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:** Northern Country Cooperative Grain Storage and Shuttle Loading Facility

2. **Proposer: Northern Country Cooperative**
   Contact person: Scot Janssen/Jeff Irvin
   Title: General Mgr./Regional Mgr.
   Address: P.O. Box 217
   City, State, ZIP: Stacyville, IA 50476
   Phone: 641-710-2348
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   Email: sjanssen@ncountrycoop.com
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3. **RGU: Mower County**
   Contact person: Angela Knish
   Title: Supervisor Environmental Services
   Address: 1105 8th Ave. NE
   City, State, ZIP: Austin, MN 55912
   Phone: 507-437-9560
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4. **Reason for EAW Preparation:** Voluntary EAW submitted by Northern Country Cooperative

Required:	Discretionary:
☐ EIS Scoping	x Citizen petition
☐ Mandatory EAW	☐ RGU discretion
	x Proposer initiated

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

   NA. Per Minnesota Administrative Rules section 4410.4300, an EAW is not mandatory.

5. **Project Location: Mower County**
   County: Mower County
   City/Township: Lansing Township Section 10 T-103N-R18W
   PLS Location (¼, ¼, Section, Township, Range): N3/4, East half of Section 10 Lansing Township, Located west of RR Right of Way.
   Watershed (81 major watershed scale): Cedar River Watershed, #07080201
   GPS Coordinates: 43d44'43" North, 92d58'87" West
   Tax Parcel Number: 08.010.0055, 08.010.0045, 08.010.0050, 08.950.0030 and 08.010.0056

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

- Figure 1: County map showing the general location of the project;
- Figure 2: U.S. Geological Survey 7.5 minute
- Figure 3: Project Soils and Depth to Water Table Maps
- Figure 4: Project Location FEMA Map
- Figure 5: Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.
- Figure 6: Minnesota Department of Natural Resources Information
- Figure 7: U.S. Fish and Wildlife National Wetlands Inventory
- Figure 8: Identified Wells around Project Location
- Figure 9: NRCS Prime Farmland Map
- Figure 10: Minnesota Geologic Map of Bedrock Geology
- Figure 11: MPCA Contaminated Sites
- Attachment 1: April 28, 2016, Minnesota Department of Natural Resources, NHIS Review Response Letter
- Attachment 2: The Geopier Rampact System
- Attachment 3: White Paper: An Optimized Approach to Dust Control in Grain Elevators and Terminals
- Attachment 4: Edward J. Heck & Sons Dust Suppression Literature
- Attachment 5: Minnesota Pollution Control Agency Impaired Waters

6. Project Description:

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

Northern Country Cooperative (NCC) is proposing to build a new state of the art grain receiving, storage and handling facility including the construction of a unit train "loop track". The new facility will service a broader range of markets for the agricultural producers in southeast Minnesota, and will help to stimulate rural economic development. Upon the completion of this project, NCC will have the ability to receive and store up to approximately 3.5 million bushels of corn in bins with the possibility of up to 2, 2 million bushel ground storage piles inside the loop track. In addition, they will be able to load 130 car unit trains onto the Canadian Pacific Railway.

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.

Over the past 10 years, Northern Country Cooperative has acquired approximately 180 acres of land in Section 10 of Lansing Township. The property upon which the new facility would be built is located west of the Village of Lansing on County Highway 2. The property is adjacent and parallel to the Canadian Pacific main line railway that runs north and south between Austin, MN and Owatonna, MN. The new grain facility would be located immediately west of the existing rail. This main line was developed through this area in the 1800's and is most likely the main reason that the Village of Lansing came to exist. This line also runs through the City of Austin and has played an integral part in developing and growing the ag-related economy in the local area. Agriculture is, and will continue to be one of the leading economic drivers for Mower County and Southeast Minnesota.

Northern Country Cooperative currently operates a grain handling facility on the East side of the rail, within the Village of Lansing. The existing facility has approximately 1.5 million bushels of permanent upright grain storage and is limited to loading 25 car unit trains. Northern Country Cooperative is currently in the process of spending $500,000.00 on upgrades to improve the existing facility. These upgrades include the installation of a new grain receiving pit, installation of a grain dust collection system on this new pit (similar to the type that will be implemented in the new facility) and a grain oiling system on both the inbound and outbound legs. These upgrades will speed up the grain receiving process, and do so in a more efficient and safe manner. It will also help to reduce grain dust emissions by up to 78% utilizing modern methods of both dust suppression and collection. The existing facility is located at a site that has no additional room for expansion, therefore Northern Country Cooperatives long-term plans will be to use the existing facility for receiving and shipping soybeans, and move the larger volumes of corn receiving and shipping to the new facility being proposed. The new facility will allow Northern Country Cooperative to take pressure off the older facility and keep volumes in the range that it was designed to handle in an effort to extend the life of the facility, while still allowing for growth of the company.

The new facility will include new offices, vehicle and truck storage, approximately 3.5 million bushels of upright grain storage and enclosed one stop dump pits equipped with grain dust suppression mechanisms (oiling systems) and dust collection systems (vacuum systems) all designed to reduce dust emissions into the local environment. There will also be the addition of a 130 car rail loop and bulk weighing system for loading rail cars. The site will also provide a much larger area for the staging of truck traffic, current and future volumes included (future traffic volumes are addressed in question 18), which will allow for more efficient and safer traffic flow into and out of the new and existing facilities. The new site will provide enough space to hold and stage up to 40 semis on site. This will keep traffic off the Township and County roads and prevent any congestion issues for the local traffic. Infrastructure needs and improvements will be handled by Northern Country Cooperative and done so by the guidelines set forth by the local providers of such services. For example the electrical needs will be determined with the help of Austin Utilities, water utilities (fresh and sanitary) with the help of the Village of Lansing Water and Sewer Districts and gas utilities with the help of Minnesota Energy. It has been indicated to Northern Country Cooperative (by the noted utilities) that there is ample access to electric, water, sewer and gas for the proposed project. The need for turning and/or passing lanes at the entrance will be determined by the Mower County Highway Engineering Department and, if deemed necessary, will be provided by Northern Country Cooperative. The need for the turning and bypass lanes has not yet been determined at this time, but preliminary conversations have already taken place between Northern Country Cooperative and Mower County. The on-site road infrastructure will consist of paved surfaces on the main roads and the use of dust control substances on the unpaved surfaces in order to minimize road dust.

During the construction process, all contractors will be required to implement any and all measures needed to eliminate and control run-off and fugitive dust that may be generated (silt fences, dust control…). A SWPPP (Stormwater Pollution Prevention Plan) will be prepared for the project and will outline all mitigation methods that will be required to be implemented by all contractors working at the construction site. All construction waste and demolition materials will be disposed of at the appropriate local landfills and any recyclable materials will be taken to the Mower County Recycling facilities (ie paper, glass, plastic and cardboard).

Geo-piers (refer to Attachment 2 for more information) will be utilized to prepare the existing sub-soil to provide the needed soil bearing capacity. By using geo-piers, we will minimize the volume of soil excavation and replacement. Soil borings will be performed by WSB & Associates to determine the existing soil profile in the construction area and to precisely identify the weight bearing

characteristics of the soil. They will identify the depth at which the subsoil base will be able to carry a load of up to 4000 psf., depth to water table and the overall characteristics of the soil profile that will determine the amount of excavation necessary to create a base to support the upright structures that will be built. If the borings would call for the removal of 10 ft. or less of topsoil and replacement and compaction with structural material, the base would be prepared through traditional methods. Preliminary borings performed in the summer of 2015 in comparable soil types located South and East of the construction site indicated that the depth of excavation would be in the 20 -30 ft. range. Northern Country Cooperative and its contractors are expecting similar results at the building site and, therefore, are anticipating the use of geo-piers. Northern Country Cooperative has utilized this soil preparation technique at several other sites in the past with great success. This process limits the amount of topsoil disruption and overall soil removal due to the fact that soil disturbance is limited to the boring of 2 ft. diameter holes in a grid pattern in the designated area in lieu of the need for over excavation and replacement with suitable structural fill that would be required with traditional excavation methods. The GPS coordinates for the holes (approximately 150 – 200 rammed aggregate piers per bin) will be flagged by a surveying crew. The geo-pier contractor will then come in with two large modified excavators, one with a large drilling derrick and the other with large pile driving attachment. The drilling rig will perform precise borings to the designated depth, removing the subsoil and creating a vertical cavity. The pile driving rig will then be placed over this hole, a very hard rock (referred to as concrete rock) is inserted into the hole in increments and pile driven to specified bearing pressure points. This process in the end creates a subsoil grid work of pilings upon which the concrete pads can be poured and the structures built upon. The only surface preparation will be to grade the surface level in order for the footings and concrete slabs to be built. The soil that is removed (which will be less than half of that required by traditional excavation) will be placed along the east side of the proposed rail loop in order to create a berm upon which trees or shrubs can be established in order to provide a buffer between the new facility and the Village of Lansing. Northern Country Cooperative believes that this method of construction is far more environmentally friendly due to the fact that the amount of surface disturbance is greatly reduced. This is a very important point of emphasis for Northern Country Cooperative, as it is our goal to be a good steward of the land along with our farmer owners.

Storm water detention basins will be installed as required by the MPCA (Minnesota Pollution Control Agency), Mower County and the Cedar River Watershed District because more than one acre of land will be disturbed by the development. The ponds will be designed as required by the aforementioned agencies and will be subject to all typical reviews and approvals. (Refer to Figure 5 for the approximate size and location of the proposed stormwater management devices). Northern Country Cooperative and Larson Engineering will also work with these agencies, as well as all other Federal, State and Local agencies, to secure any and all required permits for this project (i.e. building, air and water quality). Soil borings/test pits will also be performed by WSB in the proposed storm detention pond areas in order to determine the infiltration rates in those areas and provide information for the proper design and construction.

Northern Country Cooperative will also be employing a variety of landscaping techniques in order to provide natural barriers between the new site and the neighboring homes and small businesses in the Village of Lansing. This will include, but not be limited to, the development of the berms with the excess soil that was previously mentioned. The ultimate goal of all the landscaping that will be employed is 1) to blend in with the local landscape and 2) reduce any of the nuisance noise, dust or light for all the neighbors of Northern Country Cooperative.

In addition to the development of the facility west of the Village of Lansing, the Northern Country Cooperative board of directors has approved and allocated funds to be used in the spring of 2016 to perform renovations upon the existing grain elevator. These improvements are currently underway,

and will total approximately $500,000. These improvements are all equipment upgrades and replacements, and no permits were required for the work. The improvements include the installation of a grain oiling system on both the inbound and outbound grain legs, a one stop dump system that will be equipped with a dust collection system and some minor cosmetic improvements to the grounds. Northern Country Cooperative expects up to a 90 percent reduction in dust and particulate emissions through these improvements and a better traffic flow into and out of the current facility in order to reduce congestion. As mentioned previously, the long term plan for this existing facility is to switch it to primarily a soybean receiving and shipping facility, with the new proposed facility across the road handing the higher volumes of corn. The addition of the new facility will also help to bring the levels of grain processed at the current facility back down to the levels (approximately 4,000,000 bushels/year) that it was designed to handle efficiently. Retrofitting the existing facility with both dust suppression and collection systems and the incorporation of these systems into the new expansion will help to improve the overall air quality in the area. The increased tax base from the new facility will provide additional funds that could be allocated to providing more and better services to the local residents.

The proposed timeline for the renovation and new construction is to start with renovations on the current facility in the spring of 2016 and be able to start soil preparation and office construction at the new facility by late summer of 2016. Northern Country Cooperative is proposing to perform the new construction in phases that will align with its' fiscal year of August 1st to July 31st and that will allow for no required down time. Northern Country Cooperative is hopeful that by the spring of 2019 the new facility will be able to start shipments on the new rail system. This will of course be somewhat dictated to economic performance for the industry over the next few years, as Northern Country Cooperative is very dedicated to remaining fiscally strong and viable for its' member owners. Northern Country Cooperative will not take on a highly leveraged position in order to complete this project, but would instead look at extending the project as dictated by cash flow from operations.

c. Project magnitude:

Total Project Acreage	180 acres
Linear project length	
Retention ponds,landscape,grass	28 acres
Commercial building area (in square feet)	12,000 sq. ft.
Grain storage area (in square feet)	75,000 sq. ft.
Rail and Roads Acreage	10 acres
Farmland Acreage	140 acres
Structure height(s)	125 – 160 ft. max

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.

Northern Country Cooperative feels that this project is vital to ensuring the future success and viability of the cooperative as well as its' member owners as the industry moves into the next era of agricultural production and commodity handling and movement. Northern Country Cooperative, with the help of Land O Lakes business development services, identified the need to upgrade and expand our Lansing facilities in order to keep pace (and even catch up) to the increased size and speed of the area producers that have come about due to both economic drivers and technological innovations. Improved genetics and production methods continue to drive yield trends upward and hence add to the amount of grain that needs to be exported out of this area for processing. The grain industry in general is also being driven by both the end users and railroads to become capable of receiving and loading shuttle (unit) trains of 100 -130 cars in an efficient and timely manner (12 hrs. or less) in

order to be competitive or even have access to certain end markets. Greater access to these larger end markets is very important, if not vital, to the future of both Northern Country Cooperative and its' member owners to ensure success, viability and growth into the future.

The information gathered through the help of Land O Lakes, has led Northern Country Cooperative to develop and implement a long-term plan to invest up to 20 million dollars of its' members equity to into this new facility. This project will be funded entirely by Northern Country Cooperative, without the need for government assistance. Not only will this project provide a modern state of the art grain handling facility to meet present and future needs, done in an environmentally safe and neighbor friendly manner, but also provide a broader local tax base that will provide for better services to the surrounding community.

It is the goal of Northern Country Cooperative to bring better services to our patrons and maintain a positive image while at the same time providing a positive economic impact to the rural communities in which we are located. There will be a positive economic impact to the local economy during the construction phase and on into the operations phase due to addition of more employees. During the construction phase there will likely be between 10 and 20 workers on site, many of which being local. Many of these workers own homes in the Mower County area and therefore pay property taxes and also shop local and pay local sales tax. Contractors from outside the area will provide some short-term lodging benefits to the local economy. There will also be local fabrication jobs that will be created, as a large portion of the grain handling equipment will be built by R & S Grain Systems out of Dexter, MN. Beyond the construction efforts, once the new facility is in operation, Northern Country Cooperative will need to add 2 to 3 positions in the office area, from secretarial help to grain origination and procurement. There will also be the need to add additional general labor help in the daily outside operations of the facility, from grain unloading and loading to equipment maintenance. Northern Country Cooperative feels that this new facility is not only needed but will also drive rural economic development, provide jobs and be the type of facility that will do so in a way that will greatly enhance the overall quality of life in the area.

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

Yes.

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

As part of the design work for laying out the grain handling facility, Northern Country Cooperative attempted to look into the future (5- 15 years) as to the need for other ag related services that our customers in the Lansing area may need or want us to supply. One possible area that was identified was the plant nutrient/crop protection business. Northern Country Cooperative currently provides these services at other locations, but is unable to effectively service the Lansing area out of those locations or are limited due to logistics. Through the design and layout process of the grain facility, Larson Engineering has taken a look at leaving ample space to allow for the addition of a dry/liquid fertilizer plant. This phase would obviously be much larger in scope in regards to environmental impact and planning guidelines and require a whole new set of permitting requirements and be very strongly regulated by State and Federal agencies. At this point in time, Northern Country Cooperative has no plans for developing this phase and is not requesting consideration of this matter, but is simply looking into the future and being transparent in its planning process. The only reason for considering this possibility at this time is to ensure that the physical layout of the grain facility will not hinder or interfere with the addition of this phase if it were to come to fruition. Once again,

Northern Country Cooperative would like to emphasize that any fertilizer expansion would be a totally separate project from the grain expansion and hence require a new and separate permitting process. As stated earlier, Northern Country Cooperative is performing due diligence to ensure that the placement of the grain facility will not impair any future projects.

f. Is this project a subsequent stage of an earlier project?

Yes

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

It will be an expansion of the CUP that was requested and granted by the Township in 2006 for the development of the temporary grain storage bunkers located just east of the proposed site. At that time there was not a requirement for an environmental review for that particular project.

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	0	0	Lawn/landscaping	10	30
Deep water/streams	0	0	Impervious surface	3	6
Wooded/forest	3	2	Storm water Pond	0	1-2
Brush/Grassland	0	0	Other (describe)		
Cropland	164	140			
			TOTAL	**180**	**180**

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.***

Unit of government	Type of application	Status
MPCA	Air quality permit	to be filed
	NPDES/SDS storm water	to be filed
	NPDES/SDS wastewater	to be filed
	401 Water Quality Cert.	to be filed
MDNR		
FAA		
MDH	Public Water Supply Cert.	to be filed
	Asbestos abatement/removal	done
SWCD	Wetland delineation	WSB hired

Cedar River Watershed	Construction guidelines Storm water permit	obtained to be filed
Mower County	CUP/Zoning permit	to be filed
Lansing Township	CUP/Zoning permit Building permits	to be filed to be filed

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 vast majority of the land on which this proposed project will be built, is, and will continue to be used for cropland. The lands adjacent to the property upon which the facility will be located also consist primarily of cropland. The land located to the south and west of the site is zoned rural management, and is primarily cropland with a handful of rural building sites. The proposed building site and the land north of the proposed building site is also zoned Rural Management, and also exists primarily as cropland with a handful of building sites. The parcel east of the proposed building site (former homestead site, now owned by Northern Country Cooperative) is partially zoned Rural Management and partially zoned Rural Service Center. The Village of Lansing located to the east of the proposed site. The rail line provides a buffer between the Village of Lansing (residential) and the proposed site of the new facility. There are no existing parks or trails adjacent to the project site. Most of the adjacent cropland is considered prime farmland, and will continue to be utilized as cropland. (Refer to Figure 9 for map of prime farmland in the area)

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.

According to the most recent Mower County Comprehensive Plan available online (http://www.co.mower.mn.us/public-works-main.html), this project complies with the comprehensive plans regarding the preservation of agricultural land. While a portion of the project will be constructed on prime farmland, a majority (140 acres) of the 180 acres of land will continue to be farmland. It will create jobs (2-3 permanent office jobs, and a number of general labor and maintenance positions when the new facility is in full operation) in the rural area, provide additional tax base which can be utilized by the local government in many ways. The new facility will also be a key component to providing greater economic stability to the agricultural economy of Mower County by providing access to larger and more competitive markets for the goods produced by local farmers by

providing a new rail loop. This allows the commodities to be readily loaded onto the rail and shipped to the most competitive markets.

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

The parcel for this project falls underneath the guidelines set forth by both the Township and County under their zoning plans described for a Rural Management District. In the County ordinance, it falls under land use plans and zoning section; Division 2 "A" Agricultural District, Section 14-51 Conditional uses sub item (m) Agriculturally-orientated businesses. As for the Township, it falls under the zoning ordinances listed under Rural Management District, Article VII – (2) Conditional Uses – Commercial Grain Storage Facilities. This expansion is also being proposed in an area that has been designated for such purposes and at the same time will not hinder the ability for rural urban expansion that may be necessary at some point in the future. Furthermore, as is stated in Division 3, "RM" Rural Management, Section 14-54. Purpose:

"The "RM" Rural Management District is intended to provide a district which will allow suitable areas of the county to be retained in agricultural use; provide opportunities for limited rural non-farm residential development; regulate wetlands and woodlands, which, because of their unique physical features provide a valuable natural resource; and, ***secure economy****. To provide a district that will retain, conserve, and enhance agricultural land in the County while providing areas for rural living."*

Based on the Minnesota Department of Natural Resources (MDNR) data on Wild and Scenic Rivers and Shoreland Areas, the proposed facility is not located on or near any wild and scenic rivers or shoreland (see Figure 6)

According to the Federal Emergency Management Agency (FEMA) floodplain data, the project is not located in the floodplain (see Figure 4).

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

As has been discussed previously, nearly all nearby land uses (with the exception of the Village proper) are agricultural in nature, including an existing grain handling facility (also owned by Northern Country Cooperative) located across the Highway from the proposed new facility. While the project will require a Conditional Use Permit from the Town and the County for the proposed use, we feel that the project is compatible with current and future land use as defined by the zoning maps and the comprehensive plan.

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

While Northern Country Cooperative believes that the proposed land use is compatible with nearby land uses, we will be implementing landscaping techniques that will provide for natural barriers and will serve to provide a buffer to the Village of Lansing from noise from normal operations of the new grain handling facility. In addition, modern dust collection equipment will be provided.

10. Geology, soils and topography/land forms:

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

The local geology consists primarily of a thick (2-3 foot) layer of organic clay underlain by sand with silt and gravel. According to the Minnesota Geological Survey, the underlying Geology is composed of Dolostone, sandy dolostone, limestone and shale. It includes the Chickasaw Shale and Bassett Member of the Little Cedar Formation, and Pinicon Ridge and Spillville Formations. (Refer to Figure 10)

There does not appear to be any susceptible geologic features present on the site, therefore, the existing geology of the site is not expected to cause any limitations to either the construction or operation of the proposed facility. Likewise, the new facility is not expected to effect the existing geology of the site.

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 storm water runoff should be addressed in response to Item 11.b.ii.**

As shown on the attached NRCS soil maps (Figure 3), the overwhelming majority of soil types for the proposed construction site are made up of 3 types. They are Cylinder loam, Fairhaven silt loam (0 – 2 percent slopes) and Dowagiac loams (0 – 2 percent slopes). The areas upon which the main grain receiving, storage, loadout and office are being proposed to be built are compromised of the Cylinder loam and Fairhaven silt loam with very little to no slopes present. The majority of the soils encompassed within the project area also provide very good natural drainage characteristics and are classified by the NRCS report as "well drained". The exceptions to the "well drained" classifications would be the Cylinder loam, Lawler silt loam, and Terril silt loam which fall into the moderately to somewhat poorly drained classifications.

The existing site topography is generally flat with a gradual slope from northwest to southeast. There is an existing drainage swale south of the proposed grain storage facility that will be addressed during the design and construction of the rail loop phase of the project by installing new culverts under the new rail to maintain the existing drainage. Silt fence, temporary sedimentation basins, and temporary swales will be installed during construction as needed to maintain drainage from and through the construction site, and to protect surface water from contamination (from suspended solids) from the construction site. The project does not contain steep slopes or areas of high erosion potential.

Overall the soils in the proposed construction area appear to be very well suited for the development of a subsoil base that will be very adequate for providing the necessary weight bearing requirements for all the structures that are proposed to be built. The one possible characteristic that may require some additional mitigation during both the construction and

operating phases is the potential for a fairly high water table (as high as 18" below the surface according to the NRCS data…refer to Figure 3) that may be encountered while digging the leg foundation and dump pits. The groundwater level will be confirmed with updated soil boring, however the previous borings indicate a depth to groundwater of at least 11 feet. This elevation may still require dewatering. This process involves the temporary installation of a grid of perforated tubes around the perimeter of the proposed excavation area that are placed into the ground down to a level below the depth of the required excavation. These tubes are then connected to an above ground manifold that in turn is connected to a diesel operated suction pump which is ran over a continuous period of time until the water table in that particular area is lowered below the excavation level that is called for in the installation of the pits. The digging and construction are then able to be performed without water seepage into the hole which may pose the risk of cave in on workers. Once the construction has been completed and soil is replaced around the structures up to grade, the water table will return to its previous levels. All dewatering will be performed in accordance with all Minnesota Department of Natural Resource requirements, but will not require a permit from same.

As was stated earlier, preliminary soil borings performed by WSB in late summer 2015, have given indication that geo-piers for the subsoil preparation of the grain storage footings will be the most economical and non-evasive to the environment. Northern Country Cooperative also has experience in using the geo-pier technique in numerous other construction projects throughout the past few years, including some at the existing facility in Lansing. This technique is usually recommended in cases where there is call for a fairly substantial removal and replacement of dirt (usually greater than 10 ft.) or when the site for excavation is surrounded by other large structures that would not allow for either over excavation or safe excavation without the use of shoring devices. The preliminary soil borings conducted last summer indicate the possible need to remove and replace 20 – 30 feet of soil to reach the base required to support the structures. Instead of an excavation of that magnitude, we have elected to utilize geo-piers to provide the adequate soil bearing capacity.

The project will require the grading of approximately 16 acres overall. A final geotechnical report and grading plan are currently in progress, so an estimate of overall excavation volumes at this time would be pre-mature. It is our intent, however to utilize any excess soil from the geo-pier installation, and stormwater pond construction to create landscaped berms to help shield the Village of Lansing from the new operations.

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

The Cedar River is approximately ¾ of a mile from the proposed site. The Cedar River is currently identified as being impeded by higher than normal nitrate levels. The operations of this new facility will not add to this impediment.

There is also a natural waterway that allows for surface water to be discharged into the local drainage ditch through a culvert under the main line railway. Through all of the developmental stages of this project and continuing into the operating phase, Northern Country Cooperative will maintain the natural water flow and drainage from the site. By maintaining this natural water flow for the area, and using retention ponds to handle any additional runoff, there will be no flooding threats posed to the Village and citizens of Lansing because of this project.

Per the U.S. Fish and Wildlife Services National Wetland Inventory, there are no wetlands on, or near, the proposed project site. (Figure 7)

Stormwater runoff from the site will discharge to an unnamed drainage ditch that ultimately flows approximately 8,000 LF to the Cedar River. The Cedar River is listed on the Minnesota Pollution Control Agencies list of impaired waters (Attachment 5) as follows:

> *"Not always suitable for swimming and wading due to high bacteria levels caused by the presence of human or animal waste in the water. Concentrations of PCB in fish tissue and mercury in fish tissue exceed the water quality standard; for specific fish consumption advice refer to the Minnesota Department of Health website at http://www.health.state.mn.us/divs/eh/fish/eating/sitespecific.html. May not support a thriving community of fish and other aquatic organisms, as indicated by excessive turbidity (suspended solids)."*

It should be noted that this water is greater than one mile from the project site, however, ultimately the stormwater from this site does drain to the Cedar River. That being said, the proposed project will not affect the water quality being discharged from the site. There will be no industrial wastewater for disposal, and, other than the domestic wastewater discharged from the restroom (which will be discharged to the Town of Lansing's Sanitary Sewer System, refer to further discussion below in Section 11 (b)(i)) , the only other water leaving the site will be stormwater. All stormwater will be treated for total suspended solids via a wet detention basin prior to leaving the project site in accordance with all requirements of the Minnesota Pollution Control Agency and Mower County. The quantity of stormwater leaving the site will also be limited to the pre-development flow rates, so the project will not have any effect on the downstream surface water quality.

The section of the Cedar River discussed above is a Minnesota Department of Natural Resources protected water. It is, however over a mile and a half (as the water flows) from the project site.

The owner must ensure the contractor's work and indirect impacts (for example, runoff from the construction activities) do not have the potential to reach the impaired waters. The owner must obtain the NPDES/SDS General Construction Stormwater Permit, which outlines requirements for best management practices ("BMPs") to prevent construction stormwater runoff into the waters of the state.

According to the U.S. Fish and Wildlife Area Wetland Mapper (See Figure 7), there are no wetlands located on or near the project site. While we do not believe any further investigation is required, we have contracted WSB engineering to verify that there are no wetlands on the project 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.

As noted, the depth to groundwater is as high as 18" below the surface according to the NRCS data, but is likely deeper according to boring that have been completed nearby. The actual depth to groundwater will be verified.

The project is not in a MDH wellhead projection area.

There are several wells located within 1,000 feet of the project area. All are private wells for either irrigation or domestic water purposes. The project will not result in the production of any contaminants, and therefore we do not expect the project to negatively impact groundwater. (see Figure 8)

It should be noted that there were two 25' deep monitoring wells on the site, and just north of the site. These wells were installed when the property was owned by Huntting Elevator in the late 1980's to monitor possible contamination from herbicides and fertilizer. The investigation and monitoring was concluded and the wells were sealed in 1994 with no contamination found to be present.

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.

Typical domestic wastewater will be generated from the office building (approximately 1,000 gallons/day based of guidelines set forth by the state) and will be discharged to the Town of Lansing Sanitary Sewer System, as is currently the case for NCC's existing office across the road. Northern Country Cooperative has inquired as to the availability and service ability of the system to handle this additional load from the new office building, and it has been indicated by both Duane Mortenson and Bernie Boverhuis, from the Town of Lansing that this will not be a problem. Northern Country Cooperative is in the process of obtaining permission and permitting from the Canadian Pacific Railway in order to bore underneath the main line rail in order to hook into the Village system. An approved and licensed boring company out of the Des Moines area has been contacted to perform the boring services per the guidelines and requirements set forth by both the railroad and the local governing bodies. Access to the municipal system will allow for the abandonment of the current private septic system on the newly acquired Heikes property. The system will be abandoned in accordance with the guidelines and rules set forth by Mower Country Environmental Services, the Minnesota Pollution Control Agency and will be performed by an approved licensed contractor.

The project will not produce any industrial wastewater.

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.**

Not applicable.

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.**

Not applicable

ii. **Stormwater - Describe the quantity and quality of storm water 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 storm water discharges. Describe storm water pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat storm water runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.**

The current project site consists of tilled farmland, and does not have an existing stormwater system. The site currently drains to the southeast into an unnamed drainage ditch through the field. This ditch only flows during storm events, and the entire area is able to be tilled, planted, and harvested. The ditch travels approximately 8,000 LF where it ultimately discharges to the Cedar River. The amount of precipitation runoff from the site varies with rainfall intensity and cover crop, but is typical of farmland in Southern Minnesota.

The owner and its contractors must obtain MPCA General Construction Stormwater Permit coverage and prepare a Stormwater Pollution Prevention Plan for the construction of the new grain facility. The MPCA General Construction Stormwater Permit sets for numerous BMPs that are appropriate for both the location, and the work. All BMPs set forth will be followed by the owner and their contractors.

The construction work for this project will include, at a minimum, silt fencing along with temporary sedimentation basins to contain stormwater runoff from the disturbed construction site, and prevent the contamination of downstream conveyance devices and surface water sources. The sedimentation basins will be maintained until all upstream areas of the construction site are re-vegetated and stabilized. In addition to the silt fence, and sedimentation basin, ditch check devices (sediment logs) will be utilized in the existing and any proposed (permanent and/or temporary) swales and drainage ditches.

After completion of the project (or stabilization of all upslope areas) the temporary sedimentation basin(s) will be converted to permanent detention basin(s). The new basin(s) will control the rate at which stormwater is release from the site. The runoff from the site will be less than, or equal to, the existing runoff from the site. All discharge

points from the detention basin(s) will be stabilized with rip rap to prevent erosion. The rip rap will be designed to withstand the flows from the 100-year design flow.

In addition to controlling the rate of stormwater run-off from the site, the detention basin will serve as a treatment facility and will be designed by an engineer to remove at least 80% of the Total Suspended Solids (TSS) from the stormwater runoff.

When the project is complete, there will be less runoff, and the quality of the runoff will be better than existing conditions provide.

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.

It is anticipated that construction dewatering may be needed to construct the deep receiving pits, and perhaps for some of the deeper foundations required for the grain receiving legs. If dewatering is needed, it will not exceed the 10,000 gallons per day or 1 million gallons per year that would require a MDNR water appropriation permit, and would therefore be authorized under the MDNR General Permit 1997-0005. All requirements of the general permit will be met. The water will not be discharged to a body of water, therefore the installation of dewatering wells (if needed) would not be regulated by the Minnesota Department of Health. Discharge from construction site dewatering will be addressed in the Stormwater Pollution Prevention Plan (SWPPP) that is prepared for the site.

The existing private on-site well will be abandoned, and the new office building will connected to the existing water service provided by the Town of Lansing. The existing service already extends to the project site, so an expansion of the system will not be needed.

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.

According to the U.S. Fish and Wildlife Area Wetland Mapper (See Figure 7), there are no wetlands located on or near the project site. While we do not believe any further

investigation is required, we have contracted WSB engineering to verify that there are no wetlands on the project site.

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.

Neither the construction activities, nor the final operation of the site will occur within (or cause the alteration of) any surface water features. The existing drainage swale that runs south of the site will be maintained. Culverts will be installed under the proposed rail loop so as to not disrupt this existing, natural flow path. Ditch checks devices will be installed within this ditch during construction to prevent turbid runoff from leaving the construction site.

12. Contamination/Hazardous Materials/Wastes:

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

According to the MPCA online mapping, there are no existing sources of soil or groundwater contamination and/or hazardous waste at the existing project site (See Figure 11). The site is currently farmland, and has no other historical use. We do not expect the new grain facility, during construction or operation, to generate hazardous wastes, therefore a contingency plan or response action plan is not necessary.

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.

The owner and their contractors will manage and dispose of all construction debris under the Minnesota solid waste requirements. All items that can be recycled, will be recycled.

All waste materials will be collected and disposed of into metal trash dumpsters in the materials storage area. Dumpsters will have a secure watertight lid, be placed away from stormwater conveyances and drains, and meet all federal, state, and municipal regulations. Only trash and construction debris from the site will be deposited in the dumpster. No construction materials

will be buried on-site. All personnel will be instructed, during tailgate training sessions, regarding the correct disposal of trash and construction debris. Notices that state these practices will be posted in the office trailer and the individual who manages day-to-day site operations will be responsible for seeing that these practices are followed.

Nonhazardous building materials such as packaging material (wood, plastic, and glass), and construction scrap material (brick, wood, steel, metal scraps, and pipe cuttings) will be stored in a separate covered storage facility. Scrap and waste from these materials will be disposed of as noted above.

A designated temporary, above-grade concrete washout area will be constructed on-site. The location will be detailed on the site map when it is determined. A prefabricated concrete washout container will be used and will contain all liquid and concrete waste generated by washout operations. Signs will be posted marking the location of the washout area to ensure that concrete equipment operators use the proper facility.

Concrete pours will not be conducted during or before an anticipated storm event. Concrete mixer trucks and chutes will be washed in the designated area or concrete wastes will be properly disposed of off-site.

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.

All hazardous waste materials such as oil filters, petroleum products, paint, and equipment maintenance fluids will be stored in structurally sound and sealed shipping containers, within the hazardous materials storage area. Hazardous waste materials will be stored in appropriate and clearly marked containers and segregated from other non-waste materials. Secondary containment will be provided for all waste materials in the hazardous materials storage area and will consist of commercially available spill pallets. Additionally, all hazardous waste materials will be disposed of in accordance with federal, state, and municipal regulations. Hazardous waste materials will not be disposed of into the on-site dumpsters. All personnel will be instructed, during tailgate training sessions, regarding the proper procedures for hazardous waste disposal. Notices that state these practices will be posted in the office trailer and the individual who manages day-to-day site operations will be responsible for seeing that these practices are followed.

The hazardous waste material storage areas will be inspected weekly and immediately after storm events. The storage areas will be kept clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Material safety data sheets, material inventory, and emergency contact numbers will be maintained in the office trailer.

A spill prevention plan will be included with the site Stormwater Pollution Prevention Plan (SWPPP) that is required to be kept on-site in the job trailer at all times during construction. The spill prevention and control plan is highlighted below:

3.6 Spill Prevention and Control Plan

Spill Prevention and Control Procedures

BMP Description:

i. Employee Training: All employees will be trained via biweekly tailgate sessions, as detailed in Section 6, Part 6.3.

ii. Vehicle Maintenance: Vehicle and equipment will be maintained off-site. All vehicles and equipment including subcontractor vehicles will be checked for leaking oil and fluids. Vehicles leaking fluids will not be allowed on-site. Drip pans will be placed under all vehicles and equipment that are parked overnight.

iii. Hazardous Material Storage: Hazardous materials will be stored in accordance with Section 3, Part 1 and federal and municipal regulations.

iv. Spill Kits: Spill kits will be within the materials storage area and concrete washout areas.

v. Spills: All spills will be cleaned up immediately upon discovery. Spent absorbent materials and rags will be hauled off-site immediately after the spill is cleaned up and disposed of appropriately. Spills large enough to discharge to surface water will be reported to the National Response Center at 1-800-424-8802.

vi. Material Safety Data Sheets, a material inventory, and emergency contact information will be maintained at the on-site project trailer.

Installation Schedule:	The spill prevention and control procedures will be implemented once construction begins on-site.
Maintenance and Inspection:	All personnel will be instructed, during tailgate training sessions, regarding the correct procedures for spill prevention and control. Notices that state these practices will be posted in the office trailer, and the individual who manages day-to-day site operations will be responsible for seeing that these procedures are followed.
Responsible Staff:	Contractor

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.

All hazardous waste materials such as oil filters, petroleum products, paint, and equipment maintenance fluids will be stored in structurally sound and sealed shipping containers, within the hazardous materials storage area. Hazardous waste materials will be stored in appropriate and clearly marked containers and segregated from other non-waste materials. Secondary containment will be provided for all waste materials in the hazardous materials storage area and will consist of commercially available spill pallets. Additionally, all hazardous waste materials will be disposed of in accordance with federal, state, and municipal regulations. Hazardous waste materials will not be disposed of into the on-site dumpsters. All personnel will be instructed, during tailgate training sessions, regarding the proper procedures for hazardous waste disposal. Notices that state these practices will be posted in the office trailer and the individual who manages day-to-day site operations will be responsible for seeing that these practices are followed.

The hazardous waste material storage areas will be inspected weekly and immediately after storm events. The storage areas will be kept clean, well-organized, and equipped with ample cleanup

supplies as appropriate for the materials being stored. Material safety data sheets, material inventory, and emergency contact numbers will be maintained in the office trailer.

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 existing site consists of tilled farmland.

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 _____) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

The construction site currently exists a farmland. The site drains via an existing drainage ditch/swale that ultimately leads to the Cedar River.

We have requested and received a MDNR Natural Heritage Information System (NHIS) review of the site. (Refer to Attachment 1). The MDNR letter, dated April 28, 2016, summarizes the MDNR's NHIS review of the pond site as "rare features *may* be adversely affected" by the proposed project.

The MDNR letter states that both wood turtle and Blanding's turtles have been documented in the vicinity of the proposed project. Both are listed on the state threatened species list. While we do not anticipate encountering any of the endangered species on our site due to the current nature/use of the site, and the distance the site is from a regular water source, all recommendations provided by MDNR will be adhered to. All flyers will be provided to contractors as requested by the MDNR , and all recommendations for avoiding and minimizing impacts to the species will be adhered to. Silt fencing will be set up to keep the turtles out of the construction site, and the fencing will be removed as soon as construction is complete at the site and the area has been revegetated. All erosion control matting that is used on the construction site will be "wildlife friendly" as noted in the provided fact sheet.

In addition to the Wood and Blanding's turtles, the MDNR letter notes that northern long-eared bat (federally listed as threatened and state listed as special concern) can be found throughout Minnesota. Activities that may impact the species include wind farm operation, disturbance to hibernacula, and destruction/degradation of habitat (tree removal). The MDNR letter also states that the NHIS does not contain any known occurrences of northern long-eared bat roosts or hibernacula within an approximate 1-mile radius of the construction site.

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

The MDNR letter states that both wood turtle and Blanding's turtles have been documented in the vicinity of the proposed project. Both are listed on the state threatened species list. While we do

not anticipate encountering any of the endangered species on our site due to the current nature/use of the site, and the distance the site is from a regular water source, all recommendations provided by MDNR will be adhered to. All flyers will be provided to the contractors as requested by the MDNR and all recommendations for avoiding and minimizing impacts to the species will be adhered to. Silt fencing will be set up to keep the turtles out of the construction site, and the fencing will be removed as soon as construction is complete at the site and the area has been revegetated. All erosion control matting that is used on the construction site will be "wildlife friendly" as noted in the provided fact sheet.

Since the existing site is currently a farmed, agricultural field, the proposed project does not result in a loss of habitat for the aforementioned endangered species that could potentially be found nearby. There are no existing rare features or ecosystems present at the project site. A portion of the existing farmland will be converted to structures and maintained lawn areas, but the remainder will remain farmland. There are no nearby areas that would provide an ideal habitat for the endangered species, and the project will not result in a loss of connectivity or accessibility to an adjoining habitat. The project does not remove or alter a habitat buffer area. Neither the project area itself, nor any of the adjoining properties would be considered wildlife habitat that would be disrupted or destroyed.

Invasive species will not be introduced during the construction or operation of the new facility. All newly seeded areas will include seed specifications requiring the use of native seed mixes, weed free mulch, and the proper cleaning of equipment. While a graded area can provide an opportunity for the introduction of exotic or invasive species, this can be minimized with proper cleaning of equipment and the reestablishment of native vegetation as soon as possible after disturbance.

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

The endangered species act prohibits the "taking" (effecting the habitat) of species, such as the long-eared bat, wood turtle, or Blanding's turtle, without a permit. Based upon the information provided by MDNR, NCC does not believe that the habitat of the aforementioned species will be affected as long as all recommendations and requirements provided by MDNR are adhered to. NCC will require all contractors to adhere to these requirements.

The project will also include standard BMP's relating to erosion and sediment control to protect downstream waters and eliminate any potential effect to fish or other wildlife from sediment loss from the construction site.

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.

Northern Country Cooperative requested a Minnesota State Historical Society (MSHS) State Historic Preservation officer (SHPO) survey of the site and immediately surrounding area. The results of that request have not yet been received, however NCC does not anticipate any findings of historical

properties on the construction site given the nature of the existing site and immediately surrounding area as tilled, farmed cropland.

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 existing site consists of tilled, farmed cropland. The primary visual change as a result of the project will be the new grain bins and associated receiving towers and legs, and the new rail loop. The remaining areas of the site will remain farmed cropland. The new bins will be approximately 135' tall with the new receiving tower standing approximately 180' tall.

It is the intent of NCC to operate primarily during daylight hours, however, during peak harvest it is possible that operations could occur into the night. In addition to harvest receiving operations, rail loadout operations also have the possibility of occurring during dark hours due to the nature of the operations. The rail dictates when unit trains come and go, and therefore the facility will need to meet those requirements.

In order to minimize light pollution NCC will be installing a berm along the east side of the new rail loop and will provide landscaping on this berm that is substantial enough, even immediately after being planted, that it will provide a visual buffer between the residents of the Village of Lansing and the new grain handling facility. Site lighting will only consist of pole mounted street type lighting in areas of heavy use. All lights will be down-cast style to minimize light pollution from the site. Normal operation of the site will not require any large flood-type lighting to be installed on the bins or receiving tower. Photometric planning will be performed with the project to ensure that lighting levels do not encroach onto neighboring properties.

The new facility will not generate any noticeable plumes.

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 only stationary source emissions will be the dust particulates that may be emitted during the handling and movement of grain through the facility and during loading operations. As discussed earlier, Northern Country Cooperative will be employing a combination of both grain oiling systems and dust collection systems to help mitigate the impact upon the surrounding community and environment. The use of the vacuum collection system at the pit area and at other emission source points (i.e. load out spout) has shown up to a 78 percent reduction in emissions. The grain oiling system will help reduce emissions (especially during the shipment process) by an additional 10 percent plus during receiving of grain. This coupled with a near 90 percent reduction at the shipping point will have a cumulative effect

of reducing emissions by 90 percent or better. These reductions will result in an insignificant impact to the overall air quality and general health of the local population and workers.

With the above mentioned equipment installed the project will remain well under the 100 tons/year potential to emit threshold that would require an air quality permit be submitted. If this changes, then all required federal and state permits will be submitted.

There are no boilers or exhaust stacks planned as part of this project that would produce hazardous air pollutants, criteria pollutants or greenhouse gases.

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.

NCC expects an increase in vehicle emissions from the site. The increase will be both temporary during construction and during operation due to the increased vehicle traffic that the project will generate. The effects will be minimized via the construction of modern, advanced grain receiving equipment that greatly reduces the amount of time it takes to unload a truck of grain. This will reduce the amount of diesel idling time. In addition, the traffic flow of the site has been optimized to eliminate excess 'laps' or additional, inefficient truck movements through the site. Please refer to question 18 for further discussion of traffic counts.

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

The construction of the new facility will result in dust and noise during construction. The contractors will be required to use dust control measures to cut dust and meet applicable County and/or City Ordinances. Measures to mitigate dust from construction sites include the application of water to areas that are being actively grading along with areas of high construction traffic. In addition, construction will be avoided during periods of high winds. Extra dust control measures may include minimizing open graded areas. All areas will be seeded and mulched as soon as possible following grading operations.

Northern Country Cooperative will be employing a combination of both grain oiling systems and dust collection systems to help mitigate the impact upon the surrounding community and environment. The use of the vacuum collection system at the pit area and at other emission source points (i.e. load out spout) has shown up to a 78 percent reduction in emissions. The grain oiling system will help reduce emissions (especially during the shipment process) by an additional 10 percent plus during receiving of grain. This coupled with a near 90 percent reduction at the shipping point will have a cumulative effect of reducing emissions by 90 percent or better. These reductions will result in an insignificant impact to the overall air quality and general health of the local population and workers.

NCC will be paving all main vehicle routes on-site to further mitigate any potential sources of dust. All secondary routes will be treated with dust mitigating polymers when needed.

We do not anticipate any odors that would have any effect on the surrounding area either during construction, or during operation. There are no sensitive receptors located nearby, and quality of life will not be effected.

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.

Northern Country Cooperative will minimize the impact upon neighbors from any noise generated during rail loading and movement of rail cars by performing these tasks during normal business hours as much as possible. With normal business hours being Monday thru Friday from 7:00 a.m. – 5:00 p.m. The exception being fall harvest hours that are determined by weather and usually extend closing time to 10:00 p.m. and adds Saturdays and Sundays (typically 7-7 on Saturday and 9-6 on Sundays). Fall harvest typically runs from the last week in September thru the mid part of November depending on weather and crop size.

However, due to the somewhat irregular placement of cars by the railroad for loading, there will likely be times when car loading may have to be performed in off hours. This is due to the fact that one of the requirements imposed upon the shipper (in this case Northern Country Cooperative) is to have the unit train, 100 -130 cars, loaded and billed (ready to be removed from the yard) within 12 hours of placement. For example, if the cars were set into service at Midnight, Northern Country Cooperative would be required to have a crew come in early in the morning so that the 12 hour time restraint may be met. Therefore if the train size consists of 130 hopper cars, each holding approximately 3500 bushels of grain for a total unit quantity of 455,000 bushels, it would take approximately 5 and ¾ hours to load at 80,000 bushels/hour loading capacity. It also takes a couple of hours to inspect and ready the cars for loading before the loading process can begin. This puts the total time at plus or minus 8 hours and does not account for any minor delays encountered by inclement weather or bad order cars that must be moved to a separate siding. All these factors point out why it is imperative that the loading process begin relatively soon after placement has occurred.

With all this being said, the amount of overall loading time per month and year will actually be reduced because of the increased loading speed at the new facility (80,000 bushels/hour vs. 15,000 bushels/hour) and the ability to load more volume (455,000 bushels per train vs. 87,500 bushels per train) per each loading cycle. For example – at this time, Northern Country Cooperative is allowed to order a 25 car unit train every 4 calendar days which equates to just shy of 8 per month. Each of these 25 car unit trains requires a minimum of 8 – 10 hours of loading time because of the smaller loading system at the current facility and the amount of switching of cars from track to track that is involved. Therefore it requires a minimum of 8 full working days to load this volume on a monthly basis versus roughly 2 working days on the new system. This can also be extrapolated out over a years' time to equal anywhere from 75 to 90 days of total loading time. Even once the new facility reaches the goal of 16,000,000 bushels of grain shipped per year, it will only require a total of 36-130 car unit trains to ship this volume (36 days of loading) versus the 75 plus days it currently takes to ship approximately 6,500,000 bushels per year out of the old facility. At the end of the day, Northern Country Cooperative will work closely with the railroad in an effort to keep loadings in the normal business hours and try to reduce as much nuisance noise as possible.

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.

There will be a temporary increase in traffic during construction over the existing conditions as a result of construction vehicles and construction worker vehicles. The number of construction vehicles will vary based on the stage of construction. This traffic will be temporary and, once the facility is completed, will no longer exist. Construction will occur during daylight hours. Phase 1 is expected to take approximately 18 months to complete.

10 – 15 new parking stalls will be located next to the new office area that will accommodate both the employee parking and visitor parking on site. There will also be on site staging and parking areas for grain truck and tractor & wagon combinations that will be large enough to easily accommodate 30 plus semi units (70 feet allowed per each) and an additional overflow area capable of handling up to 15 more semi units. Currently the site receives approximately 35 semi units per day on average with a harvest peak of approximately 100 units per day. With the proposed development, the anticipated peak traffic load would come during the harvest season at 150 semi units per day (or equivalent), with an average of 75 loads per day throughout the year during normal business hours. These numbers are based from projections to handle approximately 4,500,000 bushels during harvest (45 day window) and take in an additional 15,500,000 bushels throughout the rest of the year (220 days accounting for holidays and bad weather days). The amount of permanent off road parking, coupled with the overflow areas, will allow for enough room to keep traffic moving and off 270th St. (County Road 2) and eliminate any congestion or general traffic concerns for local residents. The main entrance/exit is proposed to be located approximately 1,000 feet to the west of the main line tracks and on the south side of 270th St. This will also create a safer situation for traffic in regards to proximity to this main line road crossing (which is equipped with signal lights and cross arms). The need for passing and or turning lanes at the entrance/exit to the facility will be determined by the Mower County Highway Engineering Department and will be designed and built to their specifications if deemed necessary.

The availability of transit and/or alternative transportation modes is not applicable to this 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 project will not generate 250 vehicles per hour (or 2,500 per day), therefore a traffic impact study is not required. As stated previously, the peak traffic load during peak harvest would be approximately 150 semi units (or equivalent) per day. We are working with the local county highway engineer to determine if acceleration/deceleration or turn lanes will be required. If these lanes are required, NCC will construct them per the requirements of the

county.

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

The amount of permanent off road parking and staging areas, coupled with the overflow areas, will allow for enough room to keep traffic moving and off 270th St. (County Road 2). The main entrance/exit is proposed to be located approximately 1,000 feet to the west of the main line tracks and on the south side of 270th St. This will also create a safer situation for traffic in regards to proximity to this main line road crossing (which is equipped with signal lights and cross arms). The need for passing and or turning lanes at the entrance/exit to the facility will be determined by the Mower County Highway Engineering Department and will be designed and built to their specifications if deemed necessary.

As the project is constructed, and following construction, the owner and their customers and contractors must ensure that all federal, state and local requirements, including seasonal and/or weigh restrictions, as well as debris management and control are met and adhered to.

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.

There are no identified additional cumulative effects resulting from the construction and operation of the new grain handling facility.

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.

This project is the first phase of a potential project to accommodate agronomy sales and service in the fertilizer area (liquid and or dry) at this site. The likelihood that Northern Country Cooperative will ever add this step is 50/50 at best due to the rigorous and expensive process to add such services. We have included this possibility due to the fact that this is an area in which Northern Country Cooperative currently provides services at some of its other locations. At this point, this type of project would be at least 5 – 10 years out and would require a whole different set of guidelines and regulations to be followed. The only reason this possibility was broached at this time was to ensure that the current layout for the grain facility would be compatible with this potential future use. The grain facility being proposed currently does not pose any significant cumulative effects or burdens upon the environment and local resources and any expansion into the agronomy services area would have to be analyzed at that future point and time.

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.

NCC does not anticipate any additional environmental impacts, other than those already discussed.

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

The following paragraphs are presented in an effort to address some of the research and documentation that was submitted with the citizen petition, rather than to simply discount them.

There was a great deal of research submitted in the petition that dealt with exposure of workers in the grain industry directly and not to the general public. Much of the research was also performed nearly 40 years ago and cannot account for the technological advancements that have been made over this time period that have greatly reduced exposure to workers and the general public. From the design of the facility itself to the advances in grain dust suppression and collection systems that are implemented in the new state-of-the-art facilities, the emissions of dust have been greatly reduced as has been discussed elsewhere in this submittal.

There were also concerns expressed as to potential contamination of local water sources. One case cited in the petition involved a contamination and fish kill issue that was caused not by the grain dust itself, but rather from a pesticide referred to as phosphume that was used to treat grain for weevils at a large grain terminal on the river. The use of these pesticides in many is cases no longer allowed or accepted by the end market and instead grain screeners are used to mechanically remove the bugs. There will not be any discharges produced from operations that will negatively affect ground water quality, and in fact measures to be taken to minimize runoff during both construction and operation phases, will actually help to protect and improve both ground water and surface waters in the area.

Concerns about an increase in fugitive dust being created by increased truck traffic have been addressed through the combination of paving the high traffic areas and using dust control measures on the unpaved road surfaces. These measures combined with the fact that modern day trucks are required to meet much more stringent emission guidelines, and less idle time provided by the faster unloading system, will minimize the effect of the increased traffic on the local community. In addition, we anticipate that half or more of the traffic will be coming from west of the new facility, and will therefore, not need to enter the Village.

Another concern brought forth in the petition was an increase in noise from train traffic due to greater frequency of trains and that this may cause accelerated heart rates for nearby residents. In looking at a few of the studies that were cited in the petition, they are first of all very small in sample size and duration and seem to come to somewhat similar conclusions. While there may be a period of adjustment to the outside noise upon sleep patterns, “a startle reaction”, the participants adapted to the noise and it became habitual in nature. Also within the studies, there were no major conclusions drawn as to the long-term effects involving known health issues or effects that could be tied directly to this phenomenon other than the very vague description “may have” being loosely attached to possible effects. As was stated in the transportation section of the EAW, there will not be an increase in the number of trains running through the Village of Lansing due to this project, which means there will not be any additional noise exposure to the residents.

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

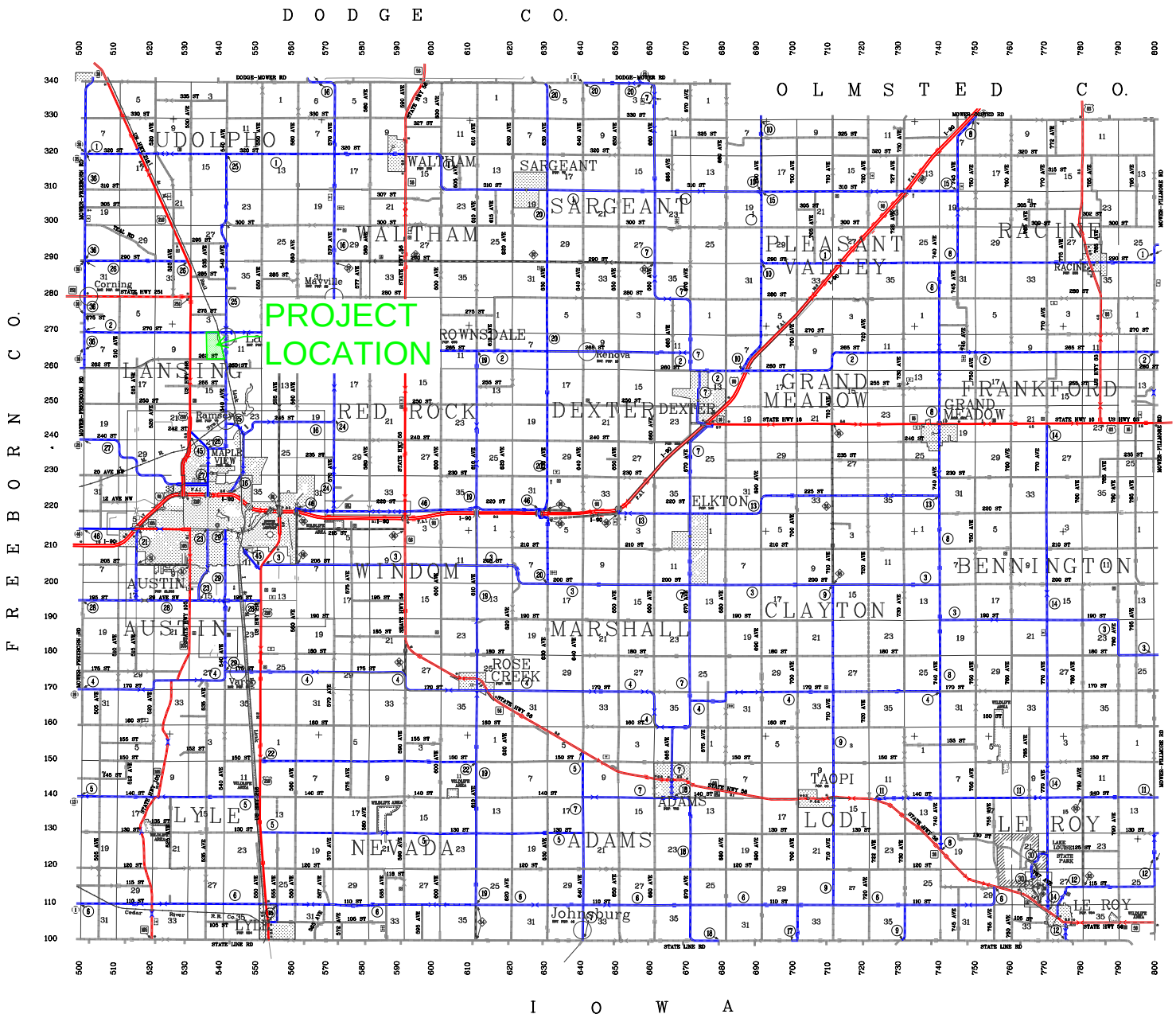
I hereby certify that:

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

Signature _____ Date _____

Title _____

FIGURE 1



HIGHWAY MAP
MOWER COUNTY MINNESOTA

OFFICE OF THE COUNTY ENGINEER
1105 8th AVENUE N.E.
AUSTIN MINNESOTA 55912
OFFICE PHONE NO. 507-437-7718
COUNTY ENGINEER: MICHAL J. HANSON

LEGEND

- PROJECTED ROAD
- PRIMITIVE ROAD
- UNIMPROVED ROAD
- GRADED AND DRAINED ROAD
- SOIL SURFACE ROAD
- GRAVEL OR STONE ROAD
- CSAH ROAD
- PAVED ROAD
- STATE HIGHWAYS

MOWER COUNTY 2005

U.S. DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

The National Map US Topo

AUSTIN EAST QUADRANGLE
MINNESOTA-MOWER CO.
7.5-MINUTE SERIES

Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: Universal Transverse Mercator, Zone 15T
10 000-foot ticks: Minnesota Coordinate System of 1983 (south zone)

Imagery.....NAIP, July 2010
Roads.....©2006-2012 TomTom
Names.....GNIS, 2013
Hydrography.....National Hydrography Dataset, 2010
Contours.....National Elevation Dataset, 1999
Boundaries.....Census, IBWC, IBC, USGS, 1972 - 2012

UTM GRID AND 2013 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square ID
WJ
Grid Zone Designation
15T

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 5 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.11

MINNESOTA
QUADRANGLE LOCATION

Blooming Prairie	Waltham	Sargeant
Austin West	Austin East	Brownsdale
London	Lyle	Rose Creek

ADJOINING 7.5' QUADRANGLES

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

AUSTIN EAST, MN
2013

FIGURE 2

FIGURE 3

Hydrologic Soil Group—Mower County, Minnesota
(Northern Country Coop--LANSING)

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Mower County, Minnesota
Survey Area Data: Version 11, Sep 28, 2015

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

Date(s) aerial images were photographed: Data not available.

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

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Mower County, Minnesota (MN099)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
129	Cylinder loam	B/D	42.4	20.8%
156A	Fairhaven silt loam, 0 to 2 percent slopes	B	105.2	51.5%
485	Lawler silt loam	C	5.9	2.9%
516A	Dowagiac loam, 0 to 2 percent slopes	B	38.2	18.7%
516B	Dowagiac loam, 2 to 6 percent slopes	B	3.8	1.8%
1812	Terril silt loam	B	8.8	4.3%
Totals for Area of Interest			**204.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

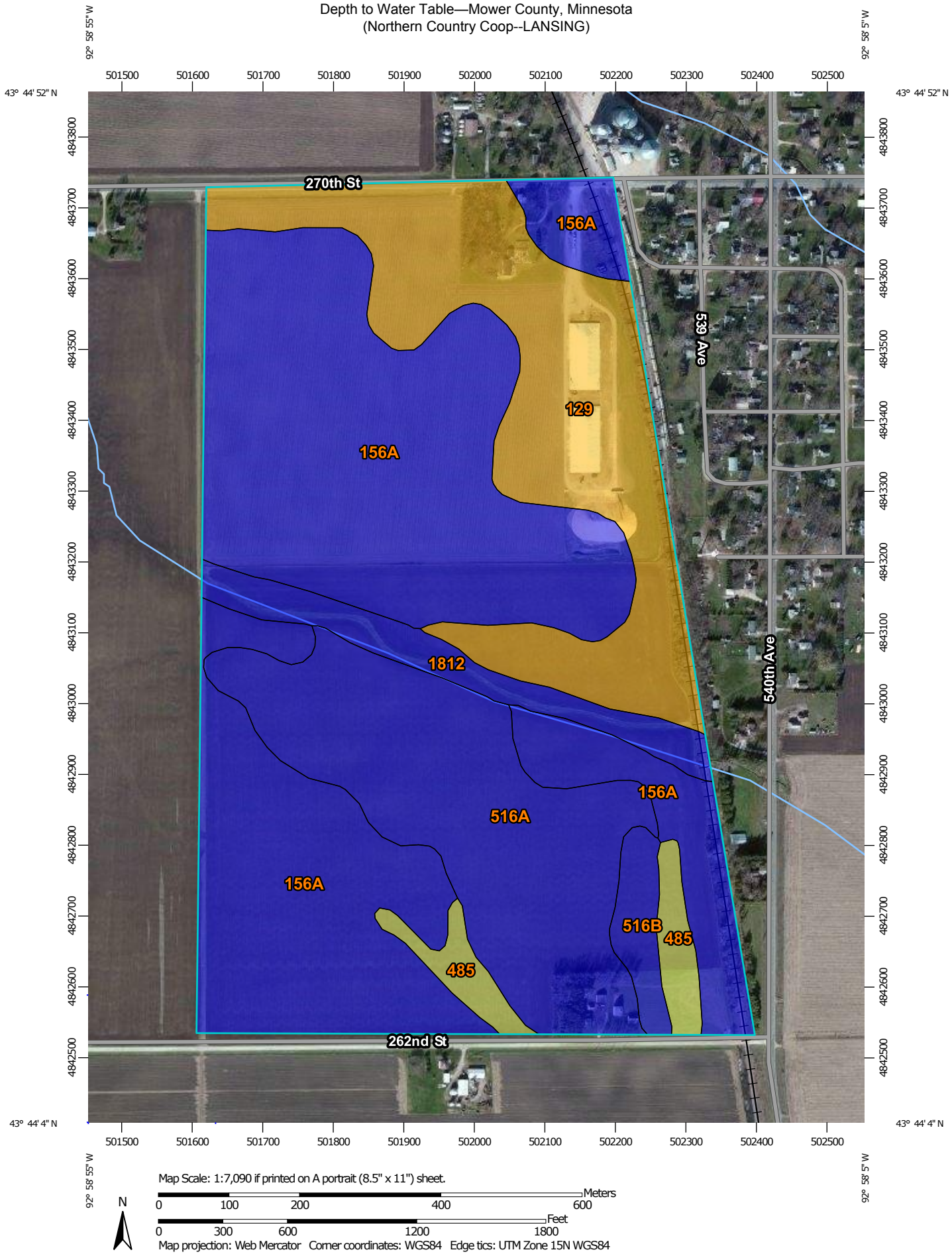
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Depth to Water Table—Mower County, Minnesota
(Northern Country Coop--LANSING)



Map Scale: 1:7,090 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Mower County, Minnesota
Survey Area Data: Version 11, Sep 28, 2015

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

Date(s) aerial images were photographed: Data not available.

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

Depth to Water Table

Depth to Water Table— Summary by Map Unit — Mower County, Minnesota (MN099)				
Map unit symbol	**Map unit name**	**Rating (centimeters)**	**Acres in AOI**	**Percent of AOI**
129	Cylinder loam	46	42.4	20.8%
156A	Fairhaven silt loam, 0 to 2 percent slopes	>200	105.2	51.5%
485	Lawler silt loam	61	5.9	2.9%
516A	Dowagiac loam, 0 to 2 percent slopes	>200	38.2	18.7%
516B	Dowagiac loam, 2 to 6 percent slopes	>200	3.8	1.8%
1812	Terril silt loam	>200	8.8	4.3%
Totals for Area of Interest			**204.3**	**100.0%**

Description

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: *None Specified*

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

MAP SCALE 1" = 1000'

500 0 1000 2000

FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0180D

FIRM

FLOOD INSURANCE RATE MAP

MOWER COUNTY, MINNESOTA AND INCORPORATED AREAS

PANEL 180 OF 450

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MOWER COUNTY	270307	0180	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
27099C0180D

EFFECTIVE DATE
SEPTEMBER 4, 2013

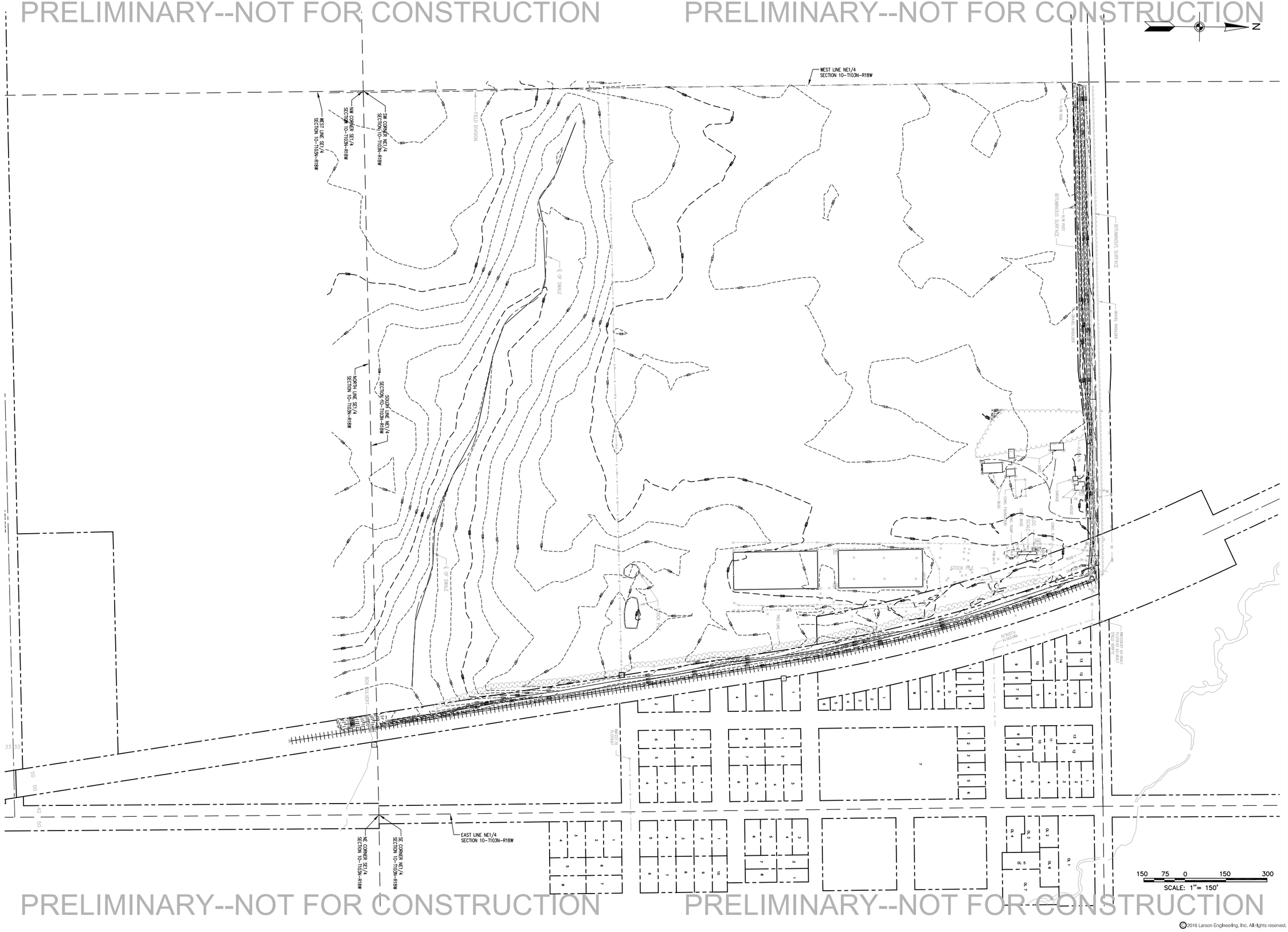
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

FIGURE 4

PRELIMINARY--NOT FOR CONSTRUCTION
PRELIMINARY--NOT FOR CONSTRUCTION

FIGURE 5



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www.larsonengr.com

CLIENT:
Northern Country Coop
53872 270th Street
Lansing, MN 55950
Attn: Scot Janssen (641) 710-2348

LANSING MINNESOTA
FACILITY PLANNING

53872 270TH STREET
LANSING, MN 55950

SEAL

Date:
Design Firm#

No.	Date	Description
0	05/26/16	FOR REVIEW/USE

Project #: 32150005.000

Drawn by: SLM

Checked by: SRG

Sheet Title:

EXISTING SITE

C-1.0

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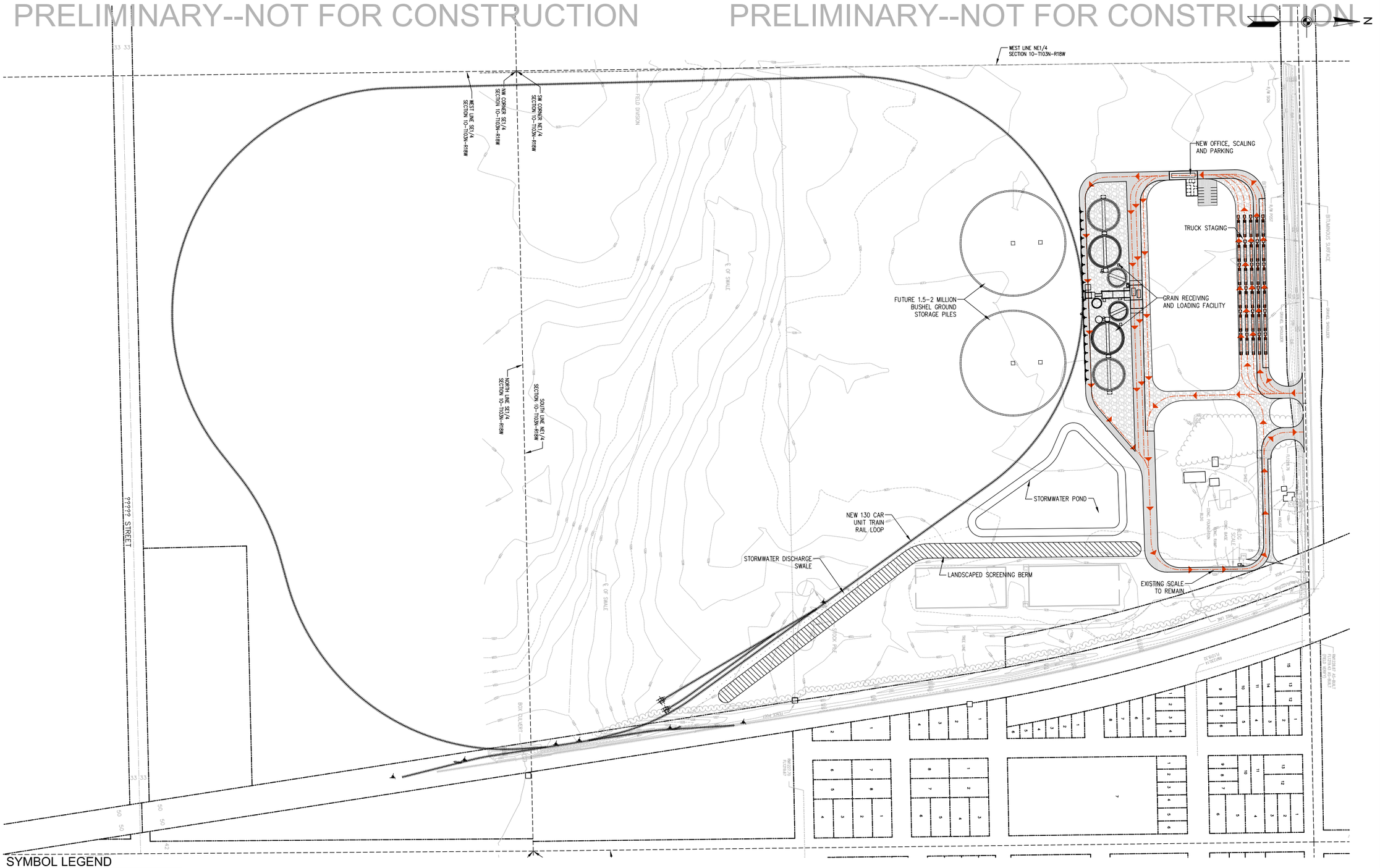
PRELIMINARY--NOT FOR CONSTRUCTION
PRELIMINARY--NOT FOR CONSTRUCTION

PRELIMINARY--NOT FOR CONSTRUCTION
PRELIMINARY--NOT FOR CONSTRUCTION



SYMBOL LEGEND

- NEW ASPHALT DRIVE/PAVEMENT
- NEW GRAVEL DRIVE
- TRUCK FLOW

150 75 0 150 300
SCALE: 1" = 150'

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LANSING MINNESOTA FACILITY PLANNING

53872 270TH STREET
LANSING, MN 55950

SEAL

Date:
Design Firm #

No.	Date	Description
0	05/26/16	FOR REVIEW/USE

Project #: 32150005.000

Drawn by: SLM

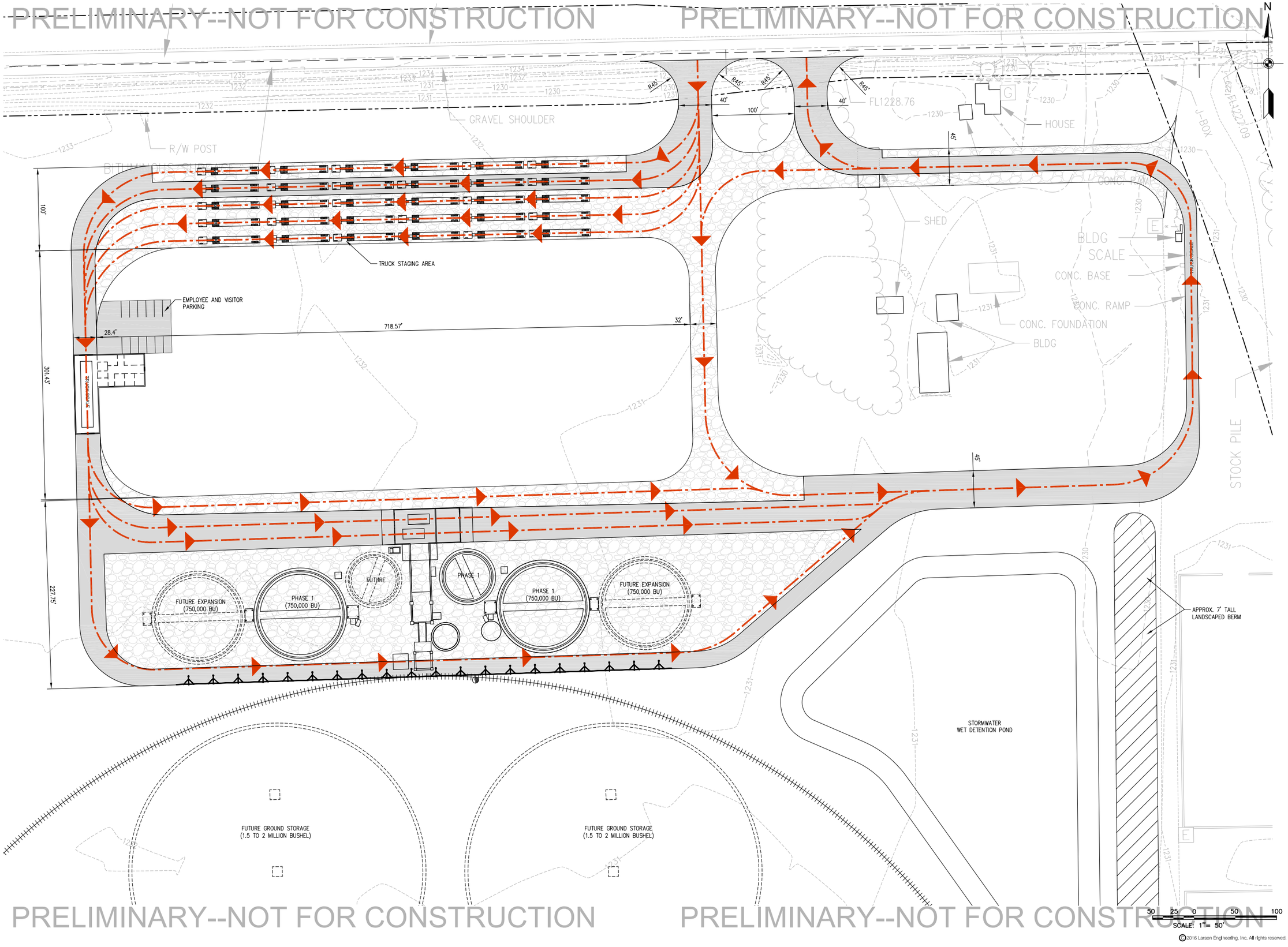
Checked by: SRG

Sheet Title:

PROPOSED SITE--OVERALL

C-2.0

PRELIMINARY--NOT FOR CONSTRUCTION
PRELIMINARY--NOT FOR CONSTRUCTION



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53872 270TH STREET
LANSING, MN 55950

SEAL

Date:
Design Firm#

No.	Date	Description
0	05/26/16	FOR REVIEW/USE

Project #: 32150005.000

Drawn by: SLM

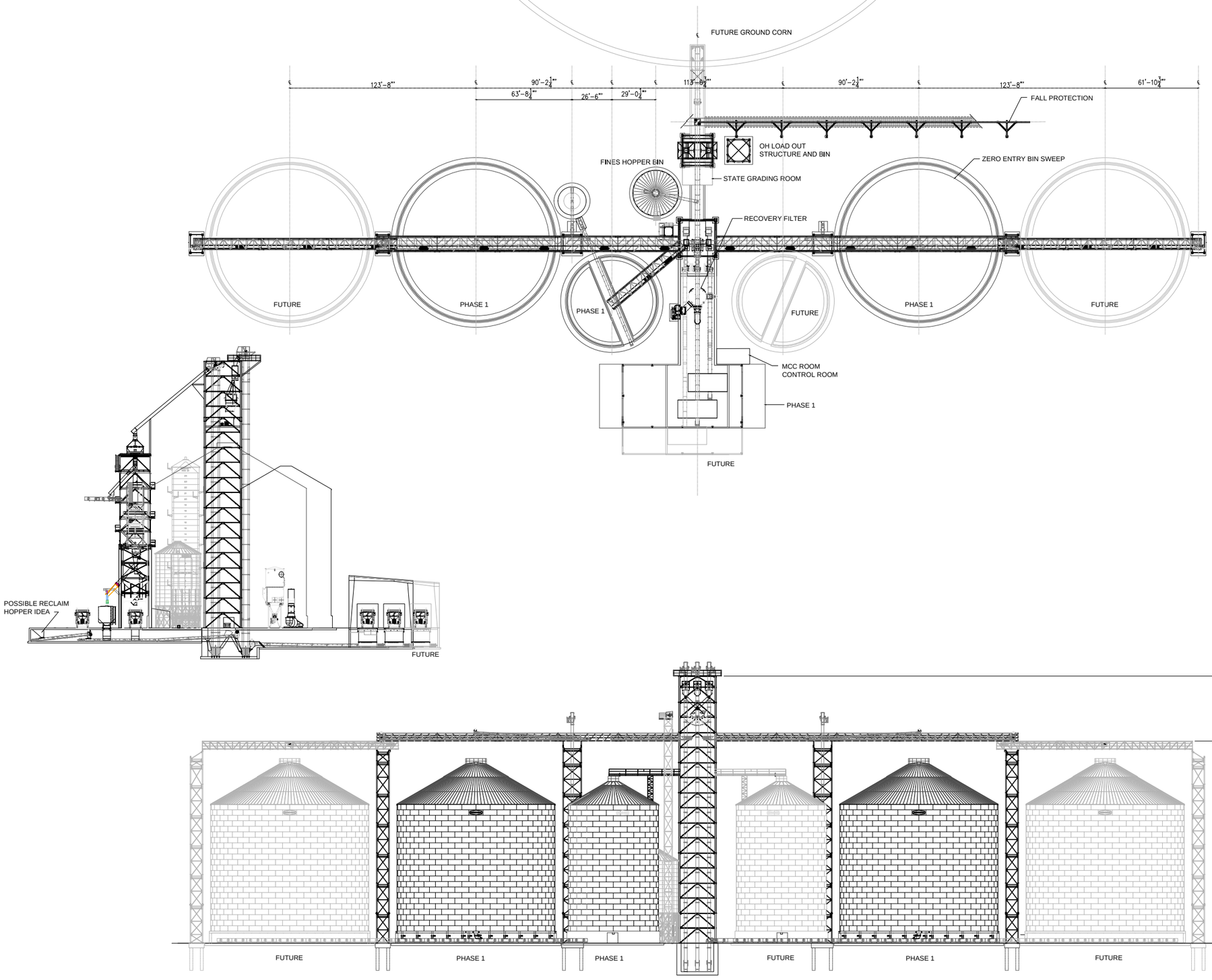
Checked by: SRG

Sheet Title:

PROPOSED SITE--ENLARGED

C-2.1

PRELIMINARY--NOT FOR CONSTRUCTION
PRELIMINARY--NOT FOR CONSTRUCTION



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FACILITY PLANNING
53872 270TH STREET
LANSING, MN 55950

SEAL

Date:
Design Firm#

No.	Date	Description
0	06/12/15	FOR REVIEW/USE
1	07/17/15	FOR REVIEW/USE

Project #: 32150005.000

Drawn by: AAF

Checked by: SRG

Sheet Title:
GENERAL ARRANGEMENT PLAN

S-1.0

PRELIMINARY--NOT FOR CONSTRUCTION
PRELIMINARY--NOT FOR CONSTRUCTION

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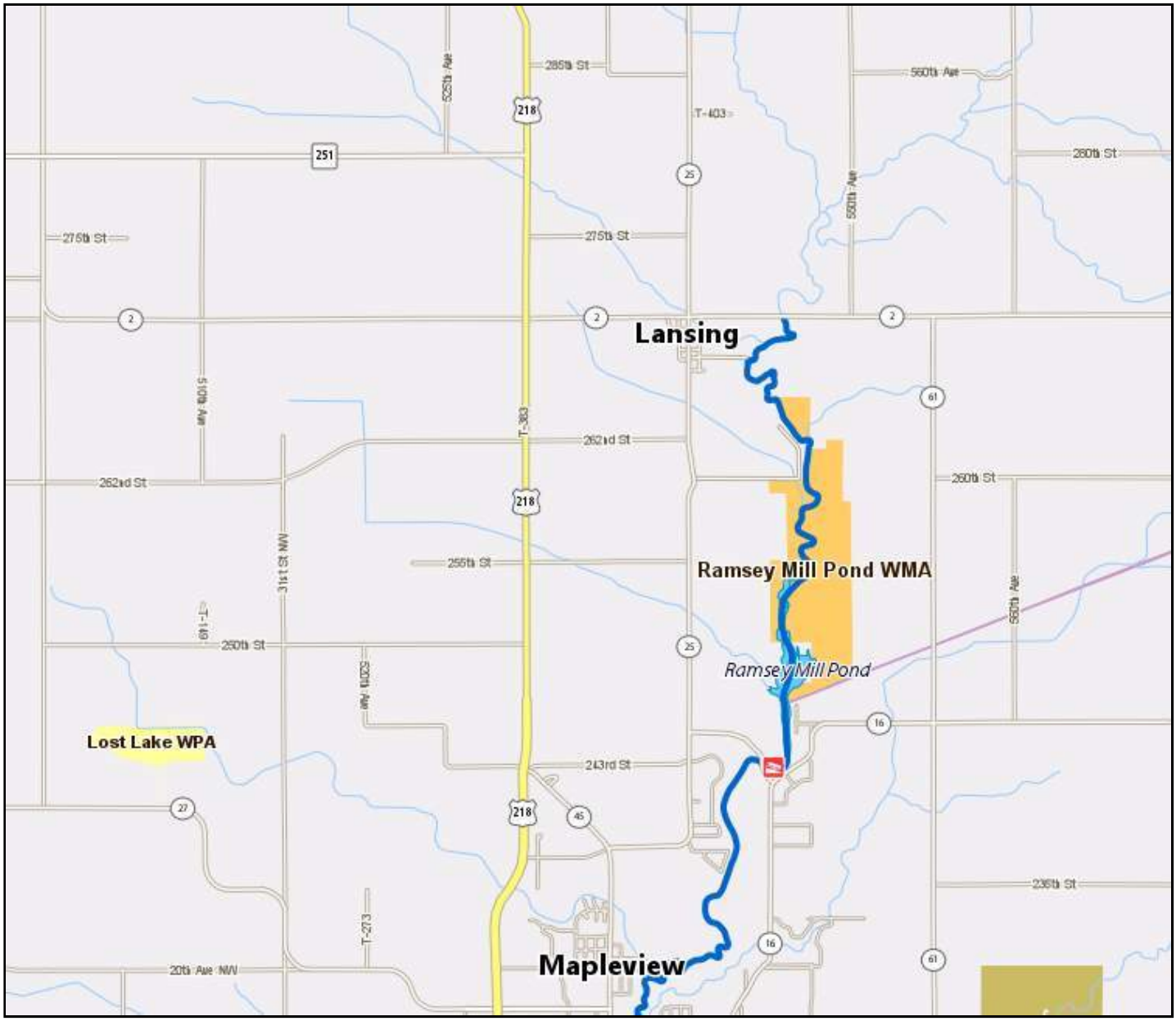
FIGURE 6

Minnesota DNR - Recreation Compass



- Lake/River
- National Forest
- National Wildlife Refuge
- Scientific & Natural Area
- State Water Trail
- State Forest
- State Park
- State Trail
- Water Access
- Wildlife Management Area

0 0.3 0.6 0.9 1.2 1.5 mi
0 0.5 1 1.5 2 2.5 km

Map Parameters (UTM Zone 15, NAD83)
minx: 495650.390625 *maxx:* 507187.500000
miny: 4836827.784703 *maxy:* 4846824.559047

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U.S. Fish and Wildlife Service
National Wetlands Inventory

NCC Shuttle Loader Facility

May 25, 2016

Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

FIGURE 7


MDH
Minnesota Department of Health
Minnesota Well Index
v1.0.11
Find address or well
Search by
Zoom to
Tools
Base Maps
Other Links
Help
Layer Name
Layer
Label
Legend
Wells
Selected Wells
Public Wells
Domestic Wells
Irrigation Wells
Monitor Wells
Other Wells
Sealed Wells
Unverified Wells
Township Range Section
DWSMA
SWBCA
Zoom to see wells, TRS, DWSMA and SWBCA
DWSMA: The area managed by a public water supplier to protect their source water
SWBCA: Special Well and Boring Construction Area layer
799941
442519
442515
413943
413901
472113
472110
Lansing
472108
472111
101393
152412
489835
213427
442520
442524
160839
442523
521643
152812
152806
489836
521642
799934
T103 R18W S10
Austin
AUSTIN MUNI AIRPORT

FIGURE 8

Minnesota Unique Well Number

413901

County Mower
Quad Austin East
Quad ID 8B

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

Entry Date 11/15/1990
Update Date
Received Date 02/14/2014

Well Name	Township	Range	Dir	Section	Subsection
WILSON	103	18	W	3	DDCCDC

Elevation 1229 **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Contact RR 2 BOX 274 BLOOMING PRAIRIE MN 55917

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
LOAM	0	4	BLACK	SOFT
CLAY	4	7	YELLOW	SOFT
SAND	7	60	BROWN	SOFT
CLAY	60	85	WHITE	SOFT
CLAY & LIMESTONE	85	160	WHITE	SOFT
LIMESTONE	160	180	GRAY	HARD

Remarks

Well Depth 180 ft. **Depth Completed** 180 ft. **Date Well Completed** 05/12/1987

Drill Method Non-specified Rotary **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint** Threaded
Drive Shoe? Yes ☒ No ☐ **Above/Below** 1.5 ft.

Casing Diameter **Weight**
5 in. To 160 ft. lbs./ft.

Open Hole From 160 ft. To 180 ft.

Screen? ☐ **Type** **Make**

Static Water Level
15 ft. Land surface Measure 05/12/1987

Pumping Level (below land surface)

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

Grouting Information Well Grouted? ☐ Yes ☒ No ☐ Not Specified

Nearest Known Source of Contamination
80 feet North Direction Septic tank/drain field Type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed 05/12/1987
Manufacturer's name FLINT & WALLING
Model Number HP 0.5 Volt 230
Length of drop pipe 47 ft Capacity 10 g.p. Typ Submersible

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

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

Miscellaneous
First Bedrock Cretaceous regolith Aquifer Wapsipinicon/Spil
Last Strat Wapsipinicon/Spillville Fm Depth to Bedrock 60 ft
Located by Minnesota Geological Survey
Locate Method GPS; accuracy 3 to 12 meters (+ 10 to 40 feet)
System UTM - Mad83, Zone 15, Meters X 502081 Y 4843749
Unique Number Verification Information from Inpute Date 07/20/1995

Angled Drill Hole

Well Contractor

Blooming Prairie	74245	SEVERTSON, J.
Licensee Business	Lic. or Reg. No.	Name of Driller

Minnesota Unique Well Number

472114

County Mower
Quad Austin East
Quad ID 8B

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

Entry Date 12/31/1991
Update Date
Received Date 02/14/2014

Well Name	Township	Range	Dir	Section	Subsection
HAUSTEIN,	103	18	W	3	DDDCDD

Elevation 1227 **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W LANSING MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOPSOIL	0	1		
SAND	1	18	BROWN	SOFT
GRAVEL/COBBLES	18	40	GRAY	SOFT
CLAY	40	49	GRAY	SOFT
SAND	49	90	BROWN	SOFT
LIMESTONE	90	126	BROWN	HARD
SANDSTONE	126	134	WHITE	SOFT
LIMESTONE	134	142	BROWN	HARD

Remarks

Well Depth 142 ft. **Depth Completed** 142 ft. **Date Well Completed** 10/26/1990

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Step down **Joint** Welded
Drive Shoe? Yes ☐ No ☒ **Above/Below** 2 ft.

Casing Diameter	Weight	Hole Diameter
5 in. To 114 ft.	lbs./ft.	16 in. To 49 ft.
10 in. To 49 ft.	lbs./ft.	10 in. To 114 ft.
		5 in. To 142 ft.

Open Hole From 114 ft. To 142 ft.

Screen? ☐ **Type** **Make**

Static Water Level
9 ft. Land surface Measure 10/26/1990

Pumping Level (below land surface)

Wellhead Completion
Pitless adapter manufacturer SIMMONS Model 1840
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
Neat Cement	0	0 ft.	114 ft.

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed 04/22/1991
Manufacturer's name AERMOTOR
Model Number SD 12 50 HP 0.5 Volt 115
Length of drop pipe 25 ft Capacity 12 g.p. Typ Submersible

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

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

Miscellaneous
First Bedrock Lower Cedar Valley Aquifer L.Cedar Valley-
Last Strat Wapsipinicon/Spillville Fm Depth to Bedrock 90 ft
Located by Minnesota Geological Survey
Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)
System UTM - Mad83, Zone 15, Meters X 502272 Y 4843750
Unique Number Verification Information from Inpute Date 07/24/1995

Angled Drill Hole

Well Contractor
Boart Longyear Drilling 49588 THILQUIST, J.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

472110

County Mower
Quad Austin East
Quad ID 8B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/31/1991
Update Date
Received Date 02/14/2014

Well Name	Township	Range	Dir	Section	Subsection
PETERSON,	103	18	W	10	AAABBA

Elevation 1226 **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W LANSING MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
SAND WITH CLAY	0	5	BROWN	SOFT
SAND MEDIUM TO	5	31	BROWN	SOFT
SILTY CLAY	31	33	GRAY	SOFT
CLAY	33	37	GRAY	
CLAY	37	48	GRAY	
SAND	48	88	BROWN	SOFT
FRACTURED	88	95	BROWN	SOFT
SOLID LIMESTONE	95	115	BROWN	HARD
SANDSTONE	115	118	BRN/YEL	SOFT
LIMESTONE	118	146	GRAY	HARD

Remarks

BLK 2,LOTS 12,13,14,15.

Well Depth 146 ft. **Depth Completed** 146 ft. **Date Well Completed** 05/22/1991

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Step down **Joint** Welded
Drive Shoe? Yes ☐ No ☒ **Above/Below** 2 ft.

Casing Diameter	Weight	Hole Diameter
5 in. To 116 ft.	lbs./ft.	15 in. To 37 ft.
10 in. To 37 ft.	lbs./ft.	10 in. To 116 ft.

Open Hole From 116 ft. To 146 ft.

Screen? ☐ **Type** **Make**

Static Water Level

7 ft. Land surface Measure 04/24/1991

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer SIMMONS Model 1840

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount		From	To
Neat Cement	15	Cubic yards	0 ft.	116 ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed 04/24/1991

Manufacturer's name AEROMOTOR

Model Number SD 12 50 HP 0.5 Volt 115

Length of drop pipe 25 ft Capacity 12 g.p. Typ Submersible

Abandoned

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

Variance

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

Miscellaneous

First Bedrock Lower Cedar Valley Aquifer Wapsipinicon

Last Strat Wapsipinicon/Spillville Fm Depth to Bedrock 88 ft

Located by Minnesota Geological Survey

Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)

System UTM - Mad83, Zone 15, Meters X 502279 Y 4843722

Unique Number Verification Information from Inpute Date 07/24/1995

Angled Drill Hole

Well Contractor

Boart Longyear Drilling	49588	THILQUIST, J.
Licensee Business	Lic. or Reg. No.	Name of Driller

Minnesota Unique Well Number

472113

County Mower
Quad Austin East
Quad ID 8B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 12/31/1991
Update Date
Received Date 02/14/2014

Well Name	Township	Range	Dir	Section	Subsection
WAALKENS,	103	18	W	3	DDDDCC

Elevation 1220 **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W LANSING MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	1	BROWN	SOFT
FINE SAND	1	30	BROWN	SOFT
MEDIUM-COARSE	30	41	BROWN	SOFT
CLAY	41	46	GRAY	SOFT
SAND	46	89	BROWN	SOFT
FRACTURED	89	118	BROWN	SOFT
SOLID LIMESTONE	118	124	BROWN	HARD
SAND	124	164	BROWN	SOFT
LIMESTONE	164	185	BROWN	HARD

Remarks

Well Depth	Depth Completed	Date Well Completed
185 ft.	185 ft.	04/08/1991

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Step down **Joint** Welded
Drive Shoe? Yes ☐ No ☒ **Above/Below** 2 ft.

Casing Diameter	Weight	Hole Diameter
5 in. To 123 ft.	lbs./ft.	15 in. To 42 ft.
10 in. To 42 ft.	lbs./ft.	10 in. To 123 ft.

Open Hole From 123 ft. To 185 ft.

Screen? ☐ **Type** **Make**

Static Water Level
5 ft. Land surface Measure 04/22/1991

Pumping Level (below land surface)
15 ft. hrs. Pumping at 20 g.p.m.

Wellhead Completion
Pitless adapter manufacturer SIMMONS Model 1840
☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
Neat Cement	0	0 ft.	122 ft.

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed 04/23/1991
Manufacturer's name AERMOTOR
Model Number SD 12 50 HP 0.5 Volt 115
Length of drop pipe 25 ft Capacity 12 g.p. Typ Submersible

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

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

Miscellaneous
First Bedrock Lower Cedar Valley Aquifer Wapsipinicon
Last Strat Wapsipinicon/Spillville Fm Depth to Bedrock 89 ft
Located by Minnesota Geological Survey
Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)
System UTM - Mad83, Zone 15, Meters X 502323 Y 4843767
Unique Number Verification Information from Inpute Date 07/24/1995

Angled Drill Hole

Well Contractor

Licensee Business	Lic. or Reg. No.	Name of Driller
Boart Longyear Drilling	49588	THILQUIST, J.

Minnesota Unique Well Number

472113

County Mower
Quad Austin East
Quad ID 8B

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

Entry Date 12/31/1991
Update Date
Received Date 02/14/2014

Well Name	Township	Range	Dir	Section	Subsection
WAALKENS,	103	18	W	3	DDDDCC

Elevation 1220 **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W LANSING MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	1	BROWN	SOFT
FINE SAND	1	30	BROWN	SOFT
MEDIUM-COARSE	30	41	BROWN	SOFT
CLAY	41	46	GRAY	SOFT
SAND	46	89	BROWN	SOFT
FRACTURED	89	118	BROWN	SOFT
SOLID LIMESTONE	118	124	BROWN	HARD
SAND	124	164	BROWN	SOFT
LIMESTONE	164	185	BROWN	HARD

Remarks

Well Depth	Depth Completed	Date Well Completed
185 ft.	185 ft.	04/08/1991

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Step down **Joint** Welded
Drive Shoe? Yes ☐ No ☒ **Above/Below** 2 ft.

Casing Diameter	Weight	Hole Diameter
5 in. To 123 ft.	lbs./ft.	15 in. To 42 ft.
10 in. To 42 ft.	lbs./ft.	10 in. To 123 ft.

Open Hole From 123 ft. To 185 ft.

Screen? ☐ **Type** **Make**

Static Water Level
5 ft. Land surface Measure 04/22/1991

Pumping Level (below land surface)
15 ft. hrs. Pumping at 20 g.p.m.

Wellhead Completion
Pitless adapter manufacturer SIMMONS Model 1840
☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
Neat Cement	0	0 ft.	122 ft.

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed 04/23/1991
Manufacturer's name AERMOTOR
Model Number SD 12 50 HP 0.5 Volt 115
Length of drop pipe 25 ft Capacity 12 g.p. Typ Submersible

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

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

Miscellaneous
First Bedrock Lower Cedar Valley Aquifer Wapsipinicon
Last Strat Wapsipinicon/Spillville Fm Depth to Bedrock 89 ft
Located by Minnesota Geological Survey
Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)
System UTM - Mad83, Zone 15, Meters X 502323 Y 4843767
Unique Number Verification Information from Inpute Date 07/24/1995

Angled Drill Hole

Well Contractor

Licensee Business	Lic. or Reg. No.	Name of Driller
Boart Longyear Drilling	49588	THILQUIST, J.

Minnesota Unique Well Number

472112

County Mower
Quad Austin East
Quad ID 8B

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

Entry Date 12/31/1991
Update Date
Received Date 02/14/2014

Well Name	Township	Range	Dir	Section	Subsection
ALLAS, LYNN	103	18	W	3	DDDDDD

Elevation 1220 **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W LANSING MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
SAND	0	33	BROWN	SOFT
CLAY	33	37	GRAY	SOFT
SAND	37	73	BROWN	SOFT
FRACTURED	73	90	BROWN	SOFT
LIMESTONE	90	96	BROWN	HARD
SANDSTONE	96	99	LT. BRN	SOFT
LIMESTONE	99	126	GRAY	HARD

Remarks

Well Depth 126 ft. **Depth Completed** 126 ft. **Date Well Completed** 05/22/1991

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Step down **Joint** Welded
Drive Shoe? Yes ☐ No ☒ **Above/Below** 2 ft.

Casing Diameter			Weight		Hole Diameter		
5 in. To	97 ft.		lbs./ft.		16 in. To	37 ft.	
10 in. To	37 ft.		lbs./ft.		10 in. To	97 ft.	

Open Hole From 97 ft. To 126 ft.

Screen? ☐ **Type** **Make**

Static Water Level
8 ft. Land surface Measure 05/22/1991

Pumping Level (below land surface)

Wellhead Completion
Pitless adapter manufacturer SIMMONS Model 1840
☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
Neat Cement	0	0 ft.	97 ft.

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed 04/22/1991
Manufacturer's name AERMOTOR
Model Number SD 12 50 HP 0.5 Volt 115
Length of drop pipe 25 ft Capacity 12 g.p. Typ Submersible

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

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

Miscellaneous
First Bedrock Lower Cedar Valley Aquifer Wapsipinicon
Last Strat Wapsipinicon/Spillville Fm Depth to Bedrock 73 ft
Located by Minnesota Geological Survey
Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)
System UTM - Mad83, Zone 15, Meters X 502401 Y 4843764
Unique Number Verification Information from Inpute Date 07/24/1995

Angled Drill Hole

Well Contractor

Boart Longyear Drilling	49588	THILQUIST, J.
Licensee Business	Lic. or Reg. No.	Name of Driller

Minnesota Unique Well Number

442518

County Mower
Quad
Quad ID

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

Entry Date 01/25/1993
Update Date 05/06/1988
Received Date 02/14/2014

Well Name	Township	Range	Dir	Section	Subsection
SLOWINSKI, J.	103	18	W	3	DCC

Elevation **Elev. Method**

Address

C/W PO BOX 106 LANSING MN 55950

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	2	BLACK	
SAND	2	6	YELLOW	
SAND	6	25	BROWN	

Remarks

WELL SEALED 05-05-1994 BY 24001
ORIGINAL USE MW - MONITOR WELL

Well Depth 25 ft. **Depth Completed** 25 ft. **Date Well Completed** 05/06/1988

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use abandoned **Status** Sealed

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint** Welded
Drive Shoe? Yes ☐ No ☒ **Above/Below**

Casing Diameter	Weight	Hole Diameter
2 in. To 15 ft.	3.65 lbs./ft.	6.2 in. To 25 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set
2 in.	10	10 ft.	15 ft. 25 ft.

Static Water Level

13.5 ft. Land surface Measure 05/13/1988

Pumping Level (below land surface)

ft. 1 hrs. Pumping at 4 g.p.m.

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☒ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
Neat Cement	0.09 Cubic yards	0 ft.	10 ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☒ No

Pump ☒ Not Installed Date Installed

Manufacturer's name

Model Number HP Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

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

Variance

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

Miscellaneous

First Bedrock Aquifer

Last Strat Depth to Bedrock ft

Located by

Locate Method

System UTM - Mad83, Zone 15, Meters X Y

Unique Number Verification Inpute Date

Angled Drill Hole

Well Contractor

Stevens Well Co.	27194	JOHNSON, R
Licensee Business	Lic. or Reg. No.	Name of Driller

Minnesota Unique Well Number

521642

County Mower
Quad
Quad ID

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

Entry Date 04/21/1995
Update Date
Received Date 02/14/2014

Well Name	Township	Range	Dir	Section	Subsection
JUHNKE,	103	18	W	10	ADA

Elevation **Elev. Method**

Address

C/W LANSING MN 55950

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
LOAM	0	2	BLACK	SOFT
SAND	2	40	BROWN	SOFT
CLAY	40	60	GRY/PNK	SOFT
GRAVEL HEAVY	60	75	VARIED	SOFT
LIMESTONE	75	80	BROWN	MEDIUM
LIMESTONE	80	123	BROWN	HARD

Remarks

SOC: LIFT PUMP

Well Depth 123 ft. **Depth Completed** 123 ft. **Date Well Completed** 09/29/1994

Drill Method Non-specified Rotary **Drill Fluid** Foam

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint** Threaded

Drive Shoe? Yes ☒ No ☐ **Above/Below** 0 ft.

Casing Diameter	Weight	Hole Diameter
5 in. To 85 ft.	15 lbs./ft.	10 in. To 30 ft.
		5 in. To 123 ft.

Open Hole From 85 ft. To 123 ft.

Screen? ☐ **Type** **Make**

Static Water Level

13 ft. Land surface Measure 09/29/1994

Pumping Level (below land surface)

13 ft. 1 hrs. Pumping at 10 g.p.m.

Wellhead Completion

Pitless adapter manufacturer BAKER Model SNAPPY

☐ Casing Protection ☐ 12 in. above grade

☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
Bentonite	2 Sacks	0 ft.	30 ft.

Nearest Known Source of Contamination

50 feet Southwes Direction Other Type

Well disinfected upon completion? ☒ Yes ☐ No

Pump ☐ Not Installed Date Installed 10/12/1994

Manufacturer's name FLINT & WALLING

Model Number HP 0.75 Volt 230

Length of drop pipe 40 ft Capacity 19 g.p. Typ Submersible

Abandoned

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

Variance

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

Miscellaneous

First Bedrock Aquifer

Last Strat Depth to Bedrock 75 ft

Located by

Locate Method

System UTM - Mad83, Zone 15, Meters X Y

Unique Number Verification Inpute Date

Angled Drill Hole

Well Contractor

Licensee Business	Lic. or Reg. No.	Name of Driller
Blooming Prairie	74245	SEVERTSON, J.

Minnesota Unique Well Number

442520

County Mower
Quad
Quad ID

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

Entry Date 01/25/1993
Update Date
Received Date 02/14/2014

Well Name	Township	Range	Dir	Section	Subsection
PETERSON, D.	103	18	W	10	ABA

Elevation **Elev. Method**

Address

C/W BOX 42 LANSING MN 55950

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	4	BLACK	
SAND	4	6	BRN/RED	
SAND	6	25	BROWN	

Remarks

WELL SEALED 05-05-1994 BY 24001
ORIGINAL USE MW - MONITOR WELL

Well Depth	Depth Completed	Date Well Completed
25 ft.	25 ft.	05/04/1988

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use abandoned **Status** Sealed

Well Hydrofractured? **Yes** ☐ **No** ☐ **From** **To**

Casing Type Single casing **Joint** Welded
Drive Shoe? **Yes** ☐ **No** ☒ **Above/Below**

Casing Diameter	Weight	Hole Diameter
2 in. To 15 ft.	3.65 lbs./ft.	6.2 in. To 25 ft.

Open Hole From ft. To ft.

Screen? ☒ **Type** stainless **Make** JOHNSON

Diameter	Slot/Gauze	Length	Set	
2 in.	10	10 ft.	15 ft.	25 ft.

Static Water Level

11.3 ft. Land surface Measure 05/05/1988

Pumping Level (below land surface)

ft. 1 hrs. Pumping at 4 g.p.m.

Wellhead Completion

Pitless adapter manufacturer Model

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
Neat Cement	0.17 Cubic yards	0 ft.	13 ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☒ No

Pump ☒ Not Installed Date Installed

Manufacturer's name

Model Number HP Volt

Length of drop pipe ft Capacity g.p. Typ

Abandoned

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

Variance

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

Miscellaneous

First Bedrock Aquifer

Last Strat Depth to Bedrock ft

Located by

Locate Method

System UTM - Mad83, Zone 15, Meters X Y

Unique Number Verification Inpute Date

Angled Drill Hole

Well Contractor

Stevens Well Co.	27194	JOHNSON, R
Licensee Business	Lic. or Reg. No.	Name of Driller

Minnesota Unique Well Number

160839

County Mower
Quad Austin East
Quad ID 8B

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

Entry Date 02/05/1988
Update Date
Received Date 02/14/2014

Well Name	Township	Range	Dir	Section	Subsection
BUSHLACK,	103	18	W	10	AAACDD

Elevation 1228 **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
SAND	0	60		
CLAY	60	84		
GALENA	84	119		
SAND CREVICE	119	120		
GALENA	120	130		

Remarks

Well Depth 130 ft. **Depth Completed** 130 ft. **Date Well Completed** 09/20/1979

Drill Method Non-specified Rotary **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint** Welded
Drive Shoe? Yes ☒ No ☐ **Above/Below** 1 ft.

Casing Diameter	Weight	Hole Diameter
5 in. To 107 ft.	lbs./ft.	9 in. To 107 ft.
		5 in. To 130 ft.

Open Hole From 107 ft. To 130 ft.

Screen? ☐ **Type** **Make**

Static Water Level
14 ft. Land surface Measure 09/20/1979

Pumping Level (below land surface)
14 ft. hrs. Pumping at 75 g.p.m.

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

Grouting Information Well Grouted? ☐ Yes ☒ No ☐ Not Specified

Material	Amount	From	To
Bentonite	0	0 ft.	107 ft.

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed 09/21/1979
Manufacturer's name RED JACKET
Model Number 50N1 9BC HP 0.5 Volt 230
Length of drop pipe 42 ft Capacity 10 g.p. Typ Submersible

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

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

Miscellaneous
First Bedrock Lower Cedar Valley Aquifer L.Cedar Valley-
Last Strat Wapsipinicon/Spillville Fm Depth to Bedrock 84 ft
Located by Minnesota Geological Survey
Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)
System UTM - Mad83, Zone 15, Meters X 502270 Y 4843578
Unique Number Verification Information from Inpute Date 05/22/1995

Angled Drill Hole

Well Contractor
Christenson Well 20065 COTTRELL, J.
Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

472109

County Mower
Quad Austin East
Quad ID 8B

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

Entry Date 12/31/1991
Update Date
Received Date 12/22/1995

Well Name	Township	Range	Dir	Section	Subsection
HARTEMA,	103	18	W	10	AAAABB

Elevation 1225 **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

C/W LANSING MN

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
MEDIUM SAND	0	20	BROWN	SOFT
FINE TO MEDIUM	20	30	BROWN	SOFT
MEDIUM TO COARSE	30	42	BROWN	SOFT
CLAY	42	46	GRAY	SOFT
SAND	46	89	BROWN	SOFT
FRACTURED	89	95	BROWN	SOFT
SOLID LIMESTONE	95	116	BROWN	HARD
SANDSTONE	116	120	YELLOW	SOFT
LIMESTONE	120	146	GRY/BRN	HARD

Remarks

BLK 1, LOTS 12 & 13.

Well Depth 146 ft. **Depth Completed** 146 ft. **Date Well Completed** 05/22/1991

Drill Method Non-specified Rotary **Drill Fluid** Bentonite

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Step down **Joint** Welded
Drive Shoe? Yes ☐ No ☒ **Above/Below** 2 ft.

Casing Diameter	Weight	Hole Diameter
5 in. To 124 ft.	lbs./ft.	15 in. To 46 ft.
10 in. To 46 ft.	lbs./ft.	10 in. To 124 ft.

Open Hole From 124 ft. To 146 ft.

Screen? ☐ **Type** **Make**

Static Water Level

Pumping Level (below land surface)

Wellhead Completion

Pitless adapter manufacturer SIMMONS Model 1840

☐ Casing Protection ☐ 12 in. above grade
☐ At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? ☒ Yes ☐ No ☐ Not Specified

Material	Amount	From	To
Neat Cement	0	0 ft.	123 ft.

Nearest Known Source of Contamination

feet Direction Type

Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed 04/23/1991

Manufacturer's name AEROMOTOR

Model Number SD 12 50 HP 0.5 Volt 115

Length of drop pipe 25 ft Capacity 12 g.p. Typ Submersible

Abandoned

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

Variance

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

Miscellaneous

First Bedrock Lower Cedar Valley Aquifer Wapsipinicon/Spil

Last Strat Wapsipinicon/Spillville Fm Depth to Bedrock 89 ft

Located by Minnesota Geological Survey

Locate Method Digitized - scale 1:24,000 or larger (Digitizing Table)

System UTM - Mad83, Zone 15, Meters X 502343 Y 4843708

Unique Number Verification Information from Inpute Date 07/24/1995

Angled Drill Hole

Well Contractor

Licensee Business	Lic. or Reg. No.	Name of Driller
Boart Longyear Drilling	49588	THILQUIST, J.

Minnesota Unique Well Number

799941

County Mower
Quad Austin East
Quad ID 8B

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

Entry Date 05/12/2015
Update Date
Received Date 05/13/2015

Well Name	Township	Range	Dir	Section	Subsection
	103	18	W	3	DCDABA

Elevation 1229 **Elev. Method** LiDAR 1m DEM (MNDNR)

Address

Stratigraphy Information

Remarks

Well Depth null **Depth Completed** null **Date Well Completed**

Drill Method **Drill Fluid**

Use **Status**

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

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

Open Hole From ft. To ft.

Screen? ☐ **Type** **Make**

Static Water Level

Pumping Level (below land surface)

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

Grouting Information Well Grouted? ☐ Yes ☐ No ☒ Not Specified

Nearest Known Source of Contamination
feet Direction Type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name
Model Number HP Volt
Length of drop pipe ft Capacity g.p. Typ

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

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

Miscellaneous
First Bedrock Aquifer
Last Strat Depth to Bedrock ft
Located by Minnesota Department of Health
Locate Method GPS SA Off (averaged)
System UTM - Mad83, Zone 15, Meters X 501945 Y 4843937
Unique Number Verification Info/GPS from data Inpute Date 05/12/2015

Angled Drill Hole

Well Contractor

Licensee Business Lic. or Reg. No. Name of Driller

Minnesota Unique Well Number

413943

County Mower
Quad Austin East
Quad ID 8B

MINNESOTA DEPARTMENT OF HEALTH

WELL AND BORING REPORT

Minnesota Statutes Chapter 1031

Entry Date 01/01/1980
Update Date
Received Date 05/22/2014

Well Name	Township	Range	Dir	Section	Subsection
SLOWINSKI, JOE	103	18	W	3	DDCCBC

Elevation 1231 **Elev. Method** 7.5 minute topographic map (+/- 5 feet)

Address

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
SAND	0	50		SOFT
CLAY	50	55	PINK	SOFT
SAND	55	63		SOFT
SAND	63	73		SOFT
CLAY	73	80	YELLOW	SOFT
SAND/CLAY	80	106	WHITE	SOFT
CLAY/SOFT SHALE	106	160	WHT/GRY	SOFT
LIME	160	180	GRY/BLU	HARD

Remarks

Well Depth 180 ft. **Depth Completed** 180 ft. **Date Well Completed** 12/00/1990

Drill Method Non-specified Rotary **Drill Fluid**

Use domestic **Status** Active

Well Hydrofractured? Yes ☐ No ☐ **From** **To**

Casing Type Single casing **Joint** Threaded
Drive Shoe? Yes ☒ No ☐ **Above/Below** 1.5 ft.

Casing Diameter **Weight**
5 in. To 160 ft. lbs./ft.

Open Hole From 160 ft. To 180 ft.

Screen? ☐ **Type** **Make**

Static Water Level
26 ft. Land surface Measure 12/00/1990

Pumping Level (below land surface)
26 ft. hrs. Pumping at 19 g.p.m.

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

Grouting Information Well Grouted? ☐ Yes ☒ No ☐ Not Specified

Nearest Known Source of Contamination
65 feet East Direction Septic tank/drain field Type
Well disinfected upon completion? ☐ Yes ☐ No

Pump ☐ Not Installed Date Installed
Manufacturer's name FLINT & WALLING
Model Number HP 0.75 Volt 230
Length of drop pipe 47 ft Capacity 19 g.p. Typ Submersible

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

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

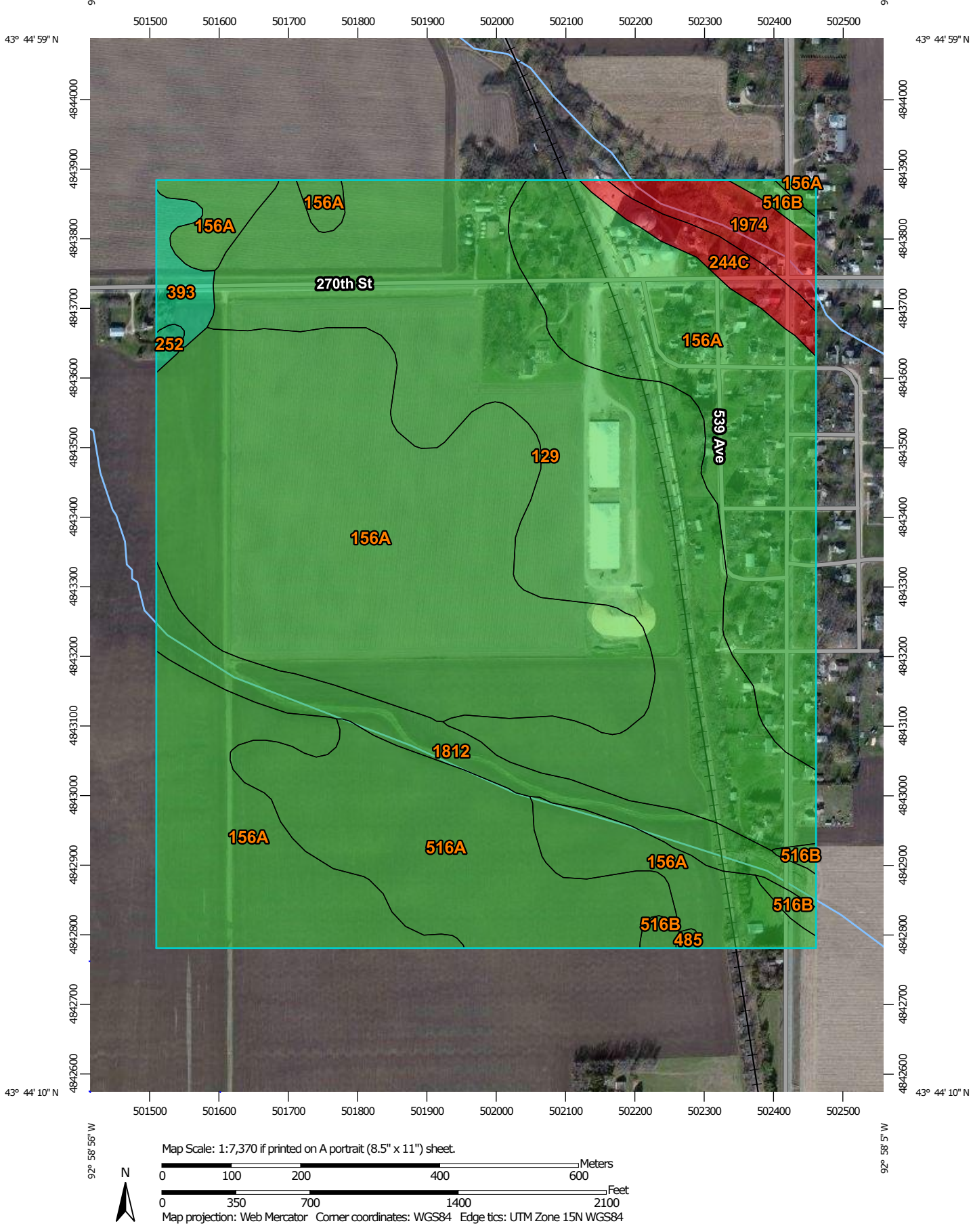
Miscellaneous
First Bedrock Cretaceous regolith Aquifer Wapsipinicon/Spil
Last Strat Wapsipinicon/Spillville Fm Depth to Bedrock 80 ft
Located by Minnesota Geological Survey
Locate Method GPS; accuracy 3 to 12 meters (+ 10 to 40 feet)
System UTM - Mad83, Zone 15, Meters X 502033 Y 4843791
Unique Number Verification Information from Inpute Date 07/20/1995

Angled Drill Hole

Well Contractor
Blooming Prairie 74245 SEVERTSON, J.
Licensee Business Lic. or Reg. No. Name of Driller

FIGURE 9

Farmland Classification—Mower County, Minnesota
(Northern Country Coop--Lansing)



Map Scale: 1:7,370 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 350 700 1400 2100

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Points

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Water Features

MAP INFORMATION

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Mower County, Minnesota
Survey Area Data: Version 11, Sep 28, 2015

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

Date(s) aerial images were photographed: Data not available.

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

Farmland Classification

Farmland Classification— Summary by Map Unit — Mower County, Minnesota (MN099)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
129	Cylinder loam	All areas are prime farmland	69.4	26.6%
156A	Fairhaven silt loam, 0 to 2 percent slopes	All areas are prime farmland	138.1	53.0%
244C	Lilah sandy loam, 6 to 12 percent slopes	Not prime farmland	4.1	1.6%
252	Marshan clay loam, 0 to 2 percent slopes, rarely flooded	Prime farmland if drained	0.5	0.2%
393	Udolpho silt loam	Prime farmland if drained	2.9	1.1%
485	Lawler silt loam	All areas are prime farmland	0.2	0.1%
516A	Dowagiac loam, 0 to 2 percent slopes	All areas are prime farmland	25.7	9.8%
516B	Dowagiac loam, 2 to 6 percent slopes	All areas are prime farmland	2.4	0.9%
1812	Terril silt loam	All areas are prime farmland	12.3	4.7%
1974	Coland-Spillville loams, frequently flooded	Not prime farmland	5.1	1.9%
Totals for Area of Interest			**260.6**	**100.0%**

Description

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

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

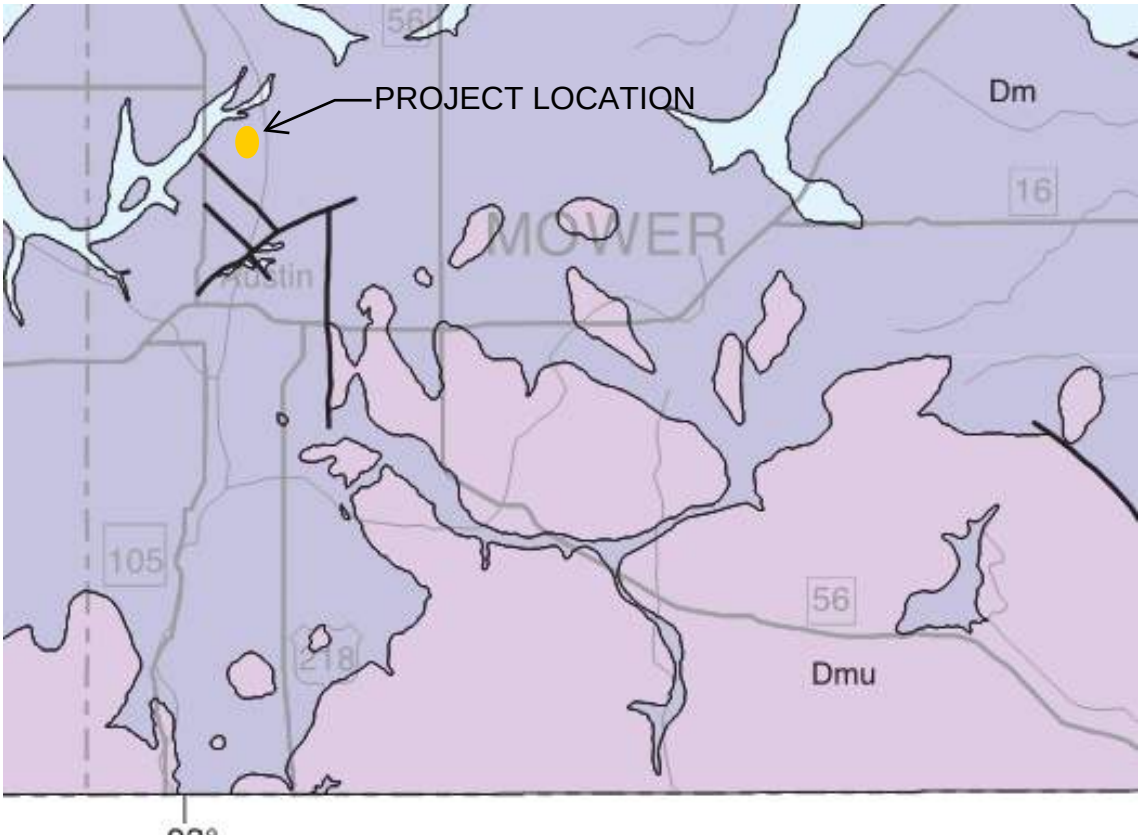
GEOLOGIC MAP OF MINNESOTA
BEDROCK GEOLOGY

Compiled by

Mark A. Jirsa, Terrence J. Boerboom, V.W. Chandler,
John H. Mossler, Anthony C. Runkel, and Dale R. Setterholm

2011

FIGURE 10



Ju **"Hallock Red Beds"**—Shale, limestone, dolomite, siltstone, and sandstone.

PALEOZOIC

Dmu **Middle and Upper Devonian**—Dolostone, limestone, and shale; includes the Lithograph City Formation, Coralville Formation, and Hinkle and Eagle Center Members of the Little Cedar Formation.

Dm **Middle Devonian**—Dolostone, sandy dolostone, limestone, and shale; includes the Chickasaw Shale and Bassett Member of the Little Cedar Formation, and Pinicon Ridge and Spillville Formations.

Ou **Upper Ordovician**—Limestone, shaley limestone, and dolostone; includes the Maquoketa Formation, and the Stewartville, Prosser, and Cummingsville Formations of the Galena Group. Also includes limestone and dolostone of the Red River Formation, and sandstone and shale of the Winnipeg Formation in northwest Minnesota.

MAP SYMBOLS

Geologic contact—Dashed where concealed by younger bedrock strata.

Fault—Strike or dip-slip kinematic sense; steeply dipping. Dashed where concealed by younger bedrock strata.

Thrust fault, or structural or geophysical discontinuity interpreted to have involved thrust displacement—Teeth on inferred upper plate.

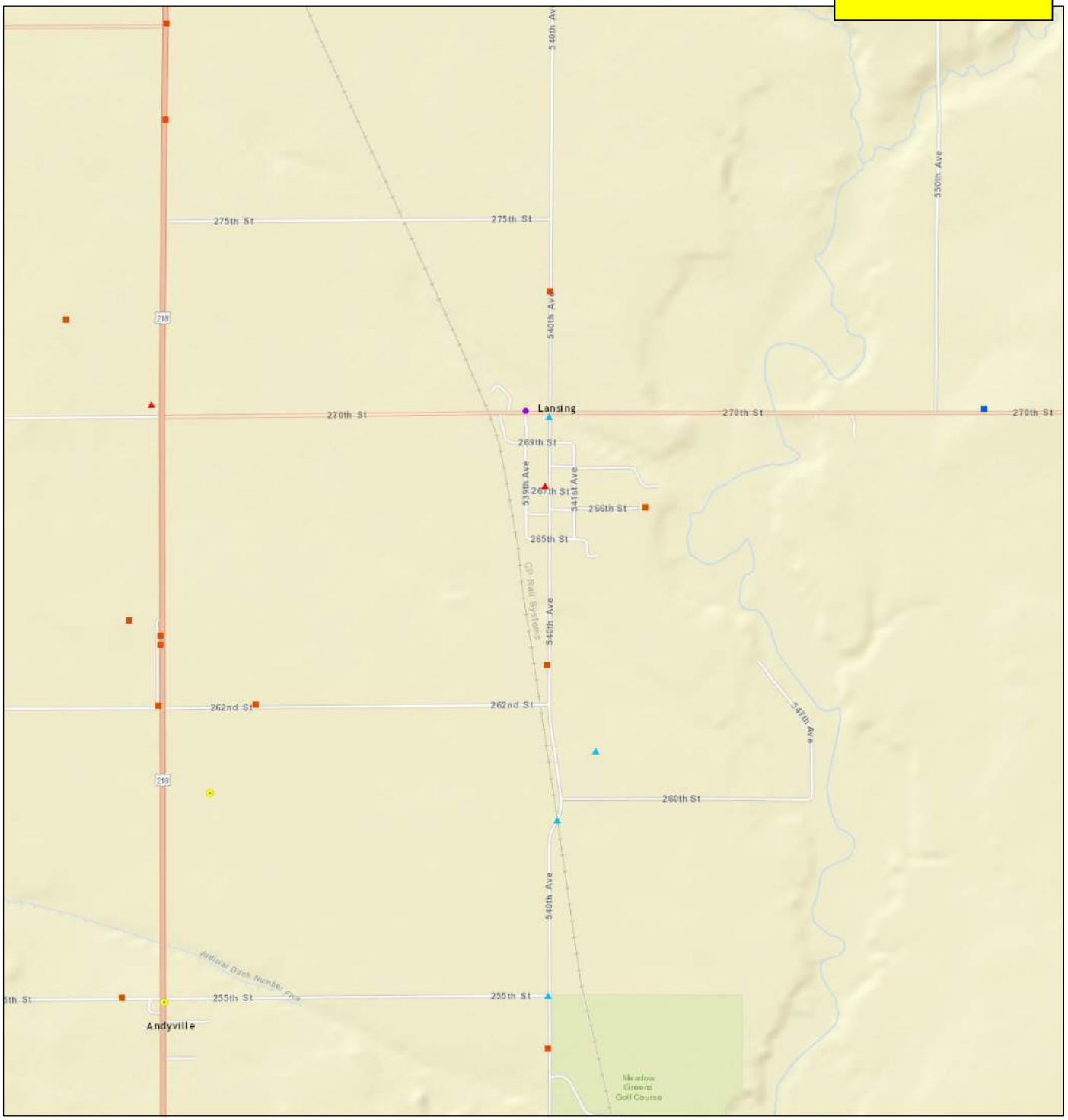
Foliation—Inferred from aeromagnetic data.

Iron-formation.

Dike—Concealed by younger bedrock strata.

NCC-Lansing

FIGURE 11



May 25, 2016

1:22,095

0 0.25 0.5 1 mi

0 0.4 0.8 1.6 km

MPCA Sites

- Multiple Activities
- Air
- Feedlot
- Hazardous Waste
- Investigation and Cleanup
- Solid Waste
- Tanks and Leaks
- Water

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

ATTACHMENT 1

Minnesota Department of Natural Resources

Division of Ecological and Water Resources, Box 25
500 Lafayette Road
St. Paul, Minnesota 55155-4025
Phone: (651) 259-5091 E-mail: samantha.bump@state.mn.us

April 28, 2016 **Correspondence # ERDB 20160383**

Ms. Sandra McClaine
Larson Engineering, Inc.
2801 East Enterprise Ave, Suite 200
Appleton, WI 54913-7889

RE: Natural Heritage Review of the proposed NCC Shuttle Loading Facility,
T103N 18W Section 10; Mower County

Dear Ms. McClaine,

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

- Wood turtles (*Clemmys insculpta*) and Blanding's turtles (*Emydoidea blandingii)*, both state-listed threatened species, have been documented in the vicinity of the proposed project and may be encountered on site. Both species are semi-aquatic, spending time both on land and in water.

  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.** In addition, if erosion control mesh will be used, the DNR recommends that the mesh be limited to wildlife-friendly materials (see enclosed fact sheet). If greater protection for turtles is desired, the second list of additional recommendations can also be implemented.

  The attached flyer should be given to all contractors working in the area. Illegal collection is a concern with wood turtles; therefore, please do not post any signs that would bring attention to the presence of these turtles. If these turtles are encountered on 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.

- The northern long-eared bat (*Myotis septentrionalis*), federally listed as threatened and state-listed as special concern, can be found throughout Minnesota. During the winter this species hibernates in caves and mines, and during the active season (approximately April-October) it roosts underneath bark, in cavities, or in crevices of both live and dead trees. Pup rearing is during June and July. Activities that may impact this species include, but are not limited to, wind farm operation, any disturbance to hibernacula, and destruction/degradation of habitat (including tree removal).

  The U.S. Fish and Wildlife Service (USFWS) has published a final 4(d) rule that identifies prohibited take. To determine whether you need to contact the USFWS, please refer to the USFWS Key to the Northern Long-Eared Bat 4(d) Rule (see links below). Please note that the NHIS does not contain any known occurrences of northern long-eared bat roosts or hibernacula within an approximate one-mile radius of the proposed project.

- The Environmental Assessment Worksheet should address whether the proposed project has the potential to adversely affect the above rare features and, if so, it should identify specific measures that will be taken to avoid or minimize disturbance.

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

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

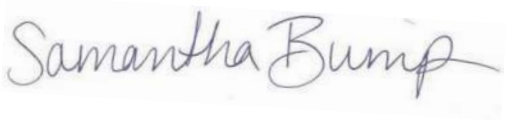
The enclosed results include an Index Report of records in the Rare Features Database, the main database of the NHIS. To control the release of specific location data, the report is copyrighted and only provides rare features locations to the nearest section. The Index Report may be reprinted, unaltered, in any 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.

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

The Natural Heritage Review does not constitute review or approval by the Department of Natural Resources as a whole. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. To determine whether there are other natural resource concerns associated with the proposed project, 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,



Samantha Bump
Natural Heritage Review Specialist

enc. Rare Features Database: Index Report
Blanding's Turtle Fact Sheet & Flyer
Wood Turtle Fact Sheet
Wildlife Friendly Erosion Control

Links: USFWS Key to the Northern Long-Eared Bat 4(d) Rule for Non-Federal Activities
http://www.fws.gov/midwest/endangered/mammals/nleb/KeyFinal4dNLEB.html
USFWS Key to the Northern Long-Eared Bat 4(d) Rule for Federal Actions
http://www.fws.gov/midwest/endangered/mammals/nleb/KeyFinal4dNLEBFedProjects.html
USFWS Northern Long-eared Bat Website
http://www.fws.gov/midwest/endangered/mammals/nleb/index.html
USFWS Northern Long-eared Bat Fact Sheet
http://www.fws.gov/midwest/endangered/mammals/nleb/nlebFactSheet.html

Cc: Kevin Mixon

Printed April 2016
Data valid for one year

Minnesota Natural Heritage Information System
Index Report of records within 1 mile radius of:
ERDB# 20160383 - NCC Shuttle Loading Facility
T103N R18W Section 10
Mower 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								
Emydoidea blandingii (Blanding's Turtle) #854 T103N R18W S11, T103N R18W S23, T103N R17W S18, T103N R18W S13, T [...]; Mower County		THR		SGCN	S2	G4	1996-07-31	25301
Glyptemys insculpta (Wood Turtle) #186 T103N R18W S11, T103N R18W S14, T103N R18W S2, T104N R18W S35, T [...]; Mower County		THR		SGCN	S2	G3	2000-05-30	25299
Vascular Plant								
Arisaema dracontium (Green Dragon) #45 T103N R18W S11; Mower County		SPC			S3	G5	2009-06-04	35794
Phlox maculata (Wild Sweet William) #12 T103N R18W S14; Mower County		SPC			S3	G5	2009-07-01	35713

Records Printed = 4

Minnesota's endangered species law (*Minnesota Statutes*, section 84.0895) and associated rules (*Minnesota Rules*, part 6212.1800 to 6212.2300 and 6134) prohibit the taking of threatened or endangered species without a permit. For plants, taking includes digging or destroying. For animals, taking includes pursuing, capturing, or killing.

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.

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Mower County

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.

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 YYY-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.

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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.

Woven 100% natural fiber erosion control materials being utilized along a central Minnesota stream. ©MN DNR, Nick Proulx

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).

Fish trapped and killed by welded-plastic square erosion control mesh improperly placed along a small central Minnesota stream. Photo courtesy of Ben Lowe.

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 aeview. 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.

CAUTION

Wood Turtles

MAY BE ENCOUNTERED
IN THIS AREA

The unique and rare wood turtle has been found in this area. Wood turtles are a State Threatened species 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. Turtles should be moved offsite to the nearest stream edge. Information and recommendations on wood turtles can be found on the back of this notice. Additional information on turtles can be obtained from Ecological Services, Nongame Wildlife Program, Box 25, DNR Building, 500 Lafayette Rd., St. Paul, MN 55155 (651) 259-5122.

Wood Turtle Life History Information

Description: The wood turtle is a medium-sized turtle with a dark green to brown, sculpted shell. The bottom of the shell is yellow with black blotches on the edges. The skin on the soft body parts near the shell is yellow; otherwise the legs, head and tail are brown. A distinctive field mark is the generally highly "carved" look to the top of the shell. However, an older turtle's shell may be worn smooth. Adult wood turtles have an average shell length of 5 ½ to 8 inches. They are normally terrestrial from April through October

Habitat: Wood turtles are found in and along mid-sized rivers and their tributaries flowing through open to wooded areas. During the spring, female wood turtles are often found on land, basking and preparing for nesting. Male wood turtles are also found on land, but they are usually closer to the water than the females. Once the females have laid their eggs, they often remain on land for the rest of the summer, foraging on plants, insects and worms. They will forage in crop fields and disturbed areas along the rivers, making them susceptible to harm from farm machinery. Wood turtles seem to prefer a habitat that includes grass fields and wooded areas. They will also use seasonal woodland pools.

Life History: After 5-6 months underwater in semi-hibernation, individuals emerge in late March or early April, depending on the season. They can be found along the water's edge and up to 400 yards away from the river. To regulate body temperature, turtles will bask for a period of time, and then seek shade. They may bury themselves in vegetation such as reed canary grass, or hide under log piles along the river. Nesting occurs in early to mid-June, and the females generally lay their eggs in the evening, nesting in an open sandy area along the river or on a south to southwest facing sandy bank along the river. They will also nest along the sides of roads if the soil is sandy. After a development period of 58-71 days, hatchlings leave the nest and travel to water. Wood turtles are mild mannered and do not attempt to bite. Adults are particularly vulnerable to being struck by automobiles while crossing roads, or hit by farm machinery in crop fields adjacent to rivers.

Recommendations: The DNR offers the following land use guidelines so that as little harm as possible comes to these rare turtles.

- Workers should be informed of the presence of wood turtles in the area.
- When working near a river, silt fencing should be put in place by mid-March, to keep turtles out of construction area. These fences need to be maintained throughout the project. **It is critical that silt fences are removed after the area has been re-vegetated.**
- **Do not leave sand piles along river, as they may be used for nesting.**
- Terrain should be left with as much natural contour as possible. Graded areas should be re-vegetated with native grasses and forbs. Use of fertilizers and pesticides should be avoided.
- Erosion should be prevented from reaching wetlands and river.
- Landscaping should be left as natural as possible; trees should not be planted in known or potential nesting sites.
- Roads should be kept to minimal standards on widths and lanes.
- Roads should be ditched, not curbed or below grade. If curbs must be used, 4" curbs at a 3:1 slope are preferred. Curbs and below grade roads trap turtles on the road, increasing road kills.
- Ditches should not be mowed until after October 1st.
- Report sightings of wood turtles to the DNR Regional Nongame Specialist.

Environmental Review Fact Sheet Series

Endangered, Threatened, and Special Concern Species of Minnesota

Blanding's Turtle

(*Emydoidea blandingii*)

Minnesota Status:	Threatened	State Rank[1]:	S2
Federal Status:	none	Global Rank[1]:	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 critical 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 1st and before June 1st).	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 <u>before August 1st</u>** so the young turtles can escape from the nest when they hatch!

REFERENCES

[1]Association 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.

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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.

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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 (218-308-2641); 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).

Compiled by the Minnesota Department of Natural Resources Division of Ecological and Water Resources, Updated August 2012
Endangered Species Review Coordinator, 500 Lafayette Rd., Box 25, St. Paul, MN 55155 / 651-259-5109

ATTACHMENT 2

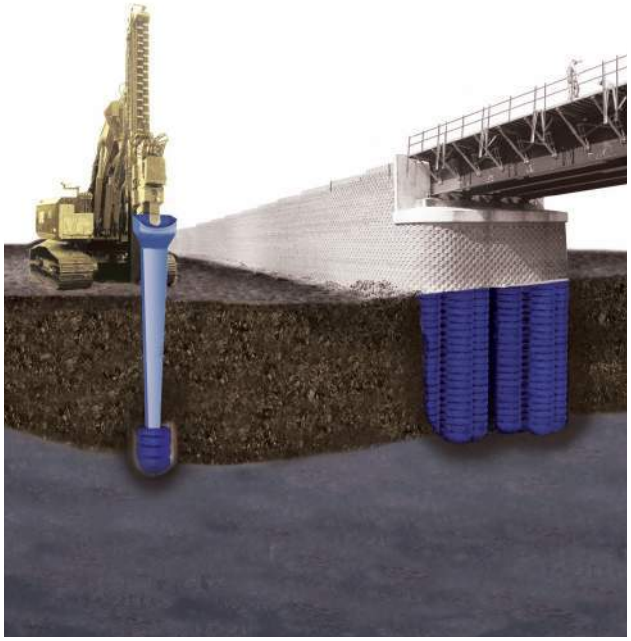
THE GEOPIER RAMPACT® SYSTEM

INTERMEDIATE FOUNDATION® SOLUTIONS

RAMPACT®

The Geopier Rampact® system creates stiff Rammed Aggregate Pier® (RAP) elements using a patented vertical ramming process. The Geopier Rampact system is extremely cost effective for installation in soils subject to caving because construction is facilitated using a patented tapered displacement mandrel, eliminating casing risks and increasing installation productivity. Aggregate is placed into the displacement tapered mandrel and RAP elements are constructed by applying direct vertical ramming energy to densely compact successive lifts of high quality crushed rock to form high stiffness engineered elements.

Through the combination of its patented tapered mandrel and direct vertical ramming action, the Geopier Rampact system laterally improves the matrix soil and increases the lateral stress as the mandrel is driven into the ground. This displacement method is ideal for contaminated sites where spoils or over-excavation is cost prohibitive or not an option. The Rampact elements also provide effective support in relatively shallow deposits of fill and other heterogeneous profiles where casing may be a concern. The Rampact system is often faster to install and provides higher capacities relative to the displacement Geopier Impact system in appropriate soil profiles. The high-performing Geopier Rampact system provides unsurpassed strength, stiffness and superior levels of performance for foundation settlement control and support that can replace massive over-excavation and replacement and deep foundations, including driven piles, drilled shafts or augered cast-in-place piles.



ADVANTAGES OF THE RAMPACT® SYSTEM

- **PRACTICAL** Vertically ramming thin lifts of aggregate is the key to providing strength and stiffness. The Rampact system eliminates casing and allows for construction in caving soils including saturated sand.
- **STRONG AND STIFF** Vertical impact ramming results in high density and high strength RAP elements providing superior support capacity and excellent settlement control. Additionally, contamination migration is prevented and capacity is improved by adding cementitious mixtures to improve stiffness and bearing support.
- **PROVEN** Thousands of structures are currently supported – proven experience that ensures high levels of performance and reliability.
- **ECONOMICAL** Often results in 20% to 50% savings compared to traditional deep foundation alternatives.
- **EFFICIENT** The patented tapered mandrel eases extraction and eliminates casing risk in mixed soils.
- **FAST** Rapid installation process means shorter schedules.
- **ENGINEERED** Projects are engineered in-house by Geopier Professional Engineers, allowing for rapid response when design or construction changes arise.

THE CONSTRUCTION PROCESS

The unique Geopier Rampact® installation process displaces soil during installation and utilizes vertical impact ramming energy to construct Rammed Aggregate Pier® elements, which exhibit unsurpassed strength and stiffness. RAP solutions are designed to provide total and differential settlement control and increase bearing support to meet project requirements.

1. A specially designed, patented hollow-tapered mandrel is driven into the ground using a strong static force augmented by high frequency vertical impact energy. Depths normally range from about 10 to 25 feet, depending on design requirements. A sacrificial cap or internal compaction mechanism prevents soil from entering the tamper foot and tapered mandrel during driving. The displacement process eliminates spoils and displaces soils laterally, densifying and reinforcing existing soils.
2. After driving to design depth, the hollow-tapered mandrel serves as a temporary casing and conduit for aggregate placement. After aggregate is placed inside, the mandrel is raised and re-driven downward to form a thin compacted lift. Compaction is achieved through static down force and dynamic vertical ramming from the hammer and mandrel. The process densifies aggregate vertically and the patented tamper/mandrel forces aggregate laterally into the loose or soft matrix soil. This results in soil improvement and lateral stress increase to provide excellent coupling with surrounding soils and reliable settlement control with superior strength and stiffness.
3. Following installation, RAP elements support shallow foundations, floor slabs and mats; reduce liquefaction potential; and improve stability support of embankments, walls and tank pads. The applied stresses are attracted to the stiff RAP elements, resulting in engineered settlement control.

APPLICATIONS

Geopier systems have become preferred replacements for massive over-excavation and replacement or deep foundations, including driven piles, drilled shafts or augered cast-in-place piles. Local Geopier engineers and representatives work with you and your specific soil conditions and loads to engineer a project-specific practical solution to improve your ground. With multiple systems we are able to engineer support for virtually any soil type and groundwater condition across many applications, including:

- ▷ Foundations
- ▷ Floor Slabs
- ▷ Industrial Facilities
- ▷ Storage Tanks
- ▷ Liquefaction Mitigation
- ▷ MSE Walls/Embankment Support
- ▷ Slope Stabilization
- ▷ Transportation
- ▷ Wind Turbines
- ▷ Uplift & Lateral Load Resistance

Subaru of Hartford
Hartford, Connecticut

Albion Ethanol Facility
Albion, Nebraska

Patient's First Parking Garage
Washington, Missouri

West Street Condos
Attleboro, Massachusetts

Geopier Foundation Company developed the Rammed Aggregate Pier® (RAP) system to provide an efficient and cost effective Intermediate Foundation® solution for the support of settlement sensitive structures. Through continual research and development, we've expanded our system capabilities to offer you more. Our design-build engineering support and site specific modulus testing combined with the experience of providing settlement control for thousands of projects provides an unmatched level of support and reliability to meet virtually all of your ground improvement challenges.

Work with regional engineers worldwide to solve your ground improvement challenges.

130 Harbour Place Drive, Suite 280, Davidson, NC 28036
800.371.7470 | info@geopier.com | marketing@geopier.com
www.geopier.com

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GEOPIER_SYSFLY_RP_01.16

ATTACHMENT 3

An Optimized Approach to Dust Control in Grain Elevators and Terminals

Geronime/Boston/McGovern/Abelson

Over 18 billion bushels of grain are produced and moved through grain handling systems in the US each year. The ability of the United States to feed its populace and livestock, support the biofuels movement, and export excess grain to emerging markets is a point of national pride and strength. The infrastructure for moving grain from one point to another includes small country elevators, larger elevators, large grain terminals, trucks, trains, barges, and ocean going shipping vessels. And every time grain is moved from one of these points to another, dust is generated. Dust which must be controlled, captured, and contained.

Trends

There are a number of trends that affect strategies for dust control in the grain industry.

At the top of this list is the fact that most existing grain handling facilities are now almost thirty years old, having been constructed during the 1980s. Now thirty years later, the U.S. is trying to move twice the amount of grain through the same fixed assets, creating a strong and increasing demand to implement process solutions that will improve uptime and reliability. Where possible, it is desirable to avoid building new infrastructure when improvements to the existing infrastructure could support the capacity needs.

When simple improvements are not enough, more substantial investments are being made to revitalize aging facilities with updates, expansions, or even the building of new facilities. With new investments comes a new focus on process improvement to eliminate waste streams, improve product quality, and improve energy efficiency. The goal is not simply to replace an aging infrastructure; the goal is to improve it.

Competition between grain trading companies is also fueling the need to substantially improve existing facilities. On the Columbia River, where the grain industry's first new export terminal in 30 years is nearing completion, several nearby grain terminals have either embarked on or will soon embark on projects intended to improve their grain handling capacity and efficiency. Without these investments, the new terminal has a substantial market advantage over the existing terminals and could undoubtedly leverage that advantage to acquire market share.

Another trend is a greater focus on dust emission issues. While federal regulations for grain dust emissions have not changed substantially in many parts of the country, some areas (like the West Coast) are experiencing tighter emission standards and increased enforcement. Even in areas where regulated emissions have not changed, emissions are still an issue because of encroachment. As neighbors move closer to grain handling facilities, general tolerance for dust emissions decreases so grain handlers need to be more concerned about emissions.

Finally, local and pending federal regulations regarding the management of combustible dust may be substantially different from past best practices. Dust control is more important than ever to grain handlers as they seek to comply with upcoming OSHA regulations intended to prevent catastrophic combustible dust events.

To summarize, the major trends that affect strategies for dust collection in the grain industry include:

- Increased material throughput
- Protection of market competitiveness
- Improved uptime and reliability
- Desire to eliminate waste streams and improve product quality
- Focus on energy efficiency as a profit driver
- Need to reduce dust emissions to meet tighter standards and to manage encroachment issues
- The anticipation of regulations for managing combustible dust

New Dust Control Solutions

As industry trends push grain handlers to look at dust control as an integral part of their operations, the dust collection industry continues to provide solutions for those demands. In some instances, companies have applied solutions that follow age-old practices and approaches, while others have developed newer and more effective solutions to meet the new demands.

One innovative approach to dust management is to collect and manage dust at the point of generation – at the source. **Capturing and controlling dust at its source provides several benefits including:**

Reduction or Elimination of waste streams. When captured dust is retained within the process generating it, it stays as part of the revenue producing product stream. Instead of turning a portion of the product into a pile of wasted dust, it remains as part of the product stream that has economic value.

Reduction or Elimination of waste stream equipment. When dusts produced in a process are separated from the original process stream, they require independent material handling equipment and process equipment. Keeping the dust within the product stream minimizes the cost and maintenance of additional material handling equipment.

Minimizing the amount of duct runs. It takes a tremendous amount of energy to move dust-laden air through long duct runs. Installing **point-of-use** dust collectors closer to the dust-generating process minimizes or eliminates unnecessary ducts, which saves energy.

Reduced duct maintenance. Minimizing duct runs reduces maintenance costs, eliminates wasted air from leaks in the duct system and eliminates costly lining of ducts.

Easier installation. Less ducting also equates to a simpler and easier installation for dust collection equipment. Smaller, lighter collectors mean less support infrastructure in grain handling facilities where collectors are often not placed on the ground.

Improved uptime and reliability for the system as a whole. With centralized dust collection, when a dust collection system requires servicing the entire dust handling system, and often the entire grain handling facility must be shut down to resolve the problem. With a series of **point-of-use** collectors, when an individual leg of the process is taken offline for maintenance, the rest of the system continues to operate. This provides a level of redundancy to the system, leading to improved uptimes for the facility. Other potential benefits of **point-of-use** collectors include:

- Minimizing impact on uptime due to servicing – minimize downtime to allow more flexibility in servicing scheduling (20 minute cycle vs. 4-8 hours); design characteristics that simplify and speed servicing actions.
- Localized systems minimize the impact on total operations when a single component has issues.
- Localized systems improve energy utilization, allowing operations to use energy only when needed to manage dust in each area. This approach eliminates wasted energy used to pull air from areas not handling dust.
- Technologies that extend filter life to reduce service frequency

Supporting a **point-of-use** innovative dust control solution requires a dust filtration product with a very small footprint, but with robust

Point of Dust Generation	Qty	Dust Control Airflow Need	Traditional Solution	Contemporary Solution
Receiving – Railcar	1	15,000 acfm	232RFW8 larger round baghouse (15,000 acfm)	(8) PowerCore® CPV-6 (15,000 acfm total)
Bucket Elevator – Leg	2	2,000 acfm	232RFW8 larger round baghouse (17,650 acfm)	(2) PowerCore® CPV-8 (2,000 acfm/each)
Bucket Elevator – Head	2	1,500 acfm		(2) PowerCore® CPV-6 (1,500 acfm/each)
Garner Scales	1	3,000 acfm		PowerCore® CPC-12 (3,000 acfm)
Conveyor – Covered	1	7,650 acfm		(3) PowerCore® CPV-6 (2,550 acfm/each)
Distributor Head	1	2,000 acfm	376 RFW 8 larger round baghouse (32,000 acfm)	PowerCore® CPV-8 (2,000 acfm)
Conveyor – Open	2	6,000 acfm		(4) PowerCore® CPV-8 (3,000 acfm/each)
Tripper	2	4,000 acfm		(2) [PowerCore® CPV-8 + PowerCore® CPV-4] (2,664 & 1,336 acfm/set)
Cleaner	1	10,000 acfm		PowerCore® CPC-48 (10,000 acfm)
Silo Bin Venting	10	800 acfm/silo	(10) DLMV 8/7 envelope-style baghouse 800 acfm/each	(10) PowerCore® CPV-2 (800 acfm/each)
Conveyor – Covered	3	5,100 acfm	376 RFW 8 larger round baghouse (18,300 acfm)	(6) PowerCore® CPV-6 (2,550 acfm/each)
Scales – Load out	1	3,000 acfm		PowerCore® CPC-12 (3,000 acfm)
Shipping – Barge	1	8,000 acfm	DLMC 2/3/15 envelope-style baghouse (8,000 acfm)	DLMC 2/3/15 envelope-style baghouse (8,000 acfm)

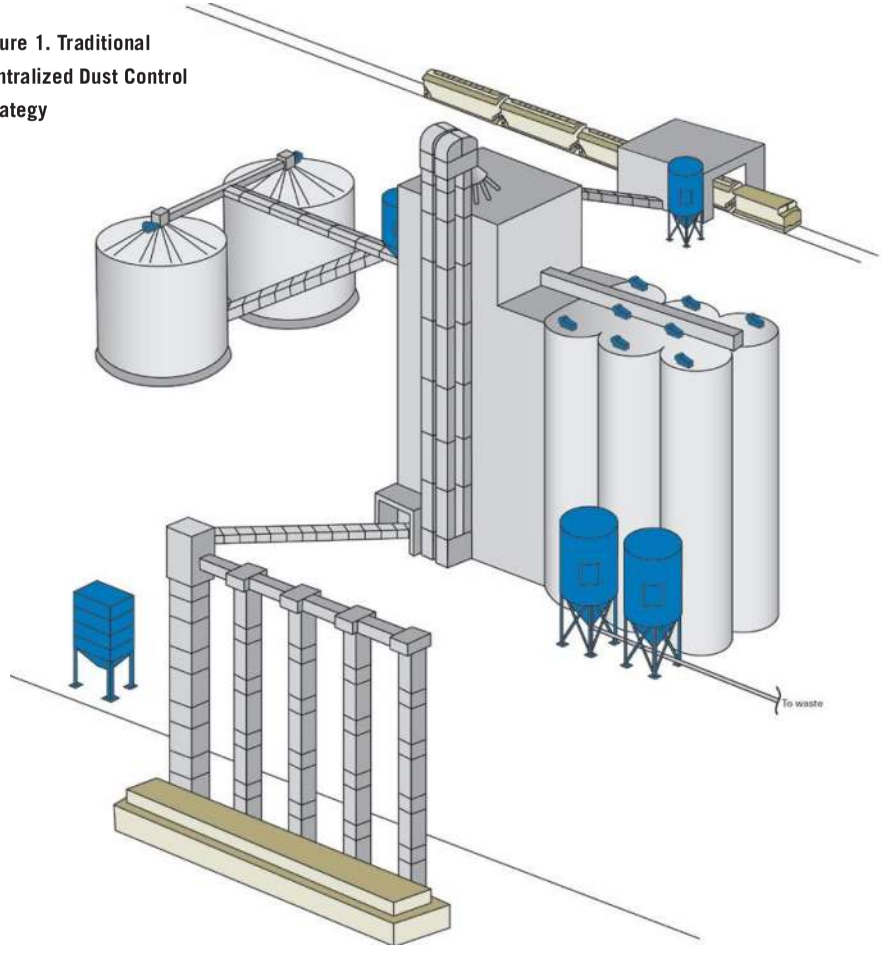
Table of dust generation points used in the typical 40,000 bushels per hour grain elevator used in our example.

performance to handle moderate to large air volumes. Traditional bag houses and cartridge collectors are generally either too large for **point-of-use** installation, or when sized to fit, are unable to handle the necessary air volumes.

Newer products on the market, such as the Donaldson®Torit® PowerCore® CP-Series dust collector, work very well as a **point-of-use** source collector. As a small, light, easy to maintain collector capable of handling the required air volume, this product offers distinct advantages over the more typical bag house technologies, which have been in use for over 40 years.

Products like this offer the ability to collect materials at the source, and allow dust control with a more manageable investment in energy costs. **Point-of-use** collectors reduce air volume for dust control; reduce horsepower investment, and minimize operational energy costs. With its smaller size and low profile, the Torit PowerCore CP collector can be installed at multiple locations in new facilities as source collectors, and can squeeze into tight spaces in existing facilities (due to its smaller size) to solve nuisance dust problems.

Figure 1. Traditional Centralized Dust Control Strategy



New Media Options

Conventional baghouse media has always had a relatively low efficiency compared to the newer media options that can now help facilities meet the demand for reduced emissions and help manage encroachment issues.

For decades nanofiber media in cartridge-style dust collectors has provided higher levels of efficiency to processes where cartridge dust collectors are applied; however, cartridge dust collectors have not been ideally suited to most grain handling operations and consequently this efficient media has not been widely adopted. With the release of the Torit PowerCore CP-Series, more efficient Ultra-Web® nanofiber media is now available for the grain industry. Testing has shown emissions can be reduced by as much as 78% when Ultra-Web® nanofiber media is used. Ultra-Web® filter media in the Torit PowerCore CP-Series collector truly does represent the best available dust control technology for the grain industry.

When a facility is not in a position to replace centralized collectors, another strategy that helps to resolve some of the issues facing grain handlers is to upgrade the media used in their existing collectors. Dura-Life® bags last 2-3 times longer than standard bags and provide both energy savings and fewer emissions. Another option is to switch out standard bags for pleated bags. Ultra-Web SB pleated bag filters deliver longer filter life, higher efficiency, and cost savings for existing baghouse collectors. Pleated bags can help resolve bag abrasion issues and may allow more air through the collector by increasing the square footage of media.

Dust Control Solutions Comparison Example

To help understand the influence a **point-of-use** dust control strategy can have on facility's operational costs, consider a typical grain elevator handling 40,000 bushels per hour of grain, transferring from rail to barges.

FIGURE 1 shows this typical elevator site with a conventional centralized dust control strategy. This facility would utilize 15 centralized bag house dust collectors, moving approximately 99,000 cfm of air anytime the facility is in operation, and the entire operation would

Figure 2. Traditional Centralized Baghouse Collectors

need to shut down for periodic dust collector maintenance. These centralized systems would involve the installation of significant amounts of ducts adding to the installation and maintenance challenge for the facility. The energy costs for air movement alone in this centralized system could exceed $70,000 a year and additionally, the collected dust from the various bag house collectors would require expensive, maintenance-intensive material handling systems. This centralized approach also creates a lower value waste stream for the collected dust.

FIGURE 3 shows the same typical 40,000 bushel per hour elevator facility with a more contemporary approach leveraging **point-of-use** source capture in the dust control strategy. The facility would utilize 43 Torit PowerCore CP-Series **point-of-use** dust collectors and one bag house collector moving the same amount of air when all areas of the facility are running, but individual zones in the facility would be offline when certain processes are not running

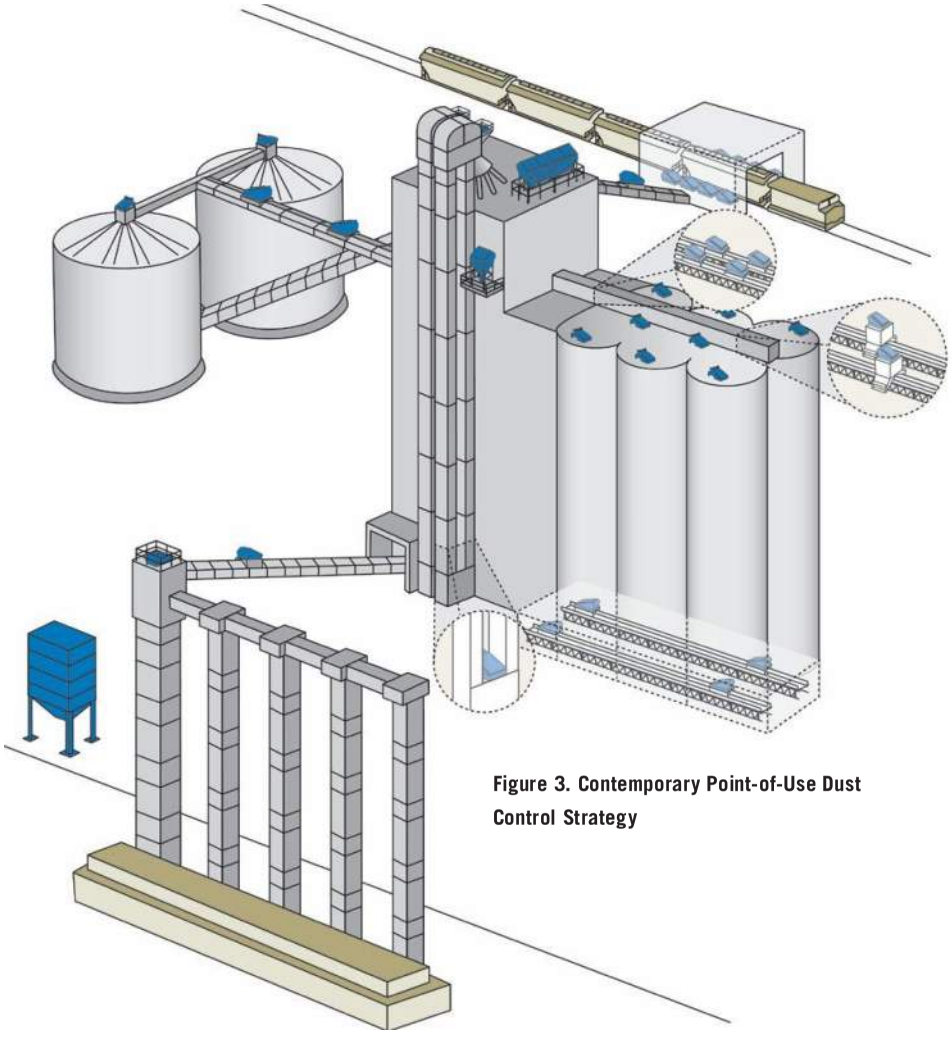


Figure 3. Contemporary Point-of-Use Dust Control Strategy

Figure 4. Implemented Point-of-Use Strategy

Figure 5. Point-of-Use Dust Control on Silo

Figure 6. Point-of-Use Dust Control on Elevator Leg

or when maintenance is required. Energy costs for this **point-of-use** strategy would approach $55,000 per year for an energy cost saving of almost 22% compared to a more traditional centralized strategy, just in air movement costs. In addition, the **point-of-use** approach does not generate the lower value waste stream. Collected dust is returned to the primary product stream and maintenance of extensive amounts of duct is reduced or eliminated in some areas.

In **FIGURE 4** the **point-of-use** dust control strategy was implemented at a major grain export terminal on the Gulf Coast. **FIGURE 5** shows a close up of a **point-of-use** collector on a silo.

Note that knowledge of best practices is essential to applying a **point-of-use** strategy, including understanding how to properly select and apply **point-of-use** equipment. As an example, **point-of-use** collection directly on the legs of a bucket elevator is not recommended, however a properly selected and designed **point-of-use** collector can allow captured dusts to be returned to the boot of the elevator offering the benefits of **point-of-use** source collection in a manner compliant with most standards. (See **FIGURE 6**)

Conclusion

The combination of a **point-of-use** dust management strategy and Torit PowerCore CP-Series collectors for dust control in the grain industry represents a best-in-class dust management strategy for meeting the changing expectations and requirements in the industry. The technology has proven itself in numerous grain installations in the U.S. alone and constitutes what should be considered, the best available dust control technology. We anticipate leading grain handlers will increasingly consider **point-of-use** dust collection technologies in their operations. ▮

ATTACHMENT 4

FEED & GRAIN EQUIPMENT

Edward J. Heck & Sons Co. specializes in Dustop mineral oil dust suppression systems, hammermill screens, hammers and other products for your feed and grain equipment - down to the nuts and bolts.

Our family-run company prides itself on industry knowledge, competitive prices, fast service, and a personal dedication to customers' needs.

For over 64 years, we have provided our customers with outstanding service and products. Browse our website and call us today to find out how we can help your grain and feed business.

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Omaha, NE 68108

Mailing Address
P.O. Box 3784
Omaha, NE 68103

Phone 800-652-8873 | 402-341-6666
Fax 402-341-6927

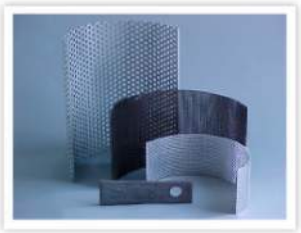
Email Us

FEATURED PRODUCTS

DUSTOP

Dustop mineral oil dust suppression systems control dust in grain storage facilities using a digital monitoring system.

VIEW PRODUCT



HAMMERMILL SCREENS & HAMMERS

Edward J. Heck & Sons Co. will provide your company with full sheets or pieces cut and fabricated to your specifications.

VIEW PRODUCT

ABOUT US

OUR HISTORY

With a background in selling grain and feed ingredients, Ed Heck began selling feed milling and grain elevator equipment from his garage more than 60 years ago. Under the leadership of Marshall Heck and Bud Brugenhemke, the fabrication of perforated screens became the perfect complement to the ever-changing list of manufacturers' products being marketed in the early 1970s.

The company has prospered each year, and today remains a respected leader in the industry under the direction of Andy Heck and Mark Wanning; the addition of Jay Clinkinbeard marks the fourth generation of family in the business.

Growing from regional roots into the international market, Edward J. Heck & Sons Co. remains small enough to attend to all their customers' needs, providing industry knowledge that comes from almost 100 years of combined experience.

Their success has been a direct result of their work ethic, their concern for the customer, and their passion for the business. Today Edward J. Heck & Sons Co. maintains the high level of professionalism and dedication to service originally set by Ed Heck over 60 years ago.

Products

We are award-winning distributors of:

- Magnets
- Screw conveyors
- Mixers and blenders
- Bin vibrators
- Level controls
- Motion and bearing monitors
- Electric actuators
- Belting buckets and bolts
- Grain testing equipment
- Truck probes
- Dust suppression systems
- Urethane sheets
- Bucket elevators
- Valves, gates, and elbows

Distribution

We proudly represent the following companies:

DUSTOPS

DUSTOP MINERAL OIL DUST SUPPRESSION SYSTEM

Dustop systems provide dust suppression in grain storage facilities, using a digital monitoring system for accurate and controlled application of mineral oil.

ADVANTAGES OF USING DUSTOP:

- Efficient airborne dust reduction
- Single-, double-, or triple-point distribution
- Cost-effective parts and labor
- Easy assembly and installation
- Automatic start and stop

HOW DUST SUPPRESSION HELPS YOU:

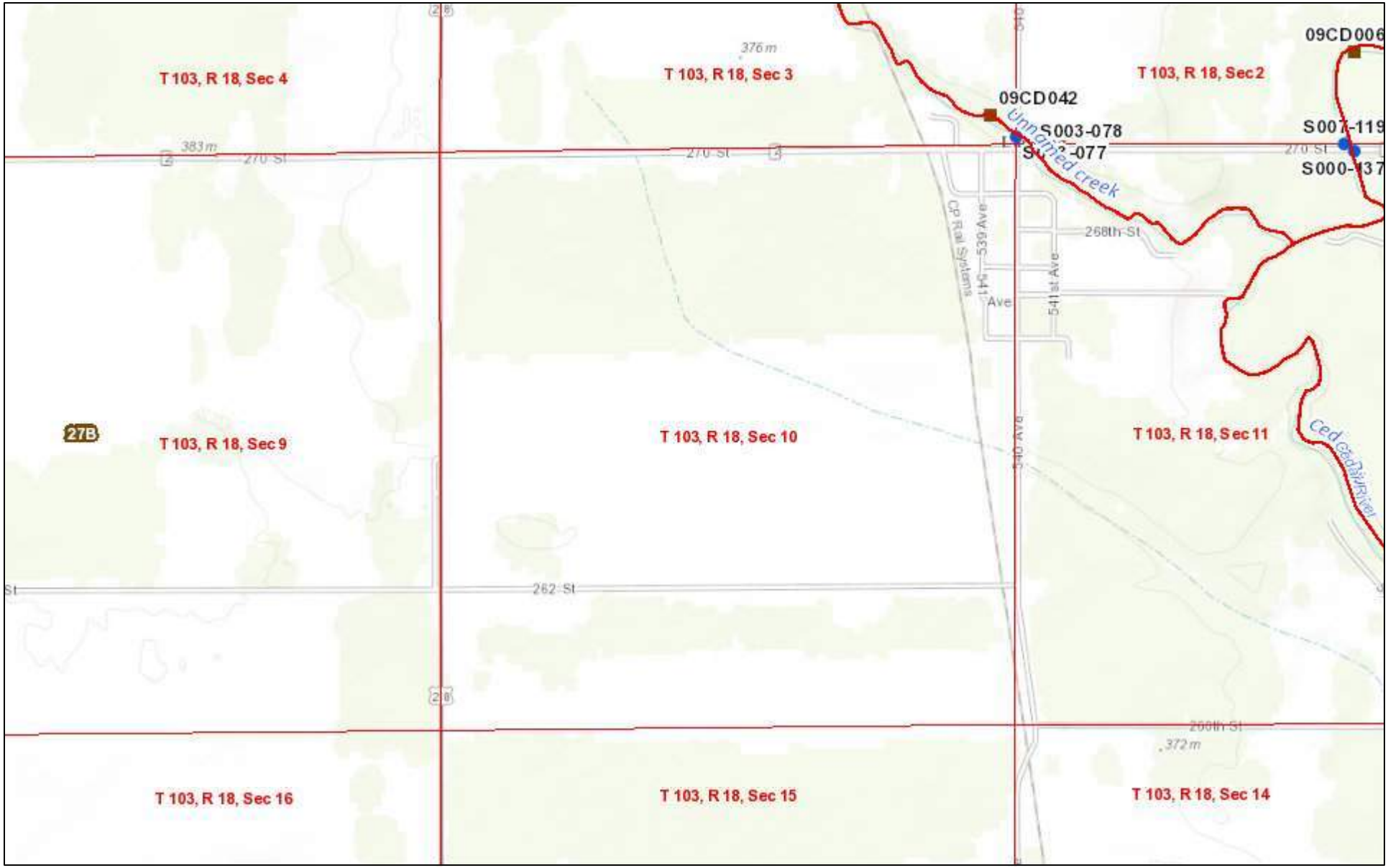
- Cleaner facilities
- Improved functioning
- Improved morale
- Reduced shrink loss

FDA regulations allow an application rate of .02% by volume. We recommend using a gallon for every 1000 bushels of grain.

DUSTOP MANUAL »

ATTACHMENT 5

NCC-LANSING



March 14, 2016

1:21,065

0 0.175 0.35 0.7 mi

0 0.275 0.55 1.1 km

Wetlands | Streams | Lakes

Lakes | Lakes | Impaired Streams

Streams | Streams | Impaired Wetlands

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey,

Minnesota Pollution Control Agency

Lakes and streams water quality dashboard

New search

Cedar River: Roberts Cr to Upper Austin Dam (Stream)

Eating the fish
Consumption advisories for this waterbody (DNR)

Stream identification number: **07080201-502**

Description	Overall condition	Biology	Recreation use
	CAUTION	CAUTION	CAUTION

Not always suitable for swimming and wading due to high bacteria levels caused by the presence of human or animal waste in the water. Concentrations of PCB in fish tissue and mercury in fish tissue exceed the water quality standard; for specific fish consumption advice refer to the Minnesota Department of Health website at http://www.health.state.mn.us/divs/eh/fish/eating/sitespecific.html
May not support a thriving community of fish and other aquatic organisms, as indicated by excessive turbidity (suspended solids)

Details:

Major Watershed	Cedar River
County	Mower
Length	4.83 miles
Next Segment	07080201-511
Ecoregion	Western Corn Belt Plains
Protected for	a healthy warm water aquatic community; industrial cooling and materials transport use without a high level of treatment

View land use around this water body

MPCA actions in this watershed

Could I become a Citizen Monitor?

Project name	Project #	Current status	Status started	Project target end yr	Number of impairments
Cedar River Basin Turbidity and Excess Nutrients TMDL in Multiple Counties	PRJ06272-001	In Progress	3/19/08	2011	11
Cedar River Major Watershed (Headwaters) WRAP Strategy	PRJ07667-001	In Progress	12/1/15	2013	43
Lower Mississippi River Basin-Fecal Coliform TMDL	PRJ07742-001	TMDL Implementation Plan approved	9/1/07	2006	40
Mercury Pollutant Reduction Plan	PRJ07770-001	TMDL Implementation Plan approved	10/1/09		1101

YES

Learn more about doing volunteer water health monitoring.

MPCA Contact info

Bill Thompson
(507)206-2627
bill.thompson@state.m

Minnesota Pollution Control Agency

Lakes and streams water quality dashboard

New search

Cedar River: Roberts Cr to Upper Austin Dam (Stream)

Eating the fish
Consumption advisories for this waterbody (DNR)

Stream identification number: **07080201-502**

Description	Overall condition	Biology	Recreation use
	CAUTION	CAUTION	CAUTION

Water condition summary

Not always suitable for swimming and wading due to high bacteria levels caused by the presence of human or animal waste in the water. Concentrations of PCB in fish tissue and mercury in fish tissue exceed the water quality standard; for specific fish consumption advice refer to the Minnesota Department of Health website at http://www.health.state.mn.us/divs/eh/fish/eating/sitespecific.html May not support a thriving community of fish and other aquatic organisms, as indicated by excessive turbidity (suspended solids)

Water quality impairments

Click the Project # to view the project's detail page

Beneficial use	Assessment year*	Assessed condition	Impairment cause	Restoration project no

Aquatic consumption	2007	One or more standards not met	Mercury in fish tissue http://www.pca.state.mn.us/wfhy9ef Pcb in fish tissue
Aquatic life	2011	One or more standards not met	Turbidity
Aquatic recreation	2011	One or more standards not met	Fecal coliform http://www.pca.state.mn.us/foyp984

* When Assessed condition is "One or more standards not met," Assessment year is the year before the impairment was added to the Inventory of Impaired Waters. Otherwise, Assessment year is the year in which MPCA's most recent assessment was performed.

More information on water quality standards.

More information on the assessment process and methods.

MPCA actions in this watershed

Project name	Project #	Current status	Status started	Project target end yr	Number of impairments
Cedar River Basin Turbidity and Excess Nutrients TMDL in Multiple Counties	PRJ06272-001	In Progress	3/19/08	2011	11
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Mercury Pollutant	PRJ07770-001	TMDL	10/1/09		1101

Could I become a Citizen Monitor?

YES

Learn more about doing volunteer water health monitoring.

MPCA Contact info

Bill Thompson
(507)206-2627
bill.thompson@state.

Reduction Plan	Implementation Plan approved

Minnesota Pollution Control Agency

Lakes and streams water quality dashboard

New search

Cedar River: Roberts Cr to Upper Austin Dam (Stream)

Eating the fish
Consumption advisories for this waterbody (DNR)

Stream identification number: **07080201-502**

Description	Overall condition	Biology	Recreation use
	CAUTION	CAUTION	CAUTION

Biology summary

May not support a thriving community of fish and other aquatic organisms, as indicated by excessive turbidity (suspended solids)

Biological stream stations

Station ID	Station name	Organization	Station type	County
09CD006	CEDAR RIVER	MPCA	BIOLOGICAL	Mower

MPCA actions in this watershed

Project name	Project #	Current status	Status started	Project target end yr	Number of impairments

Could I become a Citizen Monitor?

YES

Learn more about doing volunteer water

Cedar River Basin Turbidity and Excess Nutrients TMDL in Multiple Counties	PRJ06272-001	In Progress	3/19/08	2011	11
Cedar River Major Watershed (Headwaters) WRAP Strategy	PRJ07667-001	In Progress	12/1/15	2013	43
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Mercury Pollutant Reduction Plan	PRJ07770-001	TMDL Implementation Plan approved	10/1/09		1101

health monitoring.

MPCA Contact info

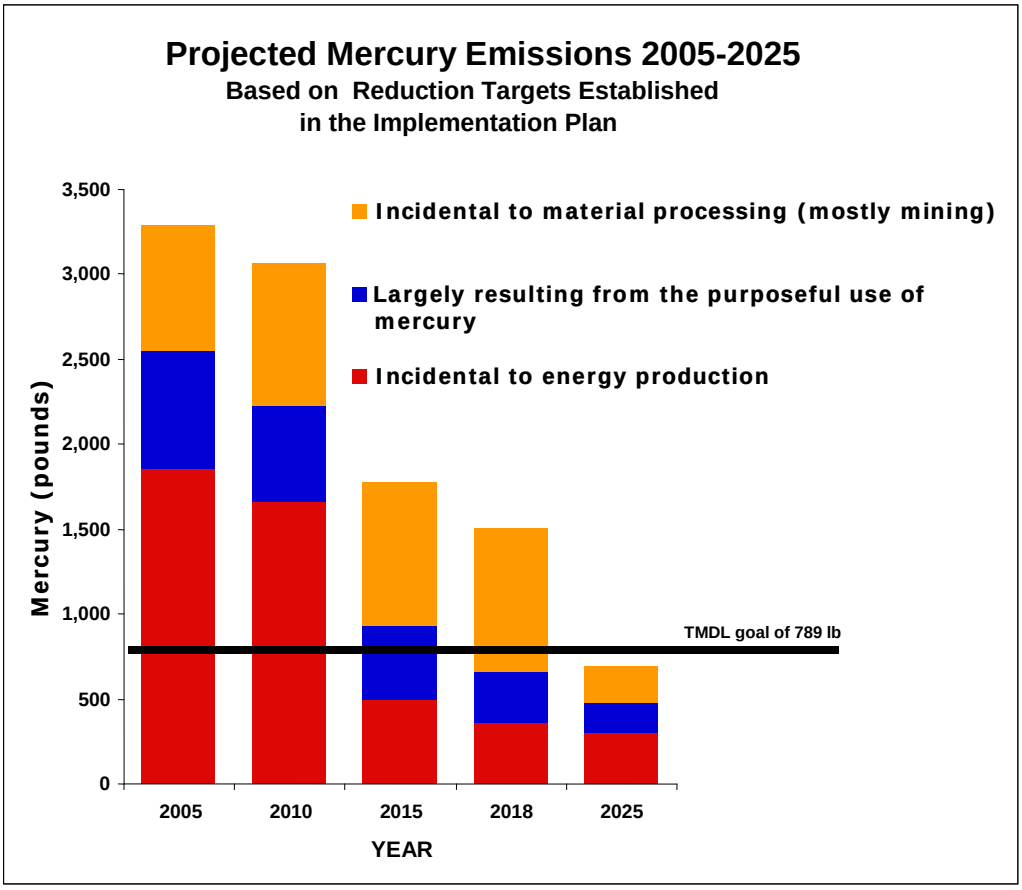
Bill Thompson
(507)206-2627
bill.thompson@state.m

Minnesota Pollution Control Agency

Minnesota's plan to reduce mercury releases

About two-thirds of the water impairments on Minnesota's 2006 Impaired Waters List were due to mercury. As required by the Clean Water Act, the Minnesota Pollution Control Agency (MPCA) prepared a Total Maximum Daily Load (TMDL) study that evaluated the sources of mercury and quantified the reductions needed for the mercury-impaired waters to meet water-quality standards.

Minnesota's Mercury TMDL established an annual air emission target of 789 pounds (lb.) and a water discharge limit of 24 lb. per year (lb./yr.) for Minnesota sources.



The air emission goal represents a 76 percent reduction from 2005 levels. The water limit is above current discharge levels by about 9 lb., allowing for some growth. This statewide TMDL was approved by the MPCA Board in December 2006 and by the U.S. Environmental Protection Agency in March 2007.

Stakeholders helped develop implementation plan

With substantial stakeholder input, the MPCA prepared a plan to reduce mercury releases in Minnesota. This plan, the Implementation Plan for Minnesota's Statewide Mercury Total Maximum Daily Load, describes actions Minnesota will take to meet water-quality standards for mercury. The implementation plan consists of strategies to ensure that water discharges remain below 24 lb./yr. and to reduce air emissions to below 789 lb./yr. by 2025.

The implementation plan includes:

- **Water Implementation Strategies** to ensure that total statewide mercury discharges remain below 24.2 lb./yr.
- **Air Implementation Strategies** to achieve reductions from existing sources to below 789 lb. by 2025. In addition, potential new and modified sources must implement best available controls and arrange for equivalent reductions from other sources or otherwise mitigate their increased emissions.

Minnesota Pollution Control Agency • 520 Lafayette Rd. N., Saint Paul, MN 55155-4194 • www.pca.state.mn.us
651-296-6300 • 800-657-3864 • TTY 651-282-5332 or 800-657-3864 • Available in alternative formats

- A **Monitoring and Evaluation Plan** describes the MPCA's plan for tracking the effectiveness of this Implementation Plan including air and water release monitoring as well as tracking key environmental response indicators. A stakeholder group will aid the MPCA in tracking implementation. Major progress reviews are planned every three years. View the plan at on the MPCA Web site at www.pca.state.mn.us/air/mercury-reductionplan.html.

Questions about the implementation plan may be directed to Ned Brooks, MPCA mercury coordinator (phone 651-757-2247, e-mail Ned.Brooks@state.mn.us)

For more information on sources of mercury contamination in Minnesota see, the MPCA fact sheet, *Sources of mercury pollution and the methylmercury contamination of fish in Minnesota* at www.pca.state.mn.us/publications/p-p2s4-06.pdf.

Summary of Mercury Air Emission Reduction Strategies and Targets 2005-2025

Source Category	Reduction Strategy Summary*	Est. Annual Mercury Emission and Targets (lb.)			Source Reduction
		2005	2018	2025	
Coal-fired Electric Generation	70-90% reduction at all units greater than 5 lb./yr. by 2025, mostly sooner	1,716	294	235	1,481 lb./yr., 86%
Industrial, Institutional, Commercial Boilers	70% reduction at all units emitting more than 2 lb./yr.	71	33	33	38 lb./yr., 54%
Wood Combustion at Industrial Boilers	70% reduction at all units emitting more than 2 lb./yr.	31	14	14	17 lb./yr., 55%
Petroleum Refining	50% reduction by 2018, improved mass balance	13	7	7	6 lb./yr., 46%
Petroleum Product Utilization	50% reduction by 2018, improved understanding of fate	27	15	15	12 lb./yr., 44%
Smelters & Shredders That Recycle Cars & Appliances	Reduce emissions to 10 lb. by 2025, conduct testing and mass balance at largest facility.	139	20	10	129 lb./yr., 93%
Ferrous Mining/Processing	75% reduction (from 2010 estimates) by 2025, research and reporting	735	841	210	525 lb./yr., 71%
Sewage Sludge Incineration	90% control at sole uncontrolled facility	9	6	6	3 lb./yr., 33%
Recycling Mercury from Products in Minnesota	Reduce emissions to 8 lb. by 2018, conduct mass balance	65	8	8	57 lb./yr., 88%
Mercury Product Manufacturing in Minnesota	Reduce emissions to .3 lb. by 2025, quantify current emissions	42	13	0.3	42 lb./yr., 99%
Cremation	Reduce emissions to 32 lb. by 2025, improve estimates	80	63	32	48 lb./yr., 60%
Dental Preparations	Reduce emissions to 5 lb. by 2025, improve estimate	62	10	5	57 lb./yr., 92%
Sale, Use & Disposal of Mercury-containing Products	Various strategies to improve end-of-life management and decrease use	235	88	88	150 lb./yr., 64%
Emissions from Other Sources	Sources not addressed by reduction strategies	89	68	71	1 lb./yr., 20%
	Total	**3,314**	**1,464**	**734**	**2,580 lb./yr., 78%**

* Reduction percentages are from estimated 2018 levels (unless noted) and are listed to explain the basis for the target. The final target is lb./yr., not a percent reduction.

Minnesota Pollution Control Agency

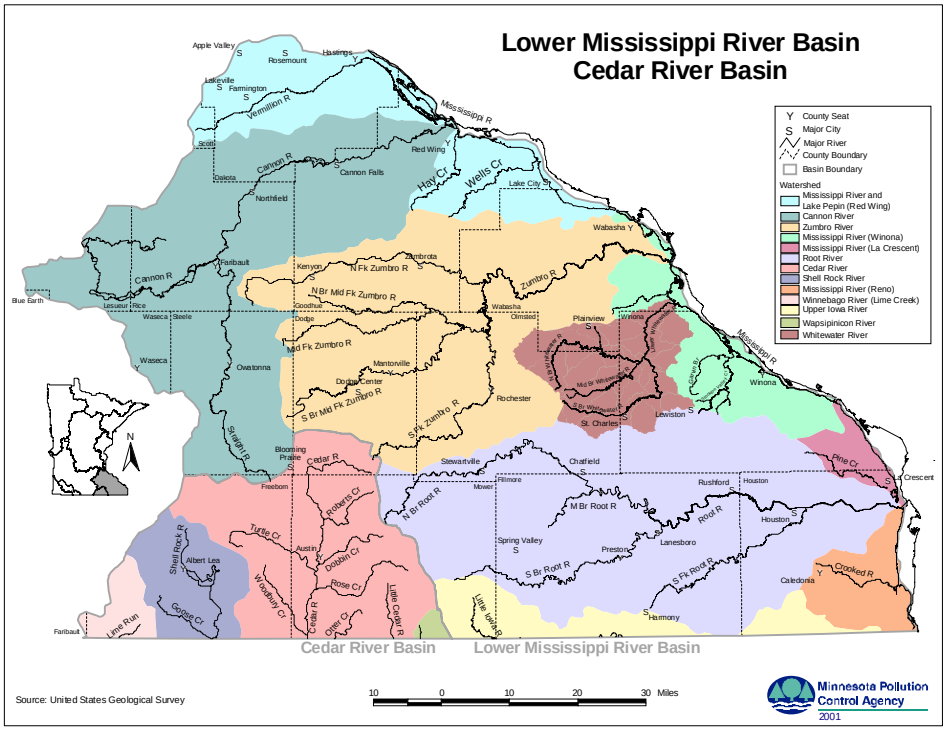
Revised Regional TMDL Evaluation of Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin

Regional Division

Impaired Waters Program

Water Quality/Impaired Waters #9.02a, August 2005

The federal Clean Water Act and the United States Environmental Protection Agency's Water Quality Planning and Management Regulations require states to develop Total Maximum Daily Loads (TMDLs) for water bodies that do not meet water quality standards.



The TMDL process establishes the allowable level of pollutants for a water body based on the relationship between pollutant sources and water conditions. Development of a TMDL Report provides a basis for determining the pollutant reductions necessary from point and nonpoint sources to restore and maintain the quality of water resources.

Thirty-nine stream reaches in the Lower Mississippi and Cedar River Basins are impaired for swimming use. Fecal coliform levels in these reaches violate Minnesota water quality standards. The purpose of this 2005 TMDL Report is to revise a 2002 TMDL developed for fecal coliform impairments in the same geographic area.

2002 Report

In 2002, the MPCA submitted a report titled, *Regional Total Maximum Daily Load Evaluation of Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin in Minnesota* to the U.S. Environmental Protection Agency (EPA). The report satisfied the requirements of the federal Clean Water Act for 20 stream reaches in the Lower Mississippi and Cedar River basins. The original report is available for review on the MPCA web site at http://www.pca.state.mn.us/water/tmdl/index.html#finaltmdl. The report was approved by the EPA in November 2002, a decision that was later challenged by the Minnesota Center for Environmental Advocacy (MCEA).

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This material can be made available in alternative formats for people with disabilities.

Results of Legal Challenge

In a June 2005 ruling, the United States District Court for Minnesota remanded the TMDL report back to the EPA for revisions. The complete court ruling is available on the MPCA Web site at http://www.pca.state.mn.us/water/tmdl/index.html#finaltmdl. In short, the court ruling states that the revised TMDL must

- Be established at a level necessary to implement the applicable water quality standards for each reach impaired with fecal coliform contamination
- Contain a margin of safety that accounts for lack of knowledge concerning the relationship between effluent limitations and water quality
- Properly account for straight pipe septic systems in the wasteload allocation of the TMDL

Wasteload allocation: all point sources or permitted facilities in the TMDL affected area

Load allocation: all nonpoint sources, including those considered part of the natural background, in the TMDL affected area

Additional Revisions

Prior to the court ruling, the MPCA had begun revisions in two other areas of the TMDL. First, a number of reaches have been added to the impaired waters list since the original TMDL was submitted for approval. As such, the revised TMDL includes 39 reaches as opposed to the 20 contained in the original report. In addition, based on new EPA guidelines, municipal separate storm sewer systems and confined animal feedlot operations are now included in the wasteload allocation, rather than the load allocation.

A Different Approach

Based on the requirements of the court order, the approach to the revised TMDL is quite different from that of the original. The original TMDL report set source-specific fecal coliform reduction goals for the entire basin. The revised report establishes monthly fecal coliform loading capacities and allocations for each individual impaired reach. Based on these loading capacities and allocations, reduction goals will be reviewed as part of an implementation plan update process.

Implementation

Despite the legal challenge, the MPCA proceeded to develop and put in place an implementation plan for the TMDL. Implementation plans detail the source reductions and needed activities for meeting the pollutant load allocations set in the TMDL. A wide range of efforts to reduce fecal coliform bacteria in the rivers and streams of the basin are underway. A few of the specific efforts include:

- Reduction of runoff from smaller, open lot livestock feedlots through increased technical, educational, and financial support
- Assistance to beef and dairy producers to accelerate the use of rotational grazing
- A doubling in the rate at which inadequate septic systems and small unsewered communities are being upgraded

Upon approval of the revised TMDL report, a public process for reviewing and updating the existing implementation plan will begin.

For More Information

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The draft TMDL report is located on the Web at http://www.pca.state.mn.us/water/tmdl/index.html#drafttmdl