legend

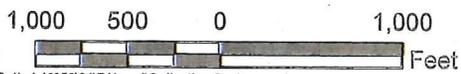
-  Wastewater Collection Area
-  Proposed Large Subsurface Sewage Treatment System
-  Proposed Forcemain

Collection System

-  Sewer



2013 Aerial Photograph (Source: Mn GEO)



Path: L:\2856\04\EA\mxd\Collection System.mxd
Date: 12/23/2014 Time: 11:23:08 AM User: ShuJC0243

CITY OF AFTON

Collection System Service Area Layout

Wenck

Engineers - Scientists
Business Professionals
www.wenck.com

1800 Pioneer Creek Center
Maple Plain, MN 55359-0429
1-800-472-2232

DEC 2014

Figure 4

Legend

-  Proposed Large Subsurface Sewage Treatment System
-  Parcel Boundaries
-  Proposed Forcemain
-  Proposed LSTS Layout
-  Approximate Wetland Boundary



2012 Aerial Photograph (Source: ESRI)
 150 75 0 150 Feet
 N

Source: San, Digital Globe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, Aero, GeoMapping, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Proposed LSTS Layout
- Existing Monitoring Wells
- Tax Parcels
- Well (listed in County Well Index)
- Well (not listed in County Well Index)
- 300' Well Setback
- 600' Well Setback
- Approximate Wetland Boundary



2012 Aerial Photograph (Source: ESRI)

250 125 0 250

Feet

Path: L:\2656104\EA\mxd\Well Setbacks.mxd
Date: 1/8/2015 Time: 7:55:54 AM User: KacHD0606

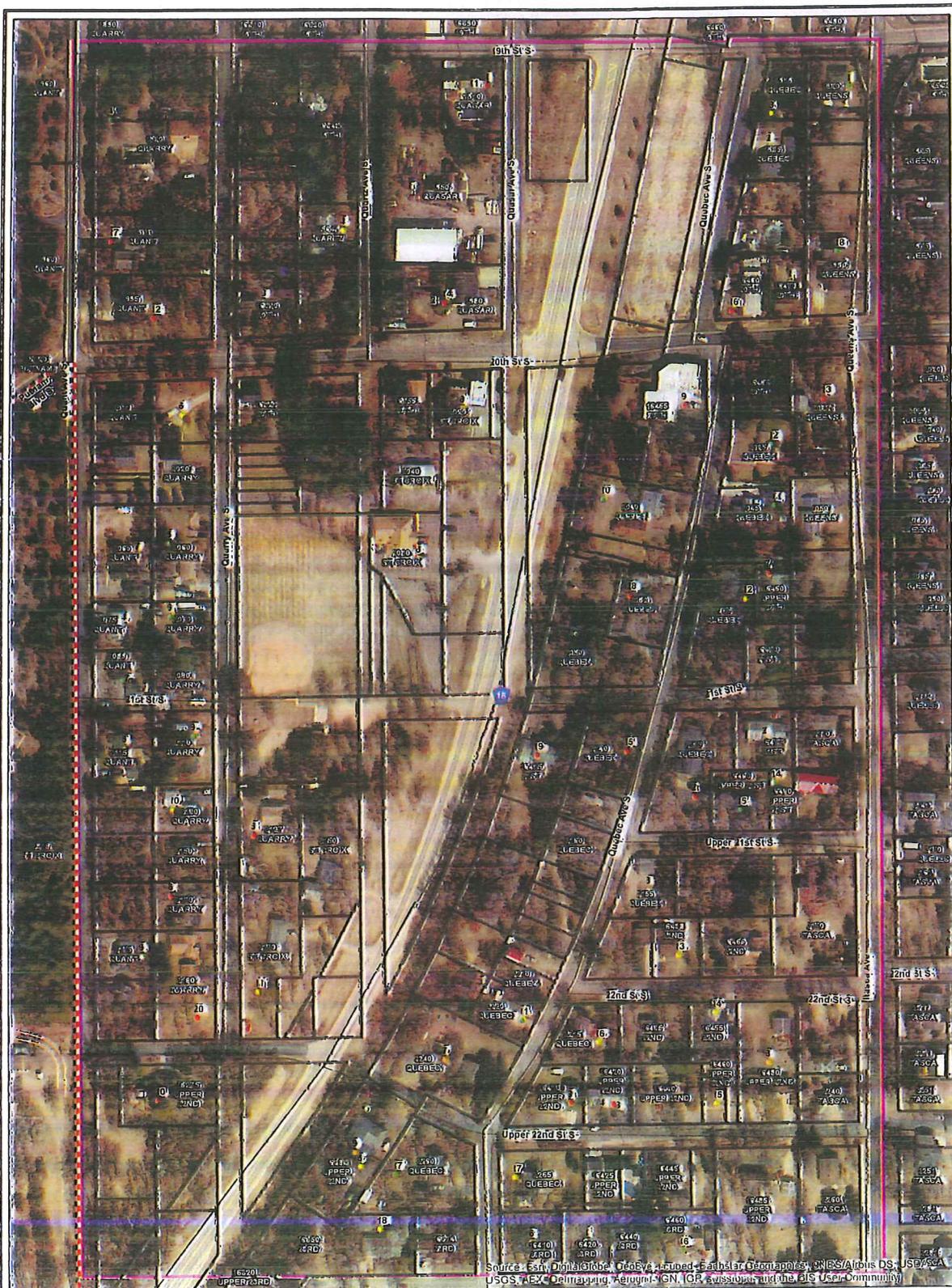
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

CITY OF AFTON
LSTS Site and Water
Supply Well Setback Distances

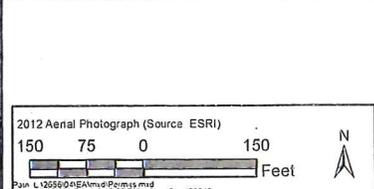
Wenck
 Engineers - Scientists
 Business Professionals
 www.wenck.com
 1800 Pioneer Creek Center
 Maple Plain, MN 55359-0429
 1-800-472-2232

DEC 2014
Figure 6





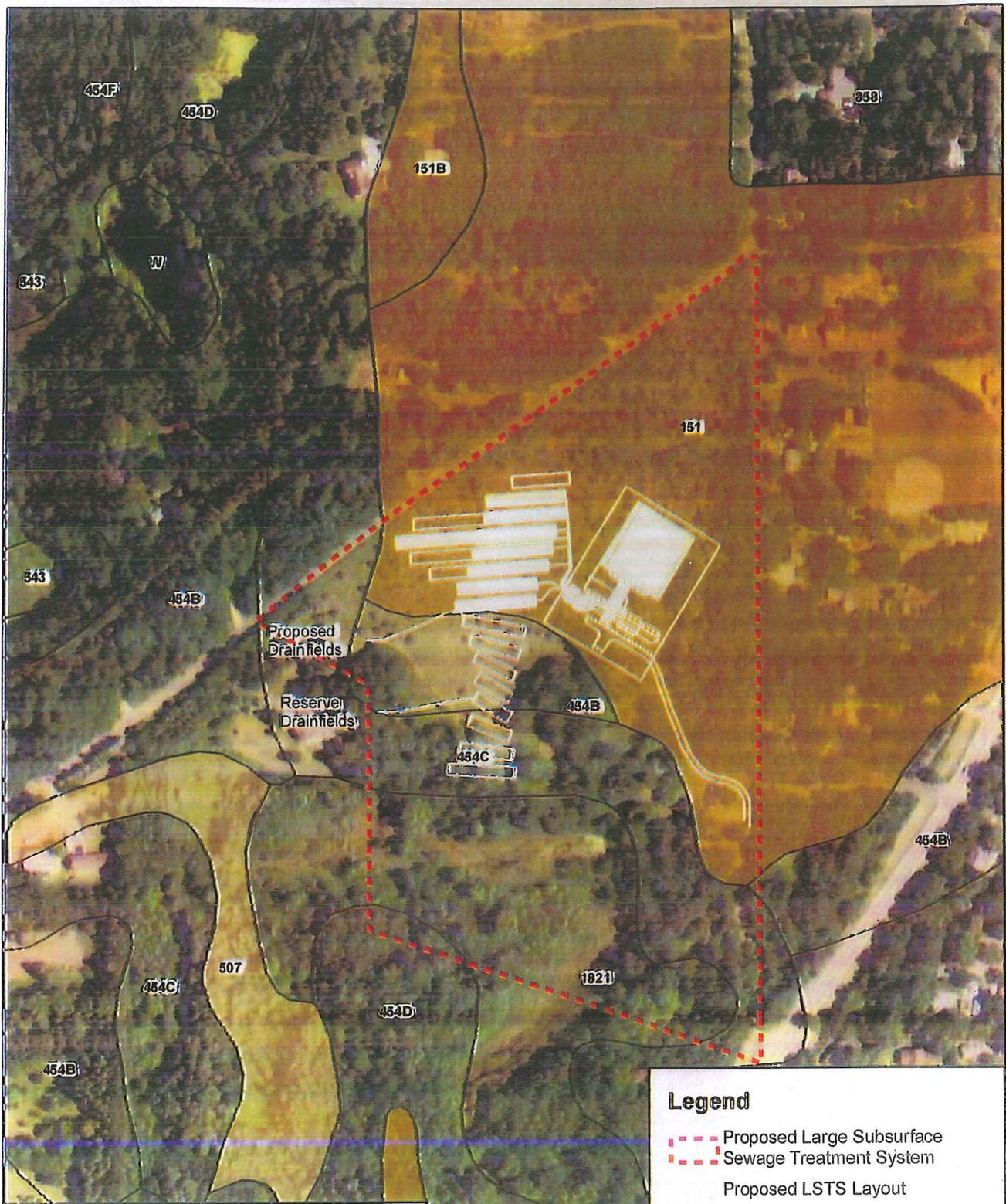
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA/FAO, USGS, AeroGRID, IGN, ICR, SwissTopo and the GIS User Community



Legend

- Proposed Large Subsurface Sewage Treatment System
- Parcel Boundaries
- Septic Permits AOI
- Proposed LSTS Layout
- 4_Digit_Permits_1972_1989
- 7_Digit_Permits_1989_1995
- 9_Digit_Permits_1995_2004
- Current_Permit_Dbase





2013 Aerial Photograph (Source: MNGEO)
 300 150 0 300
 Feet
 Path: L:\2656\04\EA\mxd\Prime Farmland.mxd
 Date: 1/2/2015 Time: 2:47:10 PM User: KacHD0606

Legend

- Proposed Large Subsurface Sewage Treatment System
- Proposed LSTS Layout
- Soil Units
- Farmland of statewide importance
- Prime farmland if drained

CITY OF AFTON

Farmland of Importance

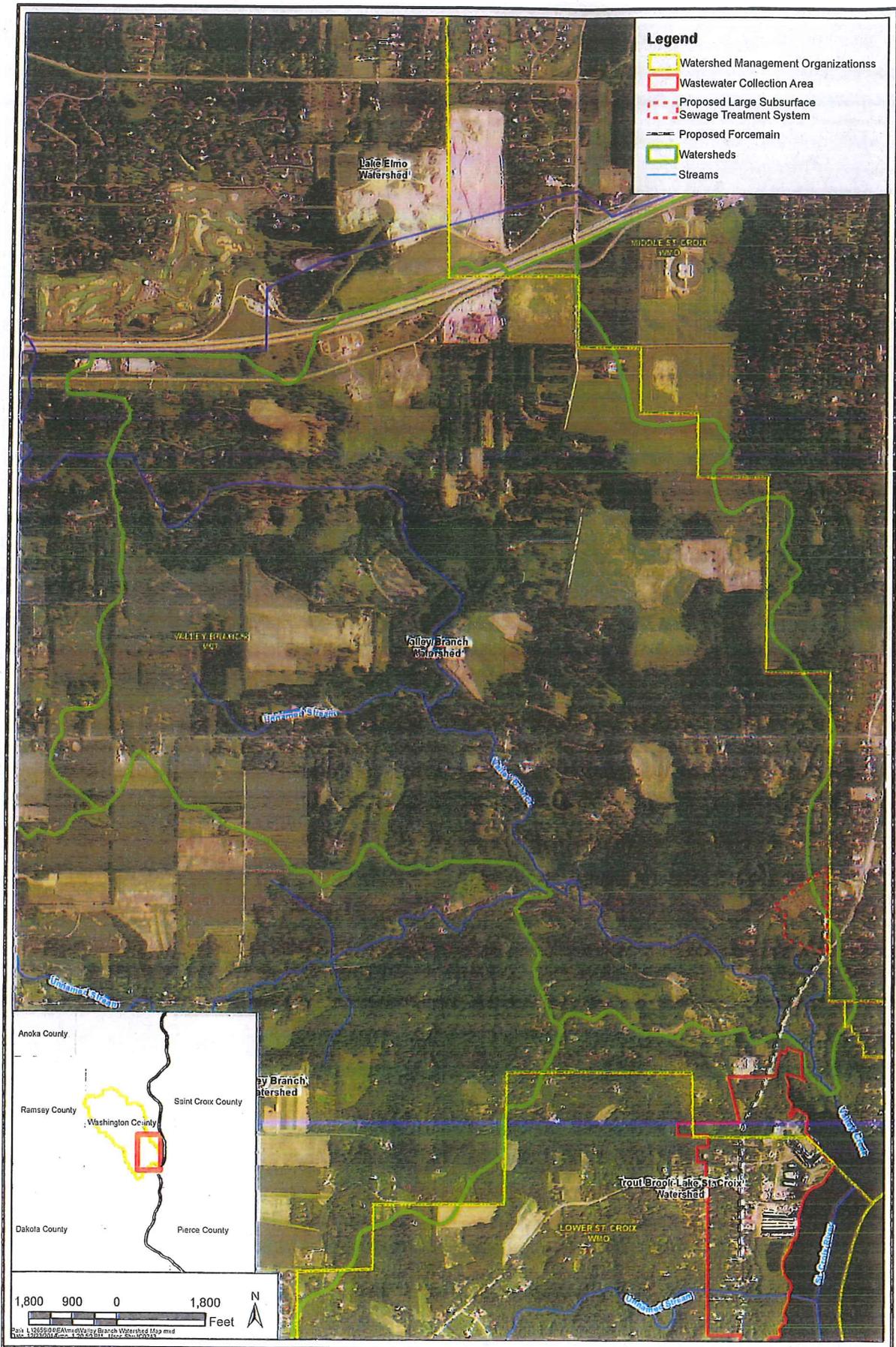
Wenck

Engineers - Scientists
 Business Professionals
 www.wenck.com

1800 Pioneer Creek Center
 Maple Plain, MN 55359-0429
 1-800-472-2232

DEC 2014

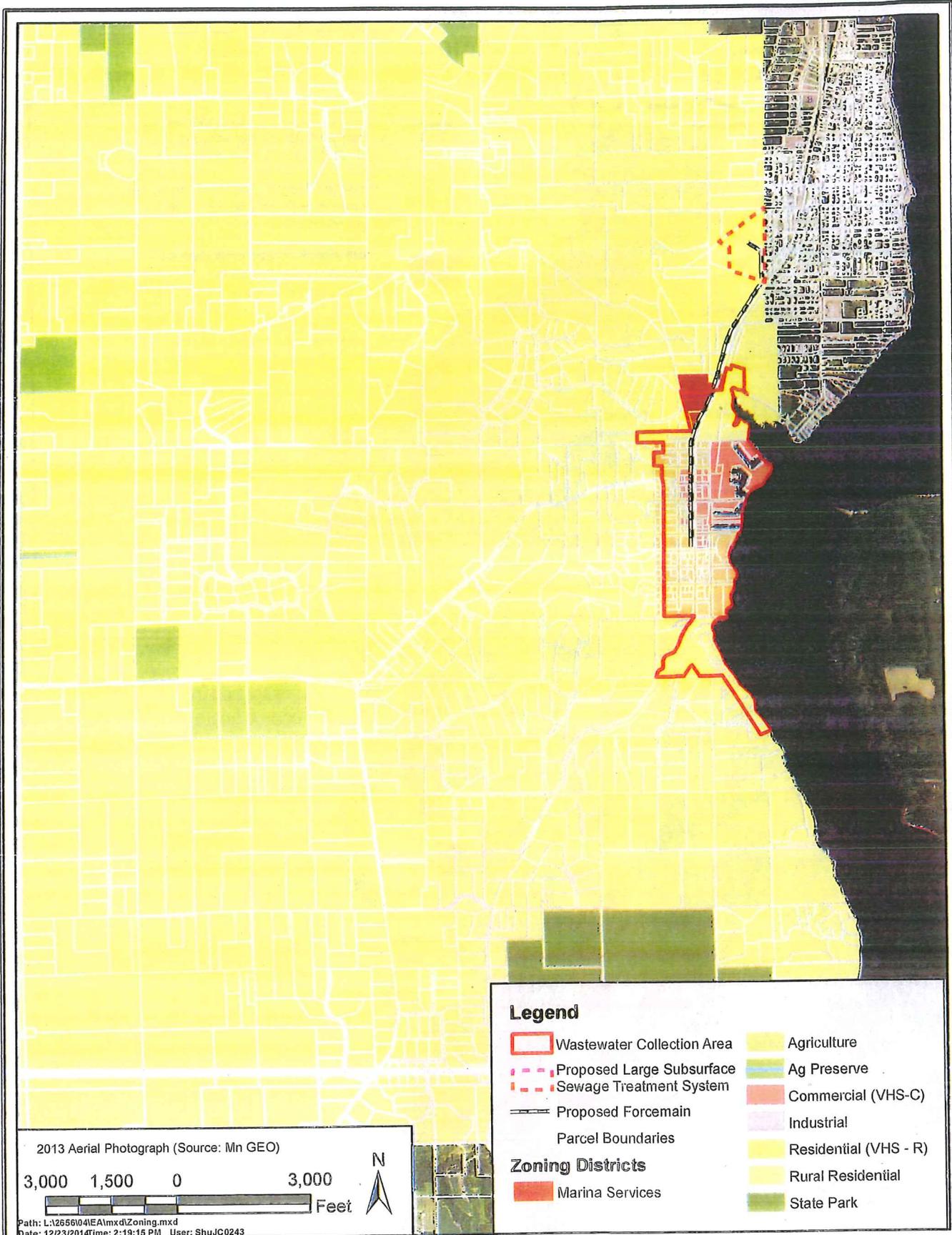
Figure 9



CITY OF AFTON
Valley Branch Creek Watershed

Wenck
Engineers - Scientists
Business Professionals
www.wenck.com
1800 Pioneer Creek Center
Maple Plain, MN 55359-0429
1-800-472-2232

DEC 2014
Figure 10



2013 Aerial Photograph (Source: Mn GEO)

3,000 1,500 0 3,000 Feet

Path: L:\2656104\EA\mxd\Zoning.mxd
 Date: 12/23/2014 Time: 2:19:15 PM User: ShuJC0243

Legend

Wastewater Collection Area	Agriculture
Proposed Large Subsurface Sewage Treatment System	Ag Preserve
Proposed Forcemain	Commercial (VHS-C)
Parcel Boundaries	Industrial
Marina Services	Residential (VHS - R)
	Rural Residential
	State Park

CITY OF AFTON

City of Afton Zoning

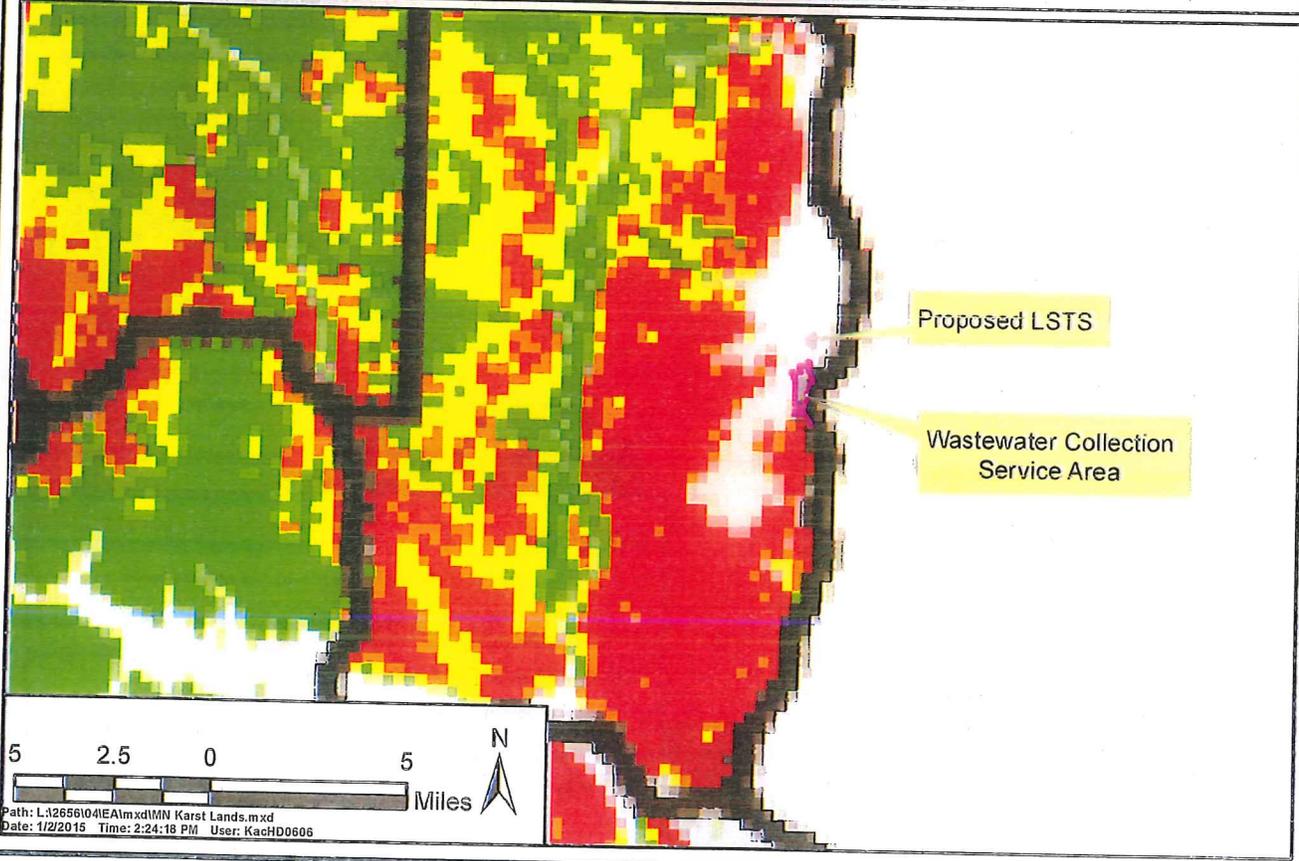
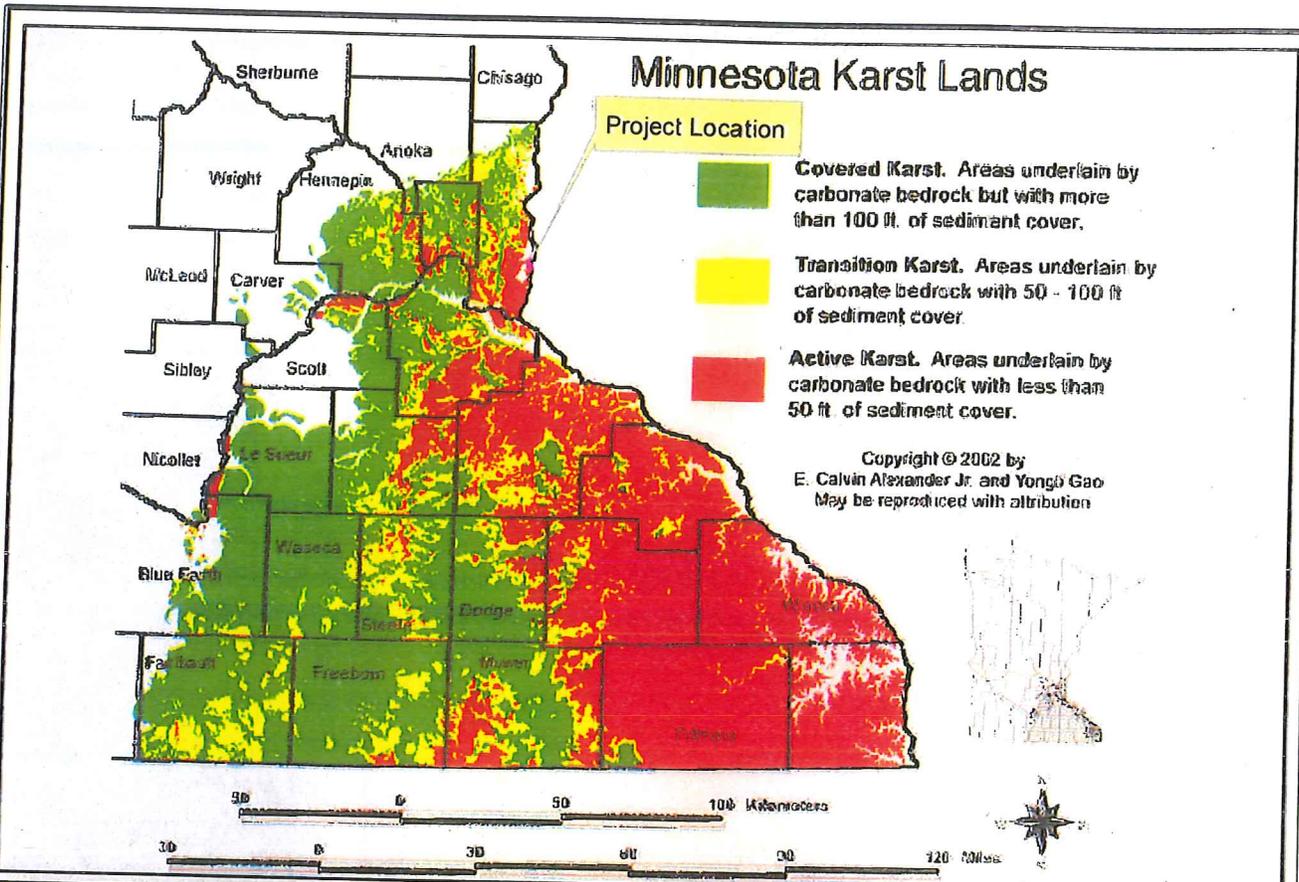
Wenck

Engineers - Scientists
 Business Professionals
 www.wenck.com

1800 Pioneer Creek Center
 Maple Plain, MN 55359-0429
 1-800-472-2232

DEC 2014

Figure 11



CITY OF AFTON

Minnesota Karst Lands

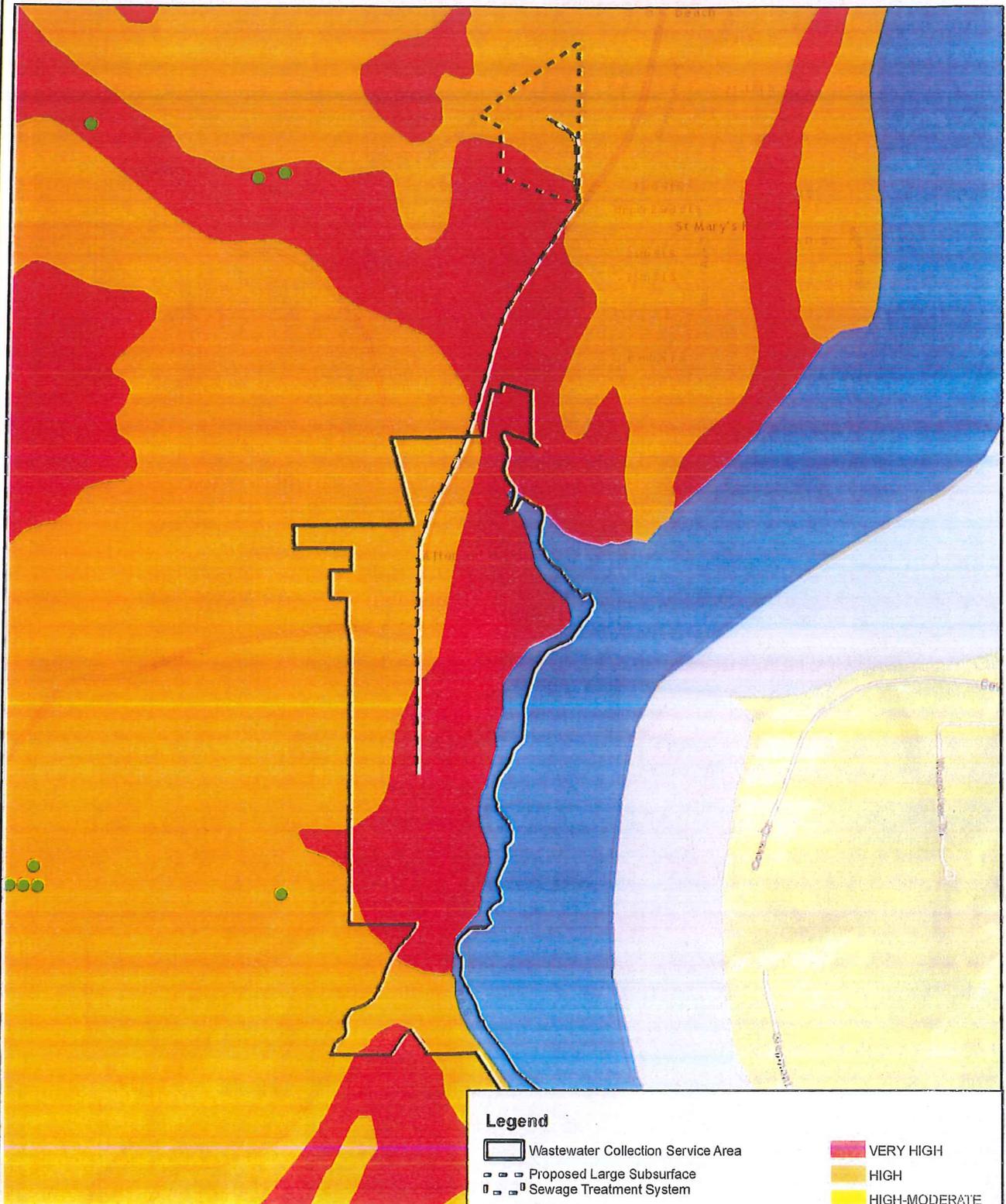
Wenck

Engineers - Scientists
Business Professionals
www.wenck.com

1800 Pioneer Creek Center
Maple Plain, MN 55359-0429
1-800-472-2232

DEC 2014

Figure 12



Legend

- Wastewater Collection Service Area
 - Proposed Large Subsurface Sewage Treatment System
 - Proposed Forcemain
 - Spring
 - VERY HIGH
 - HIGH
 - HIGH-MODERATE
 - MODERATE
 - LOW
 - WATER
- Water Table System Sensitivity to Pollution**

USA Street Maps (Source: ESRI)

1,500 750 0 1,500 Feet

Path: L:\2656104\EA\mxd\Water Table Sensitivity.mxd
Date: 12/30/2014 Time: 7:44:43 AM User: ShuJC0243

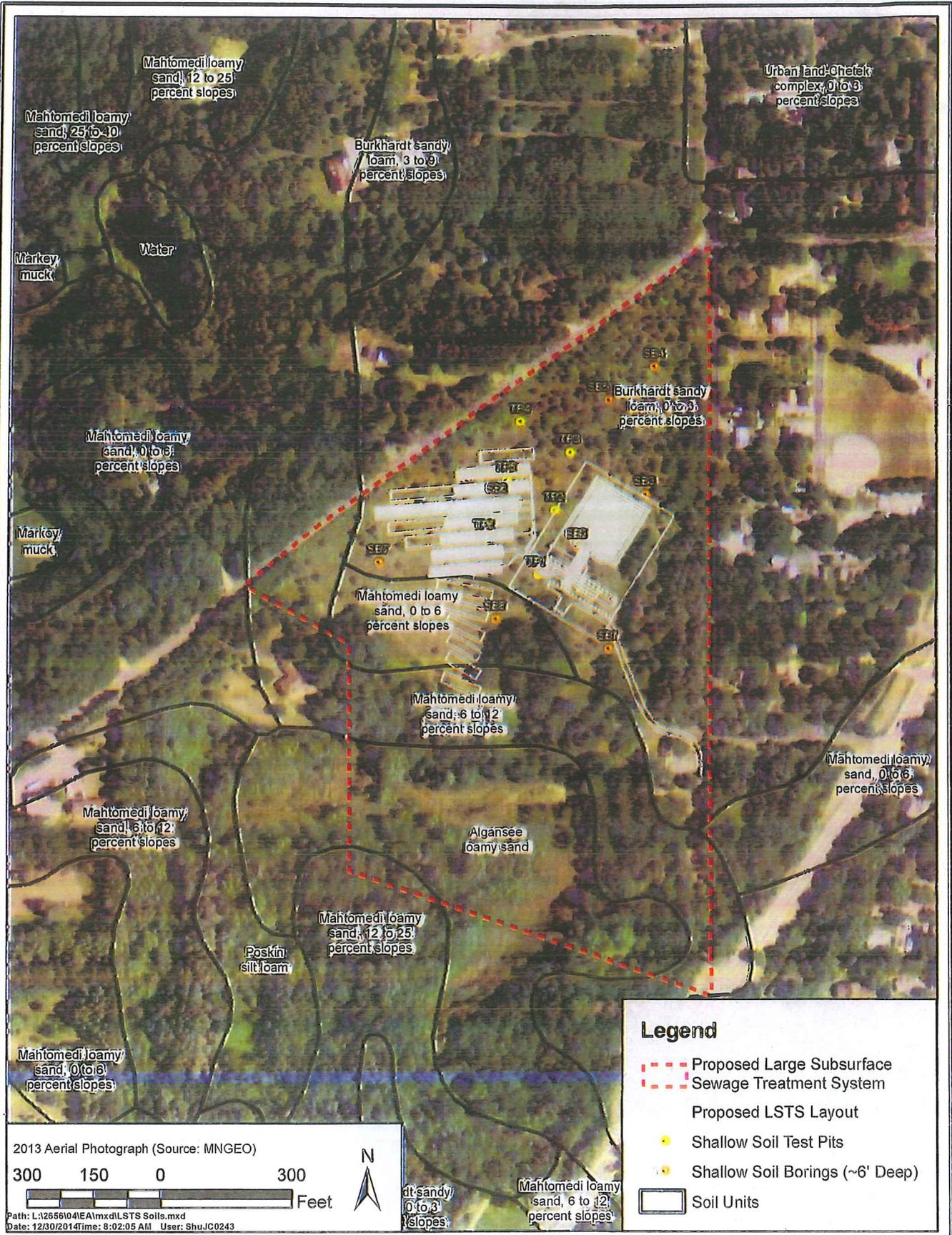
CITY OF AFTON

Water Table Sensitivity to Pollution

Wenck
 Engineers - Scientists
 Business Professionals
 www.wenck.com
 1800 Pioneer Creek Center
 Maple Plain, MN 55359-0429
 1-800-472-2232

DEC 2014

Figure 14



2013 Aerial Photograph (Source: MNGEO)

300 150 0 300 Feet

Path: L:\2656104\EA\mxd\LSTS Soils.mxd
Date: 12/30/2014 Time: 8:02:05 AM User: ShuJC0243

Legend

- - - Proposed Large Subsurface Sewage Treatment System
- Proposed LSTS Layout
- Shallow Soil Test Pits
- Shallow Soil Borings (~6' Deep)
- Soil Units

CITY OF AFTON

LSTS Site Soils Map

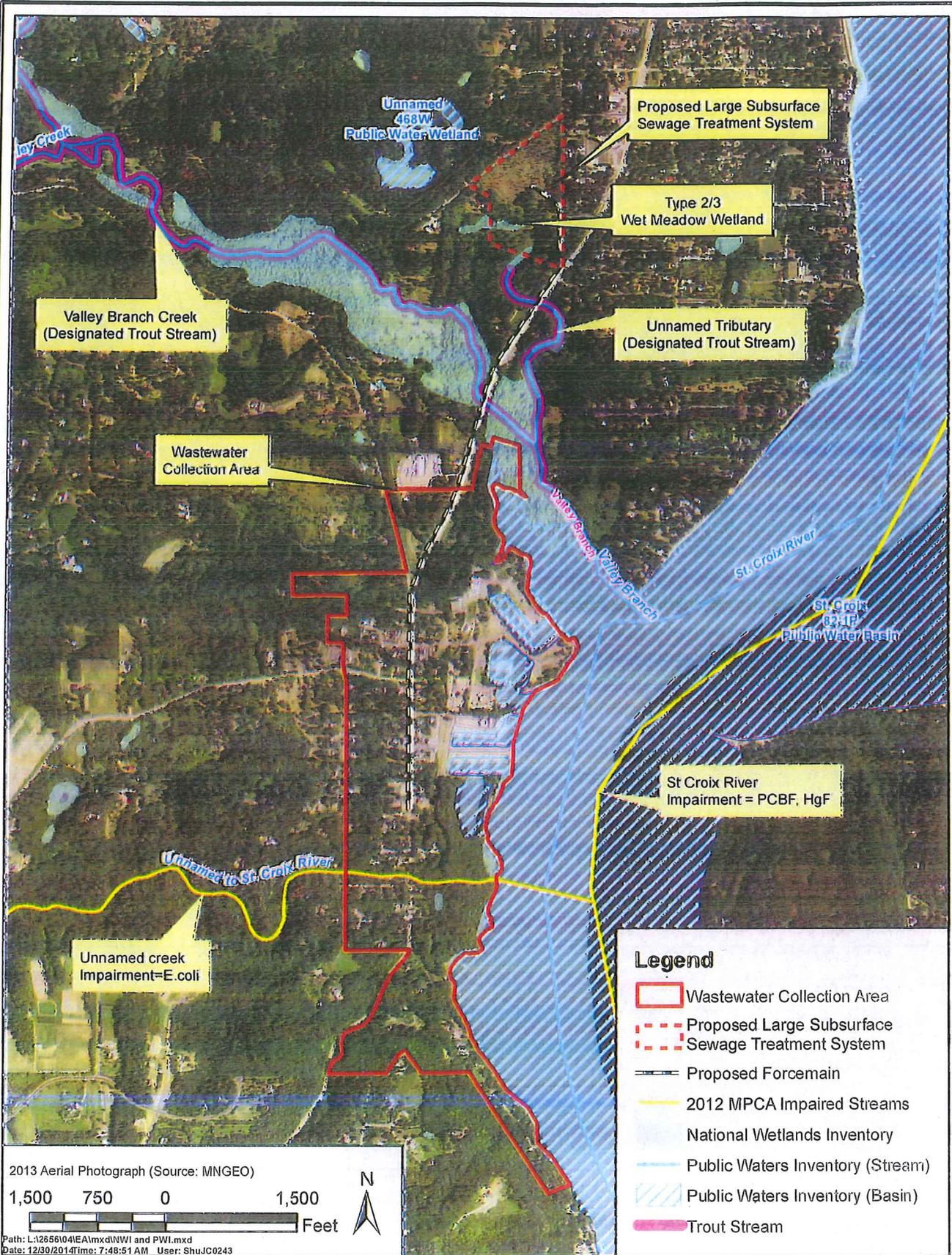
Wenck

Engineers - Scientists
Business Professionals
www.wenck.com

1800 Pioneer Creek Center
Maple Plain, MN 55359-0429
1-800-472-2232

DEC 2014

Figure 15



2013 Aerial Photograph (Source: MNGEO)

1,500 750 0 1,500 Feet

Path: L:\2656\04\EA\mxd\NWI and PWI.mxd
 Date: 12/30/2014 Time: 7:48:51 AM User: ShuJC0243

CITY OF AFTON
**National Wetlands Inventory
 & Public Waters Inventory**

Wenck
 Engineers - Scientists
 Business Professionals
 www.wenck.com
 1800 Pioneer Creek Center
 Maple Plain, MN 55359-0429
 1-800-472-2232

DEC 2014
 Figure 16

Mark D. Olson

Subject: FW: Afton Wastewater Collection and Treatment System
Attachments: Archaeology.rtf; Historic.rtf

From: Thomas Cinadr [mailto:thomas.cinadr@mnhs.org]
Sent: Tuesday, December 09, 2014 7:01 AM
To: Mark D. Olson
Subject: Re: Afton Wastewater Collection and Treatment System

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.

Archaeological sites and historic properties were identified in a search of the Minnesota Archaeological Inventory and Historic Structures Inventory for the search area requested. **Reports containing the results of the searches are 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 or construction 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 State Historic Preservation Office
Minnesota Historical Society
345 Kellogg Blvd. West
St. Paul, MN 55102

651-259-3453

On Fri, Dec 5, 2014 at 3:41 PM, Mark D. Olson <molson@wenck.com> wrote:

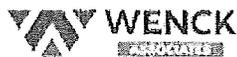
Hello Mr Cinadr,

Please find attached our cover letter requesting an updated NHIS inquiry for the above referenced project. Reference is made to a similar request from early 2013 for this same project for which, through citizen petition, an EAW is currently being prepared.

Thank you for your help with this project. Have a good weekend!

Mark D. Olson

Project Manager



Responsive partner.
Exceptional outcomes.

molson@wenck.com | D 763.479.4218 | C 612.280.5857

1800 Pioneer Creek Center | Maple Plain, MN 55359

Archaeological Site Locations

Site Number	Site Name	Twp.	Range	Sec.	Quarter Sections	Acres	Phase	Site Description	Tradition	Context	Reports	NR	CEF	DOE
County: Washington														
21WA0010	Rattlesnake Mounds	28	20	22	C-E-SE-NE	1		EW	W-2					
21WA0106	Valley Branch Creek	28	20	14	SW-NW-SW	1.4	1	AS	W-1					
21WAY		28	20	15	SW-NE	0		HD						
21WAZ	Bowles	28	20	15	NE	0		HD						

History/Architecture Inventory

PROPERTY NAME	ADDRESS	Twp	Range	Sec	Quarters	USGS	Report	NRHP	CEF	DOE	Inventory Number
COUNTY: Washington											
CITY/TOWNSHIP: Afton											
Cushing Hotel	3291 St. Croix Trail Ave. S.	28	20	22	NE-SE-NE	Hudson		Y			WA-AFC-005
house	3290 St. Croix Trail S.	28	20	22	NE-SE-NE	Hudson					WA-AFC-006
Paulson House	3160 Perrot Ave.	28	20	22	SW-NE-NE	Hudson	WA-2009-1H				WA-AFC-007
Afton Methodist Church and Parsonage	NE corner 9th Ave. & Main St.	28	20	22	SW-NE-NE	Hudson					WA-AFC-008
house	xxx 9th Ave.	28	20	22	SE-NE-NE	Hudson					WA-AFC-009
house	3390 St. Croix Trail S.	28	20	22	SE-SE-NE	Hudson					WA-AFC-010
District School No. 24	15888 34th St.	28	20	22	SE-SE-NE	Hudson					WA-AFC-011
Afton Congregational Church	3165 St. Croix Trail S.	28	20	22	SE-NE-NE	Hudson					WA-AFC-012
St. Croix Academy	xxx 10th Ave.	28	20	22	SE-NE-NE	Hudson					WA-AFC-013
house	3421 St. Croix Trail S.	28	20	22	SE-SE-NE	Hudson					WA-AFC-014
house	3466 St. Croix Trail S.	28	20	22	SE-SE-NE	Hudson					WA-AFC-015
house	3222 St. Croix Trail S.	28	20	22	NE-SE-NE	Hudson					WA-AFC-016
House, Bolle's Mill Site	2421 Stagecoach Trail	28	20	15	SE-SW-NE	Hudson					WA-AFC-027
house	4524 River Rd.	28	20	26	NW-NE-SW	Hudson					WA-AFC-028
Swedish Evangelical Lutheran Church	xxx Afton Blvd. S.	28	20	22	SE-NW-NE	Hudson					WA-AFC-034
Stephens Farmstead	15677 Afton Blvd. S	28	20	22	N						WA-AFC-048
Evergreen Cemetery	15730 Afton Blvd. S	28	20	22	NW-NE	Hudson	WA-2009-1H				WA-AFC-049
farmstead	15698 Afton Blvd. S	28	20	22	NE						WA-AFC-050
Peterson House	15894 Afton Blvd. S	28	20	22	NE-NE	Hudson	WA-2009-1H				WA-AFC-051
St. Croix Trail, South Drainage Structures	St. Croix Trail	28	20	22	NE-NE	Hudson	WA-2009-1H				WA-AFC-052
farmstead	15398 Afton Blvd. S	28	20	22	NE-NW	Hudson	WA-2009-1H				WA-AFC-053

PROPERTY NAME	ADDRESS	Twp	Range	Sec	Quarters	USGS	Report	NRHP	CEF	DOE	Inventory Number
COUNTY: Washington											
CITY/TOWNSHIP: Afton											
Hedstrom, John C., Farmhouse	15057 Afton Blvd. S	28	20	22	SW-NW	Hudson	WA-2009-1H		Y		WA-AFC-054
farmstead	15497 Afton Blvd. S	28	20	22	NE-NW	Hudson	WA-2009-1H				WA-AFC-055
Minnesota Highway 95	Afton Blvd. S	28	20	22			WA-2009-1H				WA-AFC-060
Bridge No. 5673	carries MNTH 95 (Afton Blvd) over Valley Branch Creek	28	20	14		Hudson					WA-AFT-037
CITY/TOWNSHIP: Afton Twp.											
St. Paulus Lutheran Cemetery		28	20	22	NE-NE						WA-AFT-002

Mark D. Olson

Subject: FW: NHIS request for project in City of Afton

From: Bump, Samantha (DNR) [<mailto:Samantha.Bump@state.mn.us>]
Sent: Tuesday, December 30, 2014 3:59 PM
To: Mark D. Olson
Subject: RE: NHIS request for project in City of Afton

Hi Mark,

I have reviewed the NHIS regarding the City of Afton's Wastewater Collection and Treatment System project. There are no new records in the vicinity of the project. As such, the Natural Heritage letter dated 25 June 2013 is still valid.

Thank you for consulting us on this matter. If you have any further questions, please feel free to contact me.

Happy Holidays,
Samantha Bump
NHIS Review Specialist
(651) 259-5091
Division of Ecological and Water Resources
Minnesota Department of Natural Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155

amantha.bump@state.mn.us
www.mndnr.gov/eco

From: Mark D. Olson [<mailto:molson@wenck.com>]
Sent: Friday, December 05, 2014 3:36 PM
To: Joyal, Lisa (DNR)
Subject: NHIS request for project in City of Afton

Hello Lisa

Please find attached our cover letter, data request form and background information for an updated NHIS inquiry. Reference is made to a similar request from early 2013 for this same project for which, through citizen petition, an EAW is being prepared.

Thank you for your help with this project.

Have a good weekend!

Mark D. Olson
Project Manager



Responsive partner.
Exceptional outcomes.

molson@wenck.com | D 763.479.4218 | C 612.280.5857
1800 Pioneer Creek Center | Maple Plain, MN 55359





Minnesota Department of Natural Resources

Division of Ecological and Water Resources, Box 25

500 Lafayette Road

St. Paul, Minnesota 55155-4025

Phone: (651) 259-5109 E-mail: lisa.joyal@state.mn.us

June 28, 2013

Correspondence # ERDB 20130291

Ms. Amy Denz
Wenck Associates, Inc.
1800 Pioneer Creek Center, PO Box 249
Maple Plain, MN 55359

RE: Natural Heritage Review of the proposed City of Afton Wastewater Collection & Treatment System;
T28N R20W Sections 14, 15, 22, 23, 26 & 27; Washington County

Dear Ms. Denz,

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, see the enclosed database reports; 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:

- The project boundary overlaps with a few areas that the Minnesota Biological Survey (MBS) has identified as Sites of Biodiversity Significance (please see enclosed map). 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. Factors taken into account during the ranking process include the number of rare species documented within the site, the quality of the native plant communities in the site, the size of the site, and the context of the site within the landscape. We recommend that the project be designed to avoid impacts to these ecologically significant sites. Indirect impacts from surface runoff or the spread of invasive species should also be considered during project design and implementation.
- The project boundary also overlaps with a few Central Region Regionally Significant Ecological Areas (RSEA; see enclosed map). 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 DNR Data Deli at <http://deli.dnr.state.mn.us>. Additional information, including pdf versions of the RSEA maps, is available at <http://www.dnr.state.mn.us/rsea/index.html>. If you would like help interpreting the RSEA data, please contact Hannah Texler, Regional Plant Ecologist for DNR's Central Region, at 651-259-5811 or hannah.texler@state.mn.us.

- Blanding's turtles (*Emydoidea blandingii*), a state-listed threatened species, have been reported from the vicinity of the proposed project and may be encountered on site. For your information, I have attached a Blanding's turtle fact sheet that describes the habitat use and life history of this species. The fact sheet also provides two lists of recommendations for avoiding and minimizing impacts to this rare turtle. **Please refer to the first list of recommendations for your project.** If greater protection for turtles is desired, the second list of additional recommendations can also be implemented. In addition, if erosion control blankets will be used, we recommend that they be limited to 'bio-netting' or 'natural-netting' types as the plastic mesh netting can be dangerous to reptiles (please see enclosed fact sheet).

The attached flyer should be given to all contractors working in the area. If Blanding's turtles are found on the site, please remember that state law and rules prohibit the destruction of threatened or endangered species, except under certain prescribed conditions. If turtles are in imminent danger they should be moved by hand out of harm's way, otherwise they should be left undisturbed.

- Rare snakes have been documented in the vicinity of the project area. Again, please see the enclosed fact sheet on wildlife friendly erosion control.
- Rare fish and mussels have been documented in the St. Croix River in the vicinity of the project. To protect these species, effective erosion prevention and sediment control practices should be implemented and maintained near the river.
- Several rare plants have been documented in the vicinity of the project. However, given the project details that were provided with the data request form, I do not believe the proposed project will adversely affect these rare species.

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.

The enclosed results include an Index Report and a Detailed Report of records in the Rare Features Database, the main database of the NHIS. To control the release of specific location information, which might result in the destruction of a rare feature, both reports are copyrighted.

The Index Report provides rare feature locations only to the nearest section, and may be reprinted, unaltered, in an environmental review document (e.g., EAW or EIS), municipal natural resource plan, or report compiled by your company for the project listed above. If you wish to reproduce the index report for any other purpose, please contact me to request written permission. **The Detailed Report is for your personal use only as it may include specific location information that is considered nonpublic data under Minnesota Statutes, section 84.0872, subd. 2. If you wish to reprint or publish the Detailed Report for any purpose, please contact me to request written permission.**

For environmental review purposes, the Natural Heritage letter and database reports are valid for one year; they 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 if an updated review is needed.

Please note that locations of the gray wolf (*Canis lupus*), state-listed as special concern, and the Canada lynx (*Lynx canadensis*), federally-listed as threatened, are not currently tracked in the NHIS. As such, the Natural Heritage Review does not address these species.

Furthermore, 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. Additional rare features for which we have no data may be present in the project area, or there may be other natural resource concerns associated with the proposed project. For these concerns, please contact your DNR Regional Environmental Assessment Ecologist (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.

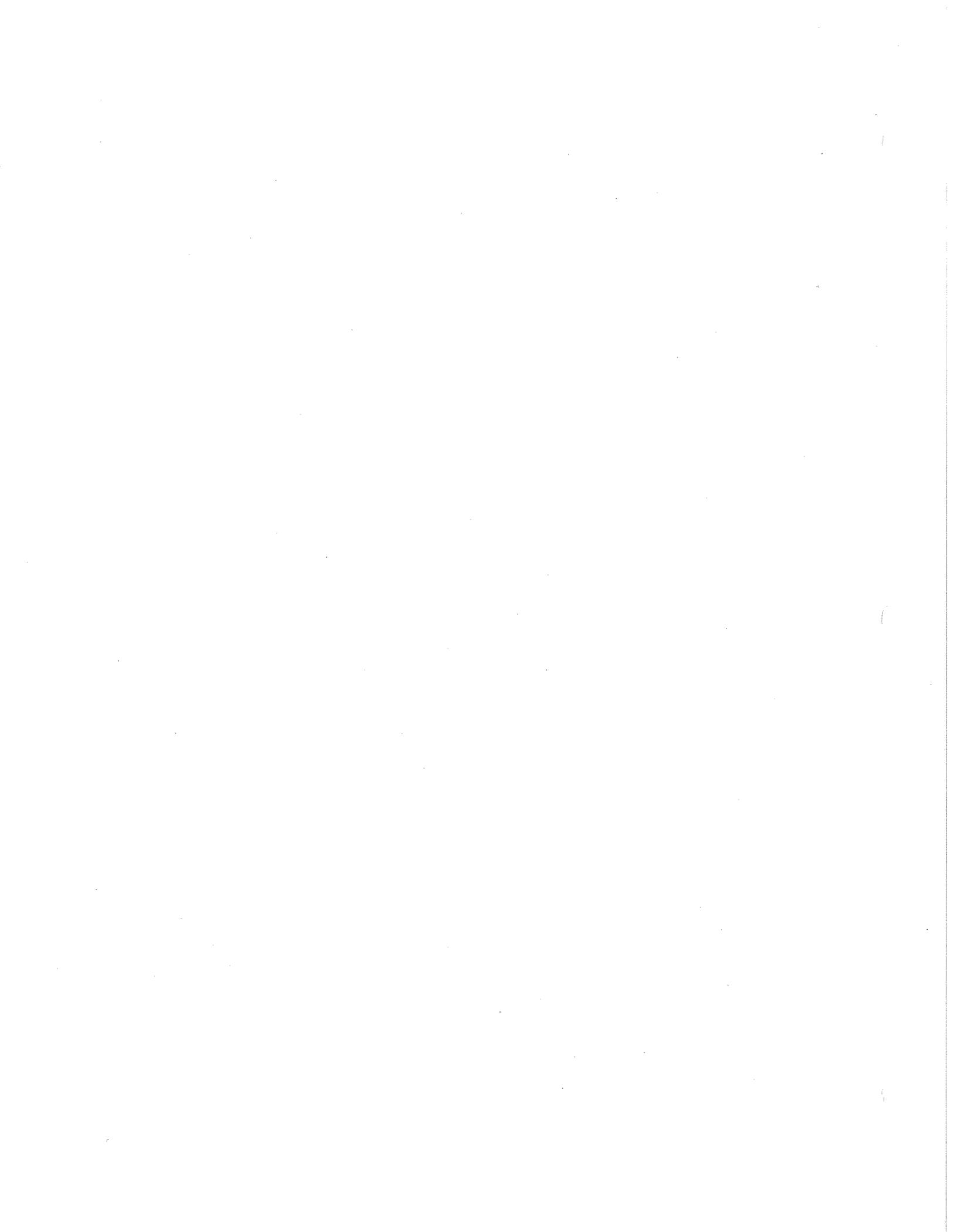
Sincerely,



Lisa Joyal
Endangered Species Review Coordinator

enc. Rare Features Database: Index Report
Rare Features Database: Detailed Report
Rare Features Database Reports: An Explanation of Fields
Blanding's Turtle Fact Sheet and Flyer
Wildlife Friendly Erosion Control
Map

cc: Melissa Doperalski



Minnesota Natural Heritage Information System
 Index Report of records within 1 mile radius of:
 ERDB# 20130291 - City of Afton WWTS
 T28N R20W Section 14,15,22,23,26,& 27
 Washington County

Printed May 2013
 Data valid for one year

Rare Features Database:

Element Name and Occurrence Number	Federal Status	MN Status	Draft Status	SGCN Status	State Rank	Global Rank	Last Obs Date	EO ID #
Vertebrate Animal								
<u>Acipenser fulvescens</u> (Lake Sturgeon) #19 T28N R20W S11, T28N R20W S12, T28N R20W S13; Washington County	SPC	no chang	SGCN	S3	G3G4	1986-10-18	15673	
<u>Ammodramus henslowii</u> (Henslow's Sparrow) #41 T28N R20W S34; Washington County	END	no chang	SGCN	S1B	G4	2001-07-14	28484	
<u>Coluber constrictor</u> (North American Racer) #25 T28N R20W S10, T28N R20W S15; Washington County	SPC	no chang	SGCN	S3	G5	1988-06-08	8606	
<u>Emydoidea blandingii</u> (Blanding's Turtle) #30 T28N R20W S10, T28N R20W S14, T28N R20W S15, T28N R20W S16; Washington County	THR	no chang	SGCN	S2	G4	1958-06	1673	
<u>Emydoidea blandingii</u> (Blanding's Turtle) #288 T28N R20W S10, T28N R20W S9; Washington County	THR	no chang	SGCN	S2	G4	1988-06-07	8899	
<u>Emydoidea blandingii</u> (Blanding's Turtle) #465 T28N R20W S14, T28N R20W S22, T28N R20W S23; Washington County	THR	no chang	SGCN	S2	G4	1989-07-26	10833	
<u>Heterodon platirhinos</u> (Eastern Hognose Snake) #28 T28N R20W S10, T28N R20W S15, T28N R20W S16, T28N R20W S9; Washington County	NON	no chang	SGCN	S4	G5	2000	8979	
<u>Heterodon platirhinos</u> (Eastern Hognose Snake) #75 T28N R20W S10, T28N R20W S11; Washington County	NON	no chang	SGCN	S4	G5	2000	27226	
<u>Lampetra appendix</u> (American Brook Lamprey) #93 T28N R20W S14, T28N R20W S15; Washington County	NON	no chang	SGCN	S4	G4	1993-08-19	18277	
<u>Lampetra appendix</u> (American Brook Lamprey) #113 T28N R20W S10, T28N R20W S15, T28N R20W S16, T28N R20W S9; Washington County	NON	no chang	SGCN	S4	G4	2000-08-20	26564	
<u>Pantherophis ramspotti</u> (Western Foxsnake) #3 T28N R20W S10, T28N R20W S11, T28N R20W S2, T28N R20W S3; Washington County	NON	no chang	SCGN	S4	G5	1935-06-10	8060	
<u>Parkesia motacilla</u> (Louisiana Waterthrush) #11 T28N R20W S22; Washington County	SPC	no chang	SGCN	S3B	G5	1988-06-18	8735	
<u>Parkesia motacilla</u> (Louisiana Waterthrush) #51 T28N R20W S10, T28N R20W S15, T28N R20W S16, T28N R20W S9; Washington County	SPC	no chang	SGCN	S3B	G5	1985	20802	

Minnesota Natural Heritage Information System
Index Report of records within 1 mile radius of:
ERDB# 20130291 - City of Afton WWTS
T28N R20W Section 14,15,22,23,26,& 27
Washington County

Rare Features Database:

Element Name and Occurrence Number	Federal Status	MN Status	Draft Status	SGCN Status	State Rank	Global Rank	Last Obs Date	EO ID #
Vertebrate Animal								
<u>Polyodon spathula</u> (Paddlefish) #1 T113N R15W S10, T113N R15W S4, T113N R15W S5, T113N R15W S9, T [...]; Dakota, Goodhue, Washington County		THR	no chang	SGCN	S2	G4	2008-09-28	16529
<u>Setophaga citrina</u> (Hooded Warbler) #1 T28N R20W S10, T28N R20W S11, T28N R20W S14, T28N R20W S15; Washington County		SPC	no chang	SGCN	S3B	G5	1996-05-29	12405
<u>Spilogale putorius</u> (Eastern Spotted Skunk) #1 T28N R20W S10, T28N R20W S15, T28N R20W S16; Washington County		THR	no chang	SGCN	S2	G4	1972-10-29	3095
Invertebrate Animal								
<u>Cicindela macra macra</u> (Sandy Stream Tiger Beetle) #6 T28N R20W S14, T28N R20W S15, T28N R20W S22, T28N R20W S23; Washington County		SPC	no chang	SGCN	S3	G5T5	1962-07-29	34810
<u>Elleptio dilatata</u> (Spike) #203 T115N R17W S21, T115N R17W S22, T115N R17W S24, T115N R17W S25, T [...]; Dakota, Washington County		SPC	THR	SGCN	S3	G5	2003-08-06	33670
<u>Eusonaia ebena</u> (Ebonyshell) #2 T28N R20W S23, T29N R20W S14, T29N R20W S23, T29N R20W S26, T29N R20W S35; Washington County		END	no chang	SGCN	S1	G4G5	2003-08-(4-7)	10454
<u>Lampsilis higginsii</u> (Higgins Eye) #2 T115N R17W S16, T115N R17W S17, T115N R17W S21, T115N R17W S22, T [...]; Dakota, Pierce, St. Croix, Washington County	LE	END	no chang	SGCN	S1	G1G2	2010-06-11	2483
<u>Ligumia recta</u> (Black Sandshell) #407 T28N R20W S11, T28N R20W S2, T28N R20W S23, T29N R20W S2, T [...]; Washington County		SPC	no chang	SGCN	S3	G4G5	2001-09-17	33852
<u>Pleurobema sintoxia</u> (Round Pigtoe) #106 T115N R17W S22, T115N R17W S25, T26N R20W S4, T26N R20W S7, T [...]; Chisago, Dakota, Washington County		THR	SPC	SGCN	S2	G4G5	2003-08-06	30010
Vascular Plant								
<u>Baptisia lactea var. lactea</u> (White Wild Indigo) #4 T28N R20W S10, T28N R20W S11, T28N R20W S12, T28N R20W S13, T [...]; Washington County		SPC	no chang		S3	G5T4T5	1978-10-06	3740

Minnesota Natural Heritage Information System
 Index Report of records within 1 mile radius of:
 ERDB# 20130291 - City of Afion WWTS
 T28N R20W Section 14,15,22,23,26,& 27
 Washington County

Printed May 2013

Data valid for one year

Rare Features Database:

Element Name and Occurrence Number

Vascular Plant

Baptisia lactea var. *lactea* (White Wild Indigo) #11

T28N R20W S14, T28N R20W S15, T28N R20W S16, T28N R20W S21, T [...]; Washington County

Besseyia bullii (Kitten-tails) #27

T28N R20W S10; Washington County

Besseyia bullii (Kitten-tails) #36

T28N R20W S15; Washington County

Helianthemum canadense (Canada Frostweed) #6

T28N R20W S35; Washington County

Liparis liliifolia (Lilium-leaved Twayblade) #9

T28N R20W S15, T28N R20W S16, T28N R20W S21, T28N R20W S22; Washington County

Liparis liliifolia (Lilium-leaved Twayblade) #10

T28N R20W S26, T28N R20W S27, T28N R20W S34, T28N R20W S35; Washington County

Liparis liliifolia (Lilium-leaved Twayblade) #64

T28N R20W S14; Washington County

Nuttallanthus canadensis (Old Field Toadflax) #2

T28N R20W S10, T28N R20W S11, T28N R20W S13, T28N R20W S14, T [...]; Washington County

Nuttallanthus canadensis (Old Field Toadflax) #11

T28N R20W S10, T28N R20W S15; Washington County

Paronychia fastigiata var. *fastigiata* (Forked Chickweed) #2

T28N R20W S14; Washington County

Penstemon digitalis (Beard-tongue) #3

T28N R20W S14, T28N R20W S15, T28N R20W S22, T28N R20W S23; Washington County

Polanisia jamesii (James' Polanisia) #2

T28N R20W S10; Washington County

Fungus

Element Name and Occurrence Number	Federal Status	MN Status	Draft Status	SGCN Status	State Rank	Global Rank	Last Obs Date	EO ID #
<i>Baptisia lactea</i> var. <i>lactea</i> (White Wild Indigo) #11 T28N R20W S14, T28N R20W S15, T28N R20W S16, T28N R20W S21, T [...]; Washington County	SPC	no chang	S3	G5T4T5	1943-06-25	3747		
<i>Besseyia bullii</i> (Kitten-tails) #27 T28N R20W S10; Washington County	THR	no chang	S2	G3	1985-05-10	3790		
<i>Besseyia bullii</i> (Kitten-tails) #36 T28N R20W S15; Washington County	THR	no chang	S2	G3	1993-06-01	9204		
<i>Helianthemum canadense</i> (Canada Frostweed) #6 T28N R20W S35; Washington County	NON	SPC	SNR	G5	1940-09-12	4785		
<i>Liparis liliifolia</i> (Lilium-leaved Twayblade) #9 T28N R20W S15, T28N R20W S16, T28N R20W S21, T28N R20W S22; Washington County	NON	no chang	SNR	G5	1971-06-14	4930		
<i>Liparis liliifolia</i> (Lilium-leaved Twayblade) #10 T28N R20W S26, T28N R20W S27, T28N R20W S34, T28N R20W S35; Washington County	NON	no chang	SNR	G5	1974-08-12	4931		
<i>Liparis liliifolia</i> (Lilium-leaved Twayblade) #64 T28N R20W S14; Washington County	NON	no chang	SNR	G5	2004-06-15	31934		
<i>Nuttallanthus canadensis</i> (Old Field Toadflax) #2 T28N R20W S10, T28N R20W S11, T28N R20W S13, T28N R20W S14, T [...]; Washington County	NON	Special C	SNR	G5	1952-06-01	4913		
<i>Nuttallanthus canadensis</i> (Old Field Toadflax) #11 T28N R20W S10, T28N R20W S15; Washington County	NON	Special C	SNR	G5	1988-05-21	8331		
<i>Paronychia fastigiata</i> var. <i>fastigiata</i> (Forked Chickweed) #2 T28N R20W S14; Washington County	END	no chang	S1	G5T5	1976-09-03	5215		
<i>Penstemon digitalis</i> (Beard-tongue) #3 T28N R20W S14, T28N R20W S15, T28N R20W S22, T28N R20W S23; Washington County	NON	no chang	SNA	G5	1973-06-16	5230		
<i>Polanisia jamesii</i> (James' Polanisia) #2 T28N R20W S10; Washington County	END	no chang	S1	G5	1988-09-02	9336		

Minnesota Natural Heritage Information System
 Index Report of records within 1 mile radius of:
 ERDB# 20130291 - City of Afton WWTS
 T28N R20W Section 14,15,22,23,26,& 27
 Washington County

Printed May 2013
 Data valid for one year

Rare Features Database:

Element Name and Occurrence Number	Federal Status	MN Status	Draft Status	SGCN Status	State Rank	Global Rank	Last Obs Date	EO ID #
Fungus								
<u>Lyxurus cruciatus</u> (A Species of Fungus) #1 T28N R20W S16; Washington County		SPC	no chang		S3	GNR	1973-09-22	34857
<u>Psathyrella cystidioides</u> (A Species of Fungus) #2 T27N R20W S2, T27N R20W S3, T27N R20W S4, T28N R20W S26, T [...]; Washington County		END	no chang		S1	GNR	1999-06-12	32530
Native Plant Community (This may not represent a complete list. Also see MCBS Native Plant Communities at http://deli.dnr.state.mn.us.)								
<u>Alder - (Maple - Loosetrife) Swamp Type #430</u> T28N R20W S10, T28N R20W S15, T28N R20W S16, T28N R20W S9; Washington County		N/A			SNR	GNR	1988-05-21	8337
<u>Dry Bedrock Bluff Prairie (Southern) Type #119</u> T28N R20W S21, T28N R20W S22; Washington County		N/A			S3	GNR	1987-08-21	7477
<u>Dry Sand - Gravel Prairie (Southern) Type #20</u> T28N R20W S10; Washington County		N/A			S2	GNR	1988-09-01	8862
<u>Elm - Ash - Basswood Terrace Forest Type #19</u> T28N R20W S14, T28N R20W S15, T28N R20W S23; Washington County		N/A			S2	GNR	1988-07-22	8662
<u>Elm - Ash - Basswood Terrace Forest Type #1667</u> T28N R20W S14, T28N R20W S15; Washington County		N/A			S2	GNR	1987-06-09	7522
<u>Gravel/Cobble Beach (River) Type #4</u> T28N R20W S22, T28N R20W S23; Washington County		N/A			S4	GNR	1988-07-22	8660
<u>Northern Bulrush-Spikerush Marsh Class #386</u> T28N R20W S14, T28N R20W S23; Washington County		N/A			S4	GNR	1988-07-22	8664
<u>Prairie Rich Fen Class #35</u> T28N R20W S10, T28N R20W S11, T28N R20W S14, T28N R20W S15; Washington County		N/A			S3	GNR	1988-08-12	8854
<u>Red Oak - White Oak - (Sugar Maple) Forest Type #51</u> T28N R20W S35; Washington County		N/A			SNR	GNR	1987-07-23	7458
<u>Red Oak - White Oak - (Sugar Maple) Forest Type #1127</u> T28N R20W S15; Washington County		N/A			SNR	GNR	1971-07-21	9380

Minnesota Natural Heritage Information System
 Index Report of records within 1 mile radius of:
 ERDB# 20130291 - City of Afton WWTS
 T28N R20W Section 14, 15, 22, 23, 26, & 27
 Washington County

Printed May 2013
 Data valid for one year

Rare Features Database:

Element Name and Occurrence Number	Federal Status	MN Status	Draft Status	SGCN Status	State Rank	Global Rank	Last Obs Date	EO ID #
Native Plant Community (This may not represent a complete list. Also see MCBS Native Plant Communities at http://deli.dnr.state.mn.us .)								
Red Oak - White Oak Forest Type #1902 T28N R20W S22; Washington County		N/A		S3	GNR	GNR	1988-05-04	10785
Seepage Meadow/Carr Type #32 T28N R20W S15; Washington County		N/A		S3	GNR	GNR	1987-06-09	7517
White Pine - Oak - Sugar Maple Forest Type #644 T28N R20W S22; Washington County		N/A		S2	GNR	GNR	1988-05-04	8335
Other (Ecological)								
Fossil invertebrate (Cambrian) #1 T28N R20W S22, T28N R20W S23, T28N R20W S26, T28N R20W S27; Washington County		N/A		SNR	GNR	GNR	1980-06	168

Records Printed = 51

An Explanation of Fields:

Element Name and Occurrence Number: The Element is the name of the rare feature. For plant and animal species records, this field holds the scientific name followed by the common name in parentheses; for all other elements it is solely the element name. Native plant community names correspond to Minnesota's Native Plant Community Classification (Version 2.0). The Occurrence Number, in combination with the Element Name, uniquely identifies each record.

Federal Status: The status of the species under the U.S. Endangered Species Act: LE = endangered; LT = threatened; LE,LT = listed endangered in part of its range, listed threatened in another part of its range; LT,PDL = listed threatened, proposed for delisting; C = candidate for listing. If null or 'No Status,' the species has no federal status.

MN Status: The legal status of the plant or animal species under the Minnesota Endangered Species Law: END = endangered; THR = threatened; SPC = special concern; NON = tracked, but no legal status. Native plant communities, geological features, and colonial waterbird nesting sites do not have any legal status under the Endangered Species Law and are represented by a N/A.

Draft Status: Proposed change to the legal status of the plant or animal species under the Minnesota Endangered Species Law: END = endangered; THR = threatened; SPC = special concern; Watchlist = tracked, but no legal status.

SGCN Status: SGCN = The species is a Species in Greatest Conservation Need as identified in Minnesota's State Wildlife Action Plan (<http://www.dnr.state.mn.us/cwcs/index.html>). This designation applies to animals only.

State Rank: Rank that best characterizes the relative rarity or endangerment of the taxon or plant community in Minnesota. The ranks do not represent a legal status. They are used by the

Minnesota Natural Heritage Information System
Index Report of records within 1 mile radius of:

ERDB# 20130291 - City of Afton WWTS
T28N R20W Section 14,15,22,23,26,& 27

Washington County

Printed May 2013
Data valid for one year

Minnesota Department of Natural Resources to set priorities for research, inventory and conservation planning. The state ranks are updated as inventory information becomes available. S1 = Critically imperiled in Minnesota because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state. S2 = Imperiled in Minnesota because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state. S3 = Vulnerable in Minnesota either because rare or uncommon, or found in a restricted range, or because of other factors making it vulnerable to extirpation. S4 = Apparently secure in Minnesota, usually widespread. S5 = Demonstrably secure in Minnesota, essentially ineradicable under present conditions. SH = Of historical occurrence in the state, perhaps having not been verified in the past 20 years, but suspected to be still extant. An element would become SH without the 20-year delay if the only known occurrences in the state were destroyed or if it had been extensively and unsuccessfully looked for. SNR = Rank not yet assessed. SU = Unable to rank. SX = Presumed extinct in Minnesota. SNA = Rank not applicable. S#S# = Range Rank: a numeric range rank (e.g., S2S3) is used to indicate the range of uncertainty about the exact status of the element. S#B, S#N = Used only for migratory animals, whereby B refers to the breeding population of the element in Minnesota and N refers to the non-breeding population of the element in Minnesota.

Global Rank: The global (i.e., range-wide) assessment of the relative rarity or imperilment of the species or community. Ranges from G1 (critically imperiled due to extreme rarity on a world-wide basis) to G5 (demonstrably secure, though perhaps rare in parts of its range). Global ranks are determined by NatureServe, an international network of natural heritage programs and conservation data centers.

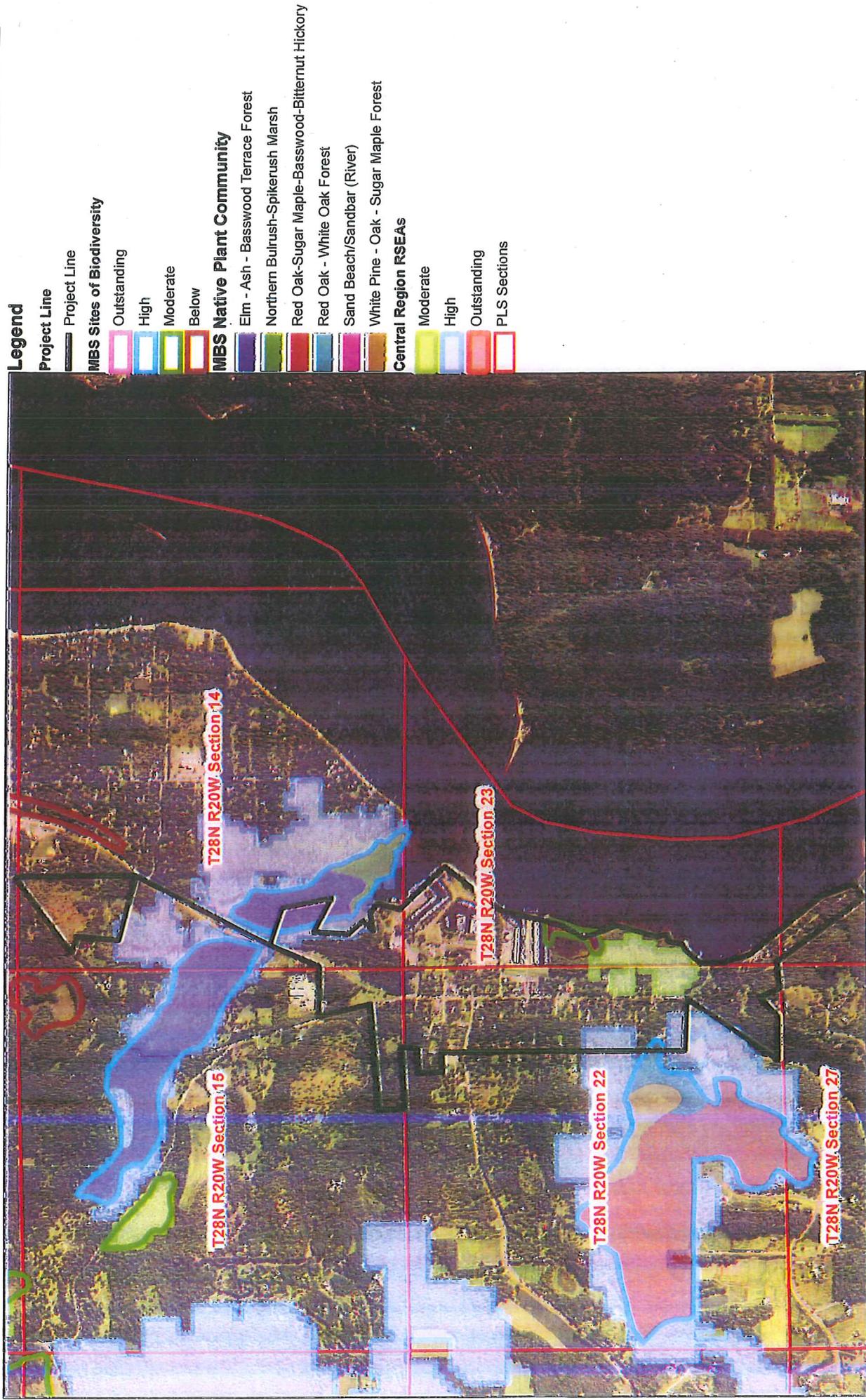
Last Observed Date: Date that the Element Occurrence was last observed to be extant at the site in format YYYY-MM-DD.

EO ID #: Unique identifier for each Element Occurrence record.

Element Occurrence: An area of land and/or water in which an Element (i.e., a rare species or community) is, or was, present, and which has practical conservation value for the Element as evidenced by potential continued (or historical) presence and/or regular recurrence at a given location. Specifications for each species determine whether multiple observations should be considered 1 Element Occurrence or 2, based on minimum separation distance and barriers to movement.

ERD# 20130291 - City of Atton WWTS
 T28N R20W Section 14, 15, 22, 23, 26, & 27
 Washington County

GIS shapefiles of MBS Sites of Biodiversity Significance and MBS Native Plant Communities can be downloaded from the DNR Data Deli at <http://deli.dnr.state.mn.us>.



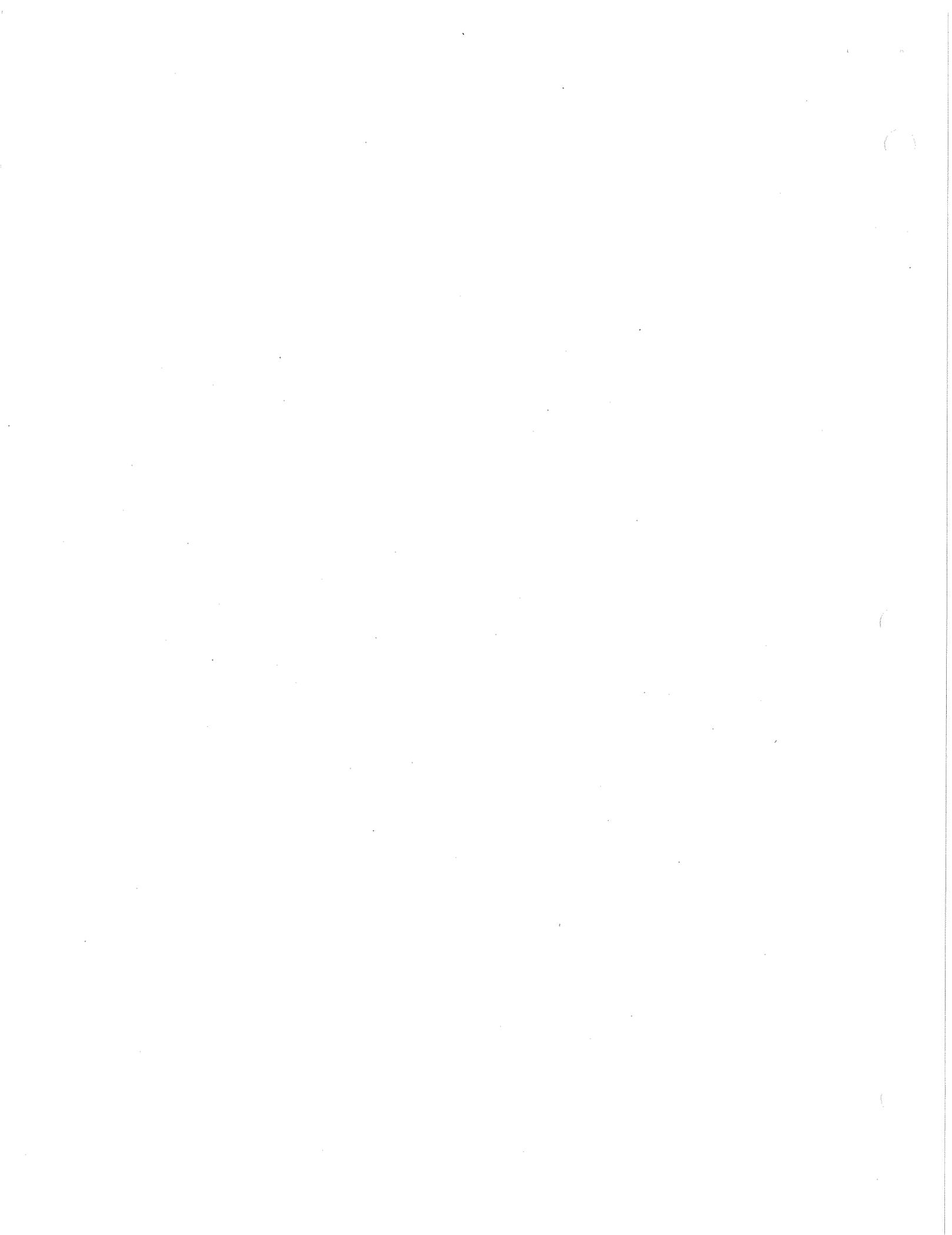
Legend

- Project Line
- MBS Sites of Biodiversity
 - Outstanding
 - High
 - Moderate
 - Below
- MBS Native Plant Community
 - Elm - Ash - Basswood Terrace Forest
 - Northern Bulrush-Spikerush Marsh
 - Red Oak-Sugar Maple-Basswood-Bitternut Hickory
 - Red Oak - White Oak Forest
 - Sand Beach/Sandbar (River)
 - White Pine - Oak - Sugar Maple Forest
- Central Region RSEAS
 - Moderate
 - High
 - Outstanding
 - PLS Sections



Copyright 2013, 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





Looming Issue with Plastic Mesh/Netting in Erosion Control Products

Plastic mesh netting is a common material in erosion control products. It is utilized to hold loose fibrous materials in place (EG straw) until vegetation is established. These products have been used extensively and are successful for reducing soil erosion, benefitting both soil health and water quality. Unfortunately there is a negative side of this component: It is increasingly being documented that it poses dangers to reptiles, amphibians, and mowing machinery.

Potential Problems:

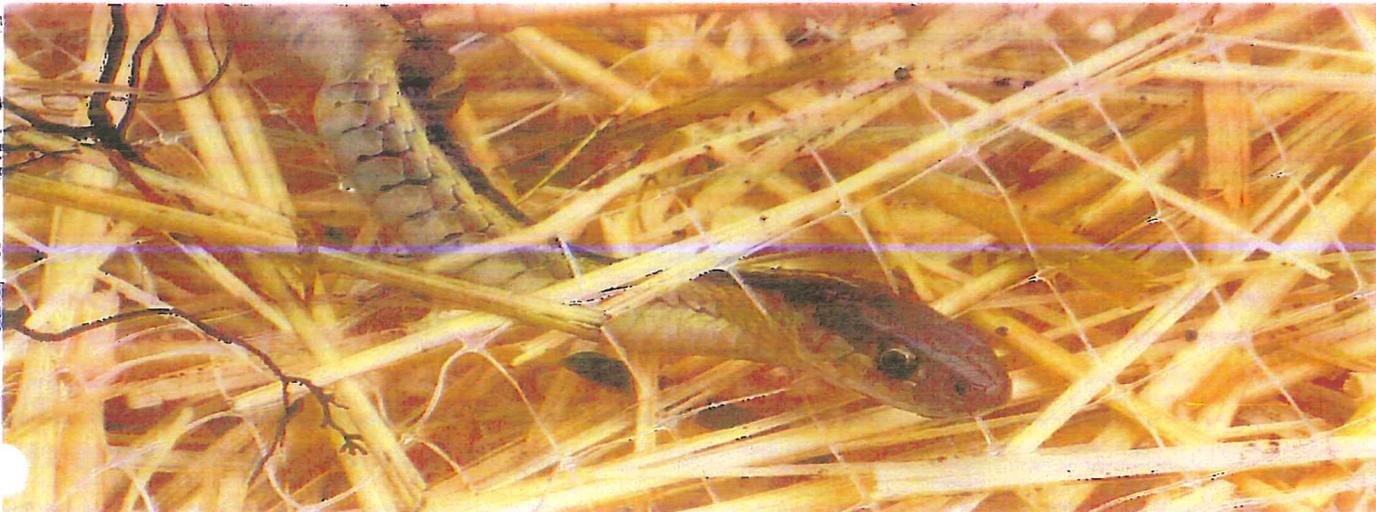
- Plastic netting lays on the surface long after other components have decomposed.
- Plastic mesh netting can result in entanglement and death of a variety of reptiles (snakes, frogs, toads, and turtles). Ducklings have also been documented entangled in the netting.
- Road maintenance machinery can snag 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:

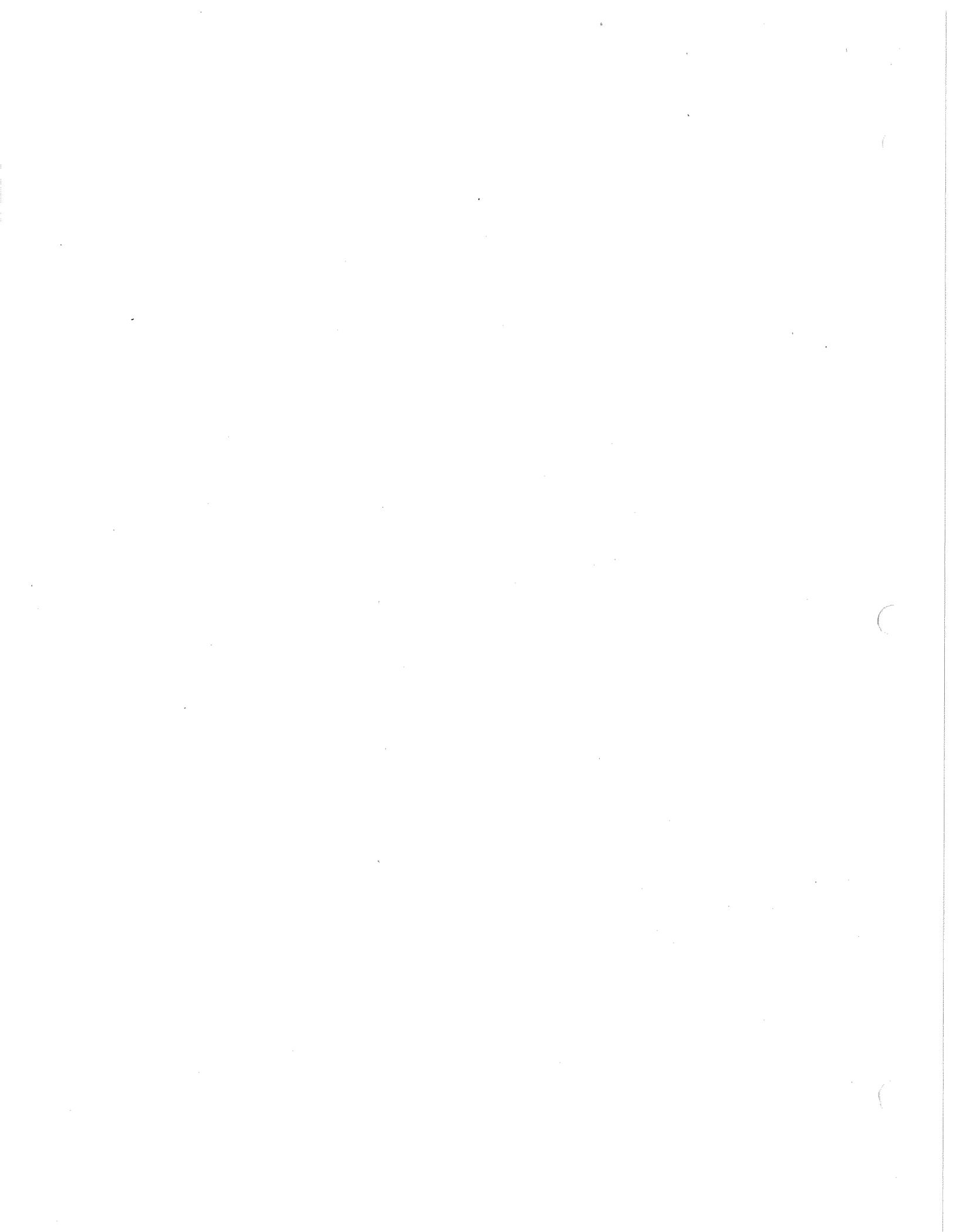
- Do not use in known locations of reptiles or amphibians that are listed as Threatened or Endangered species.
- Limit use where reptiles are likely (near wetlands, lakes, watercourses, or rock outcrops).
- Use rapidly degradable material in all components of erosion control blanket, netting or biologs (fiber rolls) that are to be left on site as part of final stabilization.
- Use types with smaller mesh size (smaller than 1/2") or use types with non-welded netting.



Areas near wetlands, lakes, watercourses or rock outcrops are likely habitat for reptiles and amphibians and may not be suitable for plastic mesh erosion control materials.



Snakes get caught in the plastic mesh



Environmental Review Fact Sheet Series

Endangered, Threatened, and Special Concern Species of Minnesota

Blanding's Turtle (*Emydoidea blandingii*)

Minnesota Status: Threatened
Federal Status: none

State Rank¹: S2
Global Rank¹: G4

HABITAT USE

Blanding's turtles need both wetland and upland habitats to complete their life cycle. The types of wetlands used include ponds, marshes, shrub swamps, bogs, and ditches and streams with slow-moving water. In Minnesota, Blanding's turtles are primarily marsh and pond inhabitants. Calm, shallow water bodies (Type 1-3 wetlands) with mud bottoms and abundant aquatic vegetation (e.g., cattails, water lilies) are preferred, and extensive marshes bordering rivers provide excellent habitat. Small temporary wetlands (those that dry up in the late summer or fall) are frequently used in spring and summer -- these fishless pools are amphibian and invertebrate breeding habitat, which provides an important food source for Blanding's turtles. Also, the warmer water of these shallower areas probably aids in the development of eggs within the female turtle. Nesting occurs in open (grassy or brushy) sandy uplands, often some distance from water bodies. Frequently, nesting occurs in traditional nesting grounds on undeveloped land. Blanding's turtles have also been known to nest successfully on residential property (especially in low density housing situations), and to utilize disturbed areas such as farm fields, gardens, under power lines, and road shoulders (especially of dirt roads). Although Blanding's turtles may travel through woodlots during their seasonal movements, shady areas (including forests and lawns with shade trees) are not used for nesting. Wetlands with deeper water are needed in times of drought, and during the winter. Blanding's turtles overwinter in the muddy bottoms of deeper marshes and ponds, or other water bodies where they are protected from freezing.

LIFE HISTORY

Individuals emerge from overwintering and begin basking in late March or early April on warm, sunny days. The increase in body temperature which occurs during basking is necessary for egg development within the female turtle. Nesting in Minnesota typically occurs during June, and females are most active in late afternoon and at dusk. Nesting can occur as much as a mile from wetlands. The nest is dug by the female in an open sandy area and 6-15 eggs are laid. The female turtle returns to the marsh within 24 hours of laying eggs. After a development period of approximately two months, hatchlings leave the nest from mid-August through early-October. Nesting females and hatchlings are often at risk of being killed while crossing roads between wetlands and nesting areas. In addition to movements associated with nesting, all ages and both sexes move between wetlands from April through November. These movements peak in June and July and again in September and October as turtles move to and from overwintering sites. In late autumn (typically November), Blanding's turtles bury themselves in the substrate (the mud at the bottom) of deeper wetlands to overwinter.

IMPACTS / THREATS / CAUSES OF DECLINE

- loss of wetland habitat through drainage or flooding (converting wetlands into ponds or lakes)
- loss of upland habitat through development or conversion to agriculture
- human disturbance, including collection for the pet trade * and road kills during seasonal movements
- increase in predator populations (skunks, raccoons, etc.) which prey on nests and young

*It is illegal to possess this threatened species.

RECOMMENDATIONS FOR AVOIDING AND MINIMIZING IMPACTS

These recommendations apply to typical construction projects and general land use within Blanding's turtle habitat, and are provided to help local governments, developers, contractors, and homeowners minimize or avoid detrimental impacts to Blanding's turtle populations. **List 1** describes minimum measures which we recommend to prevent harm to Blanding's turtles during construction or other work within Blanding's turtle habitat. **List 2** contains recommendations which offer even greater protection for Blanding's turtles populations; this list should be used *in addition to the first list* in areas which are known to be of state-wide importance to Blanding's turtles (contact the DNR's Natural Heritage and Nongame Research Program if you wish to determine if your project or home is in one of these areas), or in any other area where greater protection for Blanding's turtles is desired.

List 1. Recommendations for all areas inhabited by Blanding's turtles.	List 2. Additional recommendations for areas known to be of state-wide importance to Blanding's turtles.
GENERAL	
A flyer with an illustration of a Blanding's turtle should be given to all contractors working in the area. Homeowners should also be informed of the presence of Blanding's turtles in the area.	Turtle crossing signs can be installed adjacent to road-crossing areas used by Blanding's turtles to increase public awareness and reduce road kills.
Turtles which are in imminent danger should be moved, by hand, out of harms way. Turtles which are not in imminent danger should be left undisturbed.	Workers in the area should be aware that Blanding's turtles nest in June, generally after 4pm, and should be advised to minimize disturbance if turtles are seen.
If a Blanding's turtle nests in your yard, do not disturb the nest.	If you would like to provide more protection for a Blanding's turtle nest on your property, see "Protecting Blanding's Turtle Nests" on page 3 of this fact sheet.
Silt fencing should be set up to keep turtles out of construction areas. It is <u>critical</u> that silt fencing be removed after the area has been revegetated.	Construction in potential nesting areas should be limited to the period between September 15 and June 1 (this is the time when activity of adults and hatchlings in upland areas is at a minimum).
WETLANDS	
Small, vegetated temporary wetlands (Types 2 & 3) should not be dredged, deepened, filled, or converted to storm water retention basins (these wetlands provide important habitat during spring and summer).	Shallow portions of wetlands should not be disturbed during prime basking time (mid morning to mid-afternoon in May and June). A wide buffer should be left along the shore to minimize human activity near wetlands (basking Blanding's turtles are more easily disturbed than other turtle species).
Wetlands should be protected from pollution; use of fertilizers and pesticides should be avoided, and run-off from lawns and streets should be controlled. Erosion should be prevented to keep sediment from reaching wetlands and lakes.	Wetlands should be protected from road, lawn, and other chemical run-off by a vegetated buffer strip at least 50' wide. This area should be left unmowed and in a natural condition.
ROADS	
Roads should be kept to minimum standards on widths and lanes (this reduces road kills by slowing traffic and reducing the distance turtles need to cross).	Tunnels should be considered in areas with concentrations of turtle crossings (more than 10 turtles per year per 100 meters of road), and in areas of lower density if the level of road use would make a safe crossing impossible for turtles. Contact your DNR Regional Nongame Specialist for further information on wildlife tunnels.
Roads should be ditched, not curbed or below grade. If curbs must be used, 4 inch high curbs at a 3:1 slope are preferred (Blanding's turtles have great difficulty climbing traditional curbs; curbs and below grade roads trap turtles on the road and can cause road kills).	Roads should be ditched, not curbed or below grade.

ROADS cont.	
Culverts between wetland areas, or between wetland areas and nesting areas, should be 36 inches or greater in diameter, and elliptical or flat-bottomed.	Road placement should avoid separating wetlands from adjacent upland nesting sites, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details).
Wetland crossings should be bridged, or include raised roadways with culverts which are 36 in or greater in diameter and flat-bottomed or elliptical (raised roadways discourage turtles from leaving the wetland to bask on roads).	Road placement should avoid bisecting wetlands, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details). This is especially important for roads with more than 2 lanes.
Culverts under roads crossing streams should be oversized (at least twice as wide as the normal width of open water) and flat-bottomed or elliptical.	Roads crossing streams should be bridged.
UTILITIES	
Utility access and maintenance roads should be kept to a minimum (this reduces road-kill potential).	
Because trenches can trap turtles, trenches should be checked for turtles prior to being backfilled and the sites should be returned to original grade.	
LANDSCAPING AND VEGETATION MANAGEMENT	
Terrain should be left with as much natural contour as possible.	As much natural landscape as possible should be preserved (installation of sod or wood chips, paving, and planting of trees within nesting habitat can make that habitat unusable to nesting Blanding's turtles).
Graded areas should be revegetated with native grasses and forbs (some non-natives form dense patches through which it is difficult for turtles to travel).	Open space should include some areas at higher elevations for nesting. These areas should be retained in native vegetation, and should be connected to wetlands by a wide corridor of native vegetation.
Vegetation management in infrequently mowed areas -- such as in ditches, along utility access roads, and under power lines -- should be done mechanically (chemicals should not be used). Work should occur fall through spring (after October 1 st and before June 1 st).	Ditches and utility access roads should not be mowed or managed through use of chemicals. If vegetation management is required, it should be done mechanically, as infrequently as possible, and fall through spring (mowing can kill turtles present during mowing, and makes it easier for predators to locate turtles crossing roads).

Protecting Blanding's Turtle Nests: Most predation on turtle nests occurs within 48 hours after the eggs are laid. After this time, the scent is gone from the nest and it is more difficult for predators to locate the nest. Nests more than a week old probably do not need additional protection, unless they are in a particularly vulnerable spot, such as a yard where pets may disturb the nest. Turtle nests can be protected from predators and other disturbance by covering them with a piece of wire fencing (such as chicken wire), secured to the ground with stakes or rocks. The piece of fencing should measure at least 2 ft. x 2 ft., and should be of medium sized mesh (openings should be about 2 in. x 2 in.). It is *very important* that the fencing be **removed before August 1st** so the young turtles can escape from the nest when they hatch!

REFERENCES

- ¹Association for Biodiversity Information. "Heritage Status: Global, National, and Subnational Conservation Status Ranks." NatureServe. Version 1.3 (9 April 2001). <http://www.natureserve.org/ranking.htm> (15 April 2001).
- Coffin, B., and L. Pfannmuller. 1988. Minnesota's Endangered Flora and Fauna. University of Minnesota Press, Minneapolis, 473 pp.

REFERENCES (cont.)

- Moriarty, J. J., and M. Linck. 1994. Suggested guidelines for projects occurring in Blanding's turtle habitat. Unpublished report to the Minnesota DNR. 8 pp.
- Oldfield, B., and J. J. Moriarty. 1994. Amphibians and Reptiles Native to Minnesota. University of Minnesota Press, Minneapolis, 237 pp.
- Sajwaj, T. D., and J. W. Lang. 2000. Thermal ecology of Blanding's turtle in central Minnesota. *Chelonian Conservation and Biology* 3(4):626-636.

CAUTION



BLANDING'S TURTLES MAY BE ENCOUNTERED IN THIS AREA

The unique and rare Blanding's turtle has been found in this area. Blanding's turtles are state-listed as Threatened and are protected under Minnesota Statute 84.095, Protection of Threatened and Endangered Species. Please be careful of turtles on roads and in construction sites. For additional information on turtles, or to report a Blanding's turtle sighting, contact the DNR Nongame Specialist nearest you: Bemidji (218-308-2653); Grand Rapids (218-327-4518); New Ulm (507-359-6033); Rochester (507-206-2820); or St. Paul (651-259-5772).

DESCRIPTION: The Blanding's turtle is a medium to large turtle (5 to 10 inches) with a black or dark blue, dome-shaped shell with muted yellow spots and bars. The bottom of the shell is hinged across the front third, enabling the turtle to pull the front edge of the lower shell firmly against the top shell to provide additional protection when threatened. The head, legs, and tail are dark brown or blue-gray with small dots of light brown or yellow. A distinctive field mark is the bright yellow chin and neck.

**BLANDING'S TURTLES DO NOT MAKE GOOD PETS
IT IS ILLEGAL TO KEEP THIS THREATENED SPECIES IN CAPTIVITY**

**SUMMARY OF RECOMMENDATIONS
FOR AVOIDING AND MINIMIZING IMPACTS
TO BLANDING'S TURTLE POPULATIONS**
(see Blanding's Turtle Fact Sheet for full recommendations)

- This flyer should be given to all contractors working in the area. Homeowners should also be informed of the presence of Blanding's turtles in the area.
- Turtles that are in imminent danger should be moved, by hand, out of harm's way. Turtles that are not in imminent danger should be left undisturbed to continue their travel among wetlands and/or nest sites.
- If a Blanding's turtle nests in your yard, do not disturb the nest and do not allow pets near the nest.
- Silt fencing should be set up to keep turtles out of construction areas. It is critical that silt fencing be removed after the area has been revegetated.
- Small, vegetated temporary wetlands should not be dredged, deepened, or filled.
- All wetlands should be protected from pollution; use of fertilizers and pesticides should be avoided, and run-off from lawns and streets should be controlled. Erosion should be prevented to keep sediment from reaching wetlands and lakes.
- Roads should be kept to minimum standards on widths and lanes.
- Roads should be ditched, not curbed or below grade. If curbs must be used, 4" high curbs at a 3:1 slope are preferred.
- Culverts under roads crossing wetland areas, between wetland areas, or between wetland and nesting areas should be at least 36 in. diameter and flat-bottomed or elliptical.
- Culverts under roads crossing streams should be oversized (at least twice as wide as the normal width of open water) and flat-bottomed or elliptical.
- Utility access and maintenance roads should be kept to a minimum.
- Because trenches can trap turtles, trenches should be checked for turtles prior to being backfilled and the sites should be returned to original grade.
- Terrain should be left with as much natural contour as possible.
- Graded areas should be revegetated with native grasses and forbs.
- Vegetation management in infrequently mowed areas -- such as in ditches, along utility access roads, and under power lines -- should be done mechanically (chemicals should not be used). Work should occur fall through spring (after October 1st and before June 1st).

Rare Features Database Reports: An Explanation of Fields

Revised August 2012

The Rare Features Database is part of the Natural Heritage Information System, and is maintained by the Division of Ecological and Water Resources, Minnesota Department of Natural Resources (DNR).

Please note that the database reports are copyrighted and may not be reproduced without permission

Field Name: [Full (non-abbreviated) field name, if different]. Further explanation of field.

-D-

Draft Status: Proposed change to the legal status of the plant or animal species under the Minnesota Endangered Species Law: END = endangered; THR = threatened; SPC = special concern; Watchlist = tracked, but no legal status.

-E-

Element Name and Occ #: [Element Name and Occurrence Number]. The Element is the name of the rare feature. For plant and animal species records, this field holds the scientific name followed by the common name in parentheses; for all other elements (such as native plant communities, which have no scientific name) it is solely the element name. Native plant community names correspond to Minnesota's Native Plant Community Classification (Version 2.0). The Occurrence Number, in combination with the Element Name, uniquely identifies each record.

EO Data: [Element Occurrence Data]. For species elements, this field contains data collected on the biology of the Element Occurrence* (EO), including the number of individuals, vigor, habitat, soils, associated species, peculiar characteristics, etc. For native plant community elements, this field is a summary text description of the vegetation of the EO, including structure (strata) and composition (dominant/characteristic species), heterogeneity, successional stage/dynamics, any unique aspects of the community or additional noteworthy species (including animals). Note that this is a new field and it has not been filled out for many of the records that were collected prior to conversion to the new database system. Some of the information meeting the field definition may be found in the General Description field.

EO ID#: [Element Occurrence Identification Number]. Unique identifier for each Element Occurrence record.

EO Rank: [Element Occurrence Rank]. An evaluation of the quality and condition of an Element Occurrence (EO) from A (highest) to D (lowest). Represents a comparative evaluation of: 1) quality as determined by representativeness of the occurrence especially as compared to EO specifications and including maturity, size, numbers, etc. 2) condition (how much has the site and the EO itself been damaged or altered from its optimal condition and character). 3) viability (the long-term prospects for continued existence of this occurrence - used in ranking species only). EO Ranks are assigned based on recent fieldwork by knowledgeable individuals.

Extent Known?: A value that indicates whether the full extent of the Element is known (i.e., it has been determined through field survey) at that location. If null, the value has not been determined.

-F-

Federal Status: Status of species under the U.S. Endangered Species Act: LE = endangered; LT = threatened; LE,LT = listed endangered in part of its range, listed threatened in another part of its range; LT,PDL = listed threatened, proposed for delisting; C = candidate for listing. If null or "No Status" the species has no federal status.

First Observed Date: Date that the Element Occurrence was first reported at the site in format YYYY-MM-DD. A year followed by "Pre" indicates that the observed date was sometime prior to the date listed, but the exact date is unknown.

-G-

General Description: General description or word picture of the area where the Element Occurrence (EO) is located (i.e., the physical setting/context surrounding the EO), including a list of adjacent communities. When available, information on surrounding land use may be included. Note that the information tracked in this field is now more narrowly defined than it was in the old database system, and some of the information still in this field more accurately meets the definition of the new EO Data field. We are working to clean up the records so that the information in the two fields corresponds to the current field explanations described herein. Also note that the use of uppercase in sentences in this field is not significant but rather an artifact of transferring data from the old database system to the new system.

Global Rank: The global (i.e., range-wide) assessment of the relative rarity or imperilment of the species or community. Ranges from G1 (critically imperiled due to extreme rarity on a world-wide basis) to G5 (demonstrably secure, though perhaps rare in parts of its range). Global ranks are determined by NatureServe, an international network of natural heritage programs and conservation data centers.

-L-

Last Observed Date: Date that the Element Occurrence was last observed to be extant at the site in format YYYY-MM-DD.

Last Survey Date: Date of the most recent field survey for the Element Occurrence, regardless of whether it was found during the visit. If the field is blank, assume the date is the same as the Last Observed Date.

Location Description: County or Counties in which the Element Occurrence was documented followed by Township, Range, and Section information (not listed in any particular order). Each unique Township, Range, and Section combination is separated by a comma. In some cases, there are too many Township, Range, and Section combinations to list in the field, in which case, the information will be replaced with, "Legal description is too lengthy to fit in allotted space".

-M-

Managed Area(s): Name of the managed area (e.g., federal, state, local, or private park, forest, refuge, or preserve) containing the occurrence, if any. If this field is blank, the element probably occurs on private land. If "(Statutory Boundary)" occurs after the name of a managed area, the location may be a private inholding within the statutory boundary of a state forest or park.

MN Status: The legal status of plant or animal species under the Minnesota Endangered Species Law: END = endangered; THR = threatened; SPC = special concern; NON = tracked, but no legal status. Native plant communities, geological features, and colonial waterbird nesting sites do not have any legal status under the Endangered Species Law and are represented by a N/A.

MN Statute Name: The name of the species as identified under the Minnesota Endangered Species Law. This name may differ from the scientific name due to changes in the scientific nomenclature since 1996, when the Minnesota List of state-listed species was last revised.

-N-

NPC Classification (v1.5): Native plant community name in Minnesota's Native Vegetation: A Key to Natural Communities (Version 1.5). This earlier classification has been replaced by Minnesota's Native Plant Community Classification (Version 2.0).

-O-

Observed Area: The total area (acres), measured or estimated during fieldwork, of the Element Occurrence. If null, the value has not been determined.

-S-

SGCN Status: SGCN = The species is a Species in Greatest Conservation Need as identified in Minnesota's State Wildlife Action Plan (<http://www.dnr.state.mn.us/cwcs/index.html>). This designation applies to animals only.

Site Name: The name of the site(s) where the Element Occurrence is located. Sites are natural areas of land with boundaries determined and mapped according to biological and ecological considerations.

Survey Site #/Name: The name of the survey site, if applicable, where the Element Occurrence is located. Survey sites are sites that provide a geographic framework for recording and storing data, but their boundaries are not based on biological and ecological considerations. Minnesota County Biological Survey site numbers, if applicable, are also listed in this field.

Survey Type: Information on the type of survey used to collect information on the Element Occurrence.

Surveyor(s): Name(s) of the person(s) that collected survey information on the Element Occurrence.

State Rank: Rank that best characterizes the relative rarity or endangerment of the taxon or plant community in Minnesota. The ranks do not represent a legal status. They are used by the Minnesota Department of Natural Resources to set priorities for research, inventory and conservation planning. The state ranks are updated as inventory information becomes available. S1 = Critically imperiled in Minnesota because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state. S2 = Imperiled in Minnesota because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state. S3 = Vulnerable in Minnesota either because rare or uncommon, or found in a restricted range, or because of other factors making it vulnerable to extirpation. S4 = Apparently secure in Minnesota, usually widespread. S5 = Demonstrably secure in Minnesota, essentially ineradicable under present conditions. SH = Of historical occurrence in the state, perhaps having not been verified in the past 20 years, but suspected to be still extant. An element would become SH without the 20-year delay if the only known occurrences in the state were destroyed or if it had been extensively and unsuccessfully looked for. SNR = Rank not yet assessed. SU = Unable to rank. SX = Presumed extinct in Minnesota. SNA = Rank not applicable. S#S# = Range Rank: a numeric range rank (e.g., S2S3) is used to indicate the range of uncertainty about the exact status of the element. S#B, S#N = Used only for migratory animals, whereby B refers to the breeding population of the element in Minnesota and N refers to the non-breeding population of the element in Minnesota.

-V-

Vegetation Plot: Code(s) for any vegetation plot data that have been collected within this Element Occurrence (i.e., either Releve Number or the word "RELEVE" indicates that a releve has been collected).

* Element Occurrence – an area of land and/or water in which an Element (i.e., a rare species or community) is, or was, present, and which has practical conservation value for the Element as evidenced by potential continued (or historical) presence and/or regular recurrence at a given location. Specifications for each species determine whether multiple observations should be considered 1 Element Occurrence or 2, based on minimum separation distance and barriers to movement.

Data Security

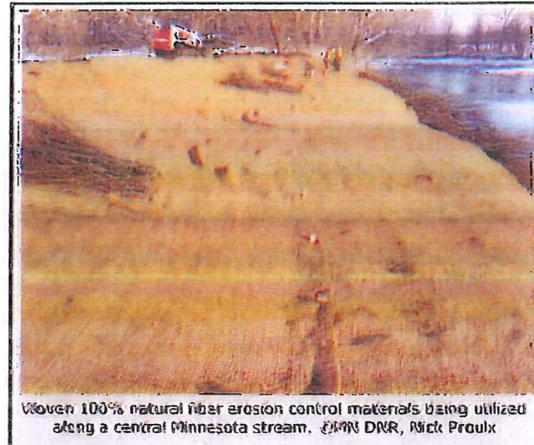
Locations of some rare features must be treated as sensitive information because widespread knowledge of these locations could result in harm to the rare features. For example, wildflowers such as orchids and economically valuable plants such as ginseng are vulnerable to exploitation by collectors; other species, such as bald eagles, are sensitive to disturbance by observers. For this reason, we prefer that publications not identify the precise locations of vulnerable species. We suggest describing the location only to the nearest section. If this is not acceptable for your purposes, please call and discuss this issue with the Endangered Species Review Coordinator at 651-259-5109.

Wildlife Friendly Erosion Control

Wildlife entanglement in, and death from, plastic netting and other man-made plastic materials has been documented in birds (Johnson, 1990; Fuller-Perrine and Tobin, 1993), fish (Johnson, 1990), mammals (Derraik, 2002), and reptiles (Barton and Kinkead, 2005; Kapfer and Paloski, 2011). Yet the use of these materials continues in many cases, without consideration for wildlife impacts. Plastic netting is frequently used for erosion control during construction and landscape projects and can negatively impact terrestrial and aquatic wildlife populations as well as snag in maintenance machinery resulting in costly repairs and delays. However, wildlife friendly erosion control materials do exist, and are sold by several large erosion control material companies. Below are a few key considerations before starting a project.

Know Your Options

- Remember to consult with local natural resource authorities (DNR, USFWS, etc.) before starting a project. They can help you identify sensitive areas and rare species.
- When erosion control is necessary, select products with biodegradable netting (natural fiber, biodegradable polyesters, etc.).
- DO NOT use products that require UV-light to biodegrade (also called, “photodegradable”). These do not biodegrade properly when shaded by vegetation.
- Use netting with rectangular shaped mesh (not square mesh).
- Use netting with flexible (non-welded) mesh.



Know the Landscape

- It is especially important to use wildlife friendly erosion control around:
 - Areas with threatened or endangered species.
 - Wetlands, rivers, lakes, and other watercourses.
 - Habitat transition zones (prairie – woodland edges, rocky outcrop – woodland edges, steep rocky slopes, etc.).
 - Areas with threatened or endangered species.
- Use erosion mesh wisely, not all areas with disturbed ground necessitate its use. Do not use plastic mesh unless it is specifically required. Other erosion control options exist (open weave textile (OWT), rolled erosion control products (RECPs) with woven natural fiber netting).



Protect Wildlife

- Avoid photodegradable erosion control materials where possible.
- Use only biodegradable materials (typically made from natural fibers), preferably those that will biodegrade under a variety of conditions.
- Wildlife friendly erosion control material costs are often similar to conventional plastic netting.



Plains Gartersnake trapped and killed by welded-plastic square erosion control mesh placed along a newly installed cement culvert in southern Minnesota. ©MN DNR, Carol Hall



A small vole that was strangled and killed by plastic erosion control material with welded and square mesh. Photo taken in southern Minnesota and provided courtesy of Tom Jessen.

Literature Referenced

Barton, C. and K. Kinkead. 2005. Do erosion control and snakes mesh? Soil and Water Conservation Society 60:33A-35A.

Derraik, J.G.B. 2002. The pollution of the marine environment by plastic debris: a review. Marine Pollution Bulletin 44:842-852.

Fuller-Perrine, L.D., and M.E. Tobin. 1993. A method for applying and removing bird-exclusion netting in commercial vineyards. Wildlife Society Bulletin 21:47-51.

Johnson, S.W. 1990. Distribution, abundance, and source of entanglement debris and other plastics on Alaskan beaches, 1982-1988. Proceedings of the Second International Conference on Marine Debris 331-348.

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.

