

MERIAM JUNCTION SANDS, LLC.

Final Environmental Impact Statement

Scott County, Minnesota

May 2020

FINAL ENVIRONMENTAL IMPACT STATEMENT

For

MERRIAM JUNCTION SANDS, LLC. PROJECT
Louisville Township
Scott County, Minnesota

RGU: Scott County, Minnesota
RGU Contact: Jesse Krzenski
Scott County Environmental Services
200 Fourth Avenue West, Shakopee 55379
952-496-8361
jkrzenski@co.scott.mn.us

Proposer: Merriam Junction Sands, LLC.
Proposer's Representative: Kirsten Pauly
Sunde Engineering PLLC
10830 Nesbitt Ave South, Bloomington 55437
(952) 881-3344
kpauly@sundecivil.com

Abstract: Scott County has prepared a Final Environmental Impact Statement for the continuation of construction aggregate mining and processing operations and the addition of industrial silica sand mining and processing operations on approximately 682 acres of property located in Louisville Township, Scott County. Final EIS Comment Deadline for Adequacy is June 15, 2020.

Draft EIS Publication Date: February 3, 2020
Draft EIS Public Meeting Date: February 25, 2020
Draft EIS Public Meeting Time: 4 pm – 6 p.m.
Draft EIS Public Meeting Location: Scott County Government Center
County Board Room
200 4th Ave W.
Shakopee, MN 55379

Draft EIS Comment Deadline: March 10, 2020
Final EIS Public Notice in EQB Monitor: June 1, 2020
Final EIS Comment Deadline for Adequacy: June 15, 2020

Executive Summary

Scott County has prepared a Final Environmental Impact Statement (FEIS) for Merriam Junction Sands, LLC's request for the continuation and expansion of construction aggregate mining and ancillary activities and the addition of industrial silica sand mining and processing operations on approximately 682 acres of property located in Louisville Township, Scott County.

The project was initially proposed by Hunt Global Resources. A Scoping Environmental Assessment Worksheet (SEAW) and a companion Scoping Decision Document (SDD) was approved in 2012 (Merriam Junctions Sands Hunt Global Resources Scoping Environmental Worksheet and Merriam Junction Sands Hunt Global Resources Scoping Decision Document). The original project included property owned by three separate entities, Malkerson Sales, Inc., Bryan Rock Products, Inc., and Mid America Festivals. Many of the studies associated with the project were initiated at that time.

In 2014 the project proposer changed hands and the project was redefined and reduced in scope. All of the property owned by Mid America Festivals was removed from the project. Scott County determined that the changes to the scope of the project were substantial enough that a new SEAW was ordered. On June 3, 2014, the SEAW and SDD for this project (Merriam Junction Sands, LLC Mining and Processing Facilities Environmental Assessment Worksheet and Merriam Junction Sands Mining and Processing Facilities Final Scoping Decision Document) was approved by the Scott County Board. A Draft Environmental Impact Statement (DEIS) was published in the EQB Monitor on February 3, 2020 and a public meeting held February 25, 2020 and the DEIS comment period ended March 10, 2020.

Section 2.0 of the FEIS includes the alternatives evaluation and screening process conducted during project scoping. The section identifies the alternatives considered in this FEIS, which include Six Alternatives which evaluate different sand plant locations, capacities and mining sequences as well as a No Build Alternative. The project is located on property that has been mined for sand and gravel and limestone resources since the 1950's. The current mining and processing operations include stripping, blasting, crushing, screening, washing, stockpiling, hauling, and reclamation activities. Under the No Build Alternative, sand and gravel and limestone mining would continue on the Malkerson Sales Property but would stop at the currently permitted mine limits on the Bryan Rock Property.

Section 3.0 of the FEIS addresses each item identified in the SDD and summarizes the results of all studies, reviews, consultation, and coordination conducted on the potential environmental impacts of the proposed action. The topics addressed in Section 3 include:

1. Land Use
2. Cover Types
3. Fish, Wildlife, and Ecologically Sensitive Resources
4. Physical Impacts on Water Resources
5. Water Use
6. Water Related Land Use Management District
7. Erosion and Sedimentation
8. Water Quality: Surface Water Runoff
9. Water Quality: Wastewater
10. Geologic Hazards and Soil Conditions
11. Soil Wastes, Hazardous Wastes, Storage Tanks
12. Traffic

13. Vehicle Related Air Emissions
14. Stationary Source Air Emissions
15. Noise
16. Nearby Resources
17. Visual Impacts
18. Compatibility with Land Use Plans
19. Public Infrastructure
20. Socioeconomic Impacts

The FEIS finds no potential for significant impacts for many of the topics evaluated. Monitoring and mitigation strategies are presented for other topics including air emissions and surface and groundwater resources.

Section 4 analyzes the cumulative potential impact of the Project, and Section 5 summarizes all of the mitigation measures that the Project may employ.

Although minor differences occur, the FEIS did not find that one alternative was substantially better than another alternative. A preferred alternative has not been selected, allowing the proposer to proceed with permit applications for any of the three plant locations and phasing sequences evaluated in the FEIS.

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List of Preparers:

Agency /Organization and Name	Draft Environmental Impact Statement Responsibility
Scott County	
Kate Sedlacek, Environmental Services Manager	RGU Coordination and EIS Review
Environmental Services	RGU and Proposer Coordination, EIS Review
Terracon	
Ken Olson, Principal, Senior Consultant	Managed Technical Review of EIS studies for Scott County
David Jerde, Senior Hydrogeologist	Technical Review of Groundwater Modelling and Water Resources
Sunde Engineering, PLLC	
Kirsten Pauly, PE/PG	Proposer's Engineer /Project Manager/EIS Preparation
Barr Engineering Company	
James Aiken, PG VP/Senior Hydrogeologist	Hydrogeology/Groundwater Modelling/Surface Water Resources
Dan Tix, PhD	Wetland Delineations/Surface Water Resources/Vegetation, Wildlife and Protected Species Resources
William Dehler, PE	Pit Wall Stability
Todd Fasking, VP/Senior Environmental Consultant	Air Emissions
Svoboda Ecological Resources	
Brian Burgner, Wetland Ecologist II	Wetland Delineations
SRF Consultants	
Jeff Bednar, TOPS	Traffic Impact Study/Vehicle related air emissions
David Braslau Associates	
David Braslau, PhD/PE	Noise Modelling
Summit Envirosolutions	
Garrett L. Knudsen, M.A., Laurie S. H. Ollila, M.A., and Andrew J. Schmidt, M.A.	Phase 1 Cultural Resources
Feser Environmental	
Stacey Feser, M.S. Soil Science	Wastewater, SSTS Site Suitability Evaluation

1.0 PROJECT DESCRIPTION

(Minn Rule 4410.2300 Item E): The proposed project shall be described with no more detail than is absolutely necessary to allow the public to identify the purpose of the project, its size, scope, environmental setting, geographic location, and the anticipated phases of development.

Merriam Junction Sands, LLC (Proposer) is proposing to continue non-metallic mineral mining and processing operations on approximately 682 acres of land (Project). The Project is located in Louisville Township, Scott County, MN (Site or Project Area), situated between U.S. Highway 169 (US 169) and the Minnesota River. The Union Pacific (UP) mainline runs through the Site. Trunk Highway 41 (TH 41) is located along the northern limits of the Site and 145th Street West (145th Street) is located near the southern boundary of the Site. The Site consists of several parcels owned by two separate property owners: Malkerson Sales, Inc. (Malkerson Sales), and Bryan Rock Products, Inc. (Bryan Rock). Figure 1: Scott County General Location Map, illustrates the geographical location of the Project. Figure 2: Site Map, illustrates the Project setting and parcel ownership.

The purpose of the Project is to continue the production of construction aggregates as well as to further develop the Site to produce silica sand. The Site will be mined in phases with remaining sand and gravel and limestone resources removed first, followed by mining of the underlying Jordan Sandstone. Construction aggregate mining and processing activities will remain consistent with current operations. Sand processing equipment, including wet processing and drying equipment, will be constructed on the Site during the initial phases of sand mine development. A railyard will be developed on the Site to accommodate the transport of the silica sand to market. Reclamation of the Site will be on-going as mining phases are completed. Reclamation of the Site will create a mix of upland and end use lakes with the potential for both future development and open space, consistent with the Scott County Comprehensive Guide Plan's future land use designations for the Site and surrounding area.

The Site has a history of mining activity including the production of construction aggregates from both sand and gravel mining and limestone quarrying and processing that dates back to the 1950's and is still being actively mined today. Figure 3: Existing Site Features, illustrates these areas. Some of the parcels that make up the Site have been mined in the past, some are currently being mined and some are future mining areas. There is a topsoil and mulch operation on the Malkerson Sales property. Soils, predominantly black dirt and compost, are imported to the Site, pulverized, screened, and sold for use in landscaping projects. Some parcels within the Site currently have non-mining related uses; such as the Renaissance Festival and other seasonal events, and a stable and horse training area. These parcels will continue to be mined for construction aggregates in the future, even in the No Build Alternative discussed in Section 2.0 below.

Past mining and quarrying activity have removed the overlying unconsolidated sediments and the limestone over much of the Site. Currently, there are active quarry operations on both the Malkerson Sales and Bryan Rock properties. Mining activity associated with the unconsolidated sand and gravel and quarrying of the Prairie du Chien Group will continue in the current fashion. Construction aggregate mining activity includes clearing of trees and vegetation as may be necessary, removal of

topsoil and overburden, blasting, extraction, processing (crushing, washing, screening), recycling of asphalt and concrete, stockpiling, loading, hauling, and reclamation.

Sand and gravel deposits remain in the northern portion of the Malkerson Sales property. Remaining limestone resources include the Renaissance Festival booth and parking area on the Malkerson Sales property, the existing permitted quarry area on the Bryan Rock property, and additional land owned by Bryan Rock extending from the southern boundary of the existing Bryan Rock quarry to the southern extent of the Project Area. The location of future construction aggregate mining activity is the same for all alternatives except the No Build Alternative. The No Build Alternative includes continued mining on the Malkerson property and in the current quarry limits on the Bryan Rock property but does not include the expansion of the Bryan Rock quarry beyond the current permitted mine limits.

Silica sand mining is proposed over approximately the southern two thirds of the Malkerson Sales property and the entire Bryan Rock property where the Jordan Sandstone is present. The Jordan Sandstone is approximately 80 to 120 feet thick within this portion of the Site. Before mining of the Jordan Sandstone can begin, the basal layer of the Prairie du Chien Group (Coon Valley Member) must be removed. The Coon Valley member is a layer of bedrock typically between five feet and 20 feet in depth that contains layered limestone, sandstone and shale. The Coon Valley does not contain appreciable quantities of marketable limestone or sandstone. This material is referred to as the “transition layer” in this document. Before sandstone mining can begin, the transition layer will be removed within a given phase. This will require blasting and subsequent removal of the transition material with an excavator and/or loader. The transition material will be stockpiled for later use in reclamation, or once a large enough mining area has been completed, the transition material will be hauled to the active reclamation area and placed directly as reclamation fill. Portions of the transition are located above the water table and portions of the transition are located below the water table. The mining plan anticipates dewatering in cells as needed to remove the transition material under dry mining conditions.

The transition material and the upper five feet of the underlying sandstone will be dewatered and blasted as necessary to break up the lightly cemented sand particles without causing the fracturing of the sandstone grains. The limited dewatering allows the blasting and removal of the transition material from the underlying sandstone under dry mining conditions and then subsequent blasting of the sandstone as needed in advance of sandstone removal. This process keeps the transition material from mixing with the underlying sandstone, which would put it out of specification. Where the sandstone is located above the water table, it will be removed with dry mining methods. Where the sandstone is located below the water table, it will be removed with wet mining techniques utilizing an excavator, dredge or dragline.

Excavated sandstone will be processed in a wet plant to clean and size the sand and then it will be sent to a dry plant where it will be dried, screened and further sized into appropriate gradations. The processed material will be stored in enclosed silos, containers, or bags and transported to market via rail cars and/or haul trucks. Wet and dry plant operations may occur year-round. A winter feed pile of washed sand will also be located in the processing area. The volume of this stockpile will be continually added to throughout the mining season, reaching maximum volumes in mid-November.

Once mining and washing shuts down for the winter, the winter feed stockpile will diminish over the course of the winter months.

Construction aggregates are currently hauled from the Site utilizing existing access points along TH 41 and US 169 and 145th Street. It is anticipated that the majority of sand will be shipped from the Site via rail and construction aggregates will continue to be hauled from the Site by trucks.

Reclamation activities will be performed in phases as mining in a given area is completed. Areas associated with processing facilities on top of sandstone resources located on either or both Malkerson Sales and Bryan Rock properties, (depending upon the alternative that is developed), will be mined and reclaimed last. Reclamation will leave the Site in a mix of waterbodies and upland areas. Final contours and establishment of native vegetation will be developed to provide diverse wildlife habitat over portions of the Site that will complement the Minnesota River Valley and adjacent public lands. Other portions of the Site will be reclaimed to allow future development of the land consistent with current county comprehensive plan land use policies. Financial assurance will be coordinated between the county and proposer as part of the Interim Use Permitting process.

2.0 PROJECT ALTERNATIVES

(Minn. Rule 4410.2300, Item G.) The EIS shall compare the potentially significant impacts of the proposal with those of other reasonable alternatives to the proposed project. The EIS must address one or more alternatives of each of the following types of alternatives or provide a concise explanation of why no alternative of a particular type is included in the EIS: alternative sites, alternative technologies, modified designs or layouts, modified scale or magnitude, and alternatives incorporating reasonable mitigation measures identified through comments received during the comment periods for EIS scoping or for the draft EIS. An alternative may be excluded from analysis in the EIS if it would not meet the underlying need for or purpose of the project, it would likely not have any significant environmental benefit compared to the project as proposed, or another alternative, of any type, that would be analyzed in the EIS would likely have similar environmental benefits but substantially less adverse economic, employment, or sociological impacts. Alternatives included in the scope of the EIS as established under part 4410.2100 that were considered but eliminated based on information developed through the EIS analysis shall be discussed briefly and the reasons for their elimination shall be stated. The alternative of no action shall be addressed.

The Environmental Impact Statement (EIS) must evaluate the “economic, employment, and sociological impacts” as well as environmental effects of the Project and compare potentially significant impacts of the proposal with a No Action Alternative and other reasonable alternatives to the Project. The Minnesota Environmental Review Rules (Minn. Rule 4410.2300, Item G.) require the EIS to address at least one alternative of each of the following types of alternatives or provide an explanation of why no alternative of a particular type is included in the EIS:

- a) No Action Alternative (No Build Alternative);
- b) Alternative Sites;
- c) Alternative Technologies;
- d) Modified Designs or Layouts;
- e) Modified Scale or Magnitude; and
- f) Alternatives incorporating reasonable mitigation measures identified through the EIS scoping and draft EIS process.

An alternative may be excluded from analysis in the EIS if:

- a) It does not meet the underlying need for or purpose of the Project;
- b) It would likely not have any significant environmental benefit compared to the proposed Project; and
- c) It would likely not have any significant environmental benefit compared to another alternative that will be analyzed in the EIS that would likely have similar environmental benefits but substantially less adverse economic, employment, or sociological impacts.

2.1 Scoping Process and Alternatives

There are a total of seven alternatives studied in the EIS. In addition to the No Build Alternative, other alternatives evaluate different plant locations, capacities and sequences of mining. The number of alternatives is necessary to provide flexibility as the Project moves forward and takes into consideration potential changes in the sand market. A preferred project has not been identified. Rather the EIS evaluates several alternatives which will inform the Proposer and the permitting authorities as to potential environmental effects and mitigation measures associated with each of the alternatives, any one of which may be developed.

With each alternative, plant production will begin at a lower production rate, increasing to maximum capacity as market conditions warrant. However, studies included in the EIS assume that the plants are operating at maximum capacity to consider worse case conditions associated with each alternative. A summary of the proposed alternatives is provided below. Figures 4.1 to 4.7 illustrate the phasing and plant locations of each alternative, including the No Build Alternative. Minor modifications to the alternatives presented in the Scoping Environmental Assessment Worksheet (SEAW) were made to account for more detailed mine planning and feasibility analysis that accompanied the EIS process. These changes include moving the Malkerson Sales northern plant site (MS-N) a short distance south to maintain the Trail of Terror parking, adjustments of phase boundaries on the Malkerson Sales property to reflect current on-site land uses, and changes to the phasing sequence of some of the alternatives. Phase boundary and sequence modifications were based on additional resource information and more detailed mine planning and feasibility analysis conducted as part of the development of the EIS. The alternatives provide an opportunity to evaluate different plant sites, different plant capacities, and different phasing progressions.

Alternative 1: Two 1.2 million ton (MT)/year processing plants. "Processing plants" refers to both a wet plant and a dry plant throughout this document. In this alternative, one plant will be located on the Bryan Rock plant site (BRP) and one plant located on MS-N. Sandstone mining and reclamation

may take place on both the Malkerson Sales property and the Bryan Rock property concurrently in Phases 1A and 1B and in Phases 2A and 2B. Material excavated from the Malkerson Sales property will be processed at the Malkerson Sales plant site. Material excavated from the Bryan Rock property will be processed at the Bryan Rock plant site. Alternative 1 includes two separate railyards and loadout facilities. (Changes from the SEAW - Phase limits were adjusted, and the MS-North plant was moved south.)

Alternative 2: Two 1.2 MT/year processing plants. One plant to be located on BRP and one plant located on the Malkerson Sales southern plant site (MS-S). Sandstone mining and reclamation may take place on both the Malkerson Sales property and the Bryan Rock property concurrently in Phases 1A and 1B and in Phases 2A and 2B. Material excavated from the Malkerson Sales property will be processed at the Malkerson Sales plant site. Material excavated from the Bryan Rock property will be processed at the Bryan Rock plant site. Alternative 2 includes two separate railyards and loadout facilities. (Changes from the SEAW - Consistent with Alternative 1, phase limits were adjusted.)

Alternative 3: One 2.4 MT/year processing plant located on BRP. Alternative 3 includes one railyard loadout facility. Phase 4 was divided into 2 phases 4a and 4b to illustrate the progression of mining through the phase from south to north. Mining and reclamation will not occur concurrently in Phase 4a and 4b (Changes from the SEAW – phasing on the Malkerson Sales property was modified to provide an alternative that accommodates Phase 1 mining in the southern portion of Malkerson Sales property while at the same time accommodating the Renaissance Festival for a greater period of time than Alternatives 4 and 5.)

Alternative 4: One 2.4 MT/year processing plant located on MS-N. Alternative 4 includes one railyard loadout facility. (Changes from the SEAW – Phasing on the Malkerson Sales property was revised to begin sandstone mining in the southern portion of the Malkerson Sales property).

Alternative 5: One 2.4 MT/year processing plant located on MS-S. Alternative 5 includes one railyard loadout facility. (Changes from the SEAW – revised phasing)

Alternative 6: One 2.4 MT/year processing plant located on BRP. Alternative 6 includes one railyard and loadout facility. (Changes from the SEAW – Revised phasing to match Alternative 5 and plant location moved to BRP)

Alternative 7: No Build Alternative. This alternative considers the continuation of limestone quarry, sand and gravel mining, and processing operations currently active on the Site as well as the continuation of topsoil/mulching operation and other non-mining related uses such as the Renaissance Festival and stable operations. In the No Build Alternative limestone mining on the Malkerson Sales property will eventually require relocation of the Renaissance Festival. Silica sand mining, silica sand processing, railyard, or expansion of the Bryan Rock quarry are not included in the No Build Alternative.

The EIS includes an analysis of a number of different topics. Some of the subjects of the analysis are not impacted by the number of alternatives studied (e.g. cultural resources, economic impact). For these topics, one study was sufficient in characterizing the potential for environmental effects as a

result of the Project compared to the No Build Alternative. Other topics required a separate analysis of each alternative because the location or size of the plant may elicit a different result (e.g. air emissions, noise). Finally, other topics required that more than one analysis was needed in order to evaluate potential worst-case scenarios, but something less than an analysis for each separate alternative was required.

2.1.1 Alternative Sites

Alternative sites are not evaluated in the EIS. The Site represents a significant resource that is well situated to cost effectively produce a significant quantity of industrial sand. The needs of the mining Project can only be located where mineral deposits exist, are under control of the Proposer, and can economically be mined, processed and sold. There are no Alternative sites located in the general vicinity that meet this underlying need or purpose of the Project.

2.1.2 Alternative Technologies

Alternative mining technologies as a standalone alternative are not studied within the EIS. Alternative non-metallic mineral mining technologies typically consider either dry mining or wet mining technologies. The Project considers a limited amount of dewatering to allow the blasting and removal of any remaining limestone and the transition material with traditional dry mining technologies that are currently utilized on-site and then utilizing wet mining technologies (e.g. dragline, excavator, or dredge) to mine the remaining portion of the sandstone. Preliminary dewatering evaluations concluded that dewatering the entire thickness of the Jordan Sandstone and subsequently dry mining the entire deposit was not feasible. Therefore, no further study of this alternative technology is conducted in the EIS.

It is important to note that where two separate technologies may be utilized for specific activities within the alternative that is being evaluated, the impacts of both technologies will be considered. For example, both rail and/or trucks may be used to transport silica sand from the Site. The EIS evaluates impacts that may be associated with both technologies and assumes the maximum amount of use by either alternative that would be considered within the Project.

2.1.3 Modified Designs or Layouts

The EIS evaluates several modified designs or layouts of the processing plant and railyard locations and configurations. The alternatives are evaluated to determine how the modified layouts may result in different environmental, economic, employment, or sociological impacts.

2.1.4 Modified Scale or Magnitude Alternatives

A Modified Scale or Magnitude Alternative is presented in the alternatives where impacts from different capacity plant sites are evaluated. Although total production capacities remain the same, project alternatives include different scales of production.

2.1.5 Alternatives That Incorporate Reasonable Mitigation Measures

Alternatives incorporating reasonable mitigation measures identified throughout the environmental review process are presented in the EIS. Mitigation measures are identified to provide decision makers with a list of possible measures to reduce impacts. Mitigation, if applicable, is discussed under each potential impact topic. Scott County will take into consideration the Environmental Quality Board's "Tools to Assist Local Governments in Planning for and Regulating Silica Sand Projects", March 7, 2014, in proposing appropriate monitoring and mitigation for this project and in developing appropriate conditions for the required land use permits.

2.1.6 No Build Alternative

The EIS includes a No Build Alternative. The No Build Alternative will be evaluated in the EIS as required by the Minnesota Environmental Quality Board's (EQB) rules. The evaluation of the No Build Alternative assumes that the existing sand and gravel mining and limestone quarry activities, topsoil/mulching operation, Renaissance Festival, and stable business land uses continue on the Malkerson Sales property. The continuation of mining on the Malkerson Sales property includes future limestone mining under the Renaissance Booth Area and sand and gravel mining in the northern portion of the Malkerson Sales property. The No Build Alternative assumes that limestone mining continues on the Bryan Rock property within the currently permitted mine limits. The No Build Alternative considers that other projects consistent with the zoning and comprehensive plan guided land uses of the area could occur on the property in the future.

3.0 EIS STUDIES

(Minn. Rule 4410.2300, Item G.) Mn Rule Environmental, economic, employment, and sociological impacts: for the proposed project and each major alternative there shall be a thorough but succinct discussion of potentially significant adverse or beneficial effects generated, be they direct, indirect, or cumulative. Data and analyses shall be commensurate with the importance of the impact and the relevance of the information to a reasoned choice among alternatives and to the consideration of the need for mitigation measures; the RGU shall consider the relationship between the cost of data and analyses and the relevance and importance of the information in determining the level of detail of information to be prepared for the EIS. Less important material may be summarized, consolidated, or simply referenced. The EIS shall identify and briefly discuss any major differences of opinion concerning significant impacts of the proposed project on the environment.

3.1 Land Use

The scoping decision document (SDD) identifies the following items to be addressed in the DEIS:

- a) The EIS will evaluate existing groundwater quality impacts associated with adjacent land uses including the Louisville Landfill, and assess how these might be impacted by each of the project alternatives.
- b) The EIS will assess the impacts of each of the project alternatives on the current and future land use in the areas adjacent to the Project.
- c) The EIS will provide a description of planned end use of the Project Area and an assessment of its compatibility with surrounding land uses and recreational goals.

This section includes information regarding the affected environment, environmental consequences, alternatives, mitigation and cumulative impact of these three topics.

3.1.1 Affected Environment

The Site is currently zoned I-1, Rural Industrial and is guided Industrial in the Scott County 2040 Comprehensive Plan. Current and recent land use and development within the Project Area includes limestone quarrying and processing operations, sand and gravel mining and processing operations, topsoil/mulching operations, horse stables, agricultural land uses, outdoor storage, open space, and a festival and events venue. Limestone quarrying and sand and gravel mining have occurred within the Project Area since the 1950's. Aggregate mining and processing continues to be the predominant land use within the project area today. The stables are a privately owned and operated facility that is not open to the public. Portions of the Project Area are used for agricultural production.

The Renaissance Festival, an annual festival held in late summer and fall of each year, operated by Mid-America Festivals, Inc. is located on a portion of the Malkerson Sales property. There is an ongoing presence at the facility for security, maintenance, upkeep, restoration and some extended residential use related to the Festival outside of the event dates. The festival area includes booths, festival grounds, a campground for employees, and parking areas for the event. The Renaissance Festival operates under a Conditional Use Permit (CUP) issued to Mid-America Festivals, Inc. by Scott County in 1988. The CUP includes the operation of the Trail of Terror, an annual event held in October and smaller events such as weddings. Wedding and special events are held in one of the Renaissance Festival buildings and are conducted during the spring, summer, and fall. The current Renaissance Festival Lease expires in 2020 and it is anticipated that the festival will relocate at some point in the near future.

Figure 3.1-1: Surrounding Land Use, illustrates current and recent land use in the surrounding area which includes a mix of industrial, commercial, residential, and agricultural land uses as well as parks and open spaces. The Site and a majority of adjacent land is zoned I-1, Rural Industrial District. Public land to the west and southwest of the Site is zoned UER, Urban Expansion Reserve. Other nearby zoning districts include C-1, General Commercial District and UBR, Urban Business Reserve (the property zoned UBR is currently an active limestone quarry located northeast of the Site). Public lands located southwest and west of the Site are zoned Urban Expansion Reserve. Descriptions of adjacent land use associated with each of these categories is provided below.

A portion of the Site is located within the Shoreland District, a district associated with the nearby Minnesota River (classified as an agricultural river) and Gifford Lake (classified as a natural environment lake). Figure 3.1-2: Scott County Zoning Map Excerpt, illustrates the zoning of the Site and surrounding area.

Adjacent Industrial and Commercial Land Uses: Land use immediately surrounding the Project Area is predominantly industrial and commercial in nature. Sand and gravel and limestone mines are located to the northeast of the Site across TH 41 and the Green Quarry, a former limestone quarry, is located to the southwest of the Site. Louisville Landfill, a closed municipal solid waste (MSW) landfill, and Dem-Con Landfill, an active demolition construction landfill, are located to the east across the UP mainline and just north of the Bryan Rock property. Other industrial and commercial land uses are established near the intersection of TH 41 and US 169 to the northeast of the Site and along the US 169 corridor east of the Site. The following industrial and commercial land uses are located within a quarter mile of the Site:

- Dueco Truck and Crane Service
- Holiday Station Store and Truck Stop
- Tracker Boating Center
- Dem-Con Landfill
- Anchor Block
- Diemold Tool
- Lano Implement Company
- Xpand, Inc.
- Drew's Concrete
- 169 Truck and Auto Repair
- MN Valley Garden Center
- RRT Shakopee Yardwaste Compost Facility/The Mulch Store
- MnDOT Maintenance Facility

Adjacent Residential Land Uses: In addition to the adjacent industrial and commercial land uses there are nine residential homes and one mobile home park, with approximately 62 mobile homes, located within a quarter mile from the Site. The cities of Chaska and Carver, with higher residential density areas, are located just over two-thirds of a mile and just over one mile from the Site, respectively.

Adjacent Public Lands, Open Space, and Agricultural Land Uses: The remainder of the surrounding land use is vacant land, agricultural land, and public lands. Public lands include a Minnesota Department of Transportation (MnDOT) truck maintenance facility, the closed Louisville Landfill, and state and federal park lands. The United States Fish and Wildlife Service (USFWS) has acquired land along both sides of the Minnesota River establishing the Minnesota Valley National Wildlife Refuge. Refuge units are located along the river valley from the City of Bloomington to Henderson Minnesota.¹ The Louisville Swamp Unit is located south of the Site and the Rapids Lake Unit and Chaska Lake Unit are located southwest and northwest of the Site on the west side of the river.

¹ https://www.fws.gov/refuge/Minnesota_Valley/about.html

The Louisville Swamp Unit is developed with trails, parking lots, and other infrastructure and contains approximately 2,600 acres of land adjacent to the Minnesota River. There are three year-round access and parking areas and two seasonal parking areas associated with the Louisville Swamp Unit. The main access and parking area are located off of US 169 via 145th Street which runs along the southern portion of the Project Area. 145th Street also serves as an access point to the Renaissance Festival and is used by the current mining operations as a local haul route.

There are several trails through the Louisville Swamp Unit. The Minnesota Valley State Corridor Trail runs through the Louisville Swamp Unit and continues to the north through the MnDNR State lands associated with the Gifford Lake area. There is an additional parking area and public access to Gifford Lake on the northwest side of the lake, west of the Site. The Chaska Unit and the Rapids Lake Unit of the National Wildlife Refuge and the City of Carver's Riverside Park are located on a floodplain across the river. There is an extensive trail network associated with these units as well. The Minnesota Bluffs regional trail currently ends in the City of Carver but is planned to eventually cross the Minnesota River and run through the abandoned UP railroad right-of-way that flanks the southwest boundary of the Site.

Adjacent Rail Corridors: The UP owns and operates a mainline rail that runs through the Site. There is an at-grade rail crossing on TH 41 and an at-grade rail crossing on 145th Street. In addition to the mainline, there are several rail sidings and associated switches along the mainline in the right-of-way along the southern portion of the Site. There are four active sidings with over one and one-half miles of siding track currently located in the railroad right-of-way adjacent to the Site. The siding tracks are on both the east and west sides of the mainline and one wraps around the southern portion of the Malkerson Sales property. This siding track previously extended along the southwestern portion of the Site continuing northwest to the Minnesota River, but that portion of the siding track has been abandoned and the right-of-way is planned for future utility and trail purposes. The mainline and three sidings also have at-grade crossings on 145th Street. South of 145th Street, there are four active sidings and an additional 1.7 miles of siding track and associated switches. There is a junction at this location with one mainline continuing south along the Minnesota River Valley and one branching off through Central Scott County. This area is known as Merriam Junction. Fluctuations in rail traffic and use of the existing sidings occur as markets utilizing rail service fluctuate over time.

3.1.2 Environmental Consequences and Alternatives- Existing Groundwater Quality Impacts

The EIS will evaluate existing groundwater quality impacts associated with adjacent land uses including the Louisville Landfill, and assess how these might be impacted by each of the Project Alternatives.#

3.1.2.1 Environmental Consequences- Existing Groundwater Quality Impacts

The only known existing groundwater quality impact in the area is the Louisville Landfill. The Louisville Landfill is located just north of the Bryan Rock property and just east of the central portion of the Malkerson Sales property. The Louisville Landfill opened in 1968 and was permitted for

operation in 1971 as an unlined MSW landfill. The landfill operated until May 1990 with a waste footprint of approximately 56 acres.

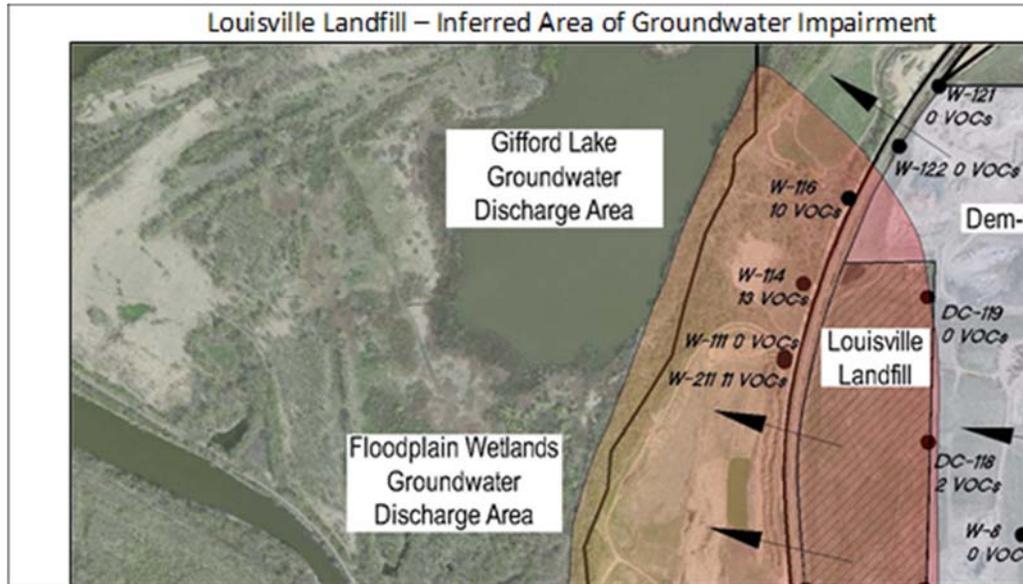
Routine groundwater monitoring at the Landfill detected the presence of groundwater contamination and a remedial investigation was conducted in 1987. Volatile organic compounds (VOCs) were found in the groundwater sampled along the western edge of the landfill and low levels of 23 VOCs were found in off-site downgradient wells.

The Louisville Landfill was closed in 1990 and has been part of the Minnesota Pollution Control Agency (MPCA) closed landfill program since 1999. The MPCA is responsible for the long term closure care, existing groundwater impairments, and on-going groundwater monitoring associated with the Louisville Landfill. The Louisville Landfill was covered with an enhanced cover system that included a low density polyethylene (LDPE) synthetic liner and landfill gas extraction system in 2003. Groundwater has typically been sampled at least annually and up to three times per year by the MPCA. The groundwater monitoring network at the Louisville Landfill consists of ten upgradient and downgradient monitoring wells that are routinely sampled by the MPCA. There are five additional upgradient and downgradient monitoring wells associated with the adjacent Dem-Con Landfill that are routinely sampled by the Dem-Con Landfill.

Since installation of the enhanced final cover and gas extraction system, concentrations of most contaminants in the groundwater have declined. Downgradient wells continue to detect low levels of VOCs. The inferred area of groundwater impairment, based on detection of one or more VOCs in a well from water quality monitoring data from the MPCA for the Louisville Landfill (6/2015) and Dem-Con Landfill (7/2015)², is indicated on the Louisville Landfill Inferred Area of Groundwater Impairment inset below. Impacted groundwater flows westerly from the landfill across the Project Area and discharges into the Minnesota River.³ As the groundwater moves westerly, concentrations of contaminants are expected to decrease due to natural attenuation (dispersion, adsorption, biodegradation, etc.). There are no landfill monitoring wells located near the discharge area of the impaired groundwater, so it is unknown if detectable concentrations of contaminants exist along the western edge of the inferred plume.

² With the exception of DC-117 which was sampled by Dem-Con Landfill in the fall of 2015 after repair of a malfunctioning pump.

³ The most recent round of groundwater sampling by the MPCA available was reviewed to determine if the general conclusions regarding water quality are still valid. The sampling was conducted on May 14, 2019. Results of downgradient wells that were sampled in both the 3/2007 and 5/2019 were reviewed, (MW-9, MW-114, MW-116 and MW-211). A summary of the results including graphs of the VOCs detected in 2007 and 2019 is included as Attachment 1A. The conclusion that “since installation of the enhanced final cover and gas extraction system, concentrations of most contaminants in the groundwater have declined. Downgradient wells continue to detect low levels of VOCs” remains valid.



Monitoring parameters have included general water quality parameters (e.g., pH), VOCs, and metals that are indicators of landfill leachate impacts. The MPCA dropped all metal parameters except manganese from the parameter list in 2012 because these parameters no longer appear to pose a threat of contamination from the Louisville Landfill. There are no water supply wells located downgradient of the landfill between the landfill and the river.

The Dem-Con Landfill (Dem-Con) is located immediately upgradient and north of the Louisville Landfill. Dem-Con was originally permitted in 1985. The northern portion of Dem-Con has a liner and leachate collection system. The permitted footprint of the northern portion of Dem-Con is only partially filled and the remaining area is an active sand and gravel mining operation. The very southern portion of Dem-Con is unlined. The central portion of the landfill contains a liner and leachate collection system on top of unlined demolition fill and the northern portion of the landfill has a liner and leachate collection system under all of the demolition fill. Groundwater from the southern, unlined portion of Dem-Con flows west under the Louisville Landfill. Groundwater from the northern, lined portion of Dem-Con flows northwest under the UP mainline and Malkerson Sales property towards Gifford Lake. The monitoring network for Dem-Con includes eight monitoring wells. There is no indication from the monitoring data that the Dem-Con Landfill is contributing or is likely to contribute to any groundwater concerns.

The mining area intersects a portion of the inferred Louisville Landfill groundwater impairment. Proposed mine operations include dewatering and the creation of end use lakes. Dewatering and the creation of end use lakes adjacent to the Louisville Landfill may result in changes to flow paths and receptors of contaminated groundwater. As an area is dewatered, groundwater is drawn from the surrounding area towards the dewatering pit. Dewatering is proposed to be limited to the upper portion of the Jordan Sandstone. As a result, dewatering increases the upward gradient in the lower portions of the Jordan Sandstone and will not increase the migration of existing groundwater contaminants to deeper portions of the aquifer.

There are several parameters in groundwater detected above background levels at the Louisville Landfill, but their concentrations have been trending downward over time. The evaluation focused on whether the proposed dewatering activities through post-mining reclamation would change the observed concentrations in groundwater or might somehow place other receptors at risk.

To determine how mine operations will affect groundwater contaminants from the Louisville Landfill, and whether or not contaminants will pose an increased risk to potential receptors as a result of mine operations, Barr Engineering Co. (Barr) conducted a Louisville Landfill Capture Evaluation for Mining Scenarios⁴ (Landfill Capture Evaluation). The Landfill Capture Evaluation method and results are summarized below. The Landfill Capture Evaluation is Appendix C of Barr Engineering's Groundwater Modelling of Mine Plan Alternatives Predictive Simulations Report (Attachment 1).

Water quality data, including metals and VOCs, from Louisville Landfill from the monitoring period from 2007 to 2015 were evaluated to identify contaminants of concern (COCs). The concentration and extent of each COC was defined based on the water quality data. COCs that were identified met the following criteria:

- Detections of the COC are current, unqualified, and verified by consecutive detections; and
- Background concentrations are exceeded

There were eight VOCs and one metal that met the above criteria. The following parameters met the criteria of having recent, verified detections above the representative background concentration:

- VOCs: 1,1-dichloroethane; 1,2-dichloroethene, cis; 1,4-dichlorobenzene; chloroethane; dichlorodifluoromethane; dichlorofluoromethane; ethyl ether; and vinyl chloride
- Metal: Boron

These COCs were then compared to applicable regulatory standards. If there is no current regulatory standard for a given parameter (e.g. tetrahydrofuran), it was not considered for evaluation. Vinyl chloride was the only COC that was determined to be at concentrations that exceed current regulatory standards and was further evaluated.

3.1.2.2 Alternatives - Existing Groundwater Quality Impacts:

Barr's Landfill Capture Evaluation was conducted to evaluate potential effects of mining on vinyl chloride, including a quantitative analysis of groundwater captured by the mine dewatering for each of the alternatives and for post mining reclamation conditions. The groundwater flow model developed for the Project was used to quantify the rates of groundwater flow to receptors (dewatering areas, end use lakes and wells) during mining and reclamation scenarios.

⁴ Barr, 2017. Technical Memorandum Louisville Landfill Capture Evaluation for Mining Scenarios. Merriam Junction Sands. Included as Appendix C of the Groundwater Modeling of Mine Plan Alternatives Predictive Simulations Report Resource Document for Environmental Impact Statement Prepared for Merriam Junction Sands, LLC July 2019

The predicted concentrations of vinyl chloride in groundwater discharging to receptors during the various mining scenarios range from non-detect to 0.40 micrograms/liter ($\mu\text{g/L}$) and are compared to the applicable regulatory standard (Health Risk Limit (HRL) of 0.2 $\mu\text{g/L}$) as shown in Table 3.1 Dilution Calculations from the Barr Landfill Capture Evaluation. Phase 2A/2B of both Alternative 1 and Alternative 2 results in an HRL exceedance in the northern phase of the Malkerson Sales property. The concentration is higher than the other scenarios because it is located closest to the Louisville Landfill and therefore has a relatively higher percentage of its inflow originating from this area.

Under the No Build Alternative, concentrations of COC's are expected to be higher than any of the other alternatives, including Alternative 1 and Alternative 2. In the No Build Alternative, there is no added dilution caused by inflow from other areas created by dewatering and the predicted concentration is simply the source concentration as natural attenuation was not evaluated. Under the No Build Alternative, groundwater impacts from the Louisville Landfill do not pose a significant environmental effect. There are currently no water supply wells located in the area situated between the Louisville Landfill and the Minnesota River. As groundwater moves from the landfill towards the discharge area of the Minnesota River, concentrations of contaminants are expected to decrease with distance from the landfill as natural attenuation processes occur. In addition, the concentrations of contaminants have decreased over time as a result of the enhanced final cover and landfill gas extraction system. This trend is expected to continue into the future.

The Barr analysis evaluated whether the proposed dewatering activities through post-mining reclamation would change the observed concentrations of contaminants in groundwater or might somehow place other receptors at risk. The conclusion is that the main effect of mining activities will be to move concentrations of contaminants into the mining areas while reducing concentrations in every scenario relative to what they would otherwise be in groundwater. There are no known receptors that would be exposed by moving contaminants into the dewatering areas. Therefore, there is a net positive effect on water quality and no significant adverse environmental impact related to the potential for dewatering to move or reduce landfill contaminants.

The landfill capture analysis was based on monitoring results available at that time (2007-2015). Since that time the MPCA has conducted additional monitoring as part of their on-going monitoring responsibilities of the closed landfill. Results from subsequent sampling events were obtained from the MPCA and reviewed to determine if the concentrations of vinyl chloride used in the analysis were still valid. The analysis was based on an average concentration of vinyl chloride in wells W-9 and DC-117 of 1.36 $\mu\text{g/l}$. There have been five events that have sampled for vinyl chloride in W-9 and DC-117 since 2015. DC-117 was non detect in two of those events. For the three events where vinyl chloride was detected in both wells, the average concentration was always lower than the average concentration used in the capture analysis. The averaged concentrations ranged from 0.54 $\mu\text{g/l}$ to 1.30 $\mu\text{g/l}$ with the lowest average occurring at the most recent 5/13/2019 sampling event. The recent monitoring results are similar enough to the concentrations used in the analysis that conclusions are still valid.

Table 3.1 Dilution Calculations

Scenario (All mining scenarios assume mitigation cell with head at 716 ft MSL)		Groundwater Receptor Area	Total Groundwater Flow to Receptor, gpm	Vinyl Chloride		
				MW-9 & DC117 Source, ug/L = 1.36		
Alternative	Phase			HRL, ug/L = 0.20		
				Landfill Flow, gpm	Dilution Factor	Diluted Concentration
1/2	1AB	BRP North	2,508	0	--	--
		MS North	2,467	102	24	0.06
	2AB	BRP	1,672	0	--	--
		MS North	625	184	3	0.40
		MS South	8,283	84	98	0.01
3	1	MS South	841	0	--	--
	2	BRP North	3,478	116	30	0.05
	3	BRP	4,202	77	55	0.02
	4A	BRP	2,751	4	706	0.00
		MS South	9,829	95	104	0.01
	4B	BRP	1,984	0	--	--
		MS North	7,202	261	28	0.05
4/5/6	1	MS South	8,978	135	66	0.02
	2	MS North	6,847	359	19	0.07
	3	BRP North	5,569	79	71	0.02
		MS North	662	0	--	--
	4	BRP	5,403	25	218	0.01
		MS North	525	1	477	0.00
Reclamation		BRP	1,458	0	--	--
		MS North	758	97	8	0.17

	Mine Pit Lake
	Dewatering Area
	Reclamation Lake
	Diluted Concentration Exceeds Standard

Since the landfill capture analysis was prepared, reporting limits for vinyl chloride have decreased from 0.5 µg/l to in 2015 to 0.05 µg/l in 2018. Two additional landfill monitoring wells have had low concentrations of vinyl chloride falling above the current 0.05 ug/l detection limit and the older 0.5 ug/l detection limit since 2015. MW-113 reported a concentration of 0.07 ug/l (below the HRL of 0.2 ug/l) during the 5/13/2019 sampling event. This is the first reported occurrence of vinyl chloride in MW-113. It is the second sample taken since the reporting limit was lowered to 0.05 ug/l, so it has not been verified. MW-113 is located downgradient of W-9 and the lower concentration found at W113, further from the source would be expected. Vinyl chloride has also been reported three times above the reporting limit in MW-114 since 2015 with concentrations of 0.2ug/l, 0.32 ug/l and 0.41 ug/l. MW-114 is located downgradient of the northern portion of the landfill. None of the closest monitoring wells to MW-114 (MW-116 to the north and well nest W-111/W-211 to the south) have had any reported detections. None of the concentrations in MW-114 are high enough to have been reported in 2015.

Review of more recent water quality monitoring data does not change the conclusion that the main effect of mining activities will be to move concentrations of contaminants into the mining areas while reducing concentrations in every scenario relative to what they would otherwise be in groundwater does not change. The MPCA is responsible for monitoring and addressing the groundwater impairments at the landfill. In the future, they may choose to conduct monitoring of the dewatering discharge or end use lake as part of their monitoring program for the landfill.

The groundwater model developed by Barr was utilized to evaluate the potential for significant environmental effects related to existing groundwater quality impairments associated with the Louisville Landfill. Each combination of phasing was evaluated with respect to proposed dewatering sequences as well as the end use or reclamation condition of the Site. The last several years of landfill monitoring has shown a trend of decreasing concentrations in groundwater contaminants associated with the landfill. This is likely due to the construction of an enhanced cover system which substantially reduces the volume of leachate produced and the construction of a landfill gas extraction system which also removes VOCs.

Comments received from the MPCA on the DEIS indicate that the MPCA is just beginning the investigation into the emerging contaminants Manganese (Mn), 1,4-Dioxane and Polyfluoroalkyl Substances (PFAS) potentially associated with the closed Louisville Landfill. The MPCA is currently expanding its monitoring well network around the landfill to investigate the extent and magnitude of groundwater contamination in excess of regulatory standards for these contaminants.

To date, the MPCA has detected Mn, 1,4-Dioxane and PFAS contamination in the MPCA monitoring well DC117, which is located approximately 1,000 feet north of the existing Bryan Rock Products existing production well. DC117 is located along the eastern edge of the Louisville Landfill. To date, the MPCA has not proposed monitoring the Bryan Rock Production well or any new monitoring wells immediately downgradient of the Louisville Landfill on the Malkerson Sales property. There are however some Louisville Landfill monitoring wells currently located on the Malkerson Sales Property.

The Landfill Capture Evaluation concludes that the Project will have no significant adverse environmental impacts related to the existing groundwater impairments associated with the Louisville Landfill. The basis for these conclusions is as follows:

- For COCs with concentrations that have been determined to be below a regulatory standard, it can be concluded that the Project will not create any additional negative environmental effect as dewatering from mining will further dilute that concentration and it will be found at lower concentrations than are currently present. No further evaluation was performed.
- For vinyl chloride, the one contaminant that is currently at concentrations that exceed the health based standard, dewatering reduces the concentrations reaching dewatered areas. In every alternative, the proposed mining operations result in reduced concentrations reaching the dewatering areas and mine pit lakes compared to the current concentrations in the impacted area near the Landfill.
- The Project will not cause an increased risk to adjacent water supply wells by modifying contaminant transport from the landfill. There are no water supply wells currently located downgradient of the Landfill. The nearest potable water supply wells that may be impacted due to changing flow directions induced by dewatering activities include the two Renaissance Festival wells located to the southwest of the Landfill and the stable well located northwest of the Landfill. There is no risk to these wells because the proposed dewatering will only affect the migration of contaminants in the Jordan Aquifer that is being mined. The existing wells are cased through the Jordan Aquifer and are separated by a confining unit. Municipal water supply wells and drinking water supply management areas are located well outside of the Project Area and there are no plans to use the mine pit lakes as potable water supplies.
- The Project will not increase the migration of existing groundwater contaminants into lower portions of the Jordan Aquifer in any of the Alternatives. As an area is dewatered, groundwater is drawn from the surrounding area towards the dewatering pit. Dewatering is proposed to be limited to the upper portion of the Jordan Sandstone. As a result, dewatering increases the upward gradient in the lower portions of the Jordan Sandstone and will not increase the migration of existing groundwater contaminants to deeper portions of the aquifer.

3.1.3 Environmental Consequences and Alternatives – Adjacent Land Use

The EIS will assess the impacts of each of the project alternatives on the current and future land use in the areas adjacent to the Project.

3.1.3.1 Environmental Consequences – -Adjacent Land Use

Environmental consequences of the Project on the current and future land uses of areas adjacent to the Project are included in the following overall discussion. This analysis addresses general land use

compatibility, the Renaissance Festival, and access to the Louisville Swamp main access. Specific project impacts on surrounding land use, such as noise or air emissions, associated with specific alternatives are discussed in detail in subsequent sections.

The Project is consistent with both current zoning and 2040 planned land use designations⁵. 2040 planned land use designations have been developed by the County to promote a compatible land use pattern that limits existing and potential land use conflicts. Mining standards in Chapter 10 of the Scott County Zoning Ordinance⁶ have been adopted by the County to control mining operations and to minimize conflicts with adjacent land uses.

The Project has been designed to meet the performance standards of the County Zoning Ordinance, including those applicable to mining operations with the exception of building height. The Zoning Ordinance establishes a maximum building height of 45 feet in the I-1 Rural Industrial District. Within the Shoreland District, all structures, except churches and agricultural structures, may not exceed 35 feet without a variance. Components of the processing and loading operations will exceed this standard and will require a variance. The following is a list of the structures associated with the sandstone processing operations that exceed 35 feet in height. There are three processing plant locations, all of which are located in previously mined areas of the Site, resulting in recessing these structures below adjacent grades. Section 3.17 Visual Impacts, evaluates the relative height of the plant area specific to each alternative plant location.

- Finished product storage tanks: 88 feet with bucket elevator at 116 feet (tall option)
- Finished product storage tanks: 65 feet with bucket elevator at 86 feet (short option)
- Dry Plant Stack: 80 feet
- Plant Building: 75 feet
- Decanting Stockpiles: 65 feet
- Wet Plant: 75 feet
- Rail Loading: 74 feet
- Truck Loading System: 51 feet
- Winter Stockpile: 50 feet

Heights of nearby features include the Louisville Landfill and Dem-Con Landfill. The Louisville Landfill rises approximately 78 feet from the base of the landfill to the top of the landfill at an elevation of 848 feet above mean sea level (msl). The Dem-Con Landfill is situated east and north of the Louisville Landfill and is permitted to an elevation of 932 feet above msl, rising 110 feet from the eastern edge of the landfill and 160 feet from northwestern property line. These features are not structures, and therefore are not subject to the structure/building height limitations within the I-1 District. The proposed building heights can be compared to some of the taller buildings in the surrounding area. The processing building at the Shakopee Sands Facility is 125 feet tall. The heights of the taller structures in Shakopee and along the Minnesota River range from 100 feet to just over 200 feet in

⁴Scott County Community Development Division, (2018) 2040 Comprehensive Plan Update. June 18, 2019 Retrieved from <https://www.scottcountymn.gov/439/2040-Comprehensive-Plan>.

⁶Scott County (effective January 20, 2010) Scott County Zoning Ordinance No. 3. Retrieved from <https://www.scottcountymn.gov/DocumentCenter/View/1428>

height. These landfills and structures are nearby, but not necessarily in the Shoreland district, and all of them exceed the current height limitations in the I-1 District.

Land use conflicts between industrial land use and residential land use may occur if land uses are situated immediately adjacent to one another and no transitional areas along natural or physical barriers (i.e., topography, drainageways, transportation corridors, etc.) are provided to minimize potential impacts. Nearby residential land use is concentrated at the Jackson Height mobile home park. The parcels the mobile home park is located on are zoned I-1 Rural Industrial and C-1 General Commercial, and the mobile home park is surrounded by industrial and commercial land uses. This residential area is located over one-half mile from any proposed sandstone mining and processing activity. Sand and gravel mining is proposed closer to the mobile homes, but the activity will be buffered by Dem-Con Drive and other industrial land uses, primarily the MnDOT truck maintenance facility. Sand and gravel mining activity is expected to occur in this area under all alternatives including the No Build Alternative.

Single family residences in the vicinity of the Project are all located across the US 169 corridor which currently provides a substantial transition and physical barrier between the residences and mining operations. The single family residences are typically located on large lots with transitional land use (open space and commercial land uses) between the Project and the single family residence.

The majority of single family homes near the Project are located over 1,000 feet from the Project boundaries. Most of these homes are located closest to the northern portion of the Bryan Rock property, which has been actively quarried for limestone for the past few decades. Blasting and excavation of limestone have lowered the quarry floor so that current processing, stockpiling, and loading operations are recessed 60-85 feet below the surrounding grade of US 169. The recessed nature of the operations acts to reduce noise, dust, and visual impacts from the mining and processing operations. Future sandstone mining and processing will also occur at this recessed elevation. Screening berms are currently located along the active portion of the Bryan Rock quarry constructed along the US 169. These perimeter berms will be extended as mining progresses to the south, providing a further topographical barrier from residential land uses.

The only single family residence within one quarter mile of the Site that is not separated from the Project by US 169 is owned by Malkerson Sales and is located north of TH 41. Continued use of the property for mining and processing activity will not have a significant environmental effect on existing single family land uses.

The Renaissance Festival booth site is located over an area that is planned to be mined for both limestone and sandstone at some point in the future. The Renaissance Festival operates under a lease which has been extended through 2020 with an eventual relocation of the festival likely under all scenarios, including the No Build scenario. Evaluations within the DEIS assume that the Renaissance Festival continues, at its current location, while mining and processing activities occur in adjacent areas within the Site. Specific topics such as noise and air that may affect the Renaissance Festival are described in subsequent sections of the DEIS. The alternatives analysis in this land use section describes the length of time that the Renaissance Festival and associated parking can be accommodated on-site for each of the Alternatives before the festival will have to be relocated to

allow for the removal of limestone and sandstone. Access to the Renaissance Festival will be maintained from both TH 41 and 145th Street while the Project and the festival operate concurrently.

The Minnesota State Corridor Trail runs along the Minnesota River west of the Project Area. The trail runs along the west side of Gifford Lake and is heavily wooded as it winds south towards the USFWS Louisville Swamp Unit. A parking area to access the State Corridor Trail is accessed off of TH 41. Approximately 272 acres of property owned by Mid-America Festivals is located between the state trail and the southern portion of the Project Area. The Mid-America Festivals property is currently open space and an exhausted limestone quarry, known as the Green Quarry. There have been preliminary plans presented to Scott County to mine sandstone from this property, although no project is proposed at this time. The Mid-America Festival property provides additional buffer area between the state trail and the Project.

The Louisville Swamp Unit of the USFWS Minnesota Valley National Wildlife Refuge is located to the southwest of the Project Area. The unit is managed for both archery and firearm hunting. The public lands are separated from the Project Area by 145th Street and the UP mainline. The main access is off of 145th Street and the parking area is located west of the Site. The trail system runs from the parking area to the southwest away from the Project Area with open space and woods buffering the trail system from mining areas.

Both the State Trail and the trails within the Louisville Swamp Unit are unpaved trails located primarily within the 100-year floodplain of the Minnesota River. The trails or portions of the trails close periodically during periods of high water. Portions of the trail are open to horses, bikes, cross country skiing and snowmobiling.

The USFWS parking lot is planned to also be used as a joint trailhead and parking lot for the Louisville Swamp and the future Merriam Junction Regional Trail (Minnesota River Bluffs Extension and Scott County Connection Regional Trail). According to the Minnesota River Bluffs Extension and Scott County Connection Regional Trail Master Plan⁷, a future at grade crossing of the future trail and 145th Street is planned to access the USFWS parking lot. The parking lot and current railroad track crossing at 145th are both located west of the Project's access points to 145th Street. All traffic generated from the Project would travel east on 145th Street and would not impact the at grade trail crossing to the USFWS parking lot.

3.1.3.2 Alternatives – Adjacent Land Use

One assessment on the current and future land uses of areas adjacent to the Project is provided in this section. Individual alternatives studied in the EIS will not create discernible differences in impacts on surrounding land use. Various alternatives will result in a difference in timing of active areas within the mine; however, overall, the same areas will be mined in all alternatives, except the No Build. Land use within the proposed Project Area is consistent for all of the alternatives, including the No Build Alternative which assumes the continuation of mining and processing of sand and gravel and limestone. Although the sandstone processing plant locations vary among three locations, all three

⁷ Minnesota River Bluffs Extension and Scott County Connection Regional Trail Master Plan prepared in partnership by Scott County Parks and Trails and Carver Parks, February 2011

plant locations are located in recessed portions of the quarry or previously mined areas. All the locations are set back from surrounding land uses by a substantial distance so the difference in their location on general land use compatibility is insignificant. Therefore, one assessment was completed for all of the alternatives. The height of the processing plant components and the potential impacts relative to the individual plants sites are addressed in Section 3.17, Visual Impacts. An exception is that individual alternatives will be addressed in evaluating potential impacts to ongoing Renaissance Festival operations in accordance with the SEAW and SDD.

a) Alternatives Analysis: Potential Impacts on Current and Future Land Use:

The Project does not have the potential for significant environmental effects associated with current and future land use. The continuation of limestone quarrying and processing, sand and gravel mining and processing, the addition of sandstone mining and processing, and the construction and operation of a railyard do not reflect a significant change in land use over the Site or surrounding area. This is also true for the No Build Alternative which continues with mining and processing activities on both the Malkerson Sales and Bryan Rock properties.

All of the alternatives included in the DEIS analysis are compatible with the current zoning, the guided future land use, and the existing surrounding land uses. Mining is an interim use and the Project Area will be reclaimed upon conclusion of mining. Reclamation will allow for a mix of future industrial development and open space, consistent with the surrounding land use.

Land use in the immediate vicinity is predominantly industrial in nature, with residential land uses separated by major highway, rail corridors and other industrial land uses. The MPCA has identified appropriate land uses for the closed Louisville Landfill which take into consideration the landfill gas and groundwater areas of concern and has determined that closed landfill management and solar energy farm uses are acceptable uses of the landfill.⁸ The Project will not impact the potential development of these planned land uses. Trails within the parks and open spaces are separated from the mining activity by distance and open spaces that is heavily wooded. Loading of railcars and operation of a railyard are similar to the activity that currently exists to the south of the Site and on the sidings located in the southern portion of the Site within the UP right-of-way. There is currently no schedule to develop the trail system within the abandoned railroad right-of-way along the southwestern boundary of the Project Area. If the future trail system were to be constructed during the life of the mine, the proposed mining limits are set back from the abandoned portion of the rail line and the large wetland complex would buffer the two uses. Development of the future trail through the abandoned right-of way will not be impacted by the Project.

b) Alternatives Analysis: Potential Impact on Renaissance Festival:

All of the alternatives, including the No Build Alternative, allow for the continuation of the Renaissance Festival at its current location for a limited period of time. Variations in phasing associated with different alternatives affect the length of time that the Renaissance Festival can remain at the current location. The Renaissance Festival operates under a lease agreement and other

⁸ MPCA Closed Landfill Use Plan, Louisville Landfill. May 15, 2013

factors not related to the Project or No Build Alternative may also impact the length of time that a festival remains at this location. The Renaissance Festival has been successfully coexisting with adjacent mining operations since its inception at the Site and has extended its lease through 2020.

Alternative 1: Alternative 1 has one plant site located on the north end of the Malkerson property and one plant on the Bryan Rock property, mining both properties in a north to south direction. The plant location and the direction of mining accommodate the Renaissance Festival through Phase 1A/Phase 1B. Under Alternative 1, mining and processing would occur concurrently on the Bryan Rock property so the timing of completion of Phase 1A mining could be 10-15 years depending upon annual production. Access to the Renaissance Festival and parking areas would remain off of TH 41 with parking areas in the northern portion off the Site (current Trail of Terror parking) and access around the east side of the plant and railyard and then back along the railroad right-of-way to the parking areas south of the Festival grounds. Renaissance Festival access to 145th Street would remain available. The current practice of limiting aggregate hauling during the peak traffic periods during the Renaissance Festival will continue.

Alternative 2: Alternative 2 has one plant site centrally located on the Malkerson Sales property and one plant on Bryan Rock property and mining both properties in a north to south direction. The plant location and direction of mining could accommodate the Renaissance Festival during mining of Phase 1A. The plant itself is located in the southern portion of Phase 1A so that under Alternative 2, the time to complete Phase 1A is estimated to be 7-10 years depending upon annual production.

Alternative 3: Alternative 3 can accommodate the Renaissance Festival for the longest of the alternatives. There is one plant site which is located on Bryan Rock property. The current parking area south of the booths would be removed during the first phase of mining; parking would be located to the north of the Festival grounds up to the stable area. The Renaissance Festival could remain until approximately halfway through Phase 4B at which time relocation to remove the limestone in preparation for Phase 4A mining would be required. This is estimated to be 16-24 years after the start of sandstone mining.

Alternatives 4, 5 and 6: Alternatives 4, 5 and 6 all have the same phasing with different plant locations. The Renaissance Festival booth site is located within Phase 1. This phasing sequence represents the shortest scenario for the accommodation of the Renaissance Festival. The Festival would have to be relocated at the onset of Phase 1 sandstone mining, within one to three years to accommodate the removal of limestone under the booth site before the area could be mined for sandstone.

No Build Alternative: Under the No Build Alternative, the Renaissance Festival could operate through 2020, the end of the current lease. The booth area would then be mined for limestone. This would mean that the Renaissance Festival could be accommodated an additional one to two years based on current production rates.

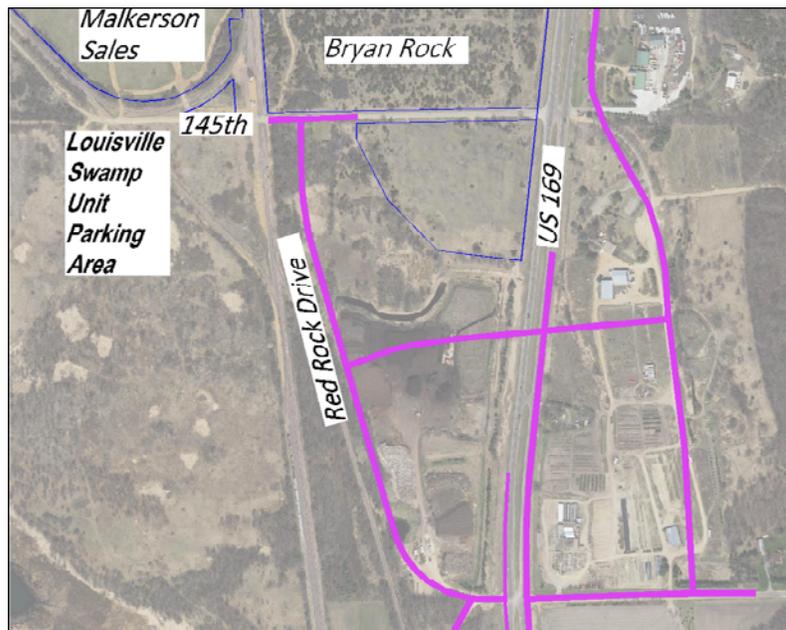
c) Alternatives Analysis: Potential Impact on Louisville Swamp Unit Access:

Access to the main parking lot of the Louisville Swamp Unit and to the Renaissance Festival from 145th Street will be maintained for all alternatives and there will be no significant environmental effects to parking lot access as a result of this Project. Access to the parking lot currently requires visitors to cross two separate rail crossings. One is a signalized crossing of the UP main line and two siding tracks, the other is an unsignalized crossing of a UP siding track to get to the Louisville Swamp parking lot. As with any rail crossing, trains on both the mainline and the siding tracks block the access for a period time that is limited to ten minutes by law. Trains coming to and from the Site are anticipated to block 145th Street for an estimated 3.03 minutes. (See Section 3.12 for additional information regarding train traffic.) The Project at maximum production would add less than four trains per week compared to the current 35-49 trains per day on the mainline and additional rail siding traffic at this crossing. Because of the additional two siding tracks, the main signalized crossing is currently blocked more frequently than the 5-7 times per day that a train on the mainline is crossing because the sidings are often blocked as trains are broken or assembled and the crossing times can be much longer for the sidings than for a train crossing on the mainline. Trains on the siding tracks that block a road crossing are also subject to a ten minute maximum by law.

In addition to the main Louisville Swamp Unit parking area located off of US 169 via 145th, there are several other access points to the Louisville Swamp Unit Parking Area. This includes access from just east of the Minnesota River bridge along TH 41 east of Chaska where the State Corridor Trail connects to and passes through the Louisville Swamp Unit; the Thompson Ferry Landing, just north of Jordan on County Road 9; Middle Road access off of Bluff Drive, just south of the Project Area; and two additional seasonal parking areas maintained for hunting access.

Regional improvements currently under construction along the US 169 corridor near 145th Street, which are unrelated to the Project itself, will result in a change in the access to 145th Street from US 169 but will not change the access to the parking lot from 145th Street. The US 169 corridor vision for this area is a conversion to freeway in the vicinity of the Project Area. The improvements reroute 145th Street to the south and provide freeway access to 145th Street and County Road 14 to the east. Access improvement project

CSAH 14 Overpass Project Layout



funding was applied for and granted in 2016 with construction beginning in 2018. The portion of the project illustrated above was completed Fall 2019.

The access improvement project results in the reduction of the current Bryan Rock US 169 access from a full access to a right in/right out restricted access. Closing direct private access points and developing interchanges and a local road network will provide for safer access for local businesses as well as for users of the Louisville Swamp Unit's main parking area. As part of the improvement plans, 145th Street will continue to provide access to the unit's parking area.

3.1.4 Environmental Consequences and Alternatives- Planned End Use Compatibility

3.1.4.1 Environmental Consequences - Planned End Use Compatibility:

The EIS will provide a description of planned end use of the Project Area and an assessment of its compatibility with surrounding land uses and recreational goals.

Planned end use of the Project Area is a mix of developable land and open space consisting of end use lakes surrounded by greenspace, consistent with adjacent land uses. Vegetation will be established around the perimeter of the end use lakes. The end use lakes and natural upland areas will be privately owned and managed and will create a diverse ecological habitat. Some upland areas that lack suitable septic sites for development may be used for agricultural uses until future development is possible when municipal sewer and water is available. Open space areas of the reclaimed Site will be compatible with, and compliment, nearby public lands and trail systems as well as the future trail corridor along the southwestern portion of the Malkerson Sales property. This future trail corridor will eventually provide a trail connection to Carver County.

The northern portion of the Malkerson Sales property where sand and gravel mining will not extend below the water table and some of the backfilled areas of the sandstone mine area will be suitable for future development. Some development could occur during the life of the mining operation adding to or replacing some of the current land uses within the Project Area. Final grades will be designed to accommodate building pads above the elevation of the floodplain. Future land use is envisioned as commercial/industrial, consistent with the goals and policies of the Scott County Comprehensive Plan, current zoning, and existing adjacent industrial land uses. The northern and southern portions of the Bryan Rock property will be backfilled to elevations suitable for future development. Potential end uses include the extension of the Dem-Con Landfill or some other type of industrial use and associated outdoor storage. Section 3.18 Compatibility with Plans and Land Use Designations, describes end use and reclamation in further detail.

3.1.4.2 Alternatives - Planned End Use

Under all of the alternatives except the No Build Alternative, final reclamation and planned end use will include the establishment of buffer areas around the perimeter of end use lakes in accordance with the slope stability analysis discussed in Section 3.11, Geologic Hazards and Soil Conditions. Perimeter areas around the end use lakes to be left as open space will be stabilized and provide a

buffer and habitat transition to public lands to the west and south of the Site. Areas to be reclaimed for future development will be backfilled with granular materials below the water table and compactable fill from the water table to five to ten feet above the water table.

Planned end use of the Site will vary among alternatives only with respect to the development of private railyards which may be operated beyond the life of the Project. Railyards include a network of tracks and sidings with switches to the mainline, as well as infrastructure to load/unload rail cars. The railyards in all of the alternatives have preliminary designs which accommodate unit trains. Future industrial uses may not require a unit train capacity and so as part of final development in all of the alternatives discussed in this section, some of the siding tracks may be removed to best accommodate the end use that is ultimately developed on the properties.

Alternative 1: Railyards will be developed in the northern portion of the Malkerson Sales property and on the Bryan Rock property. The railyard on the Malkerson Sales property will have siding tracks parallel to the mainline. The siding tracks, at maximum buildout, will be within 75 feet of the railroad right-of-way. All or a portion of the siding track could be kept in place to serve industrial end uses established in the northern portion of the property. If only two of siding tracks remain, the width is reduced to 25 feet outside of the railroad right-of-way. Because the railyard is long and narrow and situated immediately adjacent to the railroad right-of-way, keeping the railyard poses little overall impact to the reclamation plan.

The siding tracks on the Bryan Rock property will form a loop around the perimeter of the property, north of 145th Street. The entire loop or portions of the loop could remain to serve industrial uses that may be established in the northern and southern portions of the property. The railyard and associated siding tracks could be removed entirely if the tracks interfered with final use. As with the rail layout on the Malkerson property, the loop is primarily located adjacent to the perimeter of the Site. The result of leaving the entire loop track on the property is to move reclamation sideslopes further from property lines towards the interior of the property to accommodate the higher elevations of the tracks long term but has little overall impact to the reclamation plan. Minor adjustments to the location of end use lakes and perimeter slopes is all that will be necessary to accommodate either or both of the railyards on a long term basis.

Alternative 2: Railyards will be developed in the central portion of the Malkerson Sales property and on the Bryan Rock property. The railyard on the Malkerson Sales property will have siding tracks parallel to the mainline, but further to the south than in Alternative 1. Even though the siding tracks are further to the south, it would still be possible to utilize some or all of the siding tracks and extend additional track to the north, if necessary, to serve future industrial uses in the northern portion of the Malkerson Sales property. Alternative 2 is the same as Alternative 1 with respect to the railyard on the Bryan Rock property.

Alternative 3 and Alternative 6: A single railyard will be developed on the Bryan Rock property. Although this alternative has a higher capacity plant located on the Bryan Rock property, the layout of the railyard is the same loop as in Alternatives 1 and 2. These alternatives have the same potential to incorporate the railyard and the entire track or a portion of the track into final development as

Alternatives 1 and 2. There is no railyard associated with the Malkerson Sales property under these Alternatives.

Alternative 4: A single railyard will be developed in the northern portion of the Malkerson Sales property. The railyard layout will be the same as that of Alternative 1, with siding tracks parallel to the mainline which could stay to serve industrial end uses established in the northern portion of the property.

Alternative 5: A single railyard will be developed in the southern central portion of the Malkerson Sales property which would have the same minimal impact to final development as Alternative 2, only there would be no railyard associated with the Bryan Rock property.

All of the alternatives and the conceptual railyard layouts lying immediately adjacent to existing right-of-way and property lines create no land use conflicts and the long term presence of the infrastructure can be accommodated. While the railyards will be designed to accommodate unit trains, future development may not require such a large railyard and some of the siding track could be removed while keeping enough to support the future industrial uses. The presence of a private railyard may be an asset to attracting future industrial development. There are no significant environmental effects resulting from leaving some or the entire railyard infrastructure in place for any of the alternatives.

No Build Alternative: Under the No Build Alternative, limestone quarry activity would continue through the Renaissance Festival booth area, campground and southern parking area on the Malkerson Property. Sand and gravel mining would continue in the northern portion of the property. On-going mining activity on the Malkerson Sales property predates County regulations and a reclamation plan has not been developed for the property. However, most of the areas where past mining has occurred have been reclaimed. Portions of the Site have been mined to elevations that are below the 100-yr floodplain elevation. Some of these areas have been sloped and backfilled to elevations above the floodplain. Other areas require additional fill to be reclaimed to support future development. The No Build Alternative continues mining of sand and gravel in the northern portion of the Malkerson Sales property. This area will be reclaimed to grades above the floodplain elevation to accommodate future development. The approved reclamation plan for the Bryan Rock quarry includes a terraced highwall along the railroad tracks and along US 169. The current reclamation plan will need to be updated to accommodate changes in access to US 169. Reclamation leaves the floor of the quarry at elevations suitable for future industrial/commercial development. The No Build Alternative does not create end use lakes, buffer areas, or open space.

3.1.5 Mitigation – Land Use

Three specific aspects of land use were evaluated in the EIS as identified in the SDD relating to existing groundwater quality impacts associated with the Louisville Landfill; current and future land use in the areas adjacent to the Project, including the Renaissance Festival and access to the main parking area of Louisville Swamp Unit; and planned end use of the Project Area and the impact of incorporating the railyards into final use plans. While no significant environmental effects associated

with existing and future land use have been identified, the following mitigation measures could be considered by permitting authorities:

- a) There are currently no potable water supply sources located downgradient of impacted groundwater. However, if water supply sources were to be established downgradient of the impacted groundwater in the future, (which is not likely because it is within the floodplain or a mined out area), water quality testing is recommended for all alternatives, including the No Build Alternative, to insure compliance with drinking water standards.
- b) Continue to limit aggregate hauling by truck from the Site during peak traffic periods on Festival days.
- c) Comply with performance standards established in Chapter 10 of the Scott County Zoning Ordinance including establishment of screening barriers, compliance with setbacks for mining processing activities, operating and maintaining all equipment used for mining and extraction operations in a manner to minimize, as far as practical, noise, dust and vibrations. Install safety fencing, as needed, so as to minimize conflicts with adjacent land uses. Approve a Reclamation Plan that incorporates progressive development of open space and natural areas as well as future industrial development as the Site transitions from mining uses to final uses.

3.2 Cover Types

The scoping decision document (SDD) identifies the following items to be addressed in the DEIS:

- a) The EIS will evaluate existing cover types, (including the processing area) as well as projected cover types upon conclusion of mining activity based upon final reclamation of the Site.

3.2.1 Affected Environment

Effects to existing land cover are limited to areas of the Site which will be disturbed due to future mining, processing and reclamation activities. Existing land cover over the Site is a result of past and current mining, agricultural, and Renaissance Festival related land uses, as well as residential and agricultural uses related to the stable and horse training area, all of which influence the cover types and plant communities found at the Site.

Land cover is the vegetation and human constructions (buildings, roads, etc.) that cover the land surface. Land cover categories described below are generally based on Level 1 definitions for general growth patterns of the Minnesota Land Cover Classification System (MLCCS)⁹. Existing land cover areas were mapped by Barr Engineering¹⁰ in 2012, based on field surveys and aerial photo review of the Site. The 2012 delineations have been updated based on more recent aerial photo reviews and

⁹ Minnesota Land Cover Classification System, 2004. User manual Version 5.4 Minnesota Department of Natural Resources Central Region

¹⁰ Barr Engineering Company 2012. Vegetation, Wildlife, and Protected Species Report Merriam Junction Sands Mine Scott County, MN. January 2012. Minneapolis, MN

field visits to reflect land cover changes resulting from the continuation of mining activity since that time.

Figure 3.2.1: Existing Land Cover Map, illustrates existing Site land cover. The most prevalent cover types are active mine areas and grassland, reflecting the predominant mining land use of the Site. Land cover along the western perimeter of the Site is mostly forest, water and Wetland. Existing land cover categories found on the Site are described below. The results of the vegetation assessments, which focus more on types of plant communities and quality of vegetation, are discussed in Section 3.3.

Active Mine Area: These areas are active areas of mining activity on the Site including processing and stockpiling operations. Land cover in active mining areas is essentially non-vegetated exposed rock surfaces. Extraction areas, processing plants, product stockpiles, and internal haul roads are located within the land cover designation of active mine area. Active mining occupies approximately 192 acres (28% of the Site), although substantially more acreage has been mined in the past. Land cover in these previously mined areas has subsequently transitioned to mainly grassland, cropland and woodland.

Grassland: There are 158 acres (23%) of grassland on the Site. The majority of grassland is located in reclaimed portions of past limestone quarry and sand and gravel mining areas and across the southern parking lot of the Renaissance Festival on the Malkerson Sales property. There is also a 12 acre area of grassland located in the very southern portion of the Bryan Rock property south of 145th Street West which has not been previously mined but is mowed. This area serves as overflow parking for the Renaissance Festival. There are also some smaller grassland areas associated with the horse track and stable area and the northern perimeter of the Bryan Rock quarry. All of the larger grassland areas, including the area on the Bryan Rock property, are used for Renaissance Festival parking. Parking areas include a system of gravel access roads and aisles and are mowed on a regular basis.

Forest, Water and Wetland: The forest land cover category is defined as areas with equal to or greater than 60% tree canopy. The western perimeter of the Site is located adjacent to the 100 year floodplain and is characterized by forest (29 acres), water (Gifford Lake, 28 acres) and wetlands (31 acres).

Farmstead: This area is considered an artificial or manmade surface with up to 95% vegetative cover. It includes the stable area, commercial out buildings, some residential structures, gravel roads, and parking areas. Farmstead areas make up approximately 28 acres of the Site.

Shrubland: The area just south of the active Bryan Rock quarry is considered shrubland with individual shrubs or clumps of shrubs occupying greater than 25% of the cover. Shrublands make up approximately 50 acres of the Site.

Woodlands: Woodlands, characterized by open stands of trees with crowns not usually touching, are established in previously mined areas of the Malkerson Sales property, the Renaissance Festival booth site and campground area, and other small areas in the very northeastern portion of the Malkerson Sales property. Woodland areas make up approximately 110 acres of the Site.

Cropland: There are scattered areas of cropland located on the Malkerson Sales property both in previously mined areas of the Site and in unmined areas of the Site near the northern end of the property. Cropland makes up approximately 14 acres of the Site.

Sparse: Sparsely vegetated areas include areas with less than 25% vegetative cover. These areas tend to be small scattered pockets across the Site in previously mined areas, along the haul road, and scale house area of the Malkerson Sales quarry. Sparsely vegetated areas currently occupy approximately 42 acres of the Site. In the post reclamation condition, terraced and benched limestone faces will remain sparsely vegetated.

3.2.2 Environmental Consequences

The EIS will evaluate existing cover types, as well as projected cover types upon conclusion of the mining activity. The EIS will define cover types for the after mining condition based on the development of a detailed reclamation plan prepared in conjunction with the EIS.

The environmental consequences of the change in land cover resulting from the Project are considered beneficial. Under current conditions, mining occurs and will continue to occur over a significant portion of the Site as a legal nonconforming use with no reclamation standards or requirements. The permitted portion of the Site on the Bryan Rock property has an approved reclamation plan that leaves the floor of the quarry unvegetated with little to sparse land cover. The Project requires an approved Reclamation Plan for the entire Site as part of permitting. Land cover planned as part of reclamation provides a diversification of land cover types suitable for a mix of open space and natural areas and future development. Land cover in portions of the Site that will not be disturbed by the Project will remain unchanged. All unreclaimed areas currently disturbed by mining will be converted to a new land cover type, either water or revegetated upland areas, in an attempt to maintain or improve diversification of land cover types compared to existing conditions. Figure 3.2.2: Reclamation Land Cover Map, illustrates land cover upon final Site reclamation.

The biggest changes in land cover between the existing condition and the alternatives is the addition of end use lakes. Areas around the perimeter of the lakes adjacent to public lands will be reclaimed to native grasses and woodlands. The forest land cover adjacent to Gifford Lake will remain. Mined and backfilled upland areas will be reclaimed to a grassland or agricultural cover type. Much of the grassland area is designated for future development and ultimately land cover is expected to be converted again at the time of future development.

Bedrock benches and terraces are assumed to have sparse vegetation similar to naturally occurring rock outcrops. Rock terraces of variable heights will be situated around the perimeter of portions of mined areas. These bedrock benches are designated as sparsely vegetated in the reclaimed condition.

Regulated isolated wetland basins, the wetland complex in the southwestern portion of the Site, and Gifford Lake will remain in the reclamation condition. The eastern portion of the area designated for stormwater conveyance will be planted with grasses and transition to woodland further to the west as the area approaches the wetland complex.

3.2.3 Alternatives - Land Cover

Table 3.2-1 compares acreages associated with existing and reclaimed land cover of the Site. Each of the project alternatives result in the same overall reclamation of the Site, and therefore resulting land cover. There is the potential for only minor differences between alternatives. The minor differences are due to the location of the railyard associated with each alternative and whether or not all or a portion of the railyard will remain to support future development options at the time of final reclamation. Table 3.2-1 assumes that the railyards will be removed as part of final reclamation. Table 3.2-2 illustrates the impact of keeping the railyards associated with each alternative.

Reclamation land cover for Alternatives 1-6 is based on the Reclamation Land Cover Map. The acres of land cover for the reclaimed condition indicated on the table are approximate, recognizing that the ultimate establishment of land cover will be a reflection of the Site conditions encountered during mining that may impact ultimate depth and extent of mining and final soils balance of the Site as well as the timing of demand for final development of the Site.

It is important to note that the No Build Alternative does not result in maintaining existing land cover. Under the No Build Alternative, limestone and sand and gravel mining would continue to occur on the Malkerson Sales property and to the limits of the currently permitted limestone quarry on the Bryan Rock property. On Table 3.2-1, Land Cover Areas, land cover over the mined areas of the Malkerson Sales property is assumed to be consistent with the types and ratios of previously mined and reclaimed areas including: grasslands, croplands, woodlands, and sparsely vegetated land cover. Land cover on the Bryan Rock property is assumed to be consistent with the currently approved reclamation plan which includes revegetation around the perimeter of the quarry, an unvegetated (sparse land cover) and stormwater ponding areas (water land cover) over the floor of the quarry. As with Alternatives 1-6, under the No Build Alternative, the majority of the Site that is designated as sparse or grassland is likely to convert to other land cover in the future. The Site is currently zoned I-1, Rural Industrial and is guided Industrial on the 2040 Planned Land Use Map in the Scott County 2040 Comprehensive Plan. Development with up to 75% impervious coverage is allowed within the I-1 Rural Industrial District. Outlets or emergency overflows to control lake levels may be designed in conjunction with and at the time of future development around the lakes.

As illustrated in the table below, the most significant difference between the build and No Build Alternatives is that under Alternatives 1-6, end use lakes will make up a substantial portion of the land cover and under the No Build, sparsely vegetated land will make up a substantial portion of the land cover. As described in the Reclamation Plan, one of the goals of the MDNR draft reclamation rules is to establish reclamation conditions consistent with the Sites' ecological subsection. The Project is in the Big Woods 222MB ecological subsection is. This is beneficial on a regional basis because much of the land in this subsection has been converted to agricultural land uses. The Big Woods ecological subsection is characterized in part by a prevalence of groundwater fed lakes which

are features represented by Alternatives 1-6.

Table 3.2-1 Land Cover Areas

Land Cover Type	Existing (Acres)	Alt 1-6 Reclamation (Acres)	No Build (Acres)
Active Mine Area	192	0	0
Grassland	158	303	278
Woodland	110	21	69
Shrubland	50	0	41
Sparse	42	17	193
Farmstead	28	0	0
Forest	29	20	20
Cropland	14	0	17
Water (Gifford Lake)	28	28	28
Water (Wetland/stormwater pond)	31	23	36
End Use Lake	0	270	0
TOTAL	682	682	682

Some or portions of the railyard and siding track may remain as part of final reclamation if the railyard can be incorporated into final development of the Site. In all cases, if the railyard or a portion of it remains, the result will be a reduction in some of the land cover categories. The railyards, which include siding track and a rail load out area are located immediately adjacent to the existing UP and US 169 right-of-ways where current land cover is predominantly active mine area including haul roads. The overall impact to land cover if a railyard stays upon final reclamation is a reduction in grassland and a slight reduction in the size of the end use lakes as the edge treatments move inward from the perimeter of the mine and the area beneath the siding tracks is not mined. Table 3.2-2 illustrates the effect of keeping the railyards on-site as part of final reclamation. As illustrated on the table there is little overall impact to the final land cover types if the railyard(s) remain at the conclusion of mining to support some other type of future use.

Table 3.2-2 Effect of Maintaining Railyard Post Reclamation

Alternative	Railyard (Acres)	Reduction in Grassland (Acres)	Reduction in End Use Lake (Acres)
Alternative 1	37	25	12
Alternative 2	32	15	17
Alternative 3	17	8	9
Alternative 4	20	17	3
Alternative 5	15	7	8
Alternative 6	17	8	9

3.2.4 Mitigation

No significant adverse environmental effects associated with land cover have been identified. Mitigation is limited to the following:

- a) An approved Reclamation Plan and associated Reclamation Bond will provide certainty of Site stabilization and development of the proposed land covers associated with the Reclamation Plan.

3.3 Fish, Wildlife, and Ecologically Sensitive Resources

The SDD identifies the following items to be addressed in the DEIS:

- a) The EIS will evaluate potential impacts to rare features. A field study of the Project Area will be conducted to help address whether the proposed Project has the potential to adversely affect rare features.
- b) The EIS will address indirect impacts to on-site or adjacent native plant communities including the introduction or spread of invasive species.
- c) In coordination with MDNR, a natural resources survey has been conducted in areas where rock outcroppings or native prairie were identified on the Site that may be impacted by the Project. The survey results will be presented in the EIS. Sufficient information will be presented to adequately describe the environmental impact of the proposed Project. Ecologists will report on results from surveys for state-listed plants and animals and provide additional analysis of the biodiversity significance of the Site.
- d) The EIS will provide recommendations for wildlife habitat reclamation as a component of the Reclamation Plan.
- e) If protected species are found on-site, the EIS will include an evaluation of alternatives that would avoid, minimize, or mitigate impacts to the protected population. If any of the Project alternatives result in the taking of a protected species, the EIS will include an analysis of the impact of the taking of these species on a statewide level and potential mitigation measures.
- f) The EIS will assess changes in habitat with the introduction of groundwater fed ponds.

3.3.1 Affected Environment- Fish, Wildlife, and Ecologically Sensitive Resources

The EIS will present the results of the natural resources survey.

Barr Engineering prepared a Vegetation, Wildlife, and Protected Species Report (Vegetation and Wildlife Report) to identify and document biological resources at the Site¹¹. The report includes the results of surveys conducted to identify vegetative communities, wildlife species, wildlife habitat, and any federal or state-listed threatened or endangered species present on the Site. Barr conducted the field surveys in accordance with a Natural Resources Survey Plan (Survey Plan) submitted to the MDNR and included additional target species and communities, as well as specific requirements for field survey and reporting requested by the MDNR. All survey protocols followed those described in the Survey Plan and recommendations from the MDNR. The report included an additional 270 acres owned by Mid America Festivals Inc., located to the southwest of the Site, which were originally part of the Project Area but have subsequently been removed. Information presented below is for the current Project Area and does not include results that are relevant to Mid America Festivals Inc.'s property. Because the Project is not anticipated to adversely affect the river ecosystem, fish or mussel surveys were not conducted.

The Minnesota Biological Survey (MBS) identifies and maps sites of biodiversity significance in the state and assigns rankings to these sites to estimate the statewide importance of the native biodiversity for each area. Rankings guide conservation and management of natural resources. Rankings include sites of Outstanding, High, Moderate, and Below Biodiversity Significance. The Site does not include any areas identified as Outstanding, High or Moderate Biodiversity Significance by the MBS.¹² The Site's "Below" ranking indicates that the property generally lacks occurrences of rare species and natural features or does not meet MBS standards for Outstanding, High, or Moderate rank. There is an area of High Biodiversity Significance located off-site, southwest of the Project Area, in a portion of the Louisville Swamp Unit of the National Wildlife Refuge.

3.3.1.1 Rare Features: State and Federal Regulations

Endangered species regulations are designed to protect populations of threatened and endangered plant and animal species (protected species). For projects that have a potential to adversely affect protected species, the project proposer must consult with appropriate state or federal agencies to demonstrate avoidance and minimization. If a project is likely to directly affect a protected species, a takings permit may be required.

Three federal laws provide protection of certain species and each is administered by the U.S. Fish and Wildlife Service for non-marine species. First, the Endangered Species Act (ESA) of 1973 (16 U.S.C. §1531) protects federally listed threatened or endangered species, which are designated under federal law (16 U.S.C. § 1532). Second, the Migratory Bird Treaty Act (16 U.S.C. §§ 703711) is a treaty between the United States and other nations for the protection of birds that cross country borders during spring and fall migration. Third, the Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d) provides for the protection of eagles.

¹¹ Barr Engineering Company. 2012. Vegetation, Wildlife, and Protected Species Report Prepared for Merriam Junction Sands Mine Scott County, Minnesota. Dated January 2012, Minneapolis, MN.

¹² Minnesota Department of Natural Resources, 2014. Areas of Biodiversity Significance in Minnesota as determined by the MBS, 1987-2014. Division of Ecological and Water Resources, 06/2014. St. Paul, Minnesota. Retrieved online from:

http://files.dnr.state.mn.us/eco/mcbs/maps/areas_of_biodiversity_significance.pdf

Another level of protection for certain species is administered by the MDNR. Minnesota's Endangered Species Statute (Minnesota Statutes, § 84.0895) and associated rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) protect plant and wildlife species designated as threatened or endangered. A third category of listed species is “special concern”. State special concern species have no legal protection but because they are uncommon, have highly specific habitat needs, or are recovering from a delisting from threatened or endangered status, they are monitored by the state.

3.3.1.2 Threatened or Endangered Species:

No state or federally listed threatened or endangered plant or animal species were identified on the Site or are expected to occur on the Site.

3.3.1.3 Other Wildlife Species of Special Concern

Three wildlife species of concern were identified on-site during the Barr Engineering field studies; the bald eagle, the brown myotis and big brown bat which are discussed in further detail below. In addition to these three species, a snapping turtle was noted on the Site during the field study. Snapping turtles were delisted as a special concern species in 2013. Lark sparrows, a special concern species, was also noted but were identified off-site approximately 3,000 feet from the proposed mining limits.

Bald Eagle: One species tracked by the MDNR in the biotics database, the bald eagle, was found on-site. Historically, the bald eagle was on the federal list of threatened and endangered species and was also listed as threatened in Minnesota. However, due to a successful recovery plan, the number and range of bald eagles has expanded in Minnesota, other states and Canada. As a result, in 1996 the state status of bald eagles was changed from threatened to special concern. In 2007, the bald eagle was delisted from the federal list of threatened and endangered species. Bald eagles and their nests are still protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

Initial wildlife field surveys identified one adult and three juvenile bald eagles on the Site within floodplain forest along the eastern edge of Gifford Lake. These birds were observed congregating within a large tree located directly over the lake shore. No nest was observed in the vicinity. Because of this observation and because there are known records of nesting bald eagles in this area, the USFWS recommended that nest surveys be conducted to assess the potential for active bald eagle nests within or near the Site. As a follow up, Barr conducted a stick nest survey¹³ following a work plan detailing survey methods which was reviewed by the USFWS. The survey included the Site and extended one-half mile beyond the northern, western and southern Site boundaries. Property to the east of the Site across the US 169 corridor was not included in the stick nest survey extent.

¹³ Barr Engineering Company 2012. Bald Eagle Stick Nest Survey Report. Merriam Junction Sands Project Scott County, Minnesota. March 2012. Minneapolis, MN.

The survey identified one eagle stick nest within one-half mile of the Site and one unidentified (raptor or other large bird) stick nest on the Site itself. The active eagle nest was identified approximately 1,300 feet west of the Site boundary, across the river from the Site. The nest is located near a snowmobile/horse/biking/hiking trail with hunting and other recreational activities nearby.

The other stick nest identified within the survey area is located on the Site itself in the wooded area adjacent to Gifford Lake. It is near on-going mining activities, horse and hiking trail, festival events, and other recreational activities. It is an inactive nest that is significantly smaller than a bald eagle nest.

Brown Myotis and Big Brown Bat: According to the biotics database review for the Site, there is likely a colony of little brown myotis and big brown bats along Gifford Lake near the western edge of the Site. These two species of bats are listed as species of special concern in Minnesota. Special concern species are not regulated and do not have any special legal protections under state law. No bats were observed during the field surveys, (which were conducted during daylight hours). Potential bat habitat, forests and woodlands on the Site are likely suitable for summer roosting sites and foraging habitat for both species, especially over the open water areas of Gifford Lake. Most of the suitable summer roosting sites that are located on the Site likely occur along the western edges of the Site within the floodplain of the Minnesota River or along the adjacent forested slopes. Both species of bats over-winter in caves, which are not present on or near the Site.

Northern Long Eared Bat: While not identified in the area, the northern long eared bat is a Minnesota listed species of special concern which was also designated a federally threatened species by the USFWS in April 2015. The federal listing is a result of a significant population decline due to the white nose syndrome. In areas of the country impacted by white nose syndrome, which includes Minnesota, incidental take is prohibited if it occurs within a hibernation site for the northern long-eared bat. Tree removal activities within a quarter-mile of a known hibernaculum or removal of an occupied maternity roost trees, or any other trees within 150 feet of that maternity roost tree, during the pup-rearing season (June 1 through July 31) is prohibited. While the range of the northern long eared bat includes Scott County, they have not been identified on or near the Site. Based on information from the MDNR and the USFWS, there are no known hibernacula or roost trees in Scott or Carver County¹⁴. The USFWS has further determined that designating critical habitat for the summer habitat of the northern long eared bat would not benefit the species. Northern long-eared bats use a wide variety of forested areas in summer to find food and raise their young and are highly flexible in how they meet these needs. The USFWS determined that there are no specific physical habitat features essential to its conservation.¹⁵

¹⁴ MN DNR and U.S. Fish and Wildlife Service, 2016. Townships Containing Documented Northern Long-Eared Bat (NLEB) Maternity Roost Trees and/or Hibernacula Entrances in Minnesota, April 1, 2016. Retrieved online from http://files.dnr.state.mn.us/eco/ereview/minnesota_nleb_township_list_and_map.pdf

¹⁵ US Fish and Wildlife Service 2016. Press release retrieved online from: https://www.fws.gov/news/ShowNews.cfm?ref=u.s.-fish-and-wildlife-service-determines-critical-habitat-is-not-prudent-&_ID=35584

3.3.1.4 Wildlife Assemblages and Other Wildlife

Two colonies of bank swallows were identified within the Site. Both colonies consisted of hundreds of nesting pairs occupying the slopes of sand stockpiles located within a previously mined area. The nests were active during the June, July, and August site visits, but by the last site visit in September, swallows were no longer present, and the nests had presumably been vacated. Bank swallows are not federally or state-listed species; however, they are protected under the federal Migratory Bird Treaty Act. The Migratory Bird Treaty Act makes it unlawful, unless permitted by regulations, to pursue, hunt, take, capture, or kill any migratory bird, or any part, nest, or egg of such bird.

The field studies documented other species of wildlife considered common and at low conservation risk on-site. A total of forty species of birds, seven mammals, and nine reptiles and amphibians were identified. Birds commonly observed within the study area include wild turkey, American goldfinch, barn swallow, black-capped chickadee, chipping sparrow, mourning dove, and cedar waxwing. Mammal tracks and scat commonly found on-site, including in active mine areas, were that of deer, coyote, and raccoon. Northern leopard frogs were abundant and found in nearly every habitat type.

3.3.1.5 Native Plant Communities

Native plant communities are groups of native plants that have not been greatly altered by human activity over space and time. Most native plant communities have no legal protection in Minnesota. Walk-over surveys were conducted on the Site to document plant communities and vegetation structure and composition, and to search for rare and protected plant species. Native plant community searches specifically targeted prairie, wetland, and floodplain forest, which have previously been identified in the Project Area. Prior to field studies, reviews were conducted of preferred habitats, plant associations, and characteristics of species most likely to be in the area.

Vegetation was designated as a native plant community when sufficient native species were present to allow classification based on the Ecological Classification System developed by the MDNR and USFWS for ecological mapping and landscape classification. The system uses associations of biotic and environmental factors, including vegetation, hydrology, landforms, soils, and natural disturbance regimes.

Native plant community designations are not identical to the land cover designations discussed in Section 4.2 above. Specifically, native prairies can include communities with extensive prairie vegetation that have become dominated by shrubs and small trees. In addition, land cover designations may include areas that would not meet the minimum quality or size criteria used by the MBS. Therefore, there are differences between the land cover designations described in Section 3.2 and the native plant community designations discussed below.

The Vegetation and Wildlife Report indicates that substantial portions of the Site area have been disturbed and support non-native plant communities or highly degraded native plant communities. There were four native plant community types identified on-site: dry prairie, oak woodland, wet meadow/shrub carr, and bulrush marsh. Frequently, these communities had a significant

representation of non-native, exotic, or invasive species, but could still be classified as native plant community. These native plant communities make up approximately 14% of the total Site area. Some of these native plant communities that were identified have been altered and fragmented by existing developed areas and past and present mining activities. In addition, two areas of altered oak woodland have also been identified. These have been significantly altered by human activity including the presence of numerous buildings, roads, and removal of understory associated with the booth and campground areas of the Renaissance Festival grounds. Nonetheless these were mapped as an altered native plant community due to the presence of burr oak and proximity to less altered stands.

Native plant communities identified on the Site are indicated on Figure 3.3.1: *Native Plant Communities* and are described below.

Dry Prairie (Ups 13b)

About 48.8 acres of dry sand-gravel prairie (Southern) communities were mapped in the southern portion of the Bryan Rock property, primarily located just north of 145th Street as well as a small area located on the western boundary of the Bryan Rock property located south of 145th Street. The dry prairie community type has a conservation rank S2, imperiled¹⁶. This unit is characterized by well drained soils over shallow bedrock with rock exposures on top of small knobs.

The dry prairie found on the Site is degraded and somewhat variable. The condition of the native prairie communities was ranked according to the MBS Upland Prairie System – Condition Ranking System¹⁷. The dry prairie community on the Site is considered D-ranked (poor condition) primarily because of the heavy invasion of woody plants (e.g., smooth sumac, red cedar, and prickly ash). D-ranked prairies have enough native species to be recognizable as a particular native plant community, but typically have a predominance of non-native plant species and a low diversity native species, including few sensitive species. The majority of the map unit is dominated by shrubs and is mapped as shrubland in the land cover and wildlife habitat sections of the Wildlife and Vegetation Report. At the request of Scott County, Bryan Rock has periodically sprayed this area to control noxious weeds.

Native grasses found in this community include predominantly big bluestem and Indian grass grasses. Other common native grasses that are present in this community include side-oats grama, little bluestem, bracted sedge, blue vervain, awl aster, field goldenrod, bird's foot violet, and wolfberry. Grazing sensitive species including purple prairie clover, false boneset, dropseed are present but uncommon. Non-native grasses identified within this community include smooth brome, Kentucky bluegrass, quack grass and timothy.

¹⁶ "MCBA Upland Prairie System – Condition Ranking System." Minnesota Biological Survey. Minnesota Department of Natural Resources. September 2014 version.
http://files.dnr.state.mn.us/eco/mcbs/upland_prairie_system_ranking_guidelines.pdf

¹⁷ "MCBA Upland Prairie System – Condition Ranking System." Minnesota Biological Survey. Minnesota Department of Natural Resources. September 2014 version.
http://files.dnr.state.mn.us/eco/mcbs/upland_prairie_system_ranking_guidelines.pdf

Without recurrent fire, the native prairie community is susceptible to succession to woodland or forest through the invasion of trees and shrubs, which is the case of the native prairie communities located on the Site. Inset 3.3-1 illustrates the predominance of shrubs in the area delineated as dry prairie (Ups13b) in the Vegetation and Wildlife Report.

Inset 3.3-1 Dry Prairie Plant Community Dominated by Shrubs



Oak Woodland (FDs37)

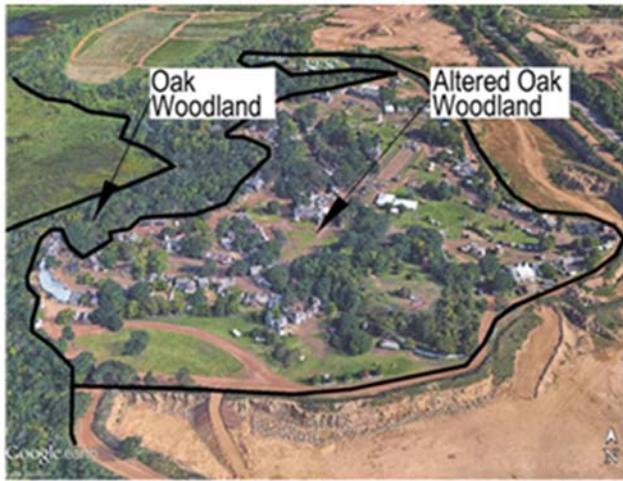
Southern dry-mesic oak (Maple) woodland (FDs37) is generally found in the Project Area on steep uplands above the Minnesota River floodplain; this community type has a conservation rank S3 (vulnerable to extirpation) or S4 (apparently secure)¹⁸. About 27.5 acres of oak woodland occur on the Site. The predominant canopy species is burr oak but northern pin oak and red oak are also present. Many oaks appear to be open-grown and have diameters at breast height of 18 to 24 inches. Typical smaller canopy and subcanopy trees include cottonwood, American elm, green ash, and occasionally hackberry, basswood, and hop hornbeam. The shrub and sapling layer is generally multi-layered with dense growth of smooth sumac, prickly ash and the invasive non-native species common buckthorn. Under the densest shrub cover herbaceous understory is sparse but more open areas have native forbs and graminoids including hog peanut, sweet cicely, wild ginger, Canada mayflower, lopseed, wild sarsaparilla, Pennsylvania sedge, large-leaf aster, and large-flowered bellwort. Herbaceous non-native species indicative of ecological degradation are common and include Kentucky bluegrass, red fescue, dandelion, and clover.

This plant community is considered to be fire-dependent woodland that historically would have experienced regular ground fires and occasional catastrophic fires. The dense shrub and sapling growth and thick forest canopy of sub-dominant trees indicates that fire has been excluded from these woodlands for decades.

¹⁸ "Conservation Status Ranks for Native Plant Community Types and Subtypes." Minnesota Department of Natural Resources. August 31, 2009.

http://files.dnr.state.mn.us/natural_resources/npc/s_ranks_npc_types_&_subtypes.pdf

Inset 3.3-2 Oak Woodland and Altered Oak Woodland



bur oak in the canopy and proximity to less altered stands allows recognition of this community as oak woodland, albeit significantly altered. Inset 3.3-2 illustrates both altered and unaltered oak woodland plant communities.

Oak Woodland (FDs37) Altered

There are two areas of altered oak woodland on the Site which encompass a total of approximately 43 acres. This altered native plant community includes the Renaissance Festival booth site and campground area. The altered communities have dominant oak canopies of varying density from which many canopy trees and understory plants have been removed. There are roads and buildings scattered throughout the altered woodland. Groundcover has largely been replaced by planted grasses, however, the presence of a

Wet Meadow/Shrub Carr (WMs83)

A large wetland complex in the southwestern portion of the Malkerson Sales property includes 3.8 acres of wet meadow and about 13.5 acres of shrub carr adjacent to floodplain wetland. The wet meadow/shrub carr community has a conservation rank S3 (vulnerable to extirpation) or S4 (apparently secure). The southern end of this wetland is higher in elevation than the portions connected to the Minnesota River and is above the elevation of typical floodwaters from the river. Much of the southern end of the wetland is native-dominated sedge meadow or shrub-carr with hydrology supplied via groundwater seepage from the base of the adjacent slopes.

The wet meadow/shrub carr community qualifies as a rare natural community under the Wetland Conservation Act. It is considered high quality and supports a large number of native wetland species including tussock sedge, lake sedge, water sedge, prairie sedge, porcupine sedge, inland sedge, wire sedge, wooly sedge, bluejoint, cattails, American sweet flag, blue iris, spotted touch-me-not, marsh fern, marsh marigold, swamp milkweed, bugleweed, Joe-Pye-weed, and boneset. Native shrubs include pussy willow, Bebb's willow, sage willow, meadow willow, bog birch, and false indigo. Invasive species are limited in this wetland, with localized areas of common reed and scattered individuals of purple loosestrife. The wet meadow grades into the shrub carr native community with more shrubs and large patches of reed grass.

Bulrush Marsh (MRn93a)

A small sliver of marsh, encompassing 3.0 acres, is located just west of the shrub carr wetland community, along the western boundary of the Site. This portion of the wetland complex is susceptible to flooding by the Minnesota River. As result, the wetland contains non-native species

and the quality of rank is low, probably CD or D.¹⁹ Dominant species include river bulrush and cattails, with substantial stands of common reed. A narrow stream channel passes through this marsh area and conveys water when this community is not flooded.

3.3.1.6 Rock Outcrops (ROs12)

No rock outcrop native plant communities are located on-site. Shallow rocky soils were observed at several locations in prairie remnants but lacked rock outcrop specialist species.

3.3.1.7 Other Plant Communities

79% of the Project Area is primarily vegetated by introduced species, either through deliberate management or indirectly as a result of previous agricultural and mining activities and other land disturbances. Most of the active and previously mined areas have little or no soil, and the ground surface consists of gravel and rock and is considered sparsely vegetated. Other previously mined areas have been converted or transitioned to grassland, second growth forest, saplings and seedlings, cropland and wetland (which include on-site stormwater and process water ponds). These communities contain little or no vegetative cover or non-native species have developed following land disturbance. Previously unmined areas that do not contain native plant communities or altered native plant communities include grasslands, Gifford Lake, and wetland. Some areas are used for crop production. Table 3.3-1 Existing Plant Communities, lists the types and sizes of plant communities found on the Site.

Table 3.3-1 Existing Plant Communities

Plant Community	Total Area (Acres)	Percent of Project Area	Percent of Project Area
Dry Prairie (Ups 13b)	48.8	7.16	14.17
Oak Woodland (FDs37)	27.5	4.03	
Wet Meadow/Shrub Carr (WMs83)	3.8/13.5	2.54	
Bulrush Marsh (MRn93a)	3.0	0.44	
Oak Woodland (FDs37) Altered	43.3	6.35	6.35
Sparely Vegetated	233.1	34.18	79.49
Grassland	184.9	27.11	
Second Growth Forest	38.8	5.69	
Saplings/Shrubs	31.2	4.57	
Cropland	14.3	2.10	
Wetland	12.0	1.76	
Gifford Lake	27.8	4.08	
Total	682	100%	100%

¹⁹ Minnesota Department of Natural Resources 2011. Email correspondence Melissa Doberalski to Danial Tix and Randy Duncan (Barr Engineering Company) September 11, 2012.

3.3.2 Environmental Consequences- Fish, Wildlife, and Ecologically Sensitive Resources

The EIS will evaluate potential impacts to rare features.

3.3.2.1 Rare Features:

No state or federal listed threatened or endangered plant or animal species were identified on the Site. Three species of special concern were identified on or near the Site: bald eagle, brown myotis and big brown bat. The potential of the Project to impact these species of special concern is related to changes in the wildlife habitats of the Site and effects of disturbances by noise and or blasting. Due to the location of the species relative to disturbances to be created by the Project, no adverse impact to these species is expected.

Bald Eagle: In general, bald eagle habitat on the Site was determined to be poor quality because most of the remaining trees are secondary growth and would not likely be selected by bald eagles for nesting. The stick nest survey did not identify any active bald eagle nests on the Site itself. One active bald eagle nest was identified within one-half mile of the Site and two others were identified outside of the one-half mile study area.

The bald eagle nesting season generally extends from late January, with courtship and nest building activity, through July with the fledging of young birds from the nest. According to USFWS' 2007 National Bald Eagle Management Guidelines (Eagle Management Guidelines)²⁰, sensitivity to human activity is greatest during the courtship and nesting phase where nests may be abandoned as a result of disturbance from human activity, however, the sensitivity to human disturbance remains high throughout the entire nesting period. Not all bald eagle pairs react to human activities the same way. Some pairs are much more tolerant to human activity than other pairs. Visibility to human activity from their nest, duration, noise levels, and previous experience with human activity all play a role on the impact human activity has on a pair of nesting eagles. Eagles are more prone to disturbance when an activity occurs in full view. Activities that may cause disturbance include activities that may startle, cause them to flush from the nest, or disrupt foraging and feeding schedules. Human activities that cause a response that leads to injury, a decrease in productivity, or nest abandonment could be considered a violation of the Eagle Act.

Mining activity that startles or disturbs nesting eagles has the potential to harm nesting eagles, their eggs or the young eagles. Mining activity, including blasting and processing, currently occurs throughout a portion of the nesting season. According to the Eagle Management Guidelines, eagles are unlikely to be disturbed by routine use of roads, homes, and other facilities where such use pre-dates the eagles successful nesting activity in a given area and in most cases, ongoing existing uses may proceed with the same intensity with little risk of disturbing bald eagles. Mining, processing, and blasting, the same activities that are proposed, have been on-going at the Site for the past 50 years. The Project will maintain the seasonal nature of mining, blasting and most processing, typically

²⁰ U.S. Fish and Wildlife Service, 2007 National Bald Eagle Management Guidelines. May 2007

beginning mid-April. Some processing, drying and screening, which will occur primarily in an enclosed building, may occur year round.

The Eagle Management Guidelines include measures developed to avoid disturbing nesting bald eagles. These measures are presented on Table 3.3-2, Activity Specific Guidelines for Avoiding Bald Eagle Disturbance. The numerical distances shown in the table are the closest the activity should be conducted to the nest. Mining and associated activities are considered Category B (as shown in Table 3.3-2) activities. Although there are similar activities occurring closer than one mile from the nest (current mining activity) the Project buffers exceed by a significant amount even the more restrictive 660 foot buffer distance recommended by USFWS.

The Project will maintain extensive vegetative and distance buffers from the eagle nests. The closest mining and processing activities will be located over 2,000 feet from any identified eagle nests. Blasting will be setback over 3,000 feet from any of the identified eagle nests. Given the distance from eagle nests to active mining and processing areas, the presence of on-going mining, processing and blasting from the past several decades on the Site, the vegetative cover in the buffer area between the nests and the mine limits, the Project will not have a significant effect on the bald eagle nesting sites.

Table 3.3-2 Activity Specific Guidelines for Avoiding Bald Eagle Disturbance

	If there is no similar activity within 1 mile of the nest	If there is similar activity closer than 1 mile of the nest
If the activity will be visible from the nest	660 feet. Landscape buffers are recommended.	660 feet or as close as existing tolerated activity of similar scope. Landscape buffers are recommended.
If the activity will not be visible from the nest	<p>Category A: 330 feet. Clearing, external construction, and landscaping between 330 feet and 660 feet should be done outside of breeding season.</p> <p>Category B: 660 feet.</p>	330 feet, or as close as existing tolerated activity of similar scope. Clearing, external construction, and landscaping between 330 feet and 660 feet should be done outside of breeding season

Bat Colonies: The Project will remove some of the trees located along Gifford Lake in the sand and gravel mining area. The Project will comply with Chapter 70 of the Scott County Zoning Ordinance, and there will be no intensive vegetation clearing within the shore impact zone, which is 75 feet, (one-half of the structure setback) from the ordinary high water level (OHW) of Gifford Lake. Vegetation removal associated with the proposed sand and gravel mining adjacent to Gifford Lake will result in a reduction of second growth forest of approximately 4.0 acres from 38.8 acres to 34.8 acres on the Site itself. The four acres where trees may be cleared is a thin strip along the outer edge of the wooded area. The wooded area adjacent to Gifford Lake continues off the Site along the southeastern edge of Gifford Lake for over 2,000 additional feet and transitions from second growth

forest into oak woodland, providing a continuous buffer of woodlands along the eastern shoreland of Gifford Lake that is more than 25 acres in size.

Bats often roost based in proximity to water and prefer to forage over open water or near shorelines and along edge habitat. Transition between two types of vegetation is important for little brown bats as they migrate and forage.²¹ The sand and gravel mine area adjacent to Gifford Lake is in a currently developed area where there are several existing commercial and agricultural buildings, residences, and horse stables with a few scattered trees. This area provides limited habitat value for roosting and foraging bats. The area is also lighted to various degrees adjacent to existing buildings, some of which are located immediately adjacent to the tree line. When the area is mined for sand and gravel and the buildings are removed, there will be no lighting of the tree line or potential roosting areas of the bats.

3.3.2.2 Native Plant Communities

The EIS will address indirect impacts to on-site or adjacent native plant communities

The Project proposes to remove 48.8 acres of dry prairie (Ups13b), 20.8 acres of oak woodland (FDs37), and 43.3 acres of altered oak woodland. These native plant communities have no legal protection in Minnesota. The Project will avoid all impacts to the wet meadow/shrub carr (WMs83) and bulrush marsh (MRn93a) communities. (The potential for indirect impacts to the wetland complex as a result of groundwater dewatering is evaluated in Section 3.4 Physical Impacts on Water Resources). The wet meadow/shrub carr qualifies as a rare natural community and as such, under the Wetland Conservation Act, has certain legal protection if a wetland replacement application were to be pursued.

The dry prairie located on the Site is considered D-ranked (poor condition) by the MBS primarily because of the heavy invasion of woody plants (e.g., smooth sumac, red cedar, and prickly ash). According to the MBS, D-ranked prairies have little chance of recovery to their natural or historic condition²². This is especially true due to the prevalence of shrubs across the area which are resistant to prescribed burns. The loss of this degraded native plant community is not considered a significant adverse environmental effect.

A buffer of oak woodland will be preserved and maintained along the entire edge of the wet meadow/shrub carr wetland. The width of the buffer will vary but will be an average width of 65 feet along the entire wetland edge. Along the wet meadow, which contains the highest quality of native plant community, the buffer will be 100 feet wide. Along the shrub carr portion of the wetland the buffer will vary from 30 to 100 feet in width. The width of the wetland buffer increases to 200 to 300 feet where the wetland complex continues off-site to the north. A strip of oak woodland runs along

²¹ Little Brown Bat (*Myotis lucifugus*) Species Guidance. WI Dept. of Natural Resources <http://dnr.wi.gov/files/pdf/pubs/er/er0705.pdf>

²² "MCBA Upland Prairie System – Condition Ranking System." Minnesota Biological Survey. Minnesota Department of Natural Resources. September 2014 version. http://files.dnr.state.mn.us/eco/mcbs/upland_prairie_system_ranking_guidelines.pdf

the entire eastern most edge of the wetland continuing north and connecting to the wooded area along the eastern edge Gifford Lake.

South of the wet meadow native community, the wetland complex extends up into a hayfield/parking area and is of very low quality. The western edge of the wetland is adjacent to non-native grassland and Renaissance Festival parking. The buffer along this portion of the wetland complex will be an average of 40 feet and vary from 35-100 feet where it transitions into the wet meadow buffer area.

The proposed buffer for the wet meadow/shrub carr wetland area meets and exceeds the Scott County requirements for wetlands of exceptional value. Based on the County definition, exceptional wetlands are wetlands that are most susceptible to human impacts, are most unique, have the highest community resource significance such as rare species habitats, and similar characteristics. The proposed wetland buffer for the non-native community low quality portion of the wetland meets and exceeds the buffer requirements for medium value wetlands. Medium value wetlands typically provide a diversity of habitats and are connected to other wetland or upland habitats to provide wildlife habitat²³.

Table 3.3-3 Scott County Wetland Buffer Requirements

Buffer Requirement	Exceptional	High	Medium	Low	Stormwater Ponds
Average Buffer Width	65 feet	50 feet	35 feet	25 feet	0
Minimum Buffer Width	25 feet	25 feet	25 feet	25 feet	0

A dry prairie native plant community which includes a population of kittertails, a state protected species is located off the Site, across the UP's spur track that is located alongside the southwestern portion of the Site. The 100 foot railroad right-of-way and siding track separates this plant community from the Project Area. Areas within the Louisville Swamp Unit just south of 145th Street also contain native plant communities. The area is designated as an area of high biodiversity significance with dry sand-gravel oak savanna and pin oak-burr oak woodland. Mining limits are located over 200 feet from the mapped native plant communities and separated by both UP right of way and 145th Street.

Upon final reclamation, native grasses will be planted along the edge of the mine adjacent to the oak woodland buffer, to the benched limestone and water's edge providing further protection from invasive species. The establishment of the end use lakes will provide additional buffer from non-native invasive plant species to the west of the wet meadow/shrub carr community greater than 1,000 feet. Native grasses planted along the southern boundary of the Site will provide a buffer to off-site native plant communities to the south and southwest of the Site.

²³ Scott County Zoning Ordinance No. 3 Chapter 6 Stormwater Management Erosion Control and Wetlands. Retrieved online at <https://www.scottcountymn.gov/documentcenter/view/1428>

3.3.2.3 Wildlife Habitat as a Component of the Reclamation Plan

The EIS will provide recommendations for wildlife habitat reclamation as a component of the Reclamation Plan.

Wildlife habitat surveys generally observed many species of wildlife considered common and at low conservation risk. This habitat, which has largely been created from mining throughout the years will persist throughout the life of the Project. Reclamation will leave the Site with an increased diversity of wildlife habitat with the creation of the end use lakes over portions of the Site and open space areas around the perimeters of the lakes adjacent to public lands. Buffer areas with existing woodlands will be maintained. The Reclamation Plan also calls for maintaining or establishing woodlands near the second growth forest adjacent to Gifford Lake, near the northern end of the wetland complex and adjacent to the southernmost end of the wetland complex.

Reclaimed shoreland and key perimeter areas will be revegetated using native grasses in accordance with the Reclamation Plan. Reclamation will consist of backfilling areas around the perimeter of the end use lakes and mine limits and seeding these areas to establish vegetation and stabilize the Site. Seed mixes are expected to vary in accordance to the slopes, drainage characteristics, and anticipated moisture conditions of the areas to be reclaimed. Non-native grasslands will be established over the areas designated for potential future development.

Reclamation will establish a variation in the vegetation across the Site and provide diversity in flora and wildlife habitats. Once established, native prairie grasses can provide a self-sustaining, low maintenance long-term cover. Under reclaimed conditions, this Site will be more integrated with adjacent public lands and provide more ecological diversity than currently exists. Vegetation around the open water bodies will help to filter and remove nutrients and pollutants, providing protection for water resources associated with the open water areas and the adjacent wetland complex.

The southern and western perimeter will provide a well suited transition of contiguous wildlife habitat to the public lands to the west and south of the Site. The vegetated buffer around the perimeter of the end use lakes will also help protect the water quality of the end use lakes. Overall, reclamation will result in larger habitat patches, higher quality native vegetation, and better habitat and plant species diversity than currently existing on-site today.

3.3.2.4 Habitat Changes Associated with End Use Lakes

The EIS will assess changes in habitat with the introduction of groundwater fed ponds.

The end use lakes and associated shoreline will have a direct beneficial effect on wildlife habitat diversity. Several species that pass through the area in migration may use the open water and shoreline of the lake, some may breed and become permanent residents, and the open water may also be used by eagles for foraging.

The end use lakes are similar in size to naturally occurring groundwater fed lakes found throughout the area. For example, Christmas Lake in Hennepin County is a naturally occurring groundwater lake encompassing approximately 260 acres. According to the MDNR Lake Finder application, Christmas Lake is 87 feet deep and is suitable for swimming and wading, with good clarity and low algae levels throughout the open water season. Although not a designated trout lake, Christmas Lake is stocked with trout and is considered one of the higher water quality lakes in the metropolitan region. The high water quality associated with Christmas Lake is in part due to its significant depth and low watershed to water body ratio. Another example is Little Long Lake in Hennepin County. Little Long Lake is a deep, cool, clear groundwater fed lake encompassing approximately 55 acres. The lake is 76 feet deep and due to its clarity, depth, and high water quality also is able to support a stocked rainbow trout population.

In addition to naturally occurring groundwater fed lakes, there are a number of examples of end use lakes created as a result of mining operations throughout the state including: several deep mine pit lakes in the iron range; Quarry Park in Stearns County, with two quarry lakes that are designated for swimming, one that is 116 feet deep with high rock formations and another that is 40 feet deep with a sandy beach²⁴. Courthouse Lake in Chaska, a manmade mine lake that is a designated trout lake; Lac Lavon in Apple Valley/Burnsville; the future lake at UMore, a 376 acre 80 foot deep lake; and the future lake at the Kraemer Mining and Materials quarry in Burnsville which will encompass over 300 acres approximately 90-100 feet deep once current dewatering activity ceases.

The water quality of the end use groundwater fed lakes is expected to be excellent. Phosphorus is typically the limiting nutrient in freshwater lakes. High levels of phosphorus cause algae blooms and contribute to poor water quality. By controlling stormwater flows into the lake and diverting regional stormwater flows around the end use lakes, inputs of phosphorus to the lake (which can occur when phosphorus is attached to soil particles that are carried in the stormwater flows) will be limited. The lakes will have a low watershed to lake ratio which will further reduce the introduction of phosphorus from outside sources into the lakes. Finally, the deeper areas of the lakes will provide the opportunity for phosphorus containing sediments to settle to the bottom of the lake and eventually be covered by sediment, removing them from recirculation.

Deep water lakes with low nutrient content typically sustain higher dissolved oxygen levels in the lower elevations of the lake where temperatures are low. It is likely that the lakes will be of high enough quality to support a trout population. As with many other groundwater fed lakes both naturally occurring and those created by mining in Minnesota, there may be opportunities to stock the lake and provide fishing and other recreational opportunities.

The creation of end use lakes will provide increased habitat diversity along the shorelines, adjacent upland areas as well as the open water areas when compared to habitat diversity of the current Site conditions or the No Build Alternative. The lakes themselves will be created over areas of the Site that have been or will be mined with the quarry floor characterized by sparse vegetation cover with limited wildlife habitat or plant diversity.

²⁴ Stearns County <http://www.co.stearns.mn.us/Recreation/CountyParks/QuarryParkandNaturePreserve>

3.3.3 Alternatives – Fish, Wildlife, and Ecologically Sensitive Resources

Each of the alternatives result in the same overall reclamation of the Site, and therefore resulting changes to wildlife habitat and ecologically sensitive resources are the same for all alternatives as discussed in Section 3.3 Environmental Consequences, above. The No-Build Alternative anticipates the continuation of mining on the Malkerson Sales Property with no reclamation requirements or establishment of wetland buffers, and the completion of mining on the Bryan Rock property in accordance with the approved reclamation plan. All mining is assumed to be above the water table and controls established including backfilling to maintain the mined areas above the 100-year floodplain on the Malkerson Sales property. It is anticipated that the floor of the quarries would remain sparsely vegetated until such time as final development occurs across the Site. Alternatives 1-6 represent enhanced habitat diversity, buffers and water quality protection compared to the No Build Alternative. Table 3.3-2 compares native plant community impacts between Alternatives 1-6 with the No Build Alternative:

Table 3.3-3 Alternatives 1-6 vs. No Build Alternative - Native Plant Community Impacts

	Alternative 1-6	No Build
Impact to Wetland Complex	No	No
Establish/Maintain Vegetated Buffer Around Wetland Complex	Yes 5.5 Acres	No
Removal of Oak Woodland Altered Native Plant Community	Yes 48.8 Acres	Yes 48.8 acres
Removal of Oak Woodland	Yes 20.8 Acres	Yes 14.8 Acres
Removal of D Ranked Dry Prairie Native Plant Community	Yes 48.8 Acres	No

3.3.4 Mitigation - Wildlife and Ecologically Sensitive Resources

The Project will not create significant adverse environmental impacts to threatened or endangered species, wildlife or ecologically sensitive areas. Substantial portions of the Project Area have been disturbed and currently support non-native plant communities or highly degraded native plant communities. Natural communities on the Site tend to be somewhat fragmented by developed areas and past and present mining activities. The majority of the contiguous natural habitat is along the western edges of the Site and the large wetland complex which the Project avoids. The Reclamation Plan will create an enhanced habitat diversity and protection of adjacent high quality native plant communities compared to the No Build Alternative. The following measures have been incorporated into the Project to prevent or minimize environmental effects related to wildlife and ecologically sensitive resources.

- Maintain 75 feet of existing second growth forest along the eastern edge of Gifford Lake to maintain bat colony roosting and foraging habitat adjacent to the open water.
- No lighting of the tree line along Gifford Lake
- If in the future, a northern long eared bat hibernaculum or maternity roost trees are identified within the area, follow USFWS regulations regarding tree removal during pup rearing season.

- Keep mining and processing activity at least 660 feet from known eagle nests during the nesting season (late January through late July).
- Maintain vegetative buffer along wetland complex.
- Reclaim the Site in accordance with the Reclamation Plan incorporating provisions to separate regional stormwater flows from the end use lakes and revegetation of upland areas including native grasses along the western and southern perimeter of the Site.

3.4 Physical Impacts on Water Resources

The SDD identifies the following items to be addressed in the DEIS:

- a) The EIS will include a wetland delineation completed in accordance with the criteria set forth in the USACE 1987 Manual and Regional Supplements. Wetland impacts will be mitigated in accordance with the 1991 Minnesota Wetland Conservation Act and Section 404 of the Clean Water Act. As part of the wetland delineation, springs and seeps will be mapped and characterized in relationship to the wetlands.
- b) The EIS will assess impacts from dewatering and surface drainage on the floodplain wetland and Gifford Lake.
- c) The EIS will include the development of a Natural Resources Plan which will include an evaluation of stormwater management and assess potential impacts to wetland areas as a result of proposed modifications to the existing stormwater system.
- d) Wetland replacement plans will be prepared as may be necessary if the Project proposes to impact any regulated wetlands within the Site or Project Area.
- e) The EIS will determine the existing watershed draining into and through the Site and determine both existing and future anticipated rates and volumes associated with full development of the watershed, to evaluate appropriate design of future stormwater conveyance measures through the Site upon final reclamation to preclude introduction of surface water runoff into the open water mine pits in the Jordan aquifer.

3.4.1 Affected Environment –Water Resources

Figure 3.4.1, Water Resources, illustrates the location of on-site and adjacent water resources that are described in Section 3.4.1.

3.4.1.1 On-Site DNR Protected Waters and Wetlands: Gifford Lake

Gifford Lake is a protected water located on the Site. Gifford Lake is located on and adjacent to the northwestern portion of the Site and is MDNR Protected Waters Inventory basin (#70-118P). It is also a federally protected navigable waterbody as it discharges directly into the Minnesota River. Gifford Lake is a shallow floodplain lake with a size of approximately 119 acres, a maximum depth of

approximately five feet and a normal water level of approximately 701.6 feet above msl²⁵. It is subject to frequent winter kill.

Gifford Lake has a direct watershed of approximately 970 acres. A large floodplain area to the south of the lake drains into Gifford Lake. Gifford Lake has two main basins. The upper basin is separated from the lower basin by the Old Highway 41 roadbed. There are two culverts running beneath the roadbed which connect the upper and lower basins and normalize the water level between the two basins. There is an open channel at the northern end of the Gifford Lake which drains to the Minnesota River and controls the normal water level of Gifford Lake. The water balance for Gifford Lake attributes 26% to groundwater inflow and 74% to surface water runoff and direct precipitation.²⁶

Gifford Lake is subject to frequent inundation by Minnesota River floodwaters, particularly in the spring of the year. Two flooding conditions exist. The first is when the river backs up through the outlet channel into the lower basin and through the culverts under Old Hwy 41 into the upper basin. This backwater flooding occurs with a probability of 89%, or approximately nine out of every ten years.² Gifford Lake also floods as a result of the river overtopping a dike on the south end of the lake. The overtopping creates a flow through condition of floodwaters from the River into the upper basin of Gifford Lake. The dike is overtopped at an elevation of approximately 706 feet above msl based on LiDAR data which corresponds to a probability of about 72% or seven out of every ten years. Flooding of Gifford Lake typically occurs for multiple days throughout the growing season, and sometimes over multiple separate flooding events. Routine flooding is a significant contributing factor in Gifford Lake's hydrology.

3.4.1.2 Nearby DNR Protected Waters and Wetlands:

Louisville Swamp is a MDNR Protected Waters Inventory Basin (#70-209P). Louisville Swamp is located over 2,300 feet to the southwest of the Site and is separated by the UP railroad and 145th Street West. Sand Creek and other unnamed tributaries to Sand Creek are also protected watercourses. Sand Creek flows into Louisville Swamp from the south and Picha Creek flows into Louisville Swamp from the east. These surface water contributions dominate the water balance for Louisville Swamp which has continual outflow through Sand Creek to the Minnesota River. Excess water flows out of the northwest end of Louisville Swamp through Sand Creek in a well-defined open channel to the Minnesota River. The protected watercourses are both over one-half mile from the Site.

Sand Creek is on the Minnesota Impaired Waters List. The impairments include Fishes Bioassessments, and Turbidity. The MPCA describes the overall condition of this segment of Sand Creek (Porter Creek to Minnesota River) as not supportive of a thriving fish community and other

²⁵Barr Engineering Company, 2014. Merriam Junction surface water balance analysis Technical Memorandum. Appendix A of Barr Engineering Company. Groundwater Modeling of Mine Plan Alternatives Predictive Simulation Report. Minneapolis, MN July 2019.

²⁶ Barr Engineering Company, July 2019. Groundwater Modeling of Mine Plan Alternatives Predictive Simulation Report. Minneapolis, MN

aquatic organisms due to excessive turbidity.²⁷ The Site does not drain to Sand Creek, Louisville Swamp or any watercourses that are tributary to Louisville Swamp.

The Minnesota River is a protected watercourse located 700 feet to 5,000 feet from the western boundary of the Site. The Minnesota River reach near the Site is on the Minnesota's Impaired Waters List. Impairments are for PCBs in Fish Tissue, Mercury in Fish Tissue, Mercury in Water Column, and Turbidity. The MPCA describes the overall condition of this segment of the Minnesota River (Carver Creek to River Mile 22) as suitable for swimming and wading, with low bacteria levels throughout the open water season and indicate that the river may not support a thriving community of fish and other aquatic organisms, as indicated by excessive turbidity (suspended solids).²⁸

The western boundary of the Site roughly parallels the floodplain of the Minnesota River and the floodplain extends just into portions of the western edge of the Site. The 100-year floodplain elevation varies from approximately 725 feet above msl in the southern portion of the Site to 724 feet above msl in the northern portion of the Site.

3.4.1.3 On-Site Wetlands

The EIS will include a wetland delineation completed in accordance with the criteria set forth in the USACE 1987 Manual and Regional Supplements. Wetland impacts will be mitigated in accordance with the 1991 Minnesota Wetland Conservation Act and Section 404 of the Clean Water Act. As part of the wetland delineation, springs and seeps will be mapped and characterized in relationship to the wetlands.

Site wetlands were delineated in two separate reports. One by Barr²⁹ which includes the southern portion of the Malkerson Sales property and the Bryan Rock property, and one by Svoboda Ecological Resources (Svoboda)³⁰, which included the central and northern portion of the Malkerson Sales property.

There are a total of three regulated wetland basins on-site, two wetland basins (S4 and S6) that are regulated under the WCA and one larger wetland complex (B4) that is regulated under both the WCA and the United States Army Corps of Engineers (USACE). There are other basins located on-site which were determined to be USACE non-jurisdictional and WCA incidental (unregulated) wetlands. These incidental basins were either created as a result of past mining operations or are active stormwater

²⁷ <https://cf.pca.state.mn.us/water/watershedweb/wdip/waterunit.cfm?wid=07020012-513&tab=Assesments>

²⁸ <https://cf.pca.state.mn.us/water/watershedweb/wdip/waterunit.cfm?wid=07020012-506&tab=Assesments>

²⁹ Barr Engineering Co. (Barr) 2011. Merriam Junction Sands Mine, Scott County, MN. Wetland Delineation Report (on portions of the property owned by Malkerson Sales Inc.). Prepared for Hunt Global Resources, Inc. October 2011.

³⁰ Svoboda Ecological Resources, 2011. Merriam Junction Sands Mine, Scott County, MN. Wetland Classification, Identification, and Delineation Report (on portions of the property owned by Malkerson Sales Inc.). Prepared for Hunt Global Resources, Inc. October 7, 2011.

or process water basins located on both the Malkerson Sales property and the Bryan Rock property that are not associated with a natural wetland basin. The WCA Notice of Decision was issued on February 15, 2012 which approved the wetland boundaries and identified incidental wetlands not subject to WCA regulation. The USACE issued a jurisdictional determination on April 10, 2015 that determined Gifford Lake and wetland B4 are the only jurisdictional waters on the Site.

Wetland S4 is 24,169 square feet (0.55 acres) in size. The wetland is classified as a Type 3, PEMFd Shallow Marsh wetland. Dominant vegetation consists of reed canary grass, various sedge species, red osier and dogwood and gray dogwood. Wetland S4 is a functioning stormwater basin associated with the active limestone mining operation located in the central portion of the Malkerson Sales property. It is a disturbed natural wetland that was partially isolated from the larger complex by the construction of a berm at its southern and western sides many decades ago. A ditch system connects wetland S4 at its north end and discharges stormwater to wetland B4 from mine areas on the Malkerson Sales property as well as stormwater runoff that originates further up the watershed (east of US 169) and flows onto the Malkerson Sales property through a culvert beneath the railroad tracks.

Although wetland S4 is used for stormwater treatment, it is located within a natural wetland area and therefore regulated under WCA. However, the ASACE determined it was not a jurisdictional wetland under Section 404 of the CWA because this basin is a stormwater treatment pond associated with active mining operations.

Wetland S6 is 9,257 square feet (0.21 acres) in size. S6 is an isolated wetland basin located within the floodplain of the Minnesota River. The wetland is classified as a Type 4, PUBFx, Deep Marsh, although the basin was dry at the time of the delineation. Dominant vegetation is located around the fringe area and consists of beggertick, cottonwood saplings, and amaranth species. This wetland was likely excavated during past mining activities but is located in a natural wetland area and therefore regulated under WCA. The USACE determined it was not a jurisdictional wetland under Section 404 of the CWA. Both Wetland S4 and Wetland S6 are located outside of the proposed mining limits.

Wetland B4 is a large wetland complex that extends along the western edge of the Site continuing west to the Minnesota River. The portion of the wetland complex that is located on the Site consists of 832,744 square feet (19.12 acres). Wetland B4 is located within the floodplain of the Minnesota River and portions of the wetland flood nearly every year. The northern end of the wetland is separated from the Minnesota River on the west side by a railroad grade, with two openings where water flows in and out of the wetland depending on the elevation of water in the river. The northern end of this wetland complex connects to the floodplain forest community associated with Gifford Lake, but is partially separated by a small berm used as a recreational trail. According to the landowners, the trail was originally a dike built and maintained for flood control in the 1950's.

The southern end of wetland B4 located within the Site is higher in elevation (approximately 710 to 714 feet above msl) and is flooded less frequently (32% probability) than the central and northern portions of the wetland complex that are situated at lower elevations. The delineation identifies Type 2, PEMB, Fresh meadow/Sedge Meadow; Type 3, PEMC, Shallow Marsh; and Type 6, PSSC, Shrub Swamp wetlands within the complex that are located on the Site. Wetland types transition into Type

3, PEMC, Shallow Marsh; and Type 1, PFOA, Floodplain Forest off-site to the north towards Gifford Lake and to the west towards the river.

The portion of the Type 2 PEMB Fresh Meadow/Sedge Meadow that is located on the very southern portion of the wetland is of low quality but transitions into wet meadow and shrub-carr native plant communities of high quality to the north as discussed in Section 3.3. According to the Minnesota Routine Assessment Method (MnRAM), the portion of B4 that is located on-site is classified as “Preserve.” The shrub-carr portion and the northern portion of the wet meadow as delineated by Barr are considered a rare natural community under WCA (S1, S2 or S3 Native Plant Community) and are of very high quality with few invasive species and high diversity of native species. For the purposes of this discussion the areas of wet meadow and shrub-carr that are rare natural communities are collectively referred to as seepage wetlands.

As described above, the B4 wetland complex consists of two distinct wetland types/native plant communities that have been evaluated separately throughout the DEIS. Although the original wetland delineation identifies the entire wetland complex as “B4”, evaluations in the DEIS distinguish two separate wetland areas. One wetland area is the “seepage wetland” which includes the high quality wet meadow and shrub carr native plant communities portion of the wetland that also appears to be fed largely by groundwater rather than surface water. The second wetland area is “wetland B4” that includes the remainder of the floodplain wetland which is at lower elevation, subject to more frequent flooding, less dependent on groundwater flow and receives excess surface water flow from water discharging out of the seepage wetland. Wetland B4 extends well beyond the Site boundaries and outlets through a ditch into the Minnesota River. When the seepage wetland and Wetland B4 are referred to collectively the term “floodplain wetland complex” is used.

Based on their water balances, groundwater accounts for 63% of the inflow to the seepage wetland while direct precipitation and surface water runoff account for 37%. The seepage wetland has about a 30% probability of flooding every year. Groundwater accounts for approximately 29% of inflow to wetland B4 while direct precipitation and surface water runoff account for 71%. Wetland B4 have about an 80% probability of flooding every year.

3.4.1.4 Off-Site Wetlands

The Barr wetland delineation includes review of nearby off-site wetlands, primarily on the south and west side of the Site on public lands, in order to evaluate nearby areas that might be indirectly affected by the Project. There are three isolated wetland basins located just to the southeast of the Bryan Rock property south of 145th Street. The three basins were included in the USACE jurisdictional determination and are not jurisdictional. The basins: B5, B6, and B9, are located alongside the railroad right-of-way and encompass 4.3, 0.3 and 0.1 acres respectively. These three wetland basins receive stormwater runoff from a large drainage area that extends across US 169. A culvert runs under the highway into a ditch that drains directly into the easternmost basin. These basins also receive some stormwater runoff from a smaller drainage area north of 145th Street, including the southern portion of the Bryan Rock property. A culvert runs under 145th Street just west of the Project boundary and an open ditch runs south towards these off-site wetland basins. The wetlands are situated 10-15 feet above the water table.

The off-site delineation also includes three isolated wetland basins: W1, W2, and W3, located on the Mid-America Festival Property west of the floodplain wetland complex and encompass 0.76, 2.18, and 0.06 acres respectively. These wetland basins are surface water fed, situated 25-35 feet above the water table.

The NWI identifies eight small isolated wetland basins located outside the limits of the off-site wetland review area between the project limits and the Louisville Swamp. These isolated wetland basins range from 0.09 to one acre in size. Five of the basins are identified as PEM1A (Type 1) wetlands, one basin is identified as a PEM1A/PEM1C (Type 1/Type 3), one is a PSS1/EM1C (Type 6) and one is a PEM1C (Type 3) wetland. All of these wetlands are surface water fed and are situated approximately 30 or more feet above the water table.

The northern boundary of Louisville Swamp was delineated by Barr Engineering. The Louisville Swamp is a large wetland complex that is located primarily on USFWS property and is described in Section 3.4.1.1 Public Waters above.

The NWI also identifies several isolated wetland basins located east of US 169. These are situated upon the bluffs. They are sustained by surface water runoff and are typically situated over 100 feet above the water table.

3.4.1.5 Springs and Seeps

Barr identified seepage areas along the edge of the seepage wetland through field investigation, collection of hydrologic data, and desktop review of aerial photographs. There were few discernable individual springs located along the wetland edge and all were associated with broader areas of groundwater emerging from the soil. The presence of seepage areas as opposed to discrete springs indicates uniform flow through the geologic layers feeding the seepage areas and a lack of preferential flow paths through fractures. Areas with the most defined seepage were identified along the upgradient (eastern) edges of the wetland. Generally, the eastern side has steeper slopes along the wetland edge formed by eroded bedrock. The seepage areas form where the groundwater intersects the land surface resulting in groundwater release into the wetland. The consistent source of water in these seepage areas contributes to the type and high quality of the wetland.

Wetlands are characterized by fine grained organic sediments with lower hydraulic conductivity than the adjacent sandstone which acts to slow the transfer of groundwater to surface water. None the less, the seepage areas are influenced primarily by groundwater. The surface water contribution to the wetland is generally greater in the spring following snowmelt and heavy spring rains; however, surface water contributions generally have a minimal effect on the water level in the areas with the strongest groundwater seepage. The seepage areas typically occur along the perimeter of the wetland and at higher elevations that experience less frequent flooding and excess water from precipitation. Excess surface water drains into lower portions of the wetland complex (wetland B4) dominated by a marsh community.

3.4.2 Environmental Consequences - Water Resources

The EIS will assess impacts from dewatering and surface drainage on the floodplain wetland and Gifford Lake.

3.4.2.1 Dewatering Impacts to Louisville Swamp, Gifford Lake, Wetland B4, and Seepage Wetland

The proposed Project will involve dewatering the upper five feet of the Jordan periodically throughout the life of the Project. Limited dewatering is required to allow blasting and removal of the transition material using dry mining techniques and then subsequently blasting the sandstone as needed in advance of sandstone removal. Transition material referred to within this DEIS is the Coon Valley Member of the Prairie du Chien Group. It is the basal member that is not of sufficient quality to market as limestone and contains too many impurities to process and market as industrial sand. The transition layer varies from 5-15 feet deep across the Site. It must be removed under dry mining conditions to prevent contamination of the sand with impurities from the transition material.

Since the top of the Jordan Sandstone varies across the Site and the water table slopes across the Site, the depth of dewatering that is needed to accomplish removal of the transition material under dry mining conditions is expected to vary between 0 and 35 feet. Dewatering is also expected to vary in duration as mining progresses across the Site. It will take longer to remove transition material in areas where it is thicker.

Once the transition material has been removed from the top of the Jordan, the sandstone will be drilled and blasted if needed. Blasting the Jordan may only be necessary where hardzones of well cemented sandstone exist. If blasting is not necessary, dewatering will typically occur for 10-20 weeks per year during the initial few years of mining. If blasting of the sandstone is necessary, dewatering will typically occur for 30-35 weeks per year. In all cases, as the open water features approach 40-50 acres in size, dewatering is likely to be necessary on a year-round basis during the final stages of mining a given phase once the transition material is removed and/or the sandstone is blasted in the final stage of a given phase, dewatering will cease in that area as operations shift to the next phase of mining.

Groundwater modeling was performed by Barr to assess the potential environmental effects related to groundwater and surface water resources in the vicinity of the Project.³¹ The Project includes limited dewatering of the transition material above the sandstone and the upper five feet of the sandstone, followed by dredging, backfilling, and reclamation of the mined areas.

Steady-state groundwater simulations of mining activities were performed for the Project alternatives. Water resources evaluated in the scope of modeling include Louisville Swamp, Gifford Lake, wetland B4 and the seepage wetland. The model was also used to evaluate the potential for

³¹ Barr Engineering Company, July 2019 Groundwater Modeling of Mine Plan Alternatives Predictive Simulations Report for Merriam Junction Sands.

the Project to alter or improve conditions related to contamination from the Louisville Landfill, discussed in Section 3.3. Groundwater simulations were also used to assess likely effects on private and public supply wells, discussed in Section 3.5.

For surface water evaluations, the groundwater model was coupled with a water balance for each surface water of interest. The water balance provides an estimate of the relative amounts of inflow to a surface water contributed by groundwater, stormwater runoff, flooding, and direct precipitation. The simulated modeled groundwater effects were used to estimate the relative contribution of groundwater into each surface water feature. The predicted increase or decrease in inflow to the surface water was then determined to evaluate the potential for a significant and permanent impact to the surface water feature.

The steady state simulations used in this study provide a conservative assessment of potential changes to surrounding surface water resources. In this context, “conservative” means that the model was constructed with inherently protective assumptions that tend to consistently overestimate the potential for groundwater effects related to mining operations. As a result, the model may predict environmental effects from temporary dewatering that may never be realized.

The basis for this conservatism is that although the model is a representation of actual conditions, it cannot replicate all conditions that could be encountered during operations. By using conservative assumptions, the model can be simplified to represent a wide range of potential future conditions including some that are relatively unlikely, extreme, or worst case. If the mine dewatering shows no or little effect under these extreme conditions, then there is a high degree of likelihood that there will be no or insignificant effects under less extreme, more likely conditions that actually result from the Project.

An example of some of the conservative elements of the groundwater model is illustrated in Table 3.4-1. Actual groundwater dewatering for short periods (weeks to months) has a lesser effect than dewatering for a longer period of time (years). In addition, dewatering to a shallow depth has less effect than greater dewatering depth. Table 3.4-1 illustrates that the dewatering elevation will for many areas vary over relatively short (weeks to months) time periods and to variable depths due to the irregularity in the elevation of the top of the Jordan across the Site.

In contrast to Table 3.4-1, the groundwater model assumes dewatering will occur down to a maximum elevation for an infinitely long (and indefinite) amount of time over the largest extent of open waterbody that will occur within a phase at any given time. The target dewatering elevation in some years may be anywhere from 8-16 feet higher than the simulated modeled dewatering elevation, which will result in lower than predicted drawdown over the surrounding surface water features. The table also illustrates the range of time that dewatering will be required to remove and blast the transition and blast the sandstone as mining moves across a phase under two conditions (hardzones vs. no hardzones) that may be encountered in a given year. If no significant hardzones are present in the sandstone, blasting of sandstone is not needed and dewatering will occur only long enough to remove the transition material. If significant areas of hardzones are present, blasting of sandstone will require longer periods of dewatering. Exploration drilling ahead of mining in a phase will determine the presence of hardzones and need to blast sandstone in a given area.

The results of the model simulations demonstrate that the proposed mining operations can be conducted in a way that avoids or minimizes the potential for environmental impact to surrounding water resources. Steady-state simulations of mining activities, including backfilling and reclamation were performed for each phase of grouped alternatives. The predictive simulations also show that mitigation strategies are an effective tool to minimize the effect so that there can be no adverse impact. The Project will include monitoring to assess actual groundwater conditions during dewatering operations and allow adoption of multiple potential mitigation techniques to avoid long-term irreversible impacts to surface water and groundwater features before they occur.

During mining, operations will be modified to adjust and accommodate actual conditions encountered. This flexible approach known as adaptive mine management will allow modification of areas to be mined within a phase if monitoring identifies trends that may lead to impacts. Adaptive mine management can be combined with other mitigation options. For example, the mining sequence within a phase may be modified to mine the areas that require the lowest dewatering elevation to be mined first when the open water feature is at its smallest extent. Mining of the area where the top of sandstone is at its highest elevation would occur during the final years of mining within a phase to minimize dewatering depths across the largest open water dewatering cell.

The potential indirect impacts of dewatering associated with each alternative are described in Section 3.4.3. Mitigation options are presented in Section 3.4.4.

a) Louisville Swamp

Louisville Swamp has a significant surface water input due to the frequency of spring flooding and the high volume of runoff from the Sand Creek and Picha Creek watersheds. Water levels in the Louisville Swamp are controlled for the most part by an outlet structure on the north end of the wetland basin which discharges into Sand Creek and then flows a short distance to the confluence with the Minnesota River. A water balance conducted by Barr for the Louisville Swamp shows that surface water contributions are sufficient to maintain wetland conditions for Louisville Swamp irrespective of additional contributions from groundwater sources. The Project will have no impact to the contributing drainage area of Louisville Swamp and therefore will have no surface drainage impacts to the Louisville Swamp. Negative surface water impacts to Louisville Swamp as a result of dewatering are not supported by the modeling results.

b) Gifford Lake

Similar to Louisville Swamp, modeling predicts 0-5 feet of drawdown in the aquifer adjacent to Gifford Lake for the various alternatives and associated phases. The actual change in lake water level due to mine dewatering will be less than the predicted decrease in head due to surface water contributions and direct precipitation. A water balance for Gifford Lake shows that groundwater contributions make up approximately 26% of inflows into the lake and surface water and direct precipitation makeup 74% of inflows. Modeling predicts a net change in inflow to Gifford Lake of 0-7%. This low volume would be difficult to discern from a simple decline in surface water outflow during most years. Based on the low anticipated drawdown at the lake, the small anticipated decrease in groundwater inflow, the typical seasonal flooding inundation, and the excess surface

flow available to offset dewatering, the project is not likely to have a significant or long term impact on Gifford Lake.

c) Floodplain Wetland B4

Modeling predicts that the aquifer drawdown beneath wetland B4 is predicted to exceed five feet during all but one of the mining phases when no mitigation is in place. The water balance for wetland B4 shows that groundwater contributions make up approximately 29% of inflows into the wetland surface water and direct precipitation make up 71% of inflows.

The water balance for wetland B4 shows that there is more surface water outflow from the wetland than evapotranspiration. The decrease in groundwater flow can be offset by a reduction in excess surface water outflow from wetland B4 during a typical growing season, reducing the overall predicted impact to wetland B4 from 29% to 2%-5%. In addition, if mitigation is implemented to the seepage wetland as described below, there will be an increase in flow from the seepage wetland into the lower elevation of wetland B4 which is expected to result in significantly more water to the floodplain wetland complex than predicted by the model.

For the reclamation condition, a 5% increase in overall groundwater flow is predicted as a result of the end use lake adjacent to the wetland complex. A positive increase in groundwater flux to the wetland is considered a positive impact. Excess water will runoff in the same manner that excess water does currently, which is through the existing drainage system and outlet channels in the wetland. Therefore, the mitigation and reclamation scenarios result in a positive outcome for long term sustainability of wetland B4.

d) Seepage Wetland

The model predicts that there is the potential for a significant change in head beneath the seepage wetland if dewatering were continued long-term. The water balance indicates that the seepage wetland is dominated by groundwater flow, with 63% contribution from groundwater and 37% contribution from surface water and direct precipitation. The maximum predicted decrease in head in the area of the seepage wetland is 15 feet. There is an estimated 63% decrease in base flow with no mitigation measures in place. The results indicate that without mitigation there is a potential for impacts to the seepage wetland.

A mitigation scenario was modeled to assess the effectiveness of mitigating the potentially significant decrease in groundwater flow to the seepage wetland. Mitigation consisted of an infiltration cell located adjacent to and upgradient of the seepage wetland. The results indicate that the mitigation scenario will be highly effective at returning the groundwater back into the system to keep the seepage wetland saturated. For every alternative, the groundwater flux returned to the wetland was 28% to 83% greater than baseline for the mitigation scenario. The results indicate that the modeled mitigation cell concept provides more water than will be required to maintain baseline conditions. Alternative methods of routing water to the wetland are as effective in maintaining groundwater discharge. Potential mitigation measures are discussed in Section 3.4.4. The reclamation condition does not result in a decrease to flow to the seepage wetland.

3.4.2.2 Surface Drainage Impacts to the Floodplain Wetland (B4) and Gifford Lake.

The EIS will assess impacts from surface drainage on the floodplain wetland and Gifford Lake.

Stormwater controls developed to protect the water quality of receiving waters have been designed and implemented at the Site for the existing mining operations. These stormwater controls are periodically updated and expanded as needed as mining progresses throughout the Site. Stormwater runoff is regulated under the CWA and mining operations at the Site are currently conducted under the General Non-Metallic Mineral Mining and Associated Activities National Pollutant Discharge Elimination Systems (General NPDES Permit) and a Stormwater Pollution Prevention Plan (SWPPP) in accordance with the General NPDES Permit. A SWPPP that includes the proposed sandstone mining (Appendix A of the Natural Resources Plan, Attachment 2) is discussed in Section 3.4.2.3. The SWPPP is a working document that is intended to be modified, amendment and supplemented by the operator over time as mining progresses across the Site, Site conditions and/or mining operations change, monitoring results or inspections indicate the need for additional best management practices (BMPs), and/or General NPDES Permit requirements are revised when new general permits are periodically issued.

The SWPPP identifies a number of site-specific BMPs to reduce or eliminate erosion, sedimentation, and water quality impacts. Surface water runoff will be managed to comply with the General NPDES Permit requirements and to minimize or eliminate the potential for any water quality impacts to receiving waters. Stormwater BMPs to be implemented at the Site are described in detail in the SWPPP and are summarized below:

a) Non-Structural BMPs:

- Minimize the area of disturbed soils at any given time;
- Establish perimeter controls; silt fence, diversion berms, or diversion swales prior to disturbing areas that have the potential to generate off-site stormwater discharges;
- Seed and mulch perimeter screening berms, diversion berms or swales within 7 days of construction to minimize the potential for erosion and off-site sedimentation;
- Use of erosion control matting in areas of concentrated flow or steeper slopes;
- Maintain perimeter controls until the drainage has been converted to drain internally as a result of mining or until the area has been stabilized and vegetation has been established;
- Use of swales and drainageways rather than pipes for stormwater conveyance when practical to reduce stormwater flow velocities and promote infiltration;
- Establish and maintain vegetated buffers along wetland boundaries to allow for pollution and sediment removal by filtering overland sheet runoff before it enters the wetland; and
- Good Housekeeping practices including: pavement sweeping, litter control, proper labelling and storage of materials such as grease, paints, detergents, pesticides and herbicides, employee training.

b) Structural BMPs:

- Flow diversion, dikes, and sediment;
- Riprap and/or other appropriate outlet protection measures at culvert and pond outlets;
- Temporary stormwater ponds located throughout the floor of active mine;
- Construction of stormwater channel to convey regional stormwater through the Site; and
- Wet sedimentation basin to treat stormwater from processing and stockpile areas prior to discharge from the Site.

Additional BMP's will be added as needed to ensure that all discharges meet the terms of the General NPDES Permit, that violations of water quality standards do not occur, that floating solids or visible foams are not discharged, and that oil or other substances are not discharged. All outlets from the Site will be located on the ground with protective measures such as riprap at the outlets to prevent erosion. Where active mining areas discharge to wetlands, pretreatment in a sedimentation basin will be required. Additional temporary sedimentation basins or infiltration areas may be required as quarry activity progresses in the western portion of the Site. Monitoring stormwater runoff discharges will be conducted in accordance with the General NPDES Permit conditions to verify the effectiveness of the BMPs.

c) Wetland Buffers:

Vegetated buffers will be established along both the seepage wetland and Gifford Lake. The buffers will help filter out phosphorus, nitrogen and sediment from snowmelt and stormwater runoff prior to entering the surface waters. The buffers will also help control the establishment of non-native invasive species in the wetland areas.

A vegetative buffer will be preserved within the setback areas along the wetlands in accordance with the Scott County Zoning Ordinance Chapter 6 Article D. Wetland Conservation. The seepage wetland is considered "Exceptional" under the Scott County Zoning Ordinance, requiring a minimum buffer of 25 feet and an average buffer of 65 feet. The Project has been designed to provide a minimum setback of 30 feet and an average setback of 65 feet setback from the seepage wetland. Buffers for wetlands S4 and S7 meet the County requirements for "High Quality" with an average buffer of 50 feet and a minimum buffer of 25 feet. Gifford Lake is a protected public water and a perennial vegetation buffer averaging 50 feet is maintained along the lakeshore in accordance with Minnesota's buffer law.

d) Stormwater Monitoring:

Stormwater discharges from active mining, processing, stockpiling or other disturbed unstabilized areas are subject to sampling and monitoring for Total Suspended Solids (TSS) in accordance with the General NPDES Permit conditions. Monitoring results are submitted to the MPCA on an annual basis. If monitoring results indicate that the benchmark values established in the General NPDES Permit are exceeded, additional BMPs will be implemented and documented in the SWPPP.

e) Reclamation:

Reclamation will establish native grasses along the mine perimeter adjacent to the seepage wetland. Establishment of native grasses beyond the wetland buffer will help to control the spread of invasive species into the native plant communities associated with the seepage wetland.

f) Mining in Floodway:

Mining is not proposed within the floodway. Disturbed soils or stockpiles will not contribute to the sediment load of floodwaters. The mining setbacks include natural grade or created berms up to at least the 725 contour prohibiting floodwaters from entering the active mine area.

Because mining, processing and reclamation will be operated in accordance with the General NPDES Permit, SWPPPs, stormwater quality BMPs, establishment of vegetated buffers adjacent to wetlands and Gifford Lake, and monitoring of stormwater discharges from the Site, the Project will not result in any significant effects to water quality from surface drainage to the seepage wetland, wetland B4 or Gifford Lake.

3.4.2.3 Natural Resources Plan

The EIS will include the development of a Natural Resources Plan which will include an evaluation of stormwater management and assess potential impacts to wetland areas as a result of proposed modifications to the existing stormwater system.

A Preliminary Natural Resources Plan (NRP) has been prepared for the Project (Attachment 2). The purpose of the NRP is to develop appropriate stormwater management to protect downstream water resources which include wetlands and public waters. This Plan will be used as the basis of the Resource Management Plan required as part of the County's IUP permit application process once environmental review is complete, and an alternative chosen for permitting.

The stormwater management system has been developed to comply with performance standards established in Chapter 6 of the Scott County Zoning Ordinance. The County standards have been developed to prevent or reduce effects or impacts of stormwater runoff, to protect wetlands and public waters, and to minimize stormwater runoff damages in order to prevent degradation of water and soil resources. Development of a stormwater management system that meets the County standards eliminates the potential for significant environmental effects to adjacent downstream surface water resources as a result of the Project.

The purpose of the NRP is to develop appropriate stormwater management to protect downstream water resources, specifically the adjacent wetlands and public waters. The NRP presents sufficient information to evaluate the environmental characteristics of the Site and surrounding area and details of proposed stormwater management to evaluate potential impacts of the Project on water and soil resources. By meeting the County stormwater management standards, there will be no significant environmental effect to adjacent downstream surface water resources as a result of the Project and proposed modifications to the existing stormwater system.

The NRP includes:

- Evaluation of existing stormwater patterns of the Site and receiving bodies;
- Hydrologic modeling and watershed analysis of pre-settlement, existing, and reclamation conditions;
- Determination of the off-site drainage areas that flow into and through the Site;
- Design of future stormwater conveyance measures to accommodate peak flows and preclude introduction of surface water runoff into the end use lakes taking into consideration future development of the contributing watershed area (See Section 3.4.2.5); and
- Identification of erosion and sedimentation control measures to be used throughout all phases of the Project to minimize or eliminate impacts to surface waters including specifically the Minnesota River and its status as an impaired water of the state (See Section 3.4.2.2).

3.4.2.4 Wetland Replacement Plans

Wetland replacement plans will be prepared as may be necessary if the Project proposes to impact any regulated wetlands within the Site or Project area

The Project does not propose impacts to regulated wetlands within the Site or Project area.

3.4.2.5 Stormwater Rates and Volumes of Existing Watershed

The EIS will determine the existing watershed draining into and through the Site and determine both existing and future anticipated rates and volumes associated with full development of the watershed, to evaluate appropriate design of future stormwater conveyance measures through the Site upon final reclamation to preclude introduction of surface water runoff into the open water mine pits in the Jordan aquifer.

- a) Determination of the off-site drainage areas that flow into and through the Site.

Regional stormwater flows from a 1,209 acre drainage area enter the Site through three arch culverts located under US 169. Stormwater flows along the west side of US 169, across the Bryan Rock entrance, and along the northern property line of Bryan Rock joined by additional off-site stormwater from the Louisville Landfill, the Dem-Con Landfill and industrially developed land east of Dem-Con and South of 130th Street West.

Additional off-site drainage flows onto the Site through a culvert under the railroad tracks near the northern end of the Louisville Landfill. Once Dem-Con Landfill's northern phases are completed, additional stormwater from the Dem-Con Landfill and developed land east of the landfill and north of 130th Street West will also flow through this culvert onto the Site. Drainage areas that flow into and through the Site are illustrated on Figure 3.4.2: Sub-Watershed Areas and Drainage Patterns.

- b) Design of future stormwater conveyance measures to accommodate identified peak flows taking into consideration future development of the contributing watershed area.

The conveyance of the regional stormwater through the Site will be maintained throughout mining. Reclamation includes the establishment of a permanent open channel designed to convey regional stormwater through the Site. The channel design accommodates 100-year peak flows. Prior to reclamation, on a temporary basis, stormwater may be routed around active mine areas, diverted internally to open water features, or discharged to the floor of the quarry.

HydroCAD modeling was performed for watershed conditions that reflect the highest anticipated peak flows. This includes the drainage area east of US 169 which was undergoing modeling by the County as part of the US 169 frontage road and access improvements. Based on communications with the County, a 100-year peak design flow of 400 cfs from the watershed east of US 169 was routed into the Site and used as the preliminary design basis of the first segment of open channel across the northern portion of the Bryan Rock property. The County drainage study was prepared by WSB and finalized January 25, 2018³² (County Drainage Study). The final design 100-year design flow was 266.1 cfs. The final design of the conveyance channel will incorporate the County Drainage Study results and will modify the design accordingly.

100-year peak flows under full development conditions for the Dem-Con Landfill and the industrial areas east of the landfill were routed through the landfill's existing stormwater management system which includes a large sedimentation basin located on an easement which extends onto Bryan Rock Property. Routing of the Dem-Con Landfill and associated industrial park stormwater utilized the NOAA Atlas 14, volume 8 precipitation frequency estimates under full landfill development. The current model accounts for greater flows than the original stormwater management design of the landfill and industrial park, as the original design basis utilized a lower 100-year rainfall amount than the current standards.

Under current conditions, the watershed east of US 169 and Anchor Block both drain into a ditch along the Bryan Rock and Dem-Con boundary and into the final Dem-Con stormwater pond. The Dem-Con pond outlets into a ditch on the Louisville Landfill property and then onto a drainageway along the northern property line of Bryan Rock. Flow continues through a trestle located beneath the railroad tracks and through culverts under the mine haul road on the Malkerson Sales property. Flow continues into a ditch system located on the floor of the quarry area. The ditch system enters wetland S4 which serves as a large stormwater basin with an outlet into the northern portion of the seepage wetland eventually flowing west into wetland B4 and the Minnesota River.

As future development within the watershed occurs, stormwater management controls will be required in accordance with the Scott County Zoning Ordinance which requires limiting peak flows to pre-settlement rates of runoff. Although the volume of runoff is expected to increase, pre-settlement rates of runoff are lower than existing rates of runoff, therefore future development in accordance with the current stormwater management standards should result in an overall decrease in peak flows in the future. The exception to this is the Dem-Con Landfill which was modeled under

³² 2018, WSB. TH169/TH41/CSAH 78/147th Street Overpass Project Final Drainage Design Report prepared for Scott County January 25, 2018.

full development conditions as opposed to existing conditions since permits for the landfill have been issued but final grades and final cover haven't yet been established.

The proposed ditch design separates the regional flows from the Dem-Con stormwater pond which will provide better water quality treatment in the Dem-Con pond. Stormwater from Dem-Con Landfill and Louisville Landfill both enter into the drainage system and a ponding area on an easement along the northwestern property line of Bryan Rock. These stormwater flows combine with the regional stormwater flows east of US 169 just prior to flowing beneath the trestle onto the Malkerson Sales property.

- c) Appropriate design of conveyance system to preclude introduction of surface water runoff into the end use lakes.

Reclamation of the Site maintains the regional stormwater drainage through an engineered open channel that will prevent it from entering the end use lakes. The northern boundary of Bryan Rock will be reserved to construct the engineered open channel and a maintenance road. Portions of the area that will not be mined are currently subject to drainage easements, some additional easement area will be required to construct and maintain the open channel. On the Malkerson Sales property a backfilled rock berm will be constructed to support the construction of the open channel and access road between the two end use lakes. The channel will then continue to the west and eventually flow into the existing drainageway on the western edge of the Malkerson Sales property and discharge at its current discharge location into wetland S4.

There are three open channel segments designed through the Site. The preliminary channel design is based on a preliminary hydrologic study for the watershed east of US 169. That design was finalized with the construction of the frontage road system and a 100 year flow rate of 266.1 cfs has subsequently been established. The final channel design will reflect the 266.1 cfs flow rate from the east of US 169. Culverts may be used as an alternative to open channel flow in some or all sections of the drainageway. Figures 3.4.3 and 3.4.4 illustrate the proposed channel design and the three segments C1, C2, and C3 through the Site. C1 receives the stormwater from east of US 169 and directs it through the northern boundary of the Bryan Rock property. C2 runs through the eastern portion of the Malkerson Sales property. C3 is the eastern portion of the open channel that flows through flatter ground into an existing channel located on the Malkerson Sales property which conveys the stormwater to wetland S4. The existing channel is appropriately sized to accommodate the 100-year flow and some minor channel improvements may be necessary to insure channel stability. There will be some grading within the 100-year floodplain (flood fringe) required to connect new ditch section with the current ditch. All grading will occur outside of the designated floodway. There will be no net loss of storage within the floodplain associated with the regional improvements.

3.4.3 Alternatives - Water Resources

This section presents the results of individual analysis of dewatering associated with each phase of each alternative. Six alternatives are being considered for the Project and evaluated in the DEIS. Because some of the mine plan alternatives differ only with respect to the processing plant locations

and sequencing of mining phases, there are only three unique dewatering scenarios to simulate. By ignoring processing plant locations and focusing on the sequence of mining phases only, the six mine plan alternatives were grouped into three alternatives for modeling: Alternatives 1/2, Alternative 3, and Alternatives 4/5/6. Reducing the mine plan alternatives to these groups for the purpose of modeling allows for more straightforward modeling scenarios. Each alternative has four or five different phases and each phase within a given grouping of alternatives was modeled. This allowed an evaluation of how potential impacts may change over time and location of dewatering activity. Each of the three groups of Alternatives that were evaluated have different phasing but the same reclamation condition.

The modeling results provide insight to the potential for future changes in groundwater related to the proposed mining activities. Based on the modeling results and the contributions from runoff and surface water flows discussed above, Louisville Swamp, Gifford Lake or wetland B4 are not expected to have any significant environmental effects from dewatering. The remainder of this discussion focuses primarily on the seepage wetland.

Results indicate that all of the project alternatives have the potential for indirect impacts to the seepage wetland. There is not a single alternative that stands out as substantially better or substantially worse than the others in terms of potential impact to the seepage wetland. The simulations also show that the decrease in head of the water table aquifer is not particularly sensitive to the order of phasing. As expected, dewatering of the Bryan Rock phases has less potential impact than dewatering during the Malkerson Sales phases which are in closer proximity to the seepage wetland.

Simulations also included a mitigation scenario which demonstrates that the proposed mining operations can be conducted in a way that avoids or minimizes this potential for indirect impacts to the seepage wetland. Table 3.4-2, from the Predictive Simulations Report, illustrates the results of each phase of each alternative for the non-mitigation simulations and Table 3.4-3 illustrates the results for the mitigation simulation.

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Table 3.4-2 Summary of Groundwater Simulation Results for Effect of Mining Scenarios on Water Resources (Non-mitigation)

Alt.	Phase	Non-Mitigation				
			Louisville Swamp	Gifford Lake	B4 Wetland Complex	Seepage Wetland
		Estimated Pumping Rate (gpm)	Predicted Net Change	Predicted Net Change	Predicted Net Change	Predicted Net Change
Alt 1/2	1A & 1B	3950	0%	-7%	-5%	-63%
	2A & 2B	3310	0%	-4%	-5%	-63%
Alt 3	1	690	0%	0%	-2%	-52%
	2	2960	0%	-3%	-5%	-63%
	3	2810	0%	-2%	-4%	-63%
	4A	3240	0%	-3%	-5%	-63%
	4B	4360	0%	-6%	-5%	-63%
Alt 4/5/6	1	2260	0%	-2%	-5%	-63%
	2	3600	0%	-6%	-5%	-63%
	3	3340	0%	-4%	-5%	-63%
	4	2940	0%	-3%	-4%	-63%
Reclamation		--	0%	-1%	5%	164%

Notes:

Positive percent change values represent an increase from baseline. Reductions (negative values) of 50% or more in water balance are **BOLD**.

Net change represents net change in water to surface water feature from all sources (direct precipitation, surface water flows, groundwater, etc.)

Percent of GW balance is percent decline from model baseline multiplied by surface water balance term gpm- gallons per minute for groundwater.

Table 3.4-3 Summary of Groundwater Simulation Results for Mining Scenarios on Water Resources (Mitigation)

Alt.	Phase	Mitigation (at 716 ft MSL)					
		Estimated Pumping Rate (gpm)	Infiltration Rate	Louisville Swamp	Gifford Lake	B4 Wetland Complex	Seepage Wetland
		Estimated Pumping Rate (gpm)	Infiltration Rate	Predicted Net Change	Predicted Net Change	Predicted Net Change	Predicted Net Change
Alt 1/2	1A & 1B	4970	1700	0%	-15%	-3%	19%
	2A & 2B	9960	7510	0%	-8%	-2%	30%
Alt 3	1	840	740	0%	-1%	1%	50%
	2	3480	1520	0%	-7%	-1%	41%
	3	4200	2360	0%	-6%	0%	41%
	4A	9830	7490	0%	-6%	-2%	32%
	4B	7200	4170	0%	-13%	-3%	21%
Alt 4/5/6	1	8980	7580	0%	-4%	-2%	18%
	2	6850	4480	0%	-13%	-3%	21%
	3	5570	4120	0%	-6%	1%	50%
	4	5400	3980	0%	-6%	1%	52%
Reclamation		--	--	0%	-1%	5%	164%

Notes:

Positive percent change values represent an increase from baseline. Reductions (negative values) of 50% or more in water balance are **BOLD**. Net change represents net change in water to surface water feature from all sources (direct precipitation, surface water flows, groundwater, etc.)

Percent of GW balance is percent decline from model baseline multiplied by surface water balance term for groundwater gpm- gallons per minute.

3.4.4 Monitoring and Mitigation - Surface Water

Mitigation measures will be identified to address potential significant direct or indirect impacts identified.

3.4.4.1 Monitoring Plan - Surface Water Resources

A Water Level Monitoring Plan (Monitoring Plan) has been prepared by Barr (Attachment 3 of the DEIS).³³ The main purpose of the Monitoring Plan is to document changes in water levels related to the dewatering associated with the Project. Monitoring will be an integral part of the Project which will utilize an adaptive mine water management process that will be implemented throughout the duration of the Project. The goal of adaptive mine water management is to minimize use, to reuse water on-site whenever possible, and return groundwater directly back to sensitive areas in a sustainable way. The monitoring metrics are straightforward. If water levels in wells near the seepage wetland start to decline, contingency actions will be implemented before the dewatering permanently affects the wetland.

The Monitoring Plan has been developed to:

1. Providing early warning of water level declines through water level monitoring;
2. Establish alert levels that will trigger focused evaluation and implementation of interim and longer-term mitigation efforts; and
3. Document the effectiveness of mitigation in areas where mitigation is implemented.

The Monitoring Plan, including trigger levels and actions will be tied to the MDNR water appropriations permit, similar to other sand mine operations. Monitoring locations were selected for the following purposes:

1. To monitor water levels in each phase during dewatering along with dewatering pumping data;
2. To monitor water levels between the dewatered phase and adjacent surface water receptors which may be impacted by drawdown and/or decreased groundwater flow;
3. To track precipitation and Minnesota River stage levels using publicly available resources.

The proposed monitoring network is illustrated on Figure 3.4.5. The network consists of groundwater and surface water monitoring points. Permission for monitoring the Louisville/Dem-Con Landfill (W-10 and W-114) will need to be obtained from the well or property owners. The location of the groundwater monitoring wells and surface water monitoring points are in positions that will allow the detection of a decline in water level that may adversely affect the adjacent surface waters and adjacent water supply wells.

The alert thresholds are based on a statistical analysis of the current baseline monitoring data, which will be updated when the dewatering begins to incorporate natural fluctuations in water level. The alert threshold is a first level of detection set to detect a very slight decrease below a prediction limit

³³ Barr Engineering Company, December 2019. Water Level Monitoring Plan, Merriam Junction Sands Scott County, MN.

based on historical water level data. If verified, the alert will trigger follow-up investigation. The alert threshold is set to be sufficiently sensitive to changing water levels to allow an assessment of changing conditions and the implementation of adequate response before adverse impact can occur. The monitoring network frequency and thresholds, from the Monitoring Plan, are indicated on Table 3.4-4.

Table 3.4-4 Water Level Monitoring Frequency and Thresholds

Monitoring Target and Location ID	Media	Frequency (during active dewatering)	Alert Level Source
Seepage Wetland			
SW1	Surf water	weekly	Lowest Baseline Elevation -1 foot
SW2	Surf water	weekly	Lowest Baseline Elevation -1 foot
W17-11	Groundwater	quarterly	Lowest Baseline Elevation minus the max. model-simulated drawdown
Wetland B4			
SW3	Surf water	weekly	Lowest Baseline Elevation -2 feet
SW4	Surf water	weekly	Lowest Baseline Elevation -2 feet
SWB4	Surf water	monthly	Lowest Baseline Elevation -2 feet
W1-11	Groundwater	quarterly	Lowest Baseline Elevation minus the max. model-simulated drawdown
Gifford Lake			
SWGIF1	Surf water	monthly	Lowest Baseline Elevation -2 feet
MW20-11	Groundwater	quarterly	Lowest Baseline Elevation minus the max. model-simulated drawdown
Louisville Swamp			
SWSWMP1	Surf water	monthly	Lowest Baseline Elevation -2 feet
MW-17-11	Groundwater	quarterly	Lowest Baseline Elevation minus the max. model-simulated drawdown
Wetland Visual Monitoring			
SW1, SW2, SW3, SW4	Vegetation	quarterly	Visual estimate of cover
Minnesota River	River Stage	daily	USGS Gage at Jordan
Precipitation Data	Rainfall	quarterly	National Weather Service
DNR Observation Wells	Groundwater	quarterly	DNR observation well network
Private Wells			
W-114	Groundwater	weekly	Lowest Baseline Elevation minus the max. model-simulated drawdown
MW4-11	Groundwater	weekly	Lowest Baseline Elevation minus the max. model-simulated drawdown

MW9-11	Groundwater	weekly	Lowest Baseline Elevation minus the max. model-simulated drawdown
MW7-11	Groundwater	weekly	Lowest Baseline Elevation minus one-half the depth of pump intake in nearest comparison private well #759599
MW10	Groundwater	weekly	Lowest Baseline Elevation minus-one half the depth of pump intake in nearest comparison private well #573107
MW1-18 (New Proposed)	Groundwater	weekly	Lowest Baseline Elevation minus the one-half the shallowest depth of pump intake in nearest comparison private wells #678856, #589960, and 587553

3.4.4.2 Mitigation -Surface Water Resources

Modeling indicates that some form of mitigation will likely be needed to prevent long term permanent impacts to the seepage wetland. A number of potential mitigation measures can be adopted at the Site. Mitigation options all involve replenishing water that is removed through the course of dewatering. Some of the options are simple, straightforward and can be readily implemented on a short-term basis. Other mitigation measures involve more infrastructure and would be expected to operate on a longer-term basis. In the reclamation condition, no decrease in groundwater flow is anticipated so none of the mitigation measures are permanent.

Because mining is progressive, starting with initially only a very small dewatering area and very low dewatering rates, changes to water levels will occur gradually. This will allow ample time for monitoring to track and correlate pumping rates and locations with the changes in water levels adjacent to the Site and implement mitigation prior to any long-term permanent effects on the seepage wetland.

Mitigation measures which will be considered for the project are described below. Appendix D of Barr's Predictive Simulations Report contains further details on applicability and feasibility of each mitigation application. The Predictive Simulations Report included the modeling of a mitigation scenario for each of the alternatives to illustrate that mitigation can be effective in eliminating a long-term impact to the seepage wetland. All mitigation will be implemented in conjunction with monitoring to verify the effectiveness of the measure.

The DNR has the regulatory oversight related to the monitoring and mitigation of water level impacts to adjacent surface water features and water supply wells from dewatering activity, however, the County may request to be included in the distribution of reporting. The draft water level monitoring plan may be modified by the DNR and incorporated as a condition of the water appropriations permit. Appropriate mitigation measures for nearby surface water features and water supply wells will be chosen by the Proposer as part of water management strategies needed to be implemented to meet the conditions of the MDNR's Water Appropriations Permit and will reflect actual permitted appropriation and permit conditions.

- a) Direct discharge:
This measure includes routing dewatering discharge to an outlet structure that discharges water adjacent to or directly to surface water feature, for example the southern end of the B4 wetland. Under this mitigation measure, water that would otherwise discharge to a wetland is intercepted and routed directly to the wetland. At the south end of the seepage wetland, this mitigation measure can take advantage of the natural ground elevation that slopes from wetland B4 into the seepage wetland and then further north into the marsh and eventually into the Minnesota River. This mimics the current flow of water through the wetland complex. A weir or spreader system can be designed at the outlet of the discharge pipe with appropriate erosion and sediment control measures installed to spread the inflow laterally across the wetland edge, reducing velocities, minimizing channelization, and replicating sheet flow of surface water runoff into the wetland basin.
- b) Drip Irrigation
This mitigation strategy involves the distribution of dewatering discharge on the surface of the wetland. This method allows saturation in precise areas of the wetland which can be matched to the current seepage areas. Water is distributed in precise locations and the system can be moved as mining progresses. The system saturates the wetland soils from the top to the bottom as opposed to groundwater flowing from bottom to the top of the soil profile.
- c) Exfiltration Trench
This mitigation strategy involves the construction of a shallow linear trench upgradient of the wetland edge. Dewatering discharge is directed to the infiltration trench where it infiltrates, recharging the groundwater that flows into the wetland. The trench design may incorporate perforated distribution pipes, blasted rock base, and/or granular backfill media to provide filtration. Maintaining a constant head within the trench will maximize infiltration rates.
- d) Infiltration Cell or Basin
This method involves the creation of a large infiltration cell or basin adjacent and upgradient of the wetland edge. Dewatering discharge is supplied to the infiltration cell. The system provides a recharge to the aquifer creating a groundwater mound that provides continuation of seepage and maintains groundwater flow to the wetland.
- e) Infiltration with Cutoff Wall
This is the option is an expansion of the previous option with a deep grouted rock wall intended to reduce the amount of recirculation of infiltrated dewatering discharge. The cut off wall essentially increases the efficiency of dewatering and reduces overall pumping rates. It would likely have the same effectiveness as the infiltration cell or basin but would have lower operating costs as a result of lower pumping rates.

3.4.4.3 Mitigation Goals

The goal of the Project is to avoid impacts when possible and proactively implement mitigation. Where monitoring indicates that dewatering is causing significant changes in groundwater levels,

options will be evaluated to determine if the mine phasing or planning can be modified to reduce impacts. Where the effects cannot be avoided, mitigation will be implemented. The mitigation measure selected will be determined based on the specifics of the monitoring results, the location of active dewatering and the anticipated progression of phasing and dewatering activity. A minimum mitigation plan may be established before the transition dewatering begins. Initial dewatering volumes will be lower than later phases of mining, so the need for initial mitigation is expected to be less than later phases. This allows for implementation of small but scalable mitigation options.

3.5 Water Use

The SDD identifies the following items to be addressed in the DEIS:

- a) The EIS will include a hydrogeologic assessment to identify any potential impacts to groundwater resources from mining activities, including mine dewatering scenarios. This assessment will include both existing and new information, including information on the installation of piezometers, geologic borings, aquifer pump testing and development of a comprehensive geologic and hydrogeologic conceptual model. A 3-D groundwater flow model will be constructed to simulate the effect of different dewatering scenarios on the groundwater system, including changes to the landfill leachate plume, nearby water supply wells and surface-water features.
- b) The EIS will include an analysis of the impact resulting from a leveling of the groundwater table across the open water bodies, including potential changes to flow into receiving waters such as the wetland complex, Louisville Swamp and Gifford Lake.
- c) The EIS will include a well survey within 1.5 miles of the project site consisting of review of wells within the County Well Index (CWI) and other well locations not within the CWI as determined by field observations to determine the locations of water supply wells that may be impacted by mining operations. Data will be collected regarding well construction, source aquifers, and elevations where readily available.
- d) The EIS will include an evaluation of the Project's impact on water quality and anticipated future public water supply wells and future municipal wells needed to serve future growth in surrounding communities.
- e) The model run to evaluate the Project's potential impact on future municipal water supply wells will be run under drought conditions to determine if the Project will have any additional impacts during drought conditions when flow reversals or increased water demands could impact regional hydrogeology.
- f) The EIS will include water conservation and reuse measures where feasible in both the mining phase and the reclamation phase of the Project.

3.5.1 Affected Environment –Water Use

3.5.1.1 Proposed Water Use

The Project will use water to process aggregates and sand, to transport sand, for dust control, and for a potable drinking water supply for employees and office staff. Quarry dewatering is also proposed.

Aggregate Washing: The Site currently operates a washplant. The plant operates under a water appropriations permit #94-6195 from the MDNR, which authorizes up to 300 gallons per minute (gpm) not to exceed 30 million gallons per year. A well supplies make up water to the clean water intake pond. The current washplant operates at a rate of approximately 500-600 gpm. Washwater is discharged into a series of sedimentation basins for clarification and clean water is returned to the washplant for reuse. A production well (MN Unique number 540281) is located adjacent to the plant and supplies make-up water to the plant. The production well is 8 inches in diameter and is 400 feet deep, cased into and completed in the Wonewoc Formation.

Sand Processing Wet Plant: The wet plant(s) will utilize separation, sizing, and cleaning equipment (e.g. hydrocyclones, hydrosizers and attrition scrubbers). The hydrocyclones and hydrosizers will perform an initial separation of fine sand and silt from the coarser sands by utilizing an upward flow of water. The attrition scrubbers break up agglomerated particles and remove any coating on the surface of the sand particles using a sand/water slurry.

A portion of the water from the wet plant(s) will be treated to remove the fines in a clarifying tank in conjunction with flocculants and coagulants (discussed in Section 3.5 Water Use) and/or sedimentation basins and then recycled back to the washplant. Waste sands will be returned to the active reclamation cell by conveyor or slurry. Make-up water will be required to account for losses in the process associated with loss to product.

Dust Control: Water for dust control is used on internal unpaved haul roads as needed. Additional dust control will be used as needed on the winter pile, which is composed of clean washed sand.

Potable Water Supply: Water use will include providing a potable water source at the office building within the sand plant site.

Non-Consumptive Water Use (water that is returned to groundwater or surface water): includes dewatering discharges and water used to create a slurry to transport sand to the wet plant for processing and waste sand to the reclamation cell.

The Project will require additional water appropriations to meet the water use demand. Water used to supply the make-up water to the sand processing wet plant, slurries used for transporting sand, and for dust control will come from the quarry dewatering when the quarry is being actively dewatered. When the quarry is not being actively dewatered, water for make-up water for the wet plant and sand slurry will come from a groundwater sump located in the active mine area and water for dust control will come from the production well. Depending upon the location of the sand plant,

a new potable water supply well will be drilled (plant located at MS South and/or BRP) or the existing potable well at the Malkerson Sales property scales house will be used (plant located at MS-North).

Table 3.5.1 Projected Water Use:

CONSUMPTIVE USE	Gallons per minute	Million gallons per year
Aggregate Washing	300	30
Sand Processing Make up Water	720	235
Dust Control	50	15
Potable Water use	0.78	0.4
NON-CONSUMPTIVE USE		
Dewatering	690-9,830	-
Sand Slurry	1850 (Returned to reclamation cell)	-

3.5.1.2 Water Conservation Measures

The EIS will include water conservation and reuse measures where feasible in both the mining phase and the reclamation phase of the Project.

The following water conservation measures will be used at the Site.

a) Recycling Aggregate Washwater

Recycling aggregate washwater can save large quantities of water. Aggregate washwater is treated through on-site sedimentation basins and then recirculated from the final clean water pond back to the washplant for reuse. About 80-90% of the washwater is recirculated and reused, reducing the overall need to supplement the washplant with make-up water from the production well. Losses are associated with the washed materials which is stockpiled. A small amount of residual moisture stays attached to the grains in the washed material stockpile and some moisture is lost through evaporation. The majority of free moisture drains (decants) through the stockpile, infiltrates and recharges the groundwater. The washwater recycling rate depends upon the amount of fine materials in the aggregates to be washed and the weather, with greater evaporative losses occurring during the warmer days of summer. The sedimentation ponds are dug out routinely to maintain their treatment efficiency reducing the need for clean water inputs. Sedimentation ponds are constructed long, narrow and deep to reduce surface area and associated pond evaporation rates.

b) Recycling Wet Plant Washwater:

The wet plant also has a water treatment plant consisting of a thickener tank and belt or plate press. Water recovered from the clarifying tank and press is sent back to the freshwater tank located adjacent to the wet plant. Wet processed sand is stockpiled in decanting piles to allow the piles to drain, reducing moisture content prior to drying. Water collected from the decanting sand piles is

used in part to form the slurry to transport waste sand to the reclamation cell. Water draining through the main washed sand stockpile (winter pile) infiltrates and recharges the groundwater. The overall treatment and recovery systems recycle 75-85% of the water used in the wet plant operations. Figure 3.5.1: *Water Circuit*, illustrates water flow, reuse, and losses associated with the wet plant.

- c) Washplant and Wet Plant Equipment Maintenance:
The washplant and wet plant will undergo regular maintenance with routine inspections of equipment, water lines, spray systems, and valves and pumps. These pieces of equipment will be inspected for leaks, clogging, worn-out parts and faulty operation that may decrease their water use efficiency.
- d) Use of Low Flow Fixtures:
Indoor plumbing fixtures in the office will be low-flow water devices and models.
- e) Dust Control:
Water conservation measures associated with dust control at the Site will include maintaining paving on main truck access routes into and out of the Site, reducing unpaved areas designated for traffic, using slurries and conveyors to transport materials where practical rather than haul trucks, and limiting watering for dust suppression to those days when sufficient moisture from precipitation has not occurred.
- f) Quarry Dewatering Management:
Proper management of water from quarry dewatering will help conserve water. During active dewatering, water will be directed to the wet plant supply make-up water needs, used as dust control, and directed to infiltration devices located onsite. The location of infiltration areas may change as mining progresses from one phase to the next. Excess water will be discharged to the open water feature in an inactive phase or off-site through a controlled outlet device to the wetland complex, or Gifford Lake in accordance with the NPDES permit for the site. If needed, the outlet location of any excess dewatering water will depend upon the location of the active phase of dewatering.

3.5.1.3 Existing Water Wells

The EIS will include a well survey within 1.5 miles of the project site consisting of a review of wells within the County Well Index (CWI) and other well locations not within the CWI as determined by field observations to determine the locations of water supply wells that may be impacted by mining operations. Data will be collected regarding well construction, source aquifers, and elevations where readily available.

a) On-Site Wells

There are several wells located on the Site. These include wells associated with current mining operations (one production well located on Bryan Rock property and one well supplying the scale house located on Malkerson Sales property); the stable area (one supply well); the Renaissance

Festival (two supply wells); Louisville Landfill monitoring wells (nine non-supply wells located on the Malkerson Sales property); and groundwater monitoring wells (also not supply wells) associated with the groundwater assessment and hydrogeologic model for the Project. Figure 3.5.2: *On-Site Wells*, illustrates the location of these wells. Some wells will need to be sealed as mining progresses through the Site. Some of the wells may be replaced by the well owner depending upon the circumstances and need.

b) Adjacent Private Wells

The Site is located in an area which is not served by public utilities, therefore surrounding industrial, commercial and residential areas are served by private or community wells. A well survey (Attachment 4) was conducted for wells located within 1.5 miles of the Site. Wells from the Minnesota Well Index were included in the survey and probable well locations were identified based on occupied buildings within the survey area. Information from the well records was compiled within the survey.

3.5.2 Environmental Consequences – Water Use

The EIS will include a hydrogeologic assessment to identify any potential impacts to groundwater resources from mining activities, including mine dewatering scenarios. A 3-D groundwater flow model will be constructed to simulate the effect of different dewatering scenarios on the groundwater system, including changes to the landfill leachate plume, nearby water supply wells and surface-water features.

The Predictive Simulations Report (PSR) prepared by Barr utilized a 3D groundwater model developed for the Site to predict the potential environmental consequences of dewatering on groundwater resources including nearby water supply wells and is discussed in this Section of the DEIS. Potential impacts of dewatering on impaired groundwater from the Louisville Landfill and the results of the Landfill Capture Evaluation are discussed in Section 3.1.2.1 and potential impacts to surface water features are discussed in Section 3.4.2.

3.5.2.1 Nearby Water Supply Wells

The PSR simulated a steady-state drawdown condition associated with mine dewatering. The simulations include a phase by phase analysis for the various alternatives. There is no significant difference in the potential amount of drawdown at any given water supply well among the proposed alternatives. However, potential drawdown effects do change with the location of the dewatering activity.

As a means of screening out areas of no potential impact from areas where there may be a plausible potential impact to surrounding water supply wells, results of all of the simulations were overlaid and the maximum extent of the 5-foot drawdown contours was established. As described in the PSR, wells outside the area defined by the 5 feet of drawdown are unlikely to be affected by the Project. This is because of both the conservatism built into the model, and the fact that properly designed supply wells should meet household needs despite a 5-foot decline in water level.

Every well within the 5-foot drawdown contour is within the potential area of impact. The maximum predicted drawdown at five foot intervals within this potential area of impact were also compiled. The maximum simulated drawdown at each known well location was then compared to each well with available well construction records to identify wells which might be impacted as a result of dewatering activity. The locations of the Drift, Prairie du Chien, and Jordan Wells within the Potential Area of Impact are illustrated on Figure 3.5.3.

The maximum lateral extent of potential drawdown effects is 1.25 miles. Therefore, the well survey extends beyond the area that could potentially be impacted by the Project. The extent of potential drawdown at private wells ranges from 5 feet (the threshold of anticipated negative impact) to 27 feet. For wells completed in the Jordan, Prairie du Chien, or Quaternary Drift Aquifers the depth of the pump setting was compared to the maximum depth of predicted drawdown across all simulated scenarios and for all alternatives. Wells with pumps set shallower than the maximum predicted drawdown were identified as a *Well of Potential Impact*. The well records were further reviewed to compare the depth of the well and the potential to lower pumps within those wells. Well locations and the height of the water column above the pump, where available, are indicated on Figure 3.5.3.

There were six wells identified as *Well of Potential Impact – Able to Lower Pump*. Three are Jordan wells and three are Quaternary Drift wells finished in unconsolidated materials. The predicted decrease in water level below the current pump settings ranges from 2-12 feet. *Wells With Potential Impacts* were identified in areas with predicted drawdowns of 12.5 feet or more. The exception is one well finished in the Quaternary Drift with a well record that indicates that the pump is set at the same elevation as the water table. This is likely a reporting error, because if the pump was set at the water level the well would experience issues with water supply whenever normal seasonal fluctuations in water levels occurred.

Although the majority of well records include pump setting information, not all of the well records do. Within the area with predicted drawdown of 12.5 feet or greater, (where an impact is more likely to occur), there is one Jordan well which is an inactive irrigation well that does not have pump setting information on the well record.

There are also water supply wells in the area that do not have a water well record. These well locations are identified as probable well locations in the well survey and their location is based on the identification of an occupied structure. Information regarding the aquifer that the well is finished in or the depth of the pump setting is not available for probable well locations. Within the area with a predicted drawdown of 12.5 feet or greater, there are seven probable well locations. The locations of wells discussed above are identified on Figure 3.5.4.

3.5.2.2 Wellhead Protection Areas

The EIS will include an evaluation of the Project's impact on water quality and future municipal wells needed to serve future growth in surrounding communities.

There are four public water supply wellhead protection areas in the vicinity of the Site: Carver North, Carver Central and Chaska South located northwest of the Site, and Shakopee, located east and northeast of the Site. There are no wellhead protection areas within the Site itself. The Carver North, Carver Central and Chaska South wellhead protection areas are located over one mile west and northwest of the Site, across the Minnesota River. The Minnesota River acts as a discharge point for the upper aquifers of the Site. The City of Shakopee's wellhead protection area is between 1,700 and 8,000 feet east of the eastern boundary of the Site. This wellhead protection area is located upgradient of the Site. Except for a 30 acre area located on the edge of the Shakopee wellhead protection area, the wellhead protection areas are located outside of the maximum extent of the five-foot drawdown contour. There will be no significant impacts to well head protection areas as a result of the Project. Figure 3.5.5 illustrates the location of the wellhead protection areas with respect to the Site and the predicted maximum extents of the five-foot drawdown contour.

A capture analysis of the potential of the Project to impact future municipal water supply wells was conducted. The analysis was conducted to determine if the end use lakes would have an impact on or limit future potential municipal well locations based on a hypothesis that higher transmissivity flow through water in the lake than in the native sandstone could create a preferential pathway for contaminants to reach a future municipal well.

The City of Shakopee Public Utilities Commission (SPUC) was consulted regarding potential future water supply to determine the most likely location of future municipal well locations and pumping capacities to serve western Shakopee and Jackson Township. SPUC has not formally sited future wells in the area, and demand for additional municipal water supply is not anticipated for approximately 20 years, depending on the rate of population growth and development in Shakopee.

Louisville Township does not currently have plans to install a municipal well; therefore, the simulated well location was chosen based on input from SPUC and Scott County, with the goals of situating the well east of the bluff and near the center of the Township, screening the well in the Jordan aquifer, and avoiding the area immediately upgradient of the Louisville Landfill, which would be a generally accepted and prudent practice regardless of whether the Project were completed while planning the hypothetical municipal well.

Steady-state pumping rates for the future Shakopee/Jackson Township and Louisville Township service areas were based on anticipated pumping rates identified in a 2005 Aquifer Sustainability Study by Short Elliott and Hendrickson³⁴ and indicated by SPUC. SPUC recommended that Well Nos. 23, 26, and 27 from the SEH report would be likely candidates for potential future municipal wells. Further, SPUC recommended that Well Nos. 23 and 26 would be screened in the Jordan aquifer and that Well No. 27 would be screened in the Tunnel City Group aquifer. Wells in the Jordan Aquifer were set to pump at an average rate of 600 gpm, and the well in the Tunnel City Group aquifer was set to pump at an average rate of 200 gpm.

³⁴ SEH, 2005. Aquifer Sustainability Study. Prairie du Chien – Jordan Aquifer. Shakopee, Minnesota. SEH No. A-SHPUC0501.00. Prepared for the Shakopee Public Utilities Commission by Short Elliott Hendrickson, Inc. (SEH). July 2005

The model run to evaluate the Project's potential impact on future municipal water supply wells will be run under drought conditions to determine if the Project will have any additional impacts during drought conditions when flow reversals or increased water demands could impact regional hydrogeology.

The analysis was also run under drought conditions which included an adjustment that accounted for a 25% increase in municipal water use and a decrease in groundwater levels consistent with the 1988-1999 drought.

Four predictive simulations of steady-state pumping were conducted, as listed below:

1. The first simulation consisted of the four future municipal wells pumping under baseline recharge conditions and assumed No Project (i.e. no created end use lakes).
2. The second simulation consisted of the four future municipal wells pumping under baseline recharge conditions and assumed Reclamation (i.e. with the created end use lakes).
3. The third simulation consisted of the four future municipal wells pumping under drought recharge conditions and assumed No Project (i.e. no created end use lakes).
4. The fourth simulation consisted of the four future municipal wells pumping under drought recharge conditions and assumed Reclamation (i.e. with the created end use lakes).

The results of the simulations indicate that the capture radius for the simulated wells was about 1,000 feet for municipal supply wells within the Jordan Sandstone and about 2,000 feet for the Tunnel City Group. Under drought conditions, the capture radius increased by approximately 500 feet. The maximum extent of these capture zones is greater than one mile from the Louisville Landfill and/or the end use lakes.

Based on the model simulations, the presence of the Project's end use lakes next to the Louisville Landfill will not affect the water quality of future municipal supply wells.

3.5.3 Alternatives – Water Use

Alternatives 1-6 were grouped into three alternatives for modeling: Alternatives 1/2, Alternative 3, and Alternatives 4/5/6. Each alternative has four or five different phases and each phase within a given grouping of alternatives was simulated. Although the cone of depression varies in location and extent depending upon a given phase, the groundwater model simulations predict only small variations in the maximum extent of drawdown among the alternatives.

3.5.3.1 End Use Lake Water Levels

The EIS will include an analysis of the impact resulting from a leveling of the groundwater table across the open water bodies, including potential changes to flow into receiving waters such as the wetland complex, Louisville Swamp and Gifford Lake.

During the post-mining period after reclamation, the water table flattens across the end-use lakes, which results in simulated aquifer drawdown upgradient of the lakes and a water-level rise near the seepage wetland. The end use lakes on the Malkerson Sales property are anticipated to equilibrate at an elevation of approximately 715 feet above msl. Water levels along the very western, downgradient edge of the end use lakes currently ranges from approximately 711-713 feet above msl representing an increased head of two to four feet adjacent to the wetland complex.

The impacts associated with leveling of water levels in the end use lakes during the reclamation period are expected to be protective of the wetland complex and are not considered a significant negative environmental effect. Gifford Lake and Louisville Swamp are located a sufficient distance away from the end use lakes so that the impacts to these water resources are expected to be negligible.

3.5.4 Monitoring and Mitigation – Water Use

The groundwater model simulations predict the maximum extent of dewatering effects. Based on the results of the well survey there are three Jordan wells and three Drift wells that may be impacted by dewatering activities. In addition, seven wells with no well construction information and one well with no pump setting information are located within the area most likely to be impacted by dewatering. The MDNR is the regulatory authority of groundwater appropriations and resolution of well interference issues related to water appropriations. The MDNR has established a well interference resolution process that is governed by Minnesota Rules 6115.0730 *Well Interference Problems Involving Appropriation*.

Water level monitoring will be conducted to monitor the change in water levels associated with the dewatering activities. The proposed Water Level Monitoring Plan (discussed in Section 3.4.4) proposes a monitoring well network consisting of nine monitoring wells including a new well to be constructed near residential water supply wells as shown on Figure 3.4.5. Water level data will be reviewed in conjunction with dewatering pumping rates and locations to further develop an understanding of actual drawdown effects. This data can be used to assess potential off-site effects of dewatering as mining and dewatering progresses across the Site. The data will allow the proposer to take actions such as lowering a pump or drilling a deeper well, that may be necessary prior to an impact to a water supply happening.

As an additional precaution, a well agreement will be offered before dewatering operations begin to all of the well owners within the 5-foot drawdown contour. The well agreement will include protocol for well owners to follow if they experience water supply issues. The agreement will include provisions for a licensed well driller to inspect the well and determine the cause of the issue and

whether it may be from dewatering, mechanical failure, etc. The agreement will specify that MJS will be responsible for all work required to restore a water supply which is determined by the licensed well driller to be a result of the dewatering activity. Well improvements may include lowering the pump, or if a situation occurs where this mitigation strategy would be ineffective, drilling a replacement well. Because only the upper portion of the Jordan Aquifer will be dewatered, there will always be a reliable source of drinking water associated with the majority of the saturated thickness of the Jordan Aquifer, which will remain unaffected throughout the duration of the Project.

3.6 Water Related Land Use Management District

The SDD identifies the following item to be addressed in the DEIS:

a) The EIS will include the development of more detailed processing plant layouts for Alternatives 1, 4 and 6 (These alternatives have a processing plant located within the Shoreland District) to evaluate conformance with the Shoreland District and necessary height variances. The plant layouts will be developed taking into consideration ways to minimize building heights, minimize placement of fill or structures within a designated floodway in conformance with the Shoreland District, and minimize the potential environmental impacts from flooding of sediment ponds, storage areas, etc. located within the 100-year floodplain.

3.6.1 Affected Environment –Water Related Land Use Management District

3.6.1.1 Shoreland District

There are three plant sites being evaluated among the alternatives: MS-N, MS-S, and BRP. The MS-N plant site is located within the Shoreland District. The MS-S and BRP plant sites are located outside of the Shoreland District. Modifications to the alternatives presented in the SEAW were made to account for more detailed mine planning and feasibility analysis that accompanied the DEIS process. These modifications are described in more detail in Section 2.1 but include moving the sand processing plant from MS-N to BRP in Alternative 6. Therefore, the two alternatives that apply to this section are Alternative 1 and Alternative 4. Alternative 1 includes a 1.2 MTY plant on the MS-N plant site and Alternative 4 includes a 2.4 MTY plant on the MS-N plant site.

The Shoreland District extends 1,000 feet from the OHW of Gifford Lake and 300 feet from the Minnesota River or the landward extent of the floodplain, whichever is greater. Figure 3.6.1 illustrates the location of the Shoreland District with respect to the Site and the MS-N plant site.

Chapter 70, Shoreland District, of the Scott County Zoning Ordinance regulates shoreland areas. Development within the Shoreland District is subject to County review and approval. Site development and grading are evaluated to ensure that soil erosion or other pollution of public waters is prevented, visibility of structures and other facilities as viewed from public waters is limited, and adequate water supply and individual sewage treatment system are available.

Development within the Shoreland District is also controlled by means of the underlying land use zoning districts. The Project is located within the Rural Industrial District. The proposed mining and

processing uses are an allowed interim use and the proposed railyard is an allowed conditional use within the Rural Industrial District. The zoning districts have been determined to be compatible with the classes of public waters to which they apply. Gifford Lake is classified as a natural environment lake and the Minnesota River is classified as an agricultural river. The structure setback and individual sewage treatment system setback from the OHW level of a natural environment lake is 150 feet. The structure setback from an agricultural river is 100 ft, and individual sewage treatment system setback from an agricultural river is 75 feet. The maximum structure height (except churches and agricultural buildings) is 35 feet within the Shoreland District.

3.6.1.2 Regulatory Floodplain

The 100-year floodplain of the Minnesota River extends into portions of the Site. The Flood Insurance Rate Map for Scott County is in the process of being updated. The Federal Emergency Management Agency (FEMA) Revised Preliminary Flood Insurance Study³⁵, dated July 13, 2018 is expected to be officially adopted by Scott County sometime in the future.

The 1% annual chance flood, commonly referred to as the “100-year flood,” is the regulatory base flood for floodplain management. The 100-year floodplain is divided into a floodway and a flood fringe. The floodway is that portion of the channel of the river and the adjacent floodplain areas that must be kept free of structures, fill materials, or other obstructions in order to pass the floodwaters without an increase in corresponding flood elevations. The flood fringe is the remaining portion of the floodplain. State and federal regulations allow development within the flood fringe as long as structures are elevated, and flood proofed. On the Site, the flood fringe extends across the southern floodplain wetland (Wetland B4) area of the Site. Floodwaters back up into the floodplain wetland but the area is located outside of the channel and floodwater flow areas.

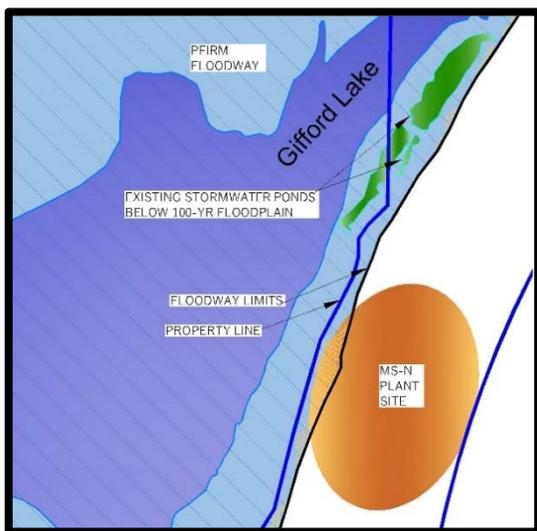
The current elevation of the 1% annual chance flood, or 100-year flood regulatory flood elevation varies from 725 feet above msl in the southern portion of the Site to 724 feet above msl in the northern portion of the Site.

A Preliminary Flood Insurance Rate Map (PFIRM) was published on September 30, 2011. The PRIFM was revised on July 13, 2018. Figure 3.6.2, Revised Preliminary Regulatory Floodplain, illustrates the location of the regulatory floodplain with respect to the Site. The Revised Preliminary Flood Insurance Rate Map (RPFIRM) lowers the base flood elevations as well as changes floodplain and flood fringe areas. The regional floodplain elevation was lowered adjacent to the Site (ranging from 723 feet above mean sea level in the southern portion of the Site to 722.7 feet above mean sea level in the northern limits of the Site adjacent to TH 41). At the same time, additional portions of the Site were included in the area illustrated graphically as being within the 1% annual chance flood (which is contradictory). The main area impacted by the RPFIRM is the limestone quarry located north of the Renaissance Festival grounds. The quarry was mined below the floodplain and backfilled for use as a parking lot for the Renaissance Festival. The quarry area is mapped as flood fringe on the RPFIRM (although the quarry area was not mapped as floodplain at all in the current or PFIRM versions) and

³⁵ Federal Emergency Management Agency, Flood Insurance Study Number 27139CV000A. Flood Insurance Study Scott County, Minnesota and Incorporated Areas. Revised Preliminary July 13, 2018.

the area is completely separated and isolated from the river channel and regional floodplain by a topographic high of approximately 728 feet above mean sea level.

The RPFIRM was compiled on a regional scale. The shaded floodplain area on the RPFIRMs correlates poorly with the actual elevations in the quarry area. Areas mapped as flood fringe extend across almost the entire quarry area that is at elevations that range up to 748 feet above mean sea level, over 25 feet above the regional flood elevation. Figure 3.6.2 also illustrates those portions of the quarry that the RPFIRM map as floodplain but were at elevations above the 723 at the time the 2011 LIDAR data was collected. Ongoing reclamation activities continue to bring portions of the quarry up in elevation above the 100 year floodplain elevation. The Proposer has been in contact with the MDNR to address this discrepancy before the official map is adopted sometime in the future. There is an additional area in the northern portion of the Site that was originally above the 100-year flood elevation and was also mined below the floodplain elevation. This area is mapped as flood fringe on the new RPFIRM as well. This area may be brought back up to an elevation above the 100-year floodplain as part of reclamation of the Site.



There are three existing stormwater management ponds located within the floodplain area just north of the MS-N plant site that were constructed in conjunction with sand and gravel mining in this area. These ponds have been determined to be incidental wetlands not regulated by the WCA and USACE non-jurisdictional basins. If the plant site is developed on MS-N, the stormwater ponds will continue to be utilized and they will be incorporated into the stormwater management design of the plant site. The inset to the left illustrates the location of the existing ponds in relation to the plant site and the regulatory floodplain.

3.6.2 Environmental Consequences – Water Related Land Use Management District

3.6.2.1 Shoreland District

Development within the Shoreland District is governed by Chapter 70 of the Scott County Zoning Ordinance. Shoreland development controls have been established to protect both the quality of public waters and the local tax base. The structure setback and the individual sewage treatment system (ISTS) setback from the Ordinary High Water Level (OHW) of Gifford Lake is 150 feet. Uses without water oriented needs must be located double the setback from the OHW or substantially screened from view from the water by vegetation assuming summer leaf on conditions or by topography. The proposed project is well screened from views from the water as illustrated below. An OHW has not been determined for Gifford Lake. The water level is controlled by an outlet at an

elevation of 701.6 feet above msl,³⁶ located at the north end of Gifford Lake (north of TH41) and remains fairly constant throughout the year except during periods of flooding. Based on vegetation, we conclude that the OHW is approximately 702.5 feet above msl. Conservatively using 704 feet above msl contour as a setback basis, all proposed structures within the plant layouts meet the required structure setback.

An ISTS will be constructed in conjunction with the development of the plant site. Two suitable ISTS locations have been identified for a drain field to serve the MS-N plant site. Both potential sites meet the 150-foot ISTS setback.

The plant layouts will be developed taking into consideration ways to minimize building heights.

The County Zoning Ordinance limits the height of structures located within the Shoreland District (except churches and agricultural buildings) to 35 feet. Structures in the plant area will exceed this height and a variance will be required. The plant will be designed to minimize the height of structural components of the plant while still allowing for plant efficiencies and enclosure of dry plant equipment. The most significant design modification is in the screening building which separates the washed and dried sand into different sizes for sale. The modification involves reducing the number of vertical stacks of screens from a much higher profile typical screening plant layout to reduce the overall height of the dry plant building. It is preferable to have a plant with a three-vertical screen stack to minimize the number of elevators and conveyors needed to lift the sand to the top of the highest screen. The three-vertical screen stack design results in the highest operating efficiency. It saves both energy and reduces the overall size of the building footprint. For the Project, in order to reduce the extent of the variance needed, the plant design was modified to a two vertical-screen stack which results in lowering the overall height of the building by approximately 30 feet.

The height of other structural components of the plant have less design flexibility as the heights are required for the practical operation of the plant. Conveyance and on-site storage volumes are required to accommodate the plant's production levels and rail/truck loading capacities. Exhaust stacks from pollution control equipment need to be high enough to achieve effective dispersion; unobstructed from surrounding buildings, structures, or vegetation. The batch tanks and storage silos need to be elevated approximately 18 feet from the ground to accommodate a conveyor system beneath the storage tanks to transfer the material from the tanks to truck or rail. Bucket elevators are used to transfer the material up to the top of the batching tanks and storage silos. Bucket elevators need to be approximately 20-30 feet taller than the tanks, depending upon the layout of the system, to accommodate the conveyors and distribution system on top of the silos. To accommodate the conveyors and the loading system requires 38 to 48 feet, not including the actual storage silo itself.

³⁶ 2017 Barr Engineering Company Groundwater Modeling of Mine Plan Alternatives Appendix A Surface Water Monitoring Memorandum.

The MS-N plant site was selected as a plant site that will be constructed outside of the sandstone mining limits. Building the plant site at this location will not cover up sandstone resource as will be the case at the other two plant sites. The shape of the property at this location is narrow with the railroad right-of-way forming a constraining boundary on one side and the location of the regulatory floodplain forming a constraining boundary on the other side. As a result, the size of the footprint of the various structural elements becomes very important. For example, (although not a structure), limiting the decanting piles to a 35-foot height would result in increasing the footprints of the decanting piles from approximately 2.25 acres to 4.4 acres, as well as requiring a doubling of underdrain and material transport systems. In general, reducing heights increases the size of the footprint of each element. This in turn creates an overall larger plant site with greater hard surface area, resulting in an increased volume of stormwater runoff that requires more stormwater management capacity.

As a result of the minimum practical height requirements of many of the elements of the plant site, the second potential design modification is to recess the plant site below the natural grade to reduce the overall height of the structures with respect to the surrounding grade. The MS-N plant site is currently at an elevation that ranges from 720 feet above msl to 760 feet above msl. The plant area will be situated entirely outside of the 100-yr regulatory flood elevation and high enough in elevation to accommodate the design of stormwater treatment facilities and structures. The excavated base grades for the structures will result in a ground elevation that will range from approximately 735-750 feet above msl. The MS-N plant site will be lowered up to 20 feet across the area where the structures are located which will effectively reduce the overall plant heights and provide additional screening.

The grade adjacent to the rail loadout structure must be at the grade of the spur track, which can only be a few feet lower than the mainline. The elevation of the mainline varies from 768 feet above msl at the northern end of the MS-N plant site to 765 feet above msl at the southern end of the MS-N plant site. The rail loadout structure will be located at the very edge of the Shoreland District boundary or just outside of it depending upon final site design.

The third potential design modification is to move the MS-N plant further to the south to take better advantage of screening provided by the existing Louisville and Dem-Con Landfills. Structural components of the sand processing plant and corresponding heights are listed in Table 3.6-1. As part of the move to the south, the winter stockpile will be located just south of the wet plant in a previously mined portion of the quarry recessed an additional 20 feet below the surrounding grade.

Table 3.6-1 Height of Structures

Structural Element	Height	Feet Above msl (approximate*)
Dry Plant Building	75	815
Dryer Exhaust Stack	80	820
Batch Tanks	65	805
Bucket Elevators to Batch Tanks	84	824
Storage Silos	88	833
Bucket Elevators to Storage Silos	116	861

Rail Loadout Structure	74	837
Truck Loadout Structure	51	786
Wet Plant Equipment (not enclosed)	75	825
Decanting Stockpiles	65	805
Winter Stockpile	50	780

* May vary slightly depending upon approval of final grading plan and rail yard design

The height variance will be for a use that is allowed within the zoning district. Industrial uses, similar to agricultural uses, are often associated with structures that exceed 35 feet in height. The type of structures, such as storage silos, bucket elevators, and loadout facilities are similar in nature to agricultural structures that are exempt from the height restriction.

The heights of the proposed plant structures can be compared to other industrial structures in the general area along the river valley. Because the Shoreland District extends 1,000 feet from Gifford Lake and only 300 feet from the Minnesota River, these adjacent structures, except Commercial Asphalt, are not located within the Shoreland District, even though they are similarly situated along the river. East of the Site, Dem-Con Landfill has final grades approved to an elevation of 932 feet above msl, significantly higher than the structures associated with the plant site. Other industrial structures on adjacent properties along the Minnesota River north and south of the Project Area have industrial uses with associated structures ranging in height from 60 feet to over 200 feet in height. Some of these land uses and heights of structures are indicated on Table 3.6.2 below.

Table 3.6.2 Height of Nearby Structures Industrial Uses

Industry	Approximate Height (feet)
Dem-Con	>150 (above railroad grade)
Commercial Asphalt	68
United Sugar Chaska	126
Rahr Malting Shakopee	> 200
Shakopee Sands	121
Cemstone	60

The MS-N plant site is situated in an area that is characterized by granular soils suitable for supporting foundations. Existing slopes across the plant area vary from approximately 3% to 9%. The entire plant site is located outside of the Shoreland District Shore Impact Zone.³⁷ The area between the shoreline and the proposed plant is vegetated. Mature hardwood trees ranging in height from 40 feet to 85 feet are located between the shore and the proposed plant area. The densely wooded area varies from 50-250 feet in width. These trees will remain in place to help preserve the natural area along the shoreline and screen the view of the plant site from the public water. Photograph 3.6.1 illustrates the view towards the MS-N plant site from the western shoreline of Gifford Lake. Stockpiles on the Dem-Con Landfill are just barely visible in the background. The existing vegetation along the eastern shoreline will provide substantial screening of the MS-N plant site from Gifford Lake.

³⁷ Shoreland District Shore Impact Zone - Land located between the ordinary high-water level of a public water and a line parallel to it at a setback of fifty (50) percent of the structure setback.



Photograph 3.6.1 - View towards the MS-N plant site from the western shoreline of Gifford Lake

The trail system on the west side of Gifford Lake is heavily wooded along most of its length. There are limited areas of clearings along the trail and none with views of the proposed plant site. The trail system on the east side of the Minnesota River is heavily wooded with mature trees and few clearings. Where a clearing exists, trees on the east side of the Minnesota River dominate the viewshed and the plant site will not be visible from this viewshed. Photograph 3.6.2 shows the viewshed towards the MS-N plant site from a clearing in the trail system along the west side of the MN River taken in early May 2017 when trees were just beginning to leaf out. The plant will be screened by existing vegetation and distance from the trail.



Photograph 3.6.2 Viewshed towards MS-N Plant Site from trail along west side of Minnesota River

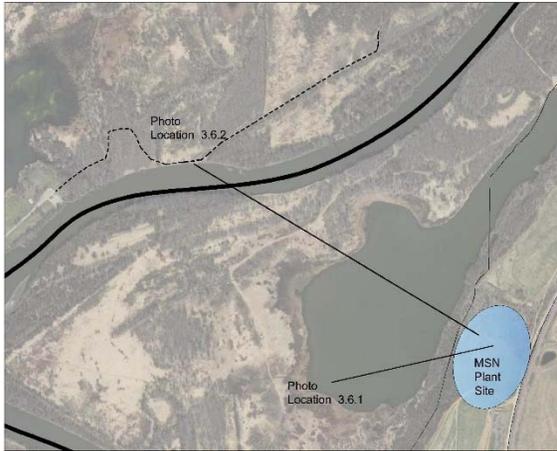
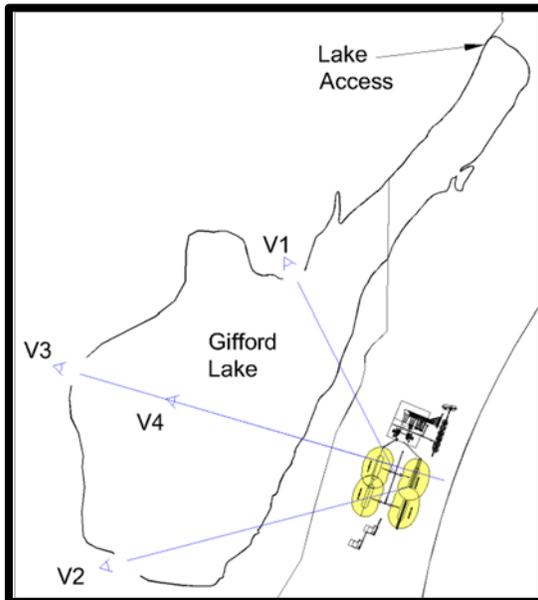


Photo Location Map

A 3D model was developed to illustrate the viewshed and the effectiveness of vegetation and distance in screening the plant site. Viewsheds were prepared from various locations on Gifford Lake during leaf out conditions. The analysis shows that only limited portions of the MS-N plant site will be just visible from certain areas of Gifford Lake. The results are presented as four viewshed renderings. In general, the plant will be most visible from the farthest western shoreline areas of Gifford Lake, where the trees appear shortest on the horizon. But even then, the visibility of the plant will be limited.



Viewshed Location Map

Four viewshed renderings are provided to illustrate the variation in expected views across the lake. Viewshed 1 is located along the far shoreline where the lake opens up to the southwest. Viewshed 2 is from the southern portion of the lake near the shoreline. Viewshed 3 is taken from the far western edge of the shoreline. Viewshed 4 is taken closer to the middle of the lake away from the shoreline, but along the same projection as Viewshed 3. The plant site will be completely screened from the narrow portion of Gifford Lake located to the north.

Viewshed 1 illustrates that the plant site will not be visible from the end of the narrow neck of the lake. Viewshed 2 illustrates that the top of the tallest components of the plant; the top of the dry plant building, the top of the storage silos, the top of the bucket elevator and the top of the wet plant are just visible over the tree line from the southernmost shoreline of the lake. The plant site

structures are over 1,800 feet away from this vantage point. This distance from the structures reduces the visual impact as well. Viewshed 2a shows the structural components in white so that they are more easily discernable in the photo rendering. Viewshed 2b illustrates the structural components painted in a neutral color, to represent more closely the actual color of the buildings and equipment, painted to better blend in with the surrounding environment and reduce visibility. The sand stockpiles remain white.

Viewshed 3 is located where the tree line provides the least amount of screening and the greatest area of structures is visible. This vantage point is located over 2,000 feet from the structures, along the far western shoreline of the lake. Viewshed 3a illustrates the plant structures in white, Viewshed 3b in a neutral tone, and Viewshed 3c adds the final elevation of the Dem-Con landfill. The top of the dryer exhaust stack, top of the storage silos and top of the bucket elevator to the storage silos may be visible over the top of the trees when near the farthest shoreline. The structures will be approximately 2,300 feet from the shoreline at this location. Viewshed 3c illustrates that once the landfill reaches final grade, the vegetated slope of the landfill will form some of the backdrop from this vantage point.

Viewshed 4 was taken 1,000 feet closer to the plant site, along the same line from Viewshed 3 towards the plant. This viewshed illustrates that as you move closer to the eastern shoreline, the structures appear closer but the trees provide additional screening height and the landfill disappears from view. As you continue to approach the shoreline, all of the structures associated with the plant becomes completely screened from view. Viewshed 4a shows the structures in white, Viewshed 4b in neutral and Viewshed 4c with the Landfill.

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Viewshed 1 – google earth image



Viewshed 2a - google earth image



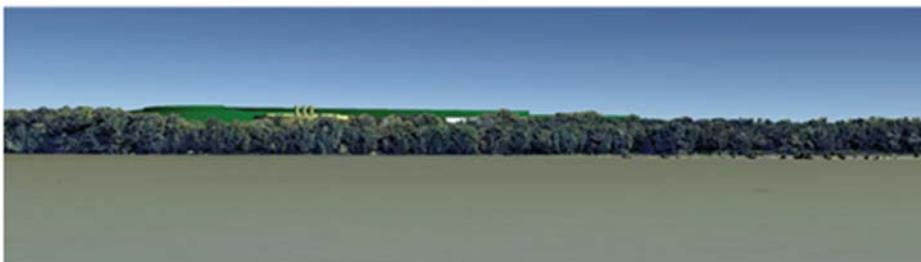
Viewshed 2b - google earth image



Viewshed 3a-google earth image



Viewshed 3b- google earth image



Viewshed 3c- google earth image



Viewshed 4a- google earth image



Viewshed 4b- google earth image



Viewshed 4c- google earth image

The 3D modeling illustrates that the proposed plant site will be substantially screened from view from all locations on the public water and will be entirely screened by vegetation, assuming summer leaf-on conditions from parts of the lake. Where portions of the plant are visible, it is only a limited portion of the plant structures. As demonstrated above, during summer leaf-on conditions the proposed structure heights will not have a significant negative impact on the viewshed from the public water or from other potential viewsheds in the area.

3.6.2.2 Regulatory Floodplain

The plant layouts will be developed taking into consideration ways to minimize placement of fill or structures within a designated floodway in conformance with the County Shoreland District

The highest known water level occurred during spring flooding in April 1965. The flood level of record is considered approximately equivalent to the 100-year flood elevation according to the PFIRM. The proposed MS-N plant site improvements will be located outside of the 100-yr floodway. There will be no stockpiles, structures or fill placed in the floodway. The lowest floor elevations of all buildings in the plant area will be no lower than the Regulatory Flood Protection Elevation³⁸ of 725.3 feet above msl, (one foot above the regulatory 100-yr flood elevation of 724.3 adjacent to the MS-N plant site). The MS-N plant site is not located in an area of steep slopes to the shore area. The standards of Chapter 70, Floodplain District, of the Scott County Zoning Ordinance will be met.

The plant layouts will be developed taking into consideration ways to minimize the potential environmental impacts from flooding of sediment ponds, storage areas, etc. located within the 100-year floodplain.

Development of the MS-N project will not alter water flow or drainage in a way that will change, divert, or interfere with drainage within the 100-year floodway. Stormwater management will be implemented in accordance with Chapter 6, Stormwater Management, Erosion Control, and Wetlands of the Scott County Zoning Ordinance. Rates of runoff and volume of runoff will be controlled, and water quality treatment will be implemented. Standard erosion and sediment control measures will be implemented as part of site development. Along the shoreline of Gifford Lake, existing vegetation will remain in place and will provide screening of the plant site from Gifford Lake. Impervious surface coverage of the plant area will not exceed seventy five percent (75%) in accordance with county standards.

A series of existing stormwater basins are located to the northwest of the MS-N plant site. These basins are located on the outer edge of the floodway. The existing sedimentation basins which were installed within the floodplain decades ago may be utilized as the final leg in the stormwater treatment system, prior to discharge into Gifford Lake. Any improvements to these basins will not

³⁸As defined by the Scott County Zoning Ordinance “The Regulatory Flood Protection Elevation shall be an elevation no lower than one (1) foot above the elevation of the regional flood plus any increases in flood elevation caused by encroachments on the floodplain that result from designation of a floodway.”

change overall stormwater patterns or negatively impact the downstream floodway, rather they will be utilized to enhance stormwater quality entering the public water. Modifications to the existing ponds will require County approval as part of the grading and drainage permit for the plant site.

3.6.3 Alternatives – Water Related Land Use Management District

3.6.3.1 Alternatives Shoreland District

Alternatives 1 and 4 include development of the MS-N plant site located within the Shoreland District. The general plant site layout will be the same for both alternatives, but Alternative 1 will be a 1.2 MTY plant and Alternative 4 will be a 2.4 MTY plant site. The larger capacity plant will have a larger equipment footprint and stockpile areas. Both alternatives will need a variance from the 35' height standard. The height of the individual pieces will be the same for each alternative as identified in Table 3.6.1. The preliminary layout of the Alternative 1 plant site is included as Figure 3.6.3 and the preliminary layout of the Alternative 4 plant site is included as Figure 3.6.4.

It should be noted that although the plant site locations for the remaining alternatives will be located outside of the Shoreland District, the other two plant sites will need a variance from the general industrial zoning code standard of 45 feet (See Section 3.1.3.1 Environmental Consequences – Adjacent Land Use).

3.6.3.2 Alternatives Regulatory Floodplain

Both Alternative 1 and Alternative 4 plant site layouts will be located above the elevation of the 100-year flood. The development of either plant site at the MS-N location will not have an impact on the hydraulic capacity of the floodway since development will be outside the floodway. Grading associated with the development of either plant site will not involve filling of the floodway. Development of either Alternative 1 or Alternative 4 at MS-N will not have an impact to the floodway.

3.6.4 Mitigation – Water Related Land Use Management Districts:

Two Project alternatives contemplate the development of a plant site within the Shoreland District. Development of the plant sites will comply with the County Shoreland District Regulations except for the height of the structures. A variance will be required for the height of the plant structure. Modifications have been made to the plant design to minimize the height of structures and still meet the needs of the Project. The heights of the proposed structures are consistent with other structures in the vicinity of the Project and structures are well screened from public waters.

Mitigation: Do not disturb existing vegetation between the limits of grading of the plant site and the shoreline of Gifford Lake.

3.7 Erosion & Sedimentation

The SDD identifies the following items to be addressed in the DEIS:

- a) The EIS will include Project magnitude data including the approximate acreage and cubic yards of overburden and rock to be excavated.
- b) The EIS will include a description of erosion & sedimentation control measures to be used within the Project. The EIS will also include the methods of how vegetation will be established and maintained on disturbed stony overburden during dry periods and how side walls with exposed sandstone faces above or below the water table will be protected from eventual erosion and undermining.
- c) The EIS will include a description of potential erosion and sedimentation impacts to the Minnesota River specifically related to its status as an impaired water of the state and a discussion of appropriate mitigation measures.

3.7.1 Affected Environment –Erosion and Sedimentation

The Project Area encompasses 682 acres. There has been mining activity on both the Malkerson Sales and Bryan Rock properties since the 1950's. On the Malkerson Sales property approximately 222 acres have been disturbed from mining activity, and approximately 138 acres stabilized and vegetated. The mined area drains to the floodplain wetland, Gifford Lake, and internal areas within the Site. Even without the proposed Project (No Build Alternative), there are plans to continue mining the Malkerson Sales property, removing limestone beneath the current Renaissance Festival Booth Area and sand and gravel from the northern portion of the Site.

On the Bryan Rock property, approximately 168 acres have been disturbed from mining activity. A small portion of the disturbed area drains off-site through a railroad culvert onto the Malkerson Sales property, but the majority of the mined area drains internally. Currently approved reclamation plans for the Bryan Rock quarry include stormwater ponding areas on the floor of the quarry with a lift station and a pumped stormwater outlet discharging under the railroad trestle and then across the Malkerson Sales property. Prior to developing the proposed Project, Bryan Rock intended to pursue permitting the remaining portion of its property for continued limestone mining.

The EIS will include Project magnitude data including the approximate acreage and cubic yards of overburden and rock to be excavated.

Topsoil and overburden have been removed over portions of the Site as the result of past mining. The No Build Alternative includes additional topsoil and overburden removal and assumes continued limestone mining to the southern limits of the permitted mine on the Bryan Rock property. The No Build Alternative also assumes continued sand and gravel and limestone mining on the Malkerson Sales property.

Tables 3.7-1 and 3.7-2 break down Project magnitude data for the Site. Table 3.7-1 presents acres previously disturbed from past sand and gravel and limestone mining to date and the total number of acres to be disturbed upon conclusion of the Project. Under the No-Build Alternative, sand and gravel and limestone mining will continue on the Malkerson property and limestone mining will continue to the limits of the current permit on the Bryan Rock property. Table 3.7-2 provides the approximate cubic yards of overburden, sand and gravel, limestone, transition, and sandstone to be excavated during the Project and under the No Build Alternative.

Table 3.7-1 Acreage of Disturbed Area from Mining

Property	Previously Mined Acreage (acres)	Total Future Mined Acreage End of Project Alternatives 1-6 (acres)	Total Future Mined Acreage No Build Alternative (acres)
Malkerson Sales	222	340	310
Bryan Rock	168	225	173
Total	390	565	483

Table 3.7-2 Approximate Volume of Material to be Excavated

	Overburden to be excavated (million cubic yards)	Sand and Gravel to be excavated (million cubic yards)	Limestone to be excavated (million cubic yards)	Transition to be excavated (million cubic yards)	Sandstone to be excavated (million cubic yards)
Alt 1-6	9.5	3	12	6	50
No Build	1	3	8	0	0

The volume of material to be backfilled to accomplish reclamation, assuming the maximum depth of sandstone mining, is 25 million cubic yards. This volume of backfill material is available on-site from overburden, transition material and reject sand (granular material that does not meet product specification due to oversize or undersize).

3.7.2 Environmental Consequences – Erosion and Sedimentation

The EIS will include a description of erosion & sedimentation control measures to be used within the Project.

The EIS will include a description of potential erosion and sedimentation impacts to the Minnesota River specifically related to its status as an impaired water of the state and a discussion of appropriate mitigation measures.

A number of erosion and sediment control practices will be employed at the Site to both prevent and control erosion thereby protecting downstream water quality. The Minnesota River adjacent to the Site is an impaired water. The impairments from Sand Creek to Carver Creek are Mercury in Fish Tissue, Mercury in Water Column, and PCB in Fish Tissue. These impairments are unrelated to mining or construction activity and the Project will not have a detrimental impact to these existing impairments. The reach of the Minnesota River from Carver Creek to River Mile 22 has these same impairments as well as turbidity. The turbidity impairment is impacted by erosion and sedimentation. The Project does not propose mining within the floodway, which will minimize the potential for floodwaters to entrain sediment from exposed soils.

As mining progresses both horizontally and vertically, a larger portion of the Site will begin to drain internally. In areas that are drained internally, runoff infiltrates into the ground. Reducing the area discharging off-site reduces the potential for erosion, sedimentation and impacts to downstream surface water quality.

BMPs will be incorporated into the operation of areas that drain off-site. The BMPs are intended to mitigate potential effects from erosion and sedimentation of the land disturbance caused by mining. The Site will operate under an MPCA NPDES Permit and will comply with erosion and sedimentation control requirements in the Scott County Zoning Code. A description of the erosion and sedimentation control measures to be implemented during the Project is provided below. The NRP and the SWPPP provide additional detail regarding erosion and sediment control practices.

BMPs are currently in place and additional BMPs will continue to be implemented at the Site as needed to minimize the potential for erosion and sedimentation and protect adjacent surface water quality. Perimeter controls will be installed prior to the start of any land disturbance within a given area that has the potential to drain off-site. Perimeter controls may include silt fences, perimeter diversion berms and swales, vegetated buffers and filter strips, infiltration areas, and energy dissipaters at outlets. Typically, as mining progresses, excavation lowers the mining area below the surrounding grade and internal drainage is established. BMPs will be extended and additional BMPs will be added as mining progresses across the Site. Areas will be stabilized and reclaimed in phases. All BMPs will be maintained, inspected, and remain in place until final stabilization in accordance with the SWPPP.

Exposed soils that drain off-site will be stabilized as soon as possible in order to limit soil erosion, but in no case will stabilization be completed later than seven days after mining or construction activity in that portion of the Site has temporarily or permanently ceased. If any area greater than five acres that drains off-site is disturbed at one time, a temporary sedimentation basin will be installed to treat the runoff prior to discharge from the Site.

Off-site discharges of stormwater that have contacted disturbed soils will be subject to sampling and monitoring in accordance with the conditions of the NPDES permit. Current intervention limits for stormwater discharges are 100 mg/L TSS. Current TSS limits for dewatering discharges from industrial sand operations are 45 mg/L, Daily Maximum, and 25 mg/L, Calendar Quarter Average. If an intervention limit is exceeded, additional BMPs are required.

Stormwater ponds and infiltration areas will be constructed to treat stormwater runoff from the plant site if it is constructed in an area that drains off-site. The volume of water that must be retained and infiltrated on-site will be at least the volume from one inch of runoff from all new impervious surfaces. Stormwater will be directed away from material storage areas to internal stormwater treatment/infiltration areas. The winter stockpile will be partially recessed and stormwater systems will direct runoff from the winter stockpile to sediment treatment areas on the floor of the quarry. The decanting piles will have an underdrain collection system to capture and reuse water draining through the piles.

The EIS will also include the methods of how vegetation will be established and maintained on disturbed stony overburden during dry periods.

The majority of soils located in mining areas are designated as stony land. These soils overlay almost all of the Bryan Rock property and most of the southern half of the Malkerson Sales property. Bedrock is typically present within 6 to 36 inches from the surface and topsoil is gravelly, containing numerous cobbles and boulders.

In areas that have been mined, topsoil and overburden have been stripped and stockpiled as perimeter berms along active mining areas to later be used in reclamation. Some areas that have been mined and backfilled have been successfully stabilized with vegetation using the stockpiled topsoil. In some areas, organic soils have been imported and blended with the native topsoil.

Vegetation will be established over future mining areas that are to be reclaimed as upland areas. The types of target vegetation will vary as to the slopes, grading characteristics, and planned end use of each area. Upland areas will be covered with sufficient topsoil from on-site sources to provide for vegetation. The topsoil will be seeded and mulched to establish vegetation. Seed mixes will be determined based on the specific conditions of individual areas to be seeded and will be based on the specific slopes, drainage characteristics, and anticipated moisture conditions of the reclaimed areas. Seed mixes may vary over time as test plots are developed and as reclamation progresses to determine seed mixes suitable to the local conditions of the reclaimed upland open space areas.

Native grasses will be utilized to establish ground cover throughout the reclaimed areas within the Site that are to remain as upland open space areas and around the end use lakes. Seed mixes will contain short to medium native grasses associated with dry prairie, dry mesic prairie, and mesic prairie species. Once established, native grasses can provide a self-sustaining, low maintenance, long-term cover. The native vegetation will provide a buffer between the Project and native plant communities to the west and south of the Site. Vegetation around the open waterbodies will help to reduce erosion and sedimentation, and will filter and remove nutrients and pollutants, providing protection for water resources associated with the open water areas and the adjacent wetland complex.

Non-native temporary covers/cover crops for soil health and soil stabilization may be used throughout the Site as a BMP for controlling erosion and sedimentation. Areas that will be converted

to future development will be backfilled, seeded, and mulched using a standard non-native seed mix appropriate for the area and suitable for the reclaimed conditions. State listed noxious weeds and invasive species will be controlled within the mine area through spot application of herbicides and routine mowing.

The EIS will also include a description of how side walls with exposed sandstone faces above or below the water table will be protected from eventual erosion and undermining.

Barr prepared a slope stability analysis³⁹ that evaluated both short term (during mining), and long term (post reclamation) slope stability of the sandstone. The protection of exposed sandstone faces above and below the water table is discussed in the following section. Results of the slope stability analysis are described in additional detail in Section 3.10 Geologic Hazards and Soil Conditions.

Exposure of sandstone faces above the water table will be limited to the very southern portion of the Site, where 0-10 feet of sandstone will be exposed above the anticipated normal water level of the end use lakes. The slope of the sandstone around the perimeter of the mine will be excavated to the reclamation slope developed to maintain long term stability based on the engineering properties of the sandstone bedrock. These slopes vary from location to location around the perimeter of the Site due to differences in external loading factors, depth of excavation, and backfilling processes. Where the sandstone face is exposed above the water table, the reclaimed slopes will vary from approximately 1.5:1 to 2:1 (horizontal to vertical) and will be protected by the overlying limestone.

Underwater slopes will be mined and reclaimed in one of two methods. Both methods were evaluated by Barr and both will likely be used at different locations throughout the quarry. The slope required to obtain an appropriate factor of safety are typically somewhat steeper for short term conditions than for long term reclamation condition. The first method will be to excavate the sandstone to the slope determined to be acceptable during mining activity and then to buttress the slope to a less steep slope designed for long term slope stability. The buttress material will be the blasted transition rock which will act to armor the slope. The second method will be to excavate the sandstone to the final reclamation slope and will not include buttressing. This method will leave some marketable material behind to establish the less steep long-term slope configuration.

The slope configurations have been designed to be stable for long term with adjacent loading from rail, highway, etc. taken into consideration. Where sandstone is exposed at the water line of the end use lakes, additional stabilization, such as riprap, is likely to be necessary in areas where wave action along the shoreline increases the erosion potential of the exposed sandstone.

3.7.3 Alternatives – Erosion and Sedimentation

³⁹ Barr Engineering Company. Pit High Wall Stability Analysis prepared for Merriam Junction Sands, LLC. January 2017.

Alternatives 1-6 all involve mining the same amount and type of material over the life of the Project. There is generally limited difference in the potential for erosion and sedimentation among the alternatives, with the exception of alternatives 1,2,4, and 5 with the development of the plant on Malkerson Sales property. Plant locations on the Malkerson Sales property have the potential to drain off-site. Development of the plant site including properly designed water quality treatment would be required in accordance with the NPDES and Scott County's stormwater management requirements. The No Build Alternative continues mining at the Site and therefore has similar potential for erosion and sedimentation as Alternatives 1-6, with the exception of the potential erosion of exposed sandstone slopes. Under the No Build Alternative, a greater portion of the Site would drain off-site to the Minnesota River at the conclusion of mining and the final development of the Site due to less internal drainage associated with the No Build Alternative.

3.7.4 Mitigation – Erosion and Sedimentation

The Site will operate under an MPCA's NPDES permit and a County IUP permit requiring compliance with stormwater management standards developed in the Scott County Zoning Code. The NPDES permit conditions require implementation of a stormwater pollution prevention plan and monitoring stormwater discharges in accordance with the permit. The Project is subject to ongoing regulatory authority with respect to erosion and sedimentation control. The following BMPs are designed into the Project to minimize erosion and sedimentation thereby protecting surface water quality. No significant environmental effects associated with erosion and sedimentation are anticipated.

- a) Operate the Site in compliance with the NRP approved by the County in conjunction with land use permits for the Project.
- b) Develop the Site utilizing BMPs designed to minimize the potential for erosion and sedimentation, thereby protecting adjacent surface waters.
- c) Operate the Site under an MPCA NPDES stormwater permit and a site specific SWPPP.
- d) Review and update the SWPPP at least annually to reflect changes in Site conditions as a result of the progression of mining and reclamation activities
- e) Sample and monitor stormwater and dewatering discharges in accordance with the NPDES permit to verify compliance with intervention limits.

3.8 Water Quality: Surface Water Runoff

The SDD identifies the following items to be addressed in the DEIS:

- a) The EIS will include hydrologic modeling and watershed analysis that will include hydrologic calculations and descriptions of pre-settlement, project development and reclamation conditions. This plan will address BMPs that will need to be implemented throughout all phases of the Project.

- b) The EIS will include an evaluation of conveyance of stormwater east of U.S. Highway 169 through the Site, identifying design capacity and taking into consideration increased runoff that may need to flow through the Site as a result of future development of the contributing watershed area.
- c) The EIS will develop a stormwater pollution prevention plan for mining and processing activities and evaluate the Project's impact on the quality of receiving waters, especially as it relates to the adjacent downstream wetland complex and the Minnesota River.

3.8.1 Affected Environment –Water Quality: Surface Water Runoff

The Site is part of a watershed area that includes land to the east of US 169. The watershed area encompasses approximately 1,811 acres that drain to the west to the floodplain wetland complex and Gifford Lake, and eventually into the Minnesota River. Figure 3.8.1, Project Watershed Area, illustrates the watershed of the Site and surrounding area. Land use in the watershed consists of undeveloped land, rural residential, commercial, and industrial land uses. The majority of surface water runoff from the watershed drains to Gifford Lake or the floodplain wetland complex and then eventually to the Minnesota River. Portions of the Minnesota River near the Site are impaired for Turbidity. This impairment is sensitive to uncontrolled erosion and sedimentation that impact stormwater quality.

3.8.2 Environmental Consequences – Water Quality: Surface Water Runoff

The watershed east of US 169 will continue to develop. Future development will be subject to the Scott County Zoning Ordinance and the stormwater management standards for rate control, volume control, and stormwater quality. Even with these controls, development is expected to result in modifications to the character of stormwater runoff as pervious areas are converted to impervious surfaces, and the watershed becomes more hydraulically connected through stormwater systems, curb and gutter, and other improvements.

3.8.2.1 Hydrologic Modeling

The EIS will include hydrologic modeling and watershed analysis that will include hydrologic calculations and descriptions of pre-settlement, project development and reclamation conditions.

The NRP (Attachment 2) includes hydrologic modeling results and additional detail related to the pre-settlement, existing, and reclamation conditions which are summarized in the following sections. BMPs are discussed in Section 3.7.2 Environmental Consequences – Water Quality: Surface Water Runoff.

3.8.2.2 Pre-settlement Conditions

There are six pre-settlement drainage areas on the Site. PS1, PS2, and PS3 all drain to Gifford Lake. PS1 is located in the northeastern portion of the Bryan Rock property which, under pre-settlement conditions, drained to the north through the current Dem-Con Landfill property and then into PS2 and Gifford Lake. PS4 and PS5 drain into the floodplain wetland, and PS6 drains south to a landlocked wetland basin southwest of the Bryan Rock southernmost parcel. Pre-settlement drainage areas of the Site are illustrated on Figure 3.8.2, Pre-Settlement Site Drainage Conditions.

Pre-settlement conditions include lake or pond outlets that were in place at the time the County ordinance was adopted and are considered pre-existing outlets. Two outlets predate the ordinance and are considered pre-existing outlets. One is the outlet associated with three stormwater basins adjacent to Gifford Lake constructed in the 1960's in conjunction with sand and gravel mining activity. Pre-settlement drainage area PS3 drains to and through these ponds and into Gifford Lake. The stormwater basin identified as wetland S4 was constructed in the 1980's to manage runoff from the quarry floor. A 60-inch culvert provides an outlet from this basin into the very northern edge of the seepage wetland. Channels within the seepage wetland direct flow a short distance into the B4 wetland complex through an established drainageway and eventually out to the Minnesota River as shown on Figure 3.8.1, *Project Watershed Areas*.

3.8.2.3 Existing Conditions

Existing conditions of the Site consider the current mining, commercial, and residential development of the Site and surrounding area. The Site includes 12 subwatershed areas, illustrated on Figure 3.8.3, Existing Site Drainage Conditions. Two subwatershed areas drain internally as a result of past mining activity and the remaining subwatershed areas drain off-site to four different receiving waters. Vegetative cover has changed from pre-settlement conditions and now also includes impervious areas associated with existing Site development. Impervious areas include the main haul road through the Site and scale house area, commercial and residential uses and their associated buildings, access roads, and paddocks, and festival booths. Pervious areas include the festival grounds, festival parking lots, quarry floor, reclaimed mining areas, pasture and grasslands.

There are a number of ponds located on-site which are used to manage stormwater runoff. The three ponds adjacent to Gifford Lake were discussed above. There are two additional ponding areas within subwatershed area EX4. One ponding area is associated with the Dem-Con Landfill. The Dem-Con pond was constructed in the 1980's and is located within a drainage easement on Bryan Rock property. The pond receives runoff from the southern portion of the Dem-Con Landfill, as well as from Anchor Block, the additional industrial lands east of Dem-Con, and drainage from a large contributing drainage area east of US 169. (Drainage into the Site is discussed in Section 3.8.2.3 below.) This pond outlets into a ditch that enters a second ponding area in the northwest corner of the Bryan Rock property. This pond, as well as water from a pond located on the Louisville Landfill, discharges under the railroad trestle and onto the Malkerson Sales property where it enters a ditch system located on the floor of the limestone quarry.

A stormwater pond is located on the floor of the Malkerson Sales limestone quarry that receives water from the stockpiling and processing area. The pond has an outlet that discharges to a ditch system that runs through the old quarry floor. The ditch system, which also receives stormwater from the Bryan Rock property and areas further upstream as described above, eventually discharges into wetland S4. Wetland S4 was constructed as a stormwater basin along the edge of wetland B4. Wetland S4 has a 60" CMP outlet that discharges water into the very northwest portion of the seepage wetland. Channels within the wetland direct the flow into wetland B4 and into the Minnesota River.

3.8.2.4 Reclamation Condition

The reclamation condition of the mined portion of the Site is modeled as open space (Modeled as HSG B soils CN=61) and water body (impervious CN=98). Much of the Site will drain internally in the reclamation condition. Potential future development areas identified on the Reclamation Plan will be required to design and implement stormwater management practices in accordance with regulations current at the time of development. Regional stormwater flow from east of US 169 will pass through the Site in an open channel designed to accommodate the 100-yr peak flow without overflowing into end use lakes. Reclamation drainage areas are illustrated on Figure 3.8.4, Reclamation Site Drainage Conditions.

3.8.2.5 Summary of Peak Rates of Runoff Pre-Settlement, Existing, Reclamation:

In accordance with the Scott County Zoning Ordinance, the Project has been designed to manage increased runoff so that the post reclamation condition will meet the Site's total 2, 10 and 100-yr peak rates of runoff for the Site. Much of the Site will drain internally resulting in peak rates of runoff that will be generally lower throughout the Site than existing conditions. Accelerated channel erosion on-site and off-site will not occur as a result of proposed mining and reclamation. Table 3.8.1 summarizes pre-settlement, existing, and post-reclamation peak rates of runoff.

Table 3.8-1 Pre-Settlement, Existing, and Post Development Peak Flows for Site*

Receiving Water	Pre-settlement			Existing Conditions			Reclamation Conditions		
	Peak flow (cfs)**			Peak flow (cfs)			Peak flow (cfs)		
	2-Yr	10-Yr	100-Yr	2-Yr	10-Yr	100-Yr	2-Yr	10-Yr	100-Yr
Gifford Lake	2.77	9.13	102.37	6.86	37.6	160.44	10.11	41.20	152.46
NE of 41	0	0	0	0.51	4.14	20.23	0	0	0
S4/B4	23.94	54.09	114.99	23.94	54.09	114.99	4.9	18.73	68.56
Wetland Complex	5.61	34.27	154.87	13.16	34.66	93.16	2.32	12.41	45.05
South of 145th	1.36	9.49	43.65	16.77	47.09	124.09	1.29	5.39	19.1
SITE TOTAL	33.68	106.98	417.13	61.24	177.58	512.91	19.45	81.67	299.39

* Does not include off-site contributions

** cfs = cubic feet per second

a) Off-site Drainage through Site

The EIS will include an evaluation of conveyance of stormwater east of U.S. Highway 169 through the Site, identifying design capacity and taking into consideration increased runoff that may need to flow through the Site as a result of future development of the contributing watershed area.

It should be noted that this scoping item is similar to scoping item e. in Section 3.4, Physical Impacts to Water Resources. "Design of future stormwater conveyance measures to accommodate identified peak flows taking into consideration future development of the contributing watershed area and precludes the introduction of regional surface water runoff into the end use lakes." Please refer to Section 3.4.2.5.1, 3.4.2.5.2, and 3.4.2.5.3 for additional detail regarding off-site drainage and design of a conveyance system through the Site.

b) Evaluation of Off-Site Drainage from East of US 169 Through the Site:

Regional stormwater flows from an approximately 1,209-acre drainage area east of US 169 enters the Site through three arch culverts located under the highway. Stormwater flows along the west side of US 169, across the Bryan Rock entrance, and along the northern property line of Bryan Rock. This stormwater is joined by additional off-site stormwater from the Louisville Landfill, the Dem-Con Landfill, and industrially developed land east of Dem-Con and South of 130th Street West. The total off-site drainage area that flows into the northern portion of the Bryan Rock property and through the Malkerson Sales property to wetland S4 is 1,350 acres.

There is a large storage area located just east of US 169 where stormwater accumulates and if enough runoff is generated from a rainfall or snowmelt event, the storage capacity is exceeded and runoff flows through the three arch culverts and into a ditch system/small storage area on the west side of US 169 and the eastern edge of the Bryan Rock property. When this storage area is exceeded, water flows overland to the northwest across the Bryan Rock quarry entrance and scale house area to a ditch system located along the Bryan Rock, Anchor Block, Dem-Con, and Louisville Landfill property lines. Stormwater from Anchor Block, Dem-Con Landfill and the development along Dem-Con Drive south of 130th and the Louisville Landfill joins the stormwater from east of US 169 along this ditch system. Stormwater from these areas is managed in accordance with the Scott County ordinances in effect at the time of development and includes ponding for rate control and water quality and some infiltration areas for volume control.

There is an existing ponding area along the western portion of the ditch system on the Bryan Rock property. When the storage is exceeded in this pond, it overflows to the west to the railroad right-of-way and under a railroad trestle and onto the Malkerson Sales property. An 18" corrugated metal pipe (CMP) culvert directs the flow under the quarry haul road and down to a ditch system on the quarry floor. The ditch system enters wetland S4 which serves as a large stormwater basin with an outlet into the northern portion of the seepage wetland eventually flowing west into wetland B4 and the Minnesota River.

c) Determination of Peak Flows Into and Through the Site Under Full Watershed Development:

HydroCAD modeling was performed for off-site watershed conditions that reflect peak flows from the 100-yr rainstorm event using Atlas 14 rainfall. Scott County modeled the drainage area in 2016-2017 in conjunction with frontage road improvements and development proposals east of US 169 and provided a design peak flow rate of 400 cfs⁴⁰ through the culverts or future conveyance under US 169 for full development of the watershed. Contributions from the off-site areas east of US 169 and the northern portion of the Bryan Rock property have been considered in determining peak flow through the Site resulting in a peak flow of 438 cfs beyond the Dem-Con Landfill ponding area.

Table 3.8-2 Off-Site Peak Flows Full Development Conditions

Inflow Location	100yr peak flow (cubic feet per second)
From US 169 to BRP NE	400
From Dem-Con Landfill pond outlet to S4	438

The conveyance of the regional stormwater through the Site will be maintained throughout mining. Reclamation includes the establishment of a permanent open channel designed to convey regional stormwater through the Site and preclude it from entering the end use lakes. The channel design accommodates 100-year peak flows for full watershed development.

3.8.2.6 SWPPP

The EIS will develop a stormwater pollution prevention plan for mining and processing activities and evaluate the Project's impact on the quality of receiving waters, especially as it relates to the adjacent downstream wetland complex and the Minnesota River.

Address BMPs that will need to be implemented throughout all phases of the Project.

Erosion and sediment management practices to be used throughout all phases of the Project have been developed to minimize or eliminate impacts to surface waters including the Minnesota River and its status as an impaired water of the State. The Site currently operates under a SWPPP and a preliminary SWPPP for the Project, which includes the addition of sandstone mining, is included as Appendix A of the NRP. The SWPPP describes BMPs that will be implemented to manage stormwater that may potentially pick up soil and contaminates throughout the Site which may then be discharged into the downstream floodplain wetland complex, Gifford Lake, and the Minnesota River. BMPs have been developed to eliminate exposure where possible, reduce exposure to the extent practical, and to treat stormwater prior to discharge where exposures do occur.

⁴⁰ Based on preliminary design. Final design to be modified to reflect the final results (100-year design flow of 266.1 cfs) contained within the TH169/TH41/CSAH 78 & 147th Street Overpass Project Final Design Report by WSB January 25, 2018

Exposure potential is typically greatest in stripped and disturbed areas that drain off-site because they have not yet been mined below the surrounding grade. Perimeter controls, including silt fence or diversion berms or swales, will be used as needed along these areas that may temporarily drain off-site. Silt fence will be maintained as needed and removed from the Site when no longer useful and mining has redirected surface water. The perimeter controls will be installed downstream of any land disturbing activities prior to the start of any land disturbance within a given area to be mined. BMPs will be extended and additional BMPs will be added as needed as mining progresses across the Site. Areas will be stabilized and reclaimed in phases, minimizing the area of disturbance which could potentially drain off-site. All BMPs shall be maintained, inspected, and remain in place until final stabilization is complete or drainage is directed internally.

Additional BMPs will be implemented to protect water quality. These are described in more detail in the Preliminary SWPPP and include:

- Stabilization of mined and backfilled areas with topsoil and establishment of vegetation in accordance with the Reclamation Plan.
- Establishment of temporary and permanent stormwater ponding areas sedimentation basins and infiltration areas.
- Use of energy dissipation devices at outlets and high velocity flow areas.
- Routine inspection and maintenance of equipment to minimize drips and leaks.
- Directing stormwater around and away from material storage, fuel storage, and transfer areas to internal stormwater/infiltration areas.
- Watering haul roads to control fugitive dust.
- Secondary containment, portable drip pans, spill kits, and employee training of proper fuel storage and handling.
- No detergent or chemicals used to wash equipment on-site. No discharge of equipment washwater off-site.
- Good housekeeping practices.

3.8.3 Alternatives – Water Quality: Surface Water Runoff

Alternatives 1-6 have all have similar potential for impacts to the quantity and quality of surface water runoff from the mining activities, varying with the location of active mining at any given time. All of the alternatives will have the same Reclamation Plan that will accommodate regional off-site drainage through the Site in an engineered drainage channel. The drainage channel will keep regional stormwater flows from entering the reclamation end use lakes.

The processing plant locations will vary in their impacts to the existing stormwater drainage pattern. Alternatives with a plant site located on the Malkerson Sales property, (Alternatives 1 and 4 with plant sites on MS-N and Alternatives 2 and 5 with plant sites on MS-S) will discharge stormwater from the plant site off-site. The stormwater will be managed in accordance with the NPDES permit and County regulations, including BMPs to provide for rate control, water quality and volume reduction. Stormwater discharges from the MS-N plant sites will be directed to Gifford Lake and stormwater discharges from MS-S will be directed to wetland S4, consistent with the current

drainage patterns of the plant sites. Monitoring of the stormwater discharges in compliance with the NPDES permit will be performed to verify the effectiveness of the BMPs incorporated into the construction and operation of the plant site(s).

Alternatives 3 and 6 have a plant site located on the floor of the existing quarry on Bryan Rock property. The plant site will be substantially recessed in elevation compared to the surrounding grade and all stormwater generated over the plant site will be handled internally and will not contribute to off-site surface water runoff.

3.8.4 Mitigation – Water Quality: Surface Water Runoff

The following measures have been designed into the Project to minimize erosion and sedimentation, thereby protecting surface water quality.

- a) Operate the Site in compliance with the NRP or RMP approved by the County in conjunction with land use permits for the Project.
- b) Construct and operate the Site utilizing BMPs designed to minimize the potential for erosion and sedimentation, thereby improving the water quality of surface runoff discharging from the Site.
- c) Promote infiltration of stormwater where feasible.
- d) Operate the Site in compliance with the MPCA NPDES stormwater permit and a site specific SWPPP.
- e) Review and update the SWPPP at least annually to reflect changes in Site conditions as a result of the progression of mining activity.
- f) Sample and monitor stormwater and dewatering discharges in accordance with the NPDES permit to verify compliance with intervention limits.
- g) Construct a stormwater conveyance channel through the Site that accommodates runoff from future development of the upstream watershed.

3.9 Water Quality: Wastewater

The SDD identifies the following items to be addressed in the DEIS:

- a) The EIS will evaluate the quantities of domestic wastewater to be generated by the Project and design wastewater treatment systems that meet the requirements of Scott County and the State of Minnesota.

- b) The EIS will describe the quantities of industrial wastewater generated by the Project and how this water will be managed. The EIS will describe the types of flocculants used and their potential impacts on receiving waters. Separate descriptions will be provided for the 1.2 MT/yr and 2.4 MT/yr plant capacities.
- c) The EIS will evaluate the management of dewatering discharges within and/or from the Site, including an evaluation of potential impacts to receiving waters.

3.9.1 Affected Environment – Water Quality: Wastewater

The Site is located in an area that is not served by municipal services. Wastewater generated at the Site will be treated in an on-site Subsurface Sewage Treatment System (SSTS). Currently the Bryan Rock property has no SSTS locations and is served by portable sanitary waste containment systems. The Malkerson Sales property has six SSTS sites that serve the stable, on-site residences, scale house and Renaissance Festival offices. All are located in the northern portion of the Site.

Average existing domestic wastewater flows are estimated at 1,667 gpd and include the following:

- | | |
|---------------------------------|----------------------------|
| 1. Indoor Arena: | 390 gpd |
| 2. Clubhouse: | 300 gpd |
| 3. Trailer: | 300 gpd |
| 4. House: | 600 gpd |
| 5. Renaissance Festival Office: | 72 gpd |
| 6. Shop: | 5 gpd (not used routinely) |

Mid America Festival events generate wastewater. The Renaissance Festival generates wastewater on a seasonal basis. The main event, the Renaissance Festival, is held for seven weekends a year with average daily attendance of approximately 20,000. Wastewater generated by the Renaissance Festival and campground is collected in holding tanks which are pumped and hauled from the Site. Bedrock near the surface of the festival grounds limits the suitability of the festival area for development of an SSTS. Portable sanitary waste containment systems are used for smaller events such as the Trail of Terror.

Industrial Wastewater generated at the Site is limited to water used for dust control and washwater discharge from aggregate washing. Industrial wastewater is handled internally at the Site where it infiltrates or evaporates at the end of the wash season.

3.9.2 Environmental Consequences – Water Quality: Wastewater

3.9.2.1 Domestic Wastewater

The EIS will evaluate the quantities of domestic wastewater to be generated by the Project and design wastewater treatment systems that meet the requirements of Scott County and the State of Minnesota.

The Project will continue to generate the domestic wastewater flows identified above throughout at least a portion of the Project. Sand and gravel mining in the northern portion of the Malkerson Sales property may result in the abandonment of one or more of the existing subsurface sewage treatment systems. SSTS's will be abandoned according to Minnesota Rules Chapter 7080-7083.

The Project may require the construction of a new SSTS to treat domestic wastewater generated at the Site's office/maintenance shop. Portable sanitary waste containment systems will continue to be used throughout the active mining area.

The quantity of additional domestic wastewater to be generated by the Project is based on 45 additional employees. 25 of these employees are assumed to use portable containment systems within the mine and wet plant area, operating on a seasonal basis. 20 of the employees are assumed to use facilities located in the office/maintenance/shop building and will generate an additional 350 gpd of domestic wastewater based on an average wastewater generation rate of 17.5 gpd per employee eight-hour shift.

The quantity of wastewater generated at each of the 1.2 MTY plants is estimated to be 50% of the wastewater to be generated at a 2.4 MTY plant based on half of the employees using facilities located in the office/maintenance/shop building and will generate 175 gpd of domestic wastewater based on an average wastewater generation rate of 17.5 gpd per employee eight-hour shift.

SSTS locations must meet certain location and design criteria established in the Scott County Subsurface Sewage Treatment System Ordinance No. 4, and technical standards of the MPCA adopted in Minnesota Rules Chapters 7080 and 7081. The proper location, design, installation, use, and maintenance of an SSTS protects the public health, safety, and general welfare by the discharge of adequately treated sewage to the groundwater.

Much of the Site has been previously disturbed from past mining activity and is therefore not suitable for development of SSTS. Feser Environmental conducted field survey and identified all suitable SSTS locations on the Project Area. The Feser SSTS Report⁴¹ (Attachment 5) includes the results of this work. The SSTS sites were identified as potential locations to serve the plant site as well as future development. The locations of primary and alternate SSTS sites that meet the requirements of Scott County and the State of Minnesota have been identified and are illustrated on Figure 3.9.1: Potential SSTS Site Locations.

The MS-N and MS-S plant site has potential suitable drainfield sites located along the western side of MS-N. The area encompasses approximately 67,000 square feet located on a wooded backslope and has not been previously disturbed by mining or other past Site activities. MS-N/SSTS is located at an elevation ranging from 724-742 feet above mean sea level and is entirely above the regional flood elevation of approximately 723.2 feet above mean sea level adjacent to this area.

⁴¹ 2019 Feser Environmental. Site Suitability for Septic Systems. Merriam Junction Sands, LLC on Property owned by Bryan Rock Products, Inc. and Malkerson Sales., Inc. 6/24/2019.

The only area with suitable SSTS sites on the Bryan Rock property is located on the very southern portion of the property. A plant site developed on the Bryan Rock property will require wastewater to be pumped to the southern end of the Bryan Rock property to these areas.

3.9.2.2 Industrial Wastewater

The EIS will describe the quantities of industrial wastewater generated by the Project and how this water will be managed. The EIS will describe the types of flocculants used and their potential impacts on receiving waters. Separate descriptions will be provided for the 1.2 MT/yr and 2.4 MT/yr plant capacities.

The Project currently generates process water from aggregate washing. The demand for washed product varies from 5 to 15 percent of total processed material each year. Limestone is washed after it has been crushed and screened. The washplant typically operates up to ten weeks a year. Washwater is discharged to on-site sedimentation ponds and is not discharged off Site. The washplant is supplied with water from a 12-inch production well completed in the Tunnel City Group and Wonewoc Sandstone (formerly the Franconia Formation and the Ironton-Galesville Sandstones) located in the northern portion of the Bryan Rock property. Bryan Rock has had a water appropriation permit since 1994 for the appropriation of 300 gallons per minute, and up to 30 million gallons per year of groundwater.

New sources of industrial wastewater generated by the Project include discharges from the wet plant and quarry dewatering discharges. The wet plant will operate up to 24 hours a day, 7 days a week for up to 36 weeks per year as weather conditions allow. Process water is recycled through a closed loop system with a water treatment plant that returns treated water to the freshwater tank for reuse. Water reuse rates of 95% or greater are anticipated. Losses to the system include moisture associated with the wet processed sand and waste materials as they leave the system. The estimated rate of water leaving the system is 232 gpm associated with the processed sand and 267 gpm associated with the sediment from the clarifier. The majority of the moisture associated with the sand evaporates and/or is removed during dry plant processing. Waste sand (sand that is too fine for market) is mixed with quarry dewatering water and water from the sand stockpile underdrain systems and returned to exhausted portions of the quarry in a sand/water slurry. The water treatment plant will use a clarifier/thickening tank followed by a filter press (belt press or plate press). Mud from the press will be used in mine reclamation backfills above the groundwater. The wet plant system will be drained on an annual basis in the fall to an upland area.

A combination of flocculants and coagulants will be used in the water treatment process. Flocculants are additives used to attract small suspended particles into larger filterable flocs that quickly settle through the water column to the bottom of the clarifier. A flocculant can be used alone or with coagulants, or the coagulant may be added after the clarifying tank to help in the effectiveness of the filter press process.

The properties of the wet plant's wastewater discharge depend upon site specific characteristics of the geologic deposit being mined and the materials being washed. Therefore, it is necessary to test

a range of polymers to identify the best products and dose to treat the wastewater discharge. The selection of the specific additives to be used will be determined during final plant design. It is anticipated that the Project will utilize similar settling agents as used at other Jordan Sandstone wet processing operations. These are typically anionic polyacrylamide flocculants and polydimethyldiallylammonium chloride (polyDADMAC) coagulants. Any additives used and their doses will be subject to approval by the MPCA through the NPDES permitting process.

Polyacrylamide polymers have no known adverse human health risks and the polymer is removed from the wastewater with the sediment in the treatment process. Acrylamide is a monomer used in the production of the polyacrylamide polymer and a small amount of the unreacted acrylamide monomer remains in the polyacrylamide flocculant as a residual product of the manufacturing process. A residual amount of DADMAC monomer also is present as a result of the production of polyDADMAC. Both Acrylamide and DADMAC monomers are water soluble, remaining in solution in the system.

The acrylamide monomer (not polyacrylamide) is listed as a probable human carcinogen by the United States Environmental Protection Agency (EPA). The DADMAC monomer has not been linked to adverse health impacts. The EPA has established a National Primary Drinking Water Regulation (NPDWR) for acrylamide which establishes the de facto limit of 0.5 micrograms per liter (ug/L) for acrylamide through a treatment technology standard. In 2015 the Minnesota Department of Health (MDH) developed a HRL for acrylamide of 0.2 µg/L. The MDH is authorized to review, develop and adopt health-protective guidance known as HRLs. An MDH-derived HRL is the concentration of a chemical in drinking water that, based on the current level of scientific understanding, is likely to pose little or no health risk to humans, including vulnerable subpopulations (typically children and the elderly). The HRL is a function of how toxic a chemical is (that is, the minimum quantity that will cause health effects), the duration of exposure, and the amount of water individuals drink during the exposure period. An HRL value incorporates several adjustment factors to account for uncertainty in our understanding of a chemical's health risks; chemicals with fewer studies will tend to have a higher degree of conservatism built into the HRL value to compensate for the higher degree of uncertainty.⁴²

There are stringent controls on the handling of the monomer in the manufacturing process and of the residual monomer concentration in commercial anionic polyacrylamide polymers. Polyacrylamide is used in variety of applications other than wastewater clarification, including soil erosion control and food processing. Both polyacrylamide and polyDADMAC are commonly used to treat public drinking water supplies prior to distribution.

Both the acrylamide and DADMAC monomers are readily biodegradable in surface water and soil. Biodegradation rates are oxygen and temperature dependent and also vary with concentration and the microorganisms previous exposure or acclimation to acrylamide. The half-life of acrylamide under aerobic conditions is typically 1-2 days and has been observed at less than 24 hours⁴¹. The acrylamide monomer is considered to have a low potential for bioaccumulation.

⁴² From MDH methods. Retrieved on line at

<https://www.health.state.mn.us/communities/environment/risk/rules/water/methods.html>

Recycling of wastewater through the wet plant will result in an increase in concentrations of the monomers until a steady state condition is reached and the mass of the monomers entering the system equals the mass of the system leaving the system in the wet sand, waste materials, and through biodegradation. As a result of rapid biodegradation, steady state concentrations are expected to be between approximately 7 µg/l and 25 µg/l⁴³ depending upon the final design of the treatment plant, size of the freshwater tank and clarifier and the realized rate of biodegradation. At the end of the season, when the system is emptied prior to freeze up, the water in the system will be stored for a minimum of 7 days (or in accordance with MPCA NPDES Permit) to allow reduction in acrylamide concentrations prior to discharging to an upland area of the site. Biodegradation will continue to occur within the soils. There will be no direct discharge of wastewaters off-site.

Acrylamide levels in the groundwater are expected to be non-detectable and there will be no impact to surface water. Typically, this would be a chemical approved for use through the MPCA NPDES program. It is anticipated that the MPCA will require an Individual NPDES Permit for at least the first five operating years and that groundwater monitoring for acrylamide will be conducted on dewatering discharges as well as on groundwater downgradient of the end of season infiltration area as part of that permit. Based on the monitoring results, the Site may qualify for a General Permit. Alternatively, if the MPCA issues a General Permit, the County may require groundwater monitoring for acrylamide and other parameters.

For the Shakopee Sand Site, which manages end of season wet plant discharge in the same manner as proposed by the Project, the MPCA issued a General Permit and the County required groundwater monitoring. The original groundwater monitoring requirements for acrylamide were removed after a period of monitoring that showed non-detects for acrylamide in the groundwater.⁴⁴

3.9.2.3 Dewatering Discharges

The EIS will evaluate the management of dewatering discharges within and/or from the Site including an evaluation of potential impacts to receiving waters.

Dewatering discharges will be managed internally to the extent possible. Dewatering discharges will be used to supply makeup water to the wet plant and to infiltration areas to provide recharge along the seepage wetland. During the initial years of any given phase the size of the excavation that needs to be dewatered and the required pumping rate will be small enough that the water can be managed internally. As the size of the excavation increases with the advancement of mining, the pumping rate will increase to effectively dewater the increasingly larger area to be dewatered. During the first phase of mining, regardless of the alternative, if there is excess dewatering discharge, it will be

⁴³ Estimated steady state concentration is based on an anticipated flocculant dose of 2.5 mg/l anionic polyacrylamide flocculant, typical for the Jordan Sandstone, but may need to be adjusted based on local variations. Steady state concentrations are directly proportional to dose so doubling the dose of the anionic polyacrylamide flocculant will double the steady state concentrations.

⁴⁴ 2018 Barr Engineering. 2018 Annual Groundwater and Surface Water Monitoring Report. Shakopee Sand LLC Scott County, MN

discharged off-site. As subsequent phases are dewatered and mined, excess dewatering discharge will be directed into a previously mined area or discharged off-site.

The management of dewatering discharge will vary depending upon the mine phasing and the alternative that is ultimately constructed. The variations in the management of dewatering discharges are described in Section 3.9.3 Alternatives Analysis. If dewatering water is discharged off-site, the flow rate and water quality will be monitored, and the discharge will be subject to monitoring in accordance with the MPCA NPDES Permit requirements. Current dewatering discharge monitoring requirements for silica mines are indicated in Table 3.9 below. Pretreatment (sedimentation) may be required to remove sediment prior to discharge in order to meet the discharge limitations. The current NPDES General Permit for dewatering discharges from a silica sand mine requires monitoring of flow rate, nitrate plus nitrite Total (as N), Nitrogen Kjeldahl Total, pH, Phosphorus, and TSS in accordance with the following table. If an individual permit is required, it is likely that additional monitoring will be required including monitoring for acrylamide. It is anticipated that if the MPCA issues a General Permit, the County will require monitoring for acrylamide in the dewatering discharge and the groundwater for a period of time to confirm no significant impacts to groundwater quality as a result of the Project.

Table 3.9 NPDES General Permit Monitoring Requirements- Silica Sand Dewatering Discharge

Parameter	Discharge Limitations						Monitoring Requirements		
	Quantity /Loading max.	Quantity /Loading units	Quality /Conc. min.	Quality /Conc. avg.	Quality /Conc. max.	Quality/ Conc. units	Frequency	Sample type	Effective period
Flow	Monitor only. calendar quarter	million gallons		Monitor only. calendar quarter average		million gallons per day	once per quarter	Measurement, Continuous	Jan-Dec
Nitrite Plus Nitrate, Total (as N)				Monitor only. calendar year average		milligrams per liter	once per year	Grab	Jan-Dec
Nitrogen, Kjeldahl, Total				Monitor only. calendar year average		milligrams per liter	once per year	Grab	Jan-Dec
pH			6.5 calendar quarter minimum		8.5 calendar quarter maximum	standard units	once per quarter	Grab	Jan-Dec
Phosphorus, Total (as P)				Monitor only. calendar quarter average		milligrams per liter	once per quarter	Grab	Jan-Dec
Solids, Total Suspended				25 calendar quarter average	45 daily maximum	milligrams per liter	once per quarter	Grab	Jan-Dec

Effluent limitations of dewatering discharges for total suspended solids are 25 mg/l calendar quarter average and 45 mg/l daily maximum. Under the General NPDES Permit, the TSS discharge standard for silica sand dewatering operations is more restrictive than the TSS dewatering standard for sand and gravel dewatering operations. In addition, the General NPDES Permit prohibits the discharge of toxic pollutants or nuisance conditions such as: floating solids, scum and visible oil film, acutely toxic conditions to aquatic life, or other adverse impact on the receiving water. It is likely that the MPCA will require an individual NPDES permit to impose additional monitoring requirements of dewatering discharge and groundwater during the initial permit term with the opportunity to convert to a General Permit at some point in the future based on monitoring results. In the event that the MPCA issues a General Permit, it is anticipated that the County will require additional dewatering discharge and groundwater monitoring.

3.9.3 Alternatives – Water Quality: Wastewater

3.9.3.1 Domestic Wastewater

The alternatives that include the MS-N and MS-S plant sites can construct an SSTS site near the MS-N plant site location. MS-S will require pumping to the site. The alternatives that include a BRP plant site can construct an SSTS site on the southern end of the Bryan Rock property and pump to that location based on the information presented in Section 3.9.2.1. The Project will generate relatively minor amounts of domestic wastewater under either the 1.2 or 2.4 MTY plant capacities. SSTS sites will be developed under full compliance of the County and State regulations.

3.9.3.2 Industrial Wastewater

All alternatives are expected to utilize chemical flocculants in a closed loop system. Alternative 1 and Alternative 2 will each have plant capacities of 1.2 MTY, 50% of the plant capacities in Alternatives 3-6. Each of the smaller plants will generate approximately one half of the industrial wastewater of the other alternatives. The flows into and out of the system and the volume of the clean water and clarifier tanks for the wet plants in Alternatives 1 and 2 are expected to be approximately one-half the flow rates and volume of these systems in the larger plants. The steady state concentrations of acrylamide monomer is expected to be the same in all of the Alternatives.

3.9.3.3 Dewatering Discharges:

Dewatering discharges will vary among the alternatives and among the phases within the alternatives. As mining begins in each phase, dewatering rates will be low. Pumping rates will increase as the size of mining progresses through a phase and the area to be dewatered increases. Groundwater modeling predicts dewatering rates ranging from 690 gpm to 4,360 gpm as shown on Table 3.4.2, depending upon phase and alternative. When mitigation measures are accounted for to provide infiltration along the western edge of the Project, the predicted pumping rates increase to account for recirculation of a portion of the infiltrated water. The range of predicted pumping rates

under the highest level of infiltration varies from 840 gpm to 9,960 gpm as shown on Table 3.4.3, depending upon alternative and phase.

Dewatering discharge that will need to be handled internally or discharged off-site after accounting for the make-up water and mitigation is shown on Table 3.9-2. These numbers were calculated taking the estimated pumping rates needed to dewater under the mitigation scenario, the estimated volume of water needed to maintain the infiltration head under the proposed mitigation, and the estimated make up water needed to supply the wet plant and represents the estimated excess water at the end of a given phase. Once mining in Phase 1 of an alternative is complete and mining and dewatering advance to additional phases, it is anticipated that excess dewatering water may be discharged into the open water feature of a previous phase excavation and handled internally.

Table 3.9-2 Estimated Maximum Dewatering Discharges per Alternative and Phase

Alternative	Phase	Maximum Excess Dewatering to Discharge off-site (gpm)
Alt 1/2	1A & 1B	2,500
	2A & 2B	1,680
Alt 3	1	0
	2	1,190
	3	1,070
	4A	1,570
Alt 4/5/6	4B	2,260
	1	630
	2	1,600
	3	680
	4	650

Off-Site discharge of dewatering water will be subject to an MPCA NPDES permit. A pretreatment basin will be constructed with a controlled overflow device. The outfall will contain erosion control to minimize the potential for any downstream impacts. Monitoring of the discharge will be conducted under the terms of the permit. The Proposer will coordinate with the MPCAs closed landfill program to develop a monitoring plan for dewatering discharge potentially impacted by groundwater contamination associated with the Louisville Landfill.

3.9.4 Mitigation – Water Quality: Wastewater

Wastewater discharges will be subject to on-going regulatory authority and the Site will operate under an NPDES Permit from the MPCA. On Site SSTS sites will be permitted and designed in accordance with County Regulations. Significant environmental impacts from wastewater are not anticipated. The following measures have been designed into the Project to minimize potential impacts associated with wastewater.

- a) On-site SSTS systems will be designed in accordance with State and County requirements. Portable sanitary waste containment systems will be used throughout the mine.
- b) Water treatment chemicals will be consistent with those commonly used in the treatment of drinking water. They will be used to maximize reuse of process water.
- c) End of season discharge of the process water will occur a minimum of 7 days after the last application allowing time for the reduction of any residual acrylamide monomer concentration.
- d) The end of season water treatment system will be discharged to an upland area of the Site. The discharge is contained and allowed to infiltrate and will be managed so that it is not directly to the mine lakes or surface water.
- e) Off-site discharges will be subject to best management practices including pretreatment, controlled outlet structure, and outlet energy dissipation.
- f) Dewatering discharge will be subject to MPCA NPDES permit and associated monitoring and reporting requirements and will include at a minimum, monitoring for acrylamide in the groundwater during at least the initial years of mining to document no impact to groundwater. Monitoring conditions will be established as part of permitting.

3.10 Geologic Hazards and Soil Conditions

The SDD identifies the following items to be addressed in the DEIS:

- a) The EIS will include a slope stability analysis of the unconsolidated materials and the underlying bedrock units remaining above and below the water table. This analysis will be used to properly design mine walls and establish sufficient setbacks from property lines, railroad tracks, roadways, structures, etc. with an appropriate factor of safety.
- b) The EIS will include the development of a spill prevention and response plan, evaluation of imported material to prevent aquifer contamination, and the development of a comprehensive groundwater monitoring and mitigation plan that continues for a period of time beyond completion of final reclamation.

3.10.1 Affected Environment –Geologic Hazards and Soil Conditions

3.10.1.1 Site Geology

The proposed Site is located in the southern region of the Twin City basin, with underlying bedrock units generally dipping to the north. Over most of the Site, a thin layer of unconsolidated material (a

mix of sand and gravel and clay) rests on top of bedrock. Bedrock is near the surface throughout the majority of the Site. An exception to this is in the northern portion of the Site where a large buried valley downcut through the Prairie du Chien Group and underlying bedrock formations. This buried valley was formed by stream erosion and subsequently filled with glacial drift during periods of glaciations. The glacial drift typically consists of sand, gravel and clay.

The Prairie du Chien Group forms the bedrock subcrop over much of the Site. The depth to the bedrock is less than 50 feet throughout the central and southern portion of the Site. The Prairie du Chien Group is composed of two units, the upper Shakopee Formation and the lower Oneota Dolomite. Both units consist largely of carbonate components, characterized by thin to very thick, beds of dolostone, with negligible amounts of sandstone and other silica bearing rocks, except in the lowermost 10 to 20 feet, within the Coon Valley Member, (the lowest member of the Oneota Dolomite), which can contain substantial quantities of sandstone, siltstone, and shale.⁴⁵ The Oneota Dolomite is being actively mined across the Site. While mining encounters small solution cavities and fracture zones typical of this formation, there is no evidence of sinkholes or other larger karst features within the Site. The proposed Project involves the continued mining and removal of the Prairie du Chien Group, therefore the potential for geologic hazards related to karst features is low.

The Prairie du Chien Group within the Site boundary is typically 25-70 feet thick due to past erosion of the uppermost portion of this bedrock unit. It has been entirely eroded away in the northern portion of the Site and is also absent over the very westernmost and southernmost portions of the Site.

Underlying the Prairie du Chien Group and forming the bedrock subcrop in the very southern portion of the Site, is the Jordan Sandstone. The Jordan Sandstone is approximately 80 to 120 feet thick within the Site. It contains two facies, a medium-to coarse-grained quartz sandstone and fine-grained feldspathic sandstone with lenses of siltstone and shale. The Jordan Sandstone is the source of the silica sand deposit.

3.10.1.2 Site Soils

The majority of original Site soils are classified as Stony Land. Stony Land is described in the Scott County Soil Survey as located chiefly on terraces within St. Lawrence and Louisville Townships⁴⁶. Limestone or sandstone underlies this soil at depths of 6 to 36 inches. In some places the bedrock is exposed. Other predominant Site soils include the Estherville sand and sandy loam, which account for close to 10% of the original Site soils. These soils are prevalent in the northern portion of the Malkerson Sales property. Estherville Soils are described as developing on gravelly and sandy outwash plains and terraces. Other soil types are present in smaller occurrences. Figure 3.10.1, *Site Soils*, and Table 3.10-1, *Soil Types*, indicate the Site soils. Mining over the course of the last 60 years has removed many of the original Site soils.

⁴³ Mossler, John. 2008. Paleozoic Stratigraphic Nomenclature for Minnesota. Report of Investigations 65. University of Minnesota St. Paul, MN.

⁴⁶ Soil Survey of Scott County United States Department of Agriculture Soil Conservation Service October 1959, and May 1997 update. Washington D.C.: U.S. Government Printing Office, 1959, 1997.

Table 3.10-1 Soil Types

Map Unit Name	Percent of Soil Type on Site
Copaston silt loam	2.4
Dickman sandy loam	6.1
Dorchester	0.2
Estherville loam and sandy loam	13.5
Salida gravelly sandy loam	1.4
Hawick	0.9
Pits, gravel	1.2
Sparta loamy fine sand	3.5
Houghton muck	3.2
Stony land	56.7
Terrace escarpments	4.5
Terril loam	1.6
Water	4.4
Waukegan silt loam	0.4

Aggregate mining operations are typically situated in areas characterized by highly permeable soils which can be conducive to higher susceptibility to groundwater contamination. The majority of Site soils are either unclassified (Stoney Land which typically is highly permeable) or hydrologic soil group A soils, indicating that they are very permeable. Based on the Scott County Groundwater Susceptibility Map⁴⁷, the Site is located in an area considered to be highly susceptible to groundwater contamination due to the shallow, highly permeable cover over the bedrock aquifer. Mining involves the removal of the native soils and overburden and reduces the depth of material overlying the water table. This has the effect of further reducing the travel time that it would take a contaminant released at the surface to travel to and enter into the groundwater aquifer.

3.10.2 Environmental Consequences - Geologic Hazards and Soil Condition

The EIS will include a slope stability analysis of the unconsolidated materials and the underlying bedrock units remaining above and below the water table. This analysis will be used to properly design mine walls and establish sufficient setbacks from property lines, railroad tracks, roadways, structures, etc. with an appropriate factor of safety.

⁴⁷ Scott County Environmental Health. Scott County, MN Groundwater Susceptibility Map. Available online at <https://www.scottcountymn.gov/530/Geology>

3.10.2.1 Slope Stability Analysis

Mining involves the creation of mine faces or high walls as material is excavated and removed for processing. Various geologic layers are encountered as mining proceeds to its deepest extents including unconsolidated overburden, limestone (Prairie du Chien Group), and sandstone (Jordan Sandstone). Geotechnical properties of individual strata influence both short term slope stability during active mining, and long term slope stability, post reclamation. External forces such as mine trucks, highway and rail corridors, saturated or unsaturated conditions of the geologic materials, reclamation backfill, and appropriate factors of safety must be taken into consideration when developing mine plans, establishing mine setbacks and designing final reclamation conditions.

Barr conducted a slope stability analysis⁴⁸ (Attachment 6) for the proposed pit high walls, including analysis of mining and reclamation slopes, anticipated loads at the top of the slopes, and mining and reclamation methodology. The results of the analysis have been used to further develop mine planning with respect to the design of appropriate excavation and final reclamation slopes that considers setbacks from property lines, external loads such as railcars, roadways, structures, etc., and an appropriate factor of safety.

As part of the slope stability analysis, geotechnical borings, test pits and block sampling were conducted to assess the density, degree of cementation and strength of the materials used in the design of the high walls. A series of six cross sections were developed that are representative of the various conditions anticipated to be encountered across the Site (Attachment 6 Slope Stability Analysis). Figure 3.10.2, Cross Section Locations for Slope Stability Analysis, illustrates the locations of the cross-sections through the mine perimeters and the separation berm which include:

- Section 1-1' representing the eastern perimeter of the Site along the US 169 corridor where the thickness of Prairie du Chien is greatest
- Section 2-2' representing the southern perimeter of the Site
- Section 3-3' representing the western perimeter of the Site
- Section 4-4' representing the northern perimeter of the Site where a buried valley is located and most of the Prairie du Chien has been eroded away resulting in unconsolidated materials overlying the Jordan
- Section 5-5' representing the western perimeter of the Bryan Rock property and the eastern perimeter of the Malkerson Sales property with the Railroad corridor situated between the two properties
- Section 6-6' representing a separation berm to be constructed for support of post-reclamation equipment loading and a stormwater channel or pipe including consideration of both unlined and lined storm water channel(s). This section was developed to evaluate the required construction of this berm. The berm represented by Section 6-6' is proposed to be constructed with hydraulic fill of waste rock to facilitate support of the stormwater open channel required to maintain drainage from off-site areas through the Site as well as to provide for vehicle and equipment access.

⁴⁸ Barr Engineering Company, January 2017 Pit High Wall Stability Analysis Merriam Junction Sands, LLC

Figure 4 of the slope stability analysis illustrates the locations of the cross sections. Cross sections 1-1' through 5-5' are presented in Appendix C of the analysis and cross section 6-6' is shown on Figure 6 of the analysis (Attachment 6, Pit Highwall Stability Analysis). The cross sections were developed assuming that the Jordan Sandstone would be mined by wet mining techniques. The existing groundwater surface Barr developed as part of the groundwater assessment was utilized in the stability analysis. External loading was incorporated into the model where external loads are anticipated due to the presence of existing infrastructure or the proposed use of equipment along the crest of the mine during mining operations and also during reclamation. External loads account for railcars, highway traffic along and mine trucks operating along the edge of the excavation.

The slope stability analysis is based on the following setbacks:

Bryan Rock Property:

North: 70 feet from property line allowing for the construction of the stormwater conveyance channel.

South: 30 feet from property line

East: 45 feet from US 169 right-of-way allowing room for berming

West: 30 feet from railroad right-of-way

Malkerson Sales Property:

North: No setback limits of sandstone mining interior of Site

South: 30 feet

East: 30 feet from railroad right-of-way

West: 30 feet from property line, variable (30-100 feet) along wetland complex

The slope stability analyses were conducted using SLOPE/W which uses limit equilibrium theory to compute the factor of safety (FOS) of earth and rock slopes. It utilizes a variety of methods to compute the FOS of a slope while analyzing complex geometry, stratigraphy, and loading. For these analyses, the selected FOS values are consistent with typical industry standards for long term conditions (FOS = 1.5), short term during typical operations with monitoring (FOS = 1.3), and extreme or short term events or where potential instability carries little to no risk for impact to personnel or property (1.05). The minimum FOS of 1.05 was used to evaluate the steepest slopes possible that could occur in areas where dredging was utilized, no personnel or equipment were working adjacent to the slopes, no adjacent external loads exist (rail or highway), and reclamation occurs shortly after a section of the final slope has been excavated. For areas where external loads are adjacent to the top of the high wall, a minimum FOS of 1.3 was applied no matter the mining method. An FOS of 1.5 was targeted for long term reclamation conditions or for mine slopes near critical infrastructure (railroad and US 169).

Long term slope stability analysis includes two reclamation scenarios: one scenario is where the reclamation slopes is excavated as part of the mining process; the second scenario is where the mine is excavated to a steeper slope and then buttressed with limestone rock to create the final reclamation slope.

a) Results: Mining No External Load -FOS 1.05

FOS – 1.05: This case represents the steepest slopes possible that could occur in areas where dredging is utilized, no personnel or equipment are working adjacent to the slopes, no adjacent external loads (rail or highway), and reclamation occurs shortly after a section of the final slope has been excavated. This condition is only applicable to Sections 2, 3 and 4. Limestone will be benched to achieve an overall slope of 0.5:1 (horizontal to vertical) and sandstone can be excavated to a 0.5:1 to 1:1 slope depending upon the amount of fracturing in the overlying limestone to maintain an FOS of 1.05. Along Section 4-4' where limestone has been eroded and a thicker sequence of unconsolidated material overlies the sand, the sandstone can be excavated to a slope of 0.8:1 to maintain a FOS of 1.05. These areas would be backfilled or buttressed to achieve required reclamation slopes.

b) Results: Active Mining with External Loads:

FOS = 1.3: This case represents maximum slopes allowable to maintain an FOS of 1.3 and considers external loads adjacent to all sections, railroad, highway and/or mine trucks. As in the case above, limestone will be benched to achieve an overall slope of 0.5:1. Slopes vary for each representative section from 0.9:1 to 2:1 depending upon the section location and the degree of fracturing of the limestone section. Table 3.10.2 includes the results for all sections.

Table 3.10-2 Stability Analysis – Active Mining with External Loads

Section	PDC Slope (H:V)	Maximum Considered PDC Highwall height (ft)	Soil Overburden Slope (H:V)	Maximum Depth of Jordan Dredging Considered (ft)	Jordan Slope – Dredging with External Loads (H:V) FOS = 1.3		External Loads Considered
					Relatively Intact PDC	Highly Fractured PDC	
1-1'	Benching to 0.5:1 equivalent	87	NA	111	1.5:1	2.0:1	Hwy and Mine Truck
2-2'	Benching to 0.5:1 equivalent	25	NA	85	1:1	1.4:1	Mine Truck
3-3'	Benching to 0.5:1 equivalent	20	NA	85	1:1	1.5:1	Mine Truck
4a – 4a'*	Benching to 0.5:1 equivalent	75	NA	80	0.9:1	1.7:1	Mine Truck
4b – 4b'*	NA	NA	3:1	80	1.1:1	NA	Mine Truck
5-5' MS^	Benching to 0.5:1 equivalent	38.5	NA	95	1.1:1	1.6:1	Rail and Mine Truck
5-5' BRP^	Benching to 0.5:1 equivalent	56	NA	95	1.1:1	1.8:1	Rail and Mine Truck

* Section 4a represents the case where all material overlying the Jordan is Prairie du Chien whereas 4b represents the case where all Prairie du Chien has been removed by erosion or mining and only soil overburden is present atop the Jordan.

^ Section 5-5' MS is in reference to potential failure surfaces with their exit zone in the MS pit while Section 5-5' BRP is in references to surfaces with their exit zone in the BRP pit.

c) Results: Reclamation with long term external loads

FOS = 1.5: An FOS of 1.5 was targeted for long term reclamation conditions or for mine slopes near critical infrastructure (railroad and US 169). This case represents maximum slopes allowable to maintain a FOS of 1.5 and considers adjacent external loads. Limestone will be benched to achieve an overall slope of 0.5:1. Slopes vary for each representative section from 1.5:1 to 2.6:1 depending upon the section location and the degree of fracturing of the limestone section. This assumes that the sections will be over excavated to the slopes indicated in Table 3.10.3 below and then buttressed with limestone to create the long-term reclamation slope. Also included in the table is the resulting FOS or, if less than 1.5, the required minimum slope, if the sandstone was not over excavated, but mined to the reclamation slope.

Table 3.10-3 Stability Analysis – Reclamation with Long Term External Loads

Section	PDC Slope (H:V)	External Loads Considered	Soil Overburden Slope (H:V)	Maximum Depth of Jordan Dredging Considered (ft)	Rock Buttress Reclamation Slope (H:V) FOS = 1.5		FOS if dredged to rock buttress reclamation slope		External Loads Considered
					Relatively Intact PDC	Highly Fractured PDC	Relatively Intact PDC	Highly Fractured PDC	
1-1'	Benching to 0.5:1 equivalent	Hwy	NA	111	2.0:1	2.6:1	1.63	1.52	Hwy
2-2'	Benching to 0.5:1 equivalent	NA	NA	85	1.5:1	1.6:1	1.67	1.7H:1V required for FOS > 1.5	NA
3-3'	Benching to 0.5:1 equivalent	NA	NA	85	1.5:1	1.6:1	1.68	1.7H:1V required for FOS > 1.5	NA
4a – 4a'	Benching to 0.5:1 equivalent	NA	NA	80	1.5:1	2.0:1	1.71	2.1H:1V required for FOS > 1.5	NA
4b – 4b'	NA	NA	3:1	80	1.5:1	NA	1.59	NA	NA
5-5' MS [^]	Benching to 0.5:1 equivalent	Rail	NA	95	1.5:1	2.0:1	1.65	1.51	Rail
5-5' BRP [^]	Benching to 0.5:1 equivalent	Rail	NA	95	1.5:1	2.3:1	1.60	1.51	Rail

* Section 4a represents the case where all material overlying the Jordan is Prairie du Chien whereas 4b represents the case where all Prairie du Chien has been removed by erosion or mining and only soil overburden is present atop the Jordan.

^ Section 5-5' MS is in reference to potential failure surfaces with their exit zone in the MS pit while Section 5-5' BRP is in reference to surfaces with their exit zone in the BRP pit.

d) Results separation berm

The separation berm will be constructed across the northern and southern phases of the Malkerson Sales property after removal of the sandstone resource. The construction of the separation berm will include a drainage channel across the top of the berm and access road for maintenance vehicles. The drainageway will route regional stormwater flows through the Site. The berm represented by cross section 6-6' on Figure 3.10.2 is proposed to be constructed using hydraulic fill from waste rock to facilitate support of the proposed swale. Drainage will be temporarily rerouted during sandstone mining across this area, sand will be removed to the target depth, and the berm will be constructed by end dumping transition material waste rock into the resulting pit. It is anticipated the resulting berm will be highly permeable and no attempt will be made to stop flow between the adjacent pits resulting from the berm construction. Upon completion of the berm, a drainage ditch will be rerouted over the crest of the berm, tying back into the existing drainage system with an outlet into Wetland B4. Table 3.10.4 indicates model assumptions and illustrates that if the channel is lined, a steeper long-term slope can be constructed while maintaining an FOS of 1.5.

Table 3.10-4 Separation Berm Stability

Section	Berm Top Width as Modeled (ft)	Maximum Berm Height as Modeled (ft)	External Loads Considered	Long Term Berm Slope with External Load and Lined Channel (H:V) FOS = 1.5	Long Term Berm Slope with External Load and Unlined Channel (H:V) FOS = 1.5
6-6'	100	138	Mine Truck	1.6:1	1.9:1

3.10.2.2 Spill Prevention and Response Plan

The EIS will include the development of a spill prevention and response plan, evaluation of imported material to prevent aquifer contamination, and the development of a comprehensive groundwater monitoring and mitigation plan that continues for a period of time beyond completion of final reclamation.

A Draft Spill Prevention Control and Countermeasures Plan (SPCC Plan) (Attachment 7) has been prepared for the Project. The SPCC Plan will be finalized once an alternative is selected, and final design is complete. The purpose of the SPCC Plan is to prevent spills of fuel, other petroleum based products, and hazardous substances, through sound engineering and management controls; and to prevent their discharge into adjacent surface waters, shorelines and/or groundwater. The SPCC Plan also identifies measures to be taken in the event that a spill does occur.

Petroleum based products to be used or handled on-site include: Diesel, Gasoline, Used Oil, Engine Oil, Hydraulic Oil, and Kerosene. Section 3.11 Solid Waste Hazardous Waste and Storage Tanks, describes the storage of these products in greater detail.

The SPCC Plan describes the specific engineering controls, such as double walled tanks, to be utilized at the Site. The SPCC Plan includes management policies and practices implemented to prevent spills or releases of hazardous materials or petroleum stored, used, and transferred at the facility as well as a guide to be used in the event of a spill. The SPCC Plan also identifies routine inspection and maintenance of storage tanks and transfer areas. Spill containment equipment is located near storage tanks and transfer areas where they are readily available should a spill occur.

Spill prevention measures include:

- Routine employee training on the proper storage and use of fuels and other substances that may be used at the facility;
- No topping off of fuel tanks;
- Fueling over impervious pads or use of drip pans;
- Proper storage of petroleum products in double walled tanks or secondary containment in accordance with the Minnesota Pollution Control Agency storage tank requirements;
- Indoor storage of any herbicides, pesticides or fertilizers used on-site;
- Routine scheduling of equipment maintenance; and
- Routine Site inspections including fuel storage and transfer areas.

The SPCC Plan also identifies steps to be taken in the event of a spill or release. Steps to be taken for both minor spills as well as large spills or discharges include:

3.10.2.3 Response to Minor Spill

A minor spill is one that poses no significant harm (or threat) to human health and safety or to the environment. Minor discharges are generally those where:

- The quantity of product discharged is small (e.g., less than 5 gallons);
- Discharged material is easily stopped and controlled at the time of the discharge;
- Discharge is localized near the source;
- Discharged material is not likely to reach water;
- There is little risk to human health or safety; and
- There is little risk of fire or explosion.

Minor spills can be cleaned up by MJS personnel. The following guidelines apply:

- 1) Immediately notify the facility manager;
- 2) Clean up spill materials and dispose of materials appropriately. Any hazardous materials shall be picked up and disposed of by a licensed hazardous waste hauler in accordance with all State and Federal rules;
- 3) Complete the Notification for Hazardous Substance Discharge Form if spill is greater than 5 gallons; and

- 4) If the spill poses a threat to human or environmental health, report the discharge to the Minnesota's 24-Hour Spill Hotline.

A large spill at the Site will most likely be the result of a tank rupture or equipment failure during transfer. Trained response personnel will use spill equipment to capture and stop product flow. The following procedures will be used for large spill containment:

- Assess conditions to protect safety of all personnel. Dial 911 if there is an immediate threat to life, safety, or property;
- If safe to do so, close the appropriate valve(s) on tank, tanker truck, or pipeline. The fuel service contractor will close the tank valve(s). The truck operator will close the tanker truck valve(s);
- The operator of the transfer pump will stop the operation of the transfer pumps (if it can be done safely);
- Eliminate all ignition and heat sources;
- Detector shall immediately warn employees in the vicinity of the spill by voice and radio. If spill releases vapors, move to fresh air and avoid low or confined areas. If evacuation of a larger area is necessary, employees will be notified by two-way radio by the detector;
- Notify the Spill Coordinator and provide the following information:
 - Spill location
 - Nature of the spill
 - Volume of the spill
 - Description of the measures taken;
- The Spill Coordinator will call External Emergency Responders if necessary (spill beyond scope of available equipment, beyond scope of training, etc.);
- The Spill Coordinator will determine if it is a reportable spill and contact the State Duty Officer Spill Coordinator and the National Response Center if necessary;
- The Spill Coordinator will call External Emergency Responders if necessary (spill beyond scope of available equipment, training, etc.);
- DO NOT attempt to respond to spills for which you are not trained. Employees should only be involved in mitigating efforts downstream and away from the spilled material. Only respond to spills if wearing the proper protective equipment (PPE);
- The Spill Coordinator should control the spill response as an Incident Commander until relieved of his/her duty. The Spill Coordinator will perform any action that is safely possible to contain the spill. If the Spill Coordinator is not on-site, response actions should only involve mitigative actions downstream from the spill, in accordance with the responders training level;
- In the event that outside contractors and/or emergency response personnel are needed, the Spill Coordinator should control the scene until the appropriate personnel arrive and the emergency response personnel arrive on the scene at which time a Unified Command should be formed. The Spill Coordinator will continue to remain on-site and share command of the scene with the Incident Commander. The Spill Coordinator will be responsible for keeping personnel away from the spill area, ensuring personnel mitigating the spill are wearing appropriate attire and are appropriately trained for the situation and giving direction on spill mitigation efforts;

- The on-scene Spill Coordinator and Incident Commander, typically the highest ranking local fire or police official on-site, will command response activities as discussed below under unified command;
- Contain the spill using appropriate absorbent materials or on-site equipment. Spills can be contained by using granular absorbent, absorbent pads or on-site equipment to excavate impacted soils;
- Divert flow from any drains, drainage channels, etc.;
- If the spill has left the property, take appropriate actions, notify external contractors (as necessary), and make necessary notifications;
- Clean up spill materials and dispose of materials appropriately. All hazardous materials shall be picked up and disposed of by a licensed hazardous waste hauler in accordance with all State and Federal rules; and
- Complete a Spill Report Form.

3.10.2.4 Evaluation of imported material to prevent aquifer contamination

Clean fill materials are periodically imported to the Site to serve as reclamation backfill material at the existing limestone and sand and gravel mining operations. The source of these materials are greenfield sites where local construction projects such as highway and bridge projects generate large volumes of excess material. Imported materials can be compactable fill materials, as well as organic materials and topsoil. Soils from commercial or industrial redevelopment or brownfield sites, that have the potential to have been affected by a spill or release from past operations, will not be accepted at the Site.

Prior to accepting imported material, the source will be verified. Documentation will be maintained that the fill material is appropriate in terms of its intended use (compactable/future building, slope construction, topsoil, etc.) and/or to have the fill material analyzed for potential contaminants based on the location and history of the source area. Fill documentation will include detailed information on the previous use of the land from where the fill is taken, whether an environmental site assessment was performed and its findings, and the results of any testing performed.

In general, imported soils will be limited to those originating from previously undeveloped land, or land that has been used solely for residential or agricultural purposes. Unacceptable sources of imported soils include previously developed industrial and/or commercial sites. MJS may require soil testing of imported soils depending upon the source and results of any environmental site assessments associated with the source materials prior to accepting imported soils.

3.10.2.5 Groundwater monitoring and mitigation plan that continues for a period of time beyond completion of final reclamation.

Contaminants of concern to be utilized on the Site are limited to petroleum-based products, blasting agents, and water treatment chemicals. A draft groundwater and surface water quality monitoring plan is presented in Section 3.11. The draft groundwater and surface water quality monitoring plan

will be finalized during the permitting process. Consistent with other mining operations in Scott County, it is anticipated that the IUP will allow for the periodic review and modification of the groundwater monitoring plan based on past monitoring results.

The MPCA is responsible for groundwater monitoring contaminants associated with the closed Louisville Landfill. The monitoring network that is sampled and parameters sampled for have varied over time. It is anticipated that the MPCA will modify their monitoring network and may need to replace certain wells that are located in proposed mine areas or plant site and/or may establish a sample location in the end use lakes.

3.10.3 Alternatives - Geologic Hazards and Soil Conditions

The analysis above is applicable to all of the alternatives since they all consider the same mine footprint, setbacks and reclamation grades.

3.10.4 Mitigation – Geologic Hazards and Soil Conditions

The following measures will be taken to minimize the potential for geologic hazards and soil condition related environmental effects.

1. Maintain excavation and reclamation slopes presented in the slope stability analysis presented above.
2. Monitor groundwater for diesel Range organics, gasoline range organics and acrylamide during Site operations. Monitor the Site as required in the water quality monitoring plan approved for the Site and as may be modified from time to time.
3. Develop and implement an SPCC Plan for the Site.

3.11 Solid Wastes, Hazardous Wastes, Storage Tanks

The SDD identifies the following items to be addressed in the DEIS:

- a) The EIS will address the management of existing buildings, equipment and solid waste remaining from the closing of the Renaissance Festival and from the prior uses of the Malkerson Sales property and generation of solid or hazardous wastes and materials related to the Project including a plan for the minimization of waste and containment of contamination.
- b) The EIS will address existing and proposed storage tanks associated with the Project.
- c) The EIS will address potential impacts to ground and surface water from agents introduced through the mining process.

3.11.1 Affected Environment - Solid Wastes, Hazardous Wastes, Storage Tanks

Portions of the Project encompass areas that have been previously developed as festival grounds, stable area, agricultural production areas, and aggregate mines. Some of these areas have structures and utilities associated with them that will generate solid waste when they are demolished ahead of mining operations. The festival, stable operations, and existing mining operations all have fuel storage tanks associated with them.

3.11.2 Environmental Consequences - Solid Wastes, Hazardous Wastes, Storage Tanks

The EIS will address the management of existing buildings, equipment and solid waste remaining from the closing of the Renaissance Festival and from the prior uses of the Malkerson Sales property.

3.11.2.1 Demolition Waste

Mining will progress into areas where there are existing buildings for all of the project alternatives, including the No Build Alternative. The Renaissance Festival booth area is located on the Malkerson Sales property where future limestone mining is planned as part of the existing mining operations. Some of the booths may be disassembled and portions reused at a separate festival location, but the majority of the booths will likely be demolished and hauled to the nearby Dem-Con Landfill. Materials, such as metals will be sorted and recycled to the extent feasible. There are several buildings located in the stable area on the Malkerson Sales property and some or all of these buildings may be demolished as part of sand and gravel mining operations. No buildings will be burned or buried on the property. Trees and brush will be chipped.

All demolition of existing buildings will be performed in accordance with Minn. Rules 7035.08005 Renovation and Demolition. These rules regulate demolition activities to ensure that hazardous materials or other regulated items are removed from buildings prior to demolition and are handled and disposed of properly. The rules apply to any of the buildings and/or booths that have fixtures or devices associated with plumbing, electrical, heating, cooling, safety, or lighting systems. Prior to demolition, appropriate demolition permits must be obtained as required and the County and the MPCA must be notified and the following items and materials must be removed from the buildings:

- mixed municipal solid waste;
- household hazardous waste (including automotive fluids, lawn and garden chemicals, pest control products, household cleaners, paint, and home improvement products);
- industrial solid waste or hazardous waste;
- tires;
- appliances;
- items or devices that contain mercury including batteries found in smoke detectors; emergency lighting systems, elevator control panels, exit signs, and security systems and alarms;
- lighting, including fluorescent lights and high intensity discharge lights, such as metal halide, high pressure sodium, mercury vapor, and neon;

- switches, thermostats and similar devices;
- devices associated with boilers, furnaces, heaters, and tanks;
- devices associated with electrical systems;
- items that contain polychlorinated biphenyls (PCBs), including transformers, transistors, capacitors in old appliances and electronic equipment, heat transfer equipment, and light ballasts;
- items that contain chlorofluorocarbons (CFCs);
- oils, including used oil, hydraulic oils;
- lead-containing items, including lead-acid batteries, lead pipes, lead sheeting, lead flashing in roof vents, and lead paint that is not firmly adhered to the substrate;
- electronic products containing a cathode ray tube, including televisions, computers and circuit boards;
- asbestos that is required to be removed under Minnesota State Rules;
- material trapped in sumps and traps, unless characterized as nonhazardous and nonliquid;
- radioactive waste; and
- other materials or items that are prohibited from disposal at the facility intended to receive the renovation or demolition waste for processing or disposal.

There are six SSTS sites located in the Malkerson Sales stable area that may be impacted by sand and gravel mining operations. These sites will be abandoned in accordance with MN Rules 7080.2500 System Abandonment. Any wells (potable and monitoring) that need to be removed as part of the mining operations will be sealed in accordance with MN Statutes 1031.301 Well Sealing Requirements.

3.11.2.2 Solid and Hazardous Waste

The EIS will address the management of generation of solid or hazardous wastes and materials related to the Project including a plan for the minimization of waste and containment of contamination.

The Project will generate limited amounts of mixed municipal solid wastes from approximately 45 employees at the Site. These materials will be stored on-site in dumpsters and picked up by a licensed hauler for recycling or disposal at a solid waste facility.

A limited amount of used oil (which is not considered a hazardous waste) will be generated from servicing vehicles and maintaining equipment. The used oil, which may include engine oil, transmission fluid, and hydraulic fluid, is drained from vehicles or machinery when it has become dirty and no longer serves its intended purpose effectively. The used oil is collected and stored in an approved storage tank to be located inside the Shop building with a concrete floor, used as heating fuel, and/or picked up by an oil recycler and transported from the Site.

Routine maintenance of the on-site facilities will generate small amounts of wastes including paint cans, pesticides, and the use of fertilizer, herbicide, or pesticide applications associated with the

establishment and/or maintenance of vegetation. All of these materials will be used in accordance with manufacturer's specifications and disposed of in accordance with applicable state and local regulations. These products will be stored inside. The Project requires a Scott County Hazardous Waste license. Hazardous Waste license includes County inspections.

Waste minimization will be achieved at the Site by recycling concrete and asphalt and producing recycled aggregates on-site. Concrete and asphalt are recycled at one of the highest rates of any recyclable material in the United States. Recycled aggregates help to extend the supply of natural aggregates and saves airspace in solid waste landfills. The Project will require a County Asphalt/Concrete Storage and Recycling license.

Washwater is recycled in the aggregate washplant and will be recycled in the wet plant. Recycling of aggregate washwater by treating the washplant discharge in a series of sedimentation ponds and subsequently returning the clarified water back to the washplant can provide recycling rates of over 80%. Recycling the washwater from the wet plant is expected to achieve a water recycling rate of 75-85 percent.

Recycling efforts will be implemented in the office and shop area. Metal items generated during the demolition of existing buildings will be recycled at the adjacent Dem-Con metal recycling facility. Used oil will be collected and shipped for recycling or used as heating fuel.

3.11.2.3 Residual Chemical Agents

The EIS will address potential impacts to ground and surface water from agents introduced through the mining process.

Flocculant use in the closed loop wet plant water treatment system is addressed in Section 3.9 Water Quality Wastewaters. The Acrylamide and PolyDADMAC monomers are readily biodegradable in soils. At the end of the season, when the system is emptied prior to freeze up, the water in the system will be stored for a minimum of seven days to allow reduction in acrylamide concentrations prior to discharging to an upland area of the Site. Infiltration will promote continued biodegradation within the soils. Infiltration/filtration will promote further reduction of the strength of the effluent prior to contact with groundwater.

There will be no direct discharge of wastewaters off-site or to a surface water or created surface water feature. The use of flocculants at non-metallic mineral mining sites is regulated by the MPCA within the NPDES Permit.

The management of end of season wet plant water is consistent with industry standard. A groundwater and surface water quality monitoring plan will be implemented to monitor for acrylamide in the groundwater, the quarry pit, end use lakes, and adjacent surface water. Monitoring for acrylamide and other water quality parameters will be performed to demonstrate

that the management of processing water on-site does not result in the violation of applicable water quality standards.⁴⁹ Existing uses of surface and groundwater in and adjacent to the Site include, on-site groundwater drinking water supplies and the adjacent surface waters which support both aquatic life and recreational uses. Water quality in both groundwater and the surface waters will be maintained per county/state standards in order to ensure their continued and future use.

A Draft Groundwater and Surface Water Quality Plan is included as Attachment 8. Because different plant alternatives will discharge to different locations, the monitoring plan will be dependent on the alternative chosen and is discussed on more detail in Section 3.11.3 below.

3.11.2.4 Existing and Proposed Storage Tanks

The EIS will address existing and proposed storage tanks associated with the Project.

Table 3.11-1 Indicates the existing tanks at the Site.

Table 3.11-1 Existing Tanks

Property	Contents	Size (gallons)	Use
Malkerson Sales:			
	Diesel	500	Farm Equipment
	Gasoline	500	Farm Equipment
	Diesel	500	Renaissance Festival operations
	Gasoline	500	Renaissance Festival operations
Bryan Rock:			
	Diesel	800	Mining Equipment
	Gasoline	800	Mining Equipment
	Used Oil	1000	Mining Equipment
	Engine Oil	500	Mining Equipment
	Hydraulic Oil	500	Mining Equipment
	#6 Kerosene	55	Portable Pressure Washer
	Diesel	250-500 (3 to 5 tanks)	Generators at Processing Plants

⁴⁹ Acrylamide has a de facto water treatment technology standard of 0.5 ug/l in drinking water. There is no primary or secondary standard for Acrylamide in Class 2 waters.

The Project will require additional above ground storage tanks. The MPCA will be notified if any of the new tanks are greater than 1,100 gallons, or between 500 and 1,100 gallons if located within 500 feet of a Class 2 surface water, within 30 days of installation. It is not anticipated that any of the new tanks will meet these notification and regulation thresholds. New tanks and their approximate sizes are listed in Table 3.11-2. The location of the new tanks will be at the dry plant area and therefore will vary depending upon alternative. All new tanks will be double walled tanks. For Alternatives with two processing plants, each plant site will have the tanks and store the volumes listed below.

The Site will operate under a SPCC Plan. (See Section 3.10 and Attachment 7 Draft SPCC). The purpose of the SPCC Plan is to prevent the occurrence of oil spills by the use of sound engineering and management controls. The SPCC Plan has been developed to protect health, safety and the environment. It includes a description of engineering controls and management practices implemented to prevent spills or releases of hazardous materials or petroleum stored, used, and transferred at the facility and a guide to be used by management in the case of a spill or release of hazardous materials or petroleum stored, used, and transferred at the Site. Facility specific and material specific response procedures and notification information is included in the SPCC Plan. (See Section 3.10 Geologic Hazards and Soil Conditions.)

Table 3.11-2 Proposed Tanks

Contents	Size (gallons)	Use
Diesel	500	Mine Equipment
Gasoline	500	Mine Equipment
Used Oil	500	From Equipment Maintenance
Diesel	500	Back up generator

3.11.3 Alternatives - Solid Wastes, Hazardous Wastes, Storage Tanks

3.11.3.1 Demolition, Solid and Hazardous Waste

All of the alternatives, including the No Build Alternative will generate the same amount of demolition waste associated with the removal of the Renaissance Festival booth area and the stable area to accommodate future limestone mining and sand and gravel mining. All of the alternatives will generate similar amounts of solid waste and minimal amounts of hazardous waste associated with vehicle and equipment maintenance (Materials of the Trade) that will be disposed of in accordance with state and federal regulations.

3.11.3.2 Residual Chemical Agents

Alternatives 1 and 2 will have two plant sites and therefore two water treatment plants associated with the wet processing of sand. There will be flocculant use at each location, but the total amount of flocculants used will remain essentially the same under all alternatives.

Alternative 1 and 2: Two wet processing plants one on Malkerson Sales (north or south) and one at Bryan Rock. Based on estimated sizes of the clean water tank and the clarifier for the 1.2 Million ton per year wet plants, the volume of water to discharge is at the end of the season at each plant location is between 2 and 3 acre-feet.

Alternatives 3-6 propose one wet processing plant location and the volume of water to discharge at the end of the season is approximately 4-4.5 acre-feet end of season.

The location of end of season discharge will vary with the alternative and final wet plant designs. All discharge areas will be designed to fully contain the wastewater and prevent it from entering a surface water. There are no potential downgradient water users for Alternatives 4, 5 and 6 as the Renaissance Festival is assumed gone during the onset of mining operations. Under Alternatives 1, 2, and 3, the operation of the Renaissance Festival could continue for the initial years of sandstone mining and processing activity. The discharge area from the Bryan Rock plant site will be to the south of the plant site during the initial phases of mining on the Bryan Rock property while the Renaissance Festival continues to operate. The Renaissance Festival wells will be monitored for acrylamide as long as the Renaissance Festival continues to operate on the Site. Attachment 8 includes a Draft Groundwater and Surface Water Quality Plan for the Project.

3.11.3.3 Storage Tanks

Alternative 1 and Alternative 2 have processing plants located on both the Malkerson Sales property and Bryan Rock property. Each plant site will require tanks for diesel fuel, gasoline, waste oil, and back-up generator fuel. Alternatives 1 and 2 result in twice as many new storage tanks as Alternatives 3-6, which have processing at one location. A draft water quality monitoring plan has been prepared and includes groundwater monitoring for both diesel range organics and gasoline range organics.

3.11.4 Mitigation – Solid Wastes, Hazardous Wastes, Storage Tanks

All above ground storage tanks will comply with MPCA regulations. New tanks used to store petroleum products at the dry plant site will be double walled construction.

The Site will operate under a SPCC Plan developed to prevent spills, effectively control a release should a spill occur, and identify proper clean up and reporting protocols in the event of a spill.

Flocculants will be used and managed in accordance with the NPDES permit.

To monitor the effect, if any, that operations have on area surface water and groundwater, the Groundwater and Surface Water Quality Monitoring Plan will be implemented. Mitigation, if required, will be completed in accordance with the plan. The plan calls for submittal of annual water quality reports to the County for review.

3.12 Traffic

The SDD identifies the following items to be addressed in the DEIS:

- a) The EIS will perform a Site specific traffic impact analysis on each of the access options that will provide an estimate of Project activities and take into consideration traffic generated from existing mining operations, the Renaissance Festival, Trail of Terror as well as impacts to area traffic from the additional truck and rail car traffic at key rail intersections within Scott County, and neighboring municipalities (Shakopee and Chaska), and access to the wildlife refuge parking lot off of 145th Street West. This will include a review of how the Dem-Con Drive connection will be made through private property, internal siding and circulation to accommodate a frontage road and future ponds outside of the US 169 clear zone, and the ability to remove any direct traffic off of US 169. The EIS will define the Project alternatives to include different percentages of trucked and railed product. Impacts to planned improvements of roads in the immediate area such as improvements along State Highway 41, U.S. Highway 169, 145th Street West and Dem-Con Drive will be considered.
- b) The EIS will identify potential roadway improvements and/or other mitigation measures which may be necessary to mitigate traffic conditions as determined in the traffic analysis including the evaluation of closing unused access points.

3.12.1 Affected Environment – Traffic

The Site currently generates traffic from the on-going mining operations, festival events and other Site operations (mulching and stable operations). For the purposes of the traffic analysis, existing hauling from current mining related activities includes 1,150,000 tons of material per year. Mulch, sand, gravel, and limestone materials are currently transported from the Malkerson Sales property to TH 41 on a paved internal haul road. A scale and scale house are located in the northern portion of the Malkerson Sales property. There are also two points of access on the southern portion of the Malkerson Sales property onto 145th Street, which has a full access onto US 169 a short distance to the east. These access locations are currently used only occasionally for aggregate hauling; for example, when there is a job to the south of the Site, empty trucks may enter the Site from 145th Street. The trucks are loaded and then exit over the scale and out to TH 41. With the regional road network improvements currently under construction (see Section 3.12.1.2), it is anticipated that in the future, more of the aggregate trucks will be routed through these southern access points to 145th Street. These two southern access points to 145th Street are also used during festival events.

Limestone materials from the Bryan Rock property are transported by truck from the Site onto US 169. There is a scale, scale house, and full access located on the northern end of the property. This access is shared with Anchor Block, the property owner to the north. It is anticipated that the shared commercial access will be reduced to a right in right out in the fall/winter of 2019 as part of the regional road network improvements currently under construction (see Section 3.12.1.2). The scale and scale house will be relocated to the southern end of the property with Bryan Rock's existing access to 145th modified to provide direct access to Red Rock Drive. Trucks can access southbound US 169 via Red Rock Drive, and the northbound US 169 via the new 147th Street overpass and County Road 14. Current reclamation plans for the Bryan Rock quarry plan for a frontage road through the

property adjacent to the US 169 corridor. Access locations are illustrated on Figure 3.12.1, *Site Access Locations*.

Hauling hours are not restricted at the current mining operations. Limestone hauling typically occurs from 6:30 am until 5:30 pm Monday through Saturday. Saturday hauling is only used during periods of high product demand. Occasionally hauling hours are extended. During the winter quarter hauling hours typically are reduced from 7:30 am to 3:30 pm Monday through Friday with no hauling on Saturday. Highest levels of traffic are generated from April through September.

Current annual truck traffic generated from the mining operations are estimated to be 60,500 loads per year (121,000 trips per year). Peak a.m. (7am to 8am) truck traffic generated is 26 loads (52 trips) per hour and peak p.m. (4pm to 5pm) truck traffic generated is 21 loads (42 trips).

The Renaissance Festival operates on the Site on a seasonal basis with an annual attendance of approximately 300,000. The event is held primarily only on weekends and takes place from mid-August through early October each year from 9 a.m. to 7 p.m. Access is provided from US 169 and the recently opened Red Rock Drive to 145th Street and from TH 41 at the Malkerson Sales current primary access. One-way traffic control is established during the Renaissance Festival where patrons enter from 145th Street and exit to TH 41. Hauling from the mining operations is reduced during peak hours of Renaissance Festival traffic generation. Access for the 2019 and 2020 seasons will be modified due to the construction activity associated with the 169/41/78/141 project. The festival lease terminates in 2020 and it is anticipated that the festival will relocate elsewhere in Scott County.

The Trail of Terror is another short term seasonal outdoor entertainment event with annual attendance that is significantly less than the Renaissance Festival and takes place on select Fridays - Sundays, mid -October through early November. Hours of operation are Fridays and Saturdays, 7 p.m. to 12:30 a.m. and Sundays from 7 p.m. to 11 p.m. The box office and attractions close at 10 p.m. and the operations close at 11 p.m. The Trail of Terror traffic utilizes the Malkerson Sales access to TH 41. The Trail of Terror lease also terminates in 2020.

3.12.1.1 Transportation Corridors in Vicinity of the Site:

US 169 is a two-way four-lane divided north/south principal arterial roadway. No parking is allowed on either side of the roadway within the study area. The year 2018 average daily traffic (ADT) volume was 34,500 vehicles per day (vpd) north of TH 41 and 30,000 vpd south of TH 41.

TH 41 is a two-way multi-lane divided "A" minor arterial roadway transitioning to a two-lane undivided "A" minor arterial roadway. The year 2017 ADT volume northwest of US 169 was 18,200 vpd. No parking is allowed on either side of the roadway.

CSAH 78 is a two-way four-lane divided transitioning to a two-lane undivided "A" minor arterial roadway. No parking is allowed on either side of the roadway. The year 2017 ADT volume east of US 169 was 5,200 vpd.

130th Street and 145th Street are two-way two-lane local roadways. No published ADT volumes are available for these segments. The current ADT volume within the study area is estimated at 630 vpd on 130th Street west of US 169 and 30 vpd on 145th Street west of US 169.

Dem-Con Drive is a two-way multi-lane local roadway at TH 41 and transitions to a two-way two-lane local roadway north and south of the intersection area. No published ADT volumes are available for this segment. The current ADT volume within the study area is estimated at 1,920 vpd north of TH 41 and 1,480 south of TH 41.

The posted speed limit along US 169, TH 41 and CSAH 78 within the study area is 55 miles per hour (mph). Speed limits on 130th Street, 145th Street and Dem-Con Drive are not posted, but are assumed at the statutory 30 mph.

Highway/Railroad At-Grade Crossings

The UP railroad runs through the Site. Trains routinely run through the Site. There are at-grade crossings at TH 41 and 145th Street. The crossing at TH 41 is equipped with crossing arms. The speed through downtown Shakopee is dictated by the city at 10 mph. The rail speed is set at 30 mph to 49 mph generally through the other areas. Crossing signal/gate arms are activated 30 seconds before the train enters the intersection. Site-generated crossing blocking time is limited by law to ten minutes⁵⁰.

3.12.1.2 Planned Regional Transportation Improvements

Scott County and MnDOT are constructing 2018-2020 regional improvements to area roadways. The project includes an interchange at the existing at grade intersection of US 169 and TH 41/CSAH 78, an overpass over US 169 near CSAH14, and the extension of a frontage road system along the east side of US 169 between CSAH 78 and CSAH 14 (2018-2020 Regional Improvements). The project is intended to improve the safety and mobility of the area and will result in the closure of multiple direct access points onto US 169. Construction began in the Fall of 2018 with the majority of construction activities to occur in 2019 and 2020.

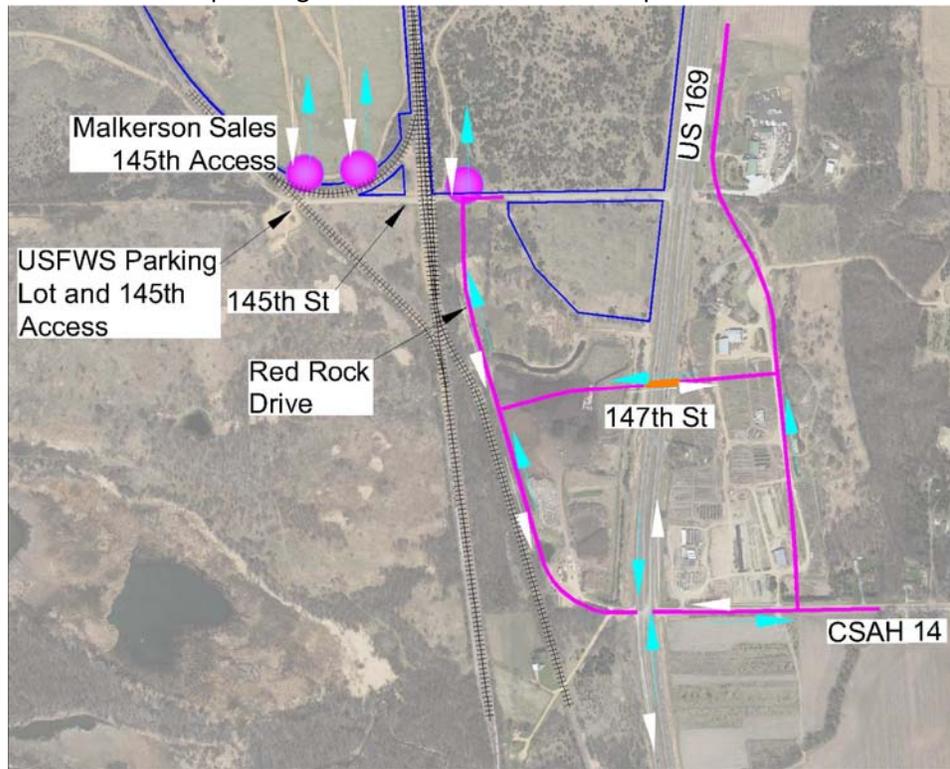
The 2018-2020 regional improvements are the result of a MnDOT corridor management plan that recommended transitioning the section of US 169 from Interstate 494 to the City of Belle Plaine to freeway status. As a freeway, US 169 will accommodate the large increase in commercial vehicle traffic volumes originating in southern Minnesota and address the current safety and mobility issues along the corridor.

⁵⁰ Minnesota State Statute: 219.383 SAFE OPERATION OF TRAIN OVER ROAD; PENALTY. Subdivision. 3. Not to block public road or street. No railway corporation shall permit a public road or street crossing a railroad track to be closed for traffic by a standing car, train, engine, or other railroad equipment, or by a switching movement which continuously blocks a crossing for longer than 10 minutes. Subdivision. 4. Penalty. A railway corporation violating this section is guilty of a petty misdemeanor. A corporation that commits a second or subsequent violation of this section is guilty of a misdemeanor.

The 2018-2020 regional improvements resulted in the closure of the median and a right in right out access only at the Bryan Rock main northern access point. Bryan Rock's scale, scale house, and main access were relocated to the southern end of their property with direct access to Red Rock Drive. An overpass has been constructed at CSAH 14 and a new east and west frontage road system have been constructed. The frontage roads connect with the CSAH 14 overpass. On ramps and off ramps have been constructed on US 169 providing access to and from the east and west frontage roads. Construction of the west frontage road resulted in the realignment of 145th Street through the southern portion of the Bryan Rock property. The 145th access to US 169 has been closed. Inset 3.12.1 illustrates the concept of the CSAH 14 overpass improvements, Project related truck routes, and the USFWS parking lot access off of 145th Street.

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Inset 3.12.1 Overpass alignment and southern access points.



3.12.2 Environmental Consequences – Traffic

The EIS will perform a Site specific traffic impact analysis on each of the access options that will provide an estimate of Project activities and take into consideration traffic generated from existing mining operations, the Renaissance Festival, Trail of Terror as well as impacts to area traffic from the additional truck and rail car traffic at key rail intersections within Scott County, and neighboring municipalities (Shakopee and Chaska), and access to the wildlife refuge parking lot off of 145th Street West.

A Traffic Impact Study (TIS) was prepared by SRF Consulting Group⁵¹ that analyzes each of the Site access options and provides an estimate of Project activities including existing mining operations, the Renaissance Festival and Trail of Terror (Attachment 9). The TIS estimates impacts to area traffic from the additional truck and rail traffic.

⁵¹ SRF Consulting Group, Inc. May 26, 2016 Merriam Junction Sands Facilities Louisville Township, Scott County Traffic Impact Study. Addendum 1 dated May 26, 2016 addressing cumulative effects and Addendum 2 dated April 24, 2019 addressing County Comments

It is anticipated that the majority of silica sand will be transported from the Site by rail. The UP railroad owns the mainline track that runs adjacent to and through the Site. Rail yard and rail load-out facilities will be constructed as part of the Project. Improvements will include construction of switches from the mainline and spur lines to accommodate unit trains. The rail load-out facilities will allow the transport of up to 2.4 million tons of sand annually. However, due to the potential for market changes and final product destinations, sand may be hauled by truck to a barge or rail transloading facility or to the final market. The TIS addressed two scenarios: one with 90% of sand transported from the Site by rail and 10% transported by truck and one with 100% percent of the sand transported from the Site by truck.

3.12.2.1 Existing Mining Operations

The TIS includes an analysis of existing and projected limestone and sand and gravel related traffic. The proposed increase in traffic associated with limestone and sand and gravel is to accommodate projected market demand and is based on past historic record production highs that exceeded 1.5 million tons per year from the MJS properties.

Table 3.12.1: Project Elements Summary

Type of Use	Existing Conditions	Proposed Conditions
Limestone Mining, Processing and Transport	1.0 million tons/year	1.5 million tons/year
Sand and Gravel Mining, Processing and Transport	150,000 tons/year	450,000 tons/year
Sandstone Mining, Processing and Transport	---	2.4 million tons/year

Impacts to adjacent roadways were evaluated by obtaining data from MnDOT or collecting data on nearby intersections and roadway segments. The following intersections were included in the study area:

TH 169/TH 41	TH 169/130th Street
TH 169/Bryan Rock Site Access	TH 169/145th Street
TH 41/Dem-Con Drive	TH 41/Malkerson Sales Site Access

An existing intersection capacity analysis was completed to establish a baseline condition to which future traffic operations could be compared. Each of the study intersections were analyzed and the level of service (LOS) based on average delay per vehicle was determined. LOS A indicates the best traffic operation, while LOS F indicates an intersection where demand exceeds capacity. An overall intersection LOS A - LOS D is generally considered acceptable in urban areas. An overall LOS E-F indicates that the intersection is over capacity.

Table 3.12.2: Existing Intersection Capacity Analysis

Intersection	Level of Service (LOS)	
	A.M. Peak Hour	P.M. Peak Hour
TH 169/TH 41 ⁽¹⁾	D ⁽³⁾	D ⁽³⁾
TH 169/130th Street ⁽²⁾	A/F ⁽³⁾	A/E ⁽³⁾
TH 169/Bryan Rock Products Site Access ⁽²⁾	A/D	A/D
TH 169/145th Street ⁽²⁾	A/C	A/C
TH 41/Dem-Con Drive ⁽¹⁾	B	B
TH 41/Malkerson Sales Site Access ⁽²⁾	A/E ⁽³⁾	A/F ⁽³⁾

(1) A signalized intersection with the overall LOS shown.

(2) An unsignalized intersection with all-way or side-street stop control, the overall LOS is shown followed by the worst approach LOS.

(3) Overall LOS D or minor approach LOS E-F (approaching capacity).

Traffic forecasting was applied to existing traffic levels to account for increases in general background traffic. Forecasting was extended from 2017 to 2026 due to the anticipation of proposed major improvements to the existing transportation system beyond that timeframe.

3.12.2.2 Renaissance Festival and Trail of Terror

The Renaissance Festival and Trail of Terror events were evaluated as part of the analysis. The Renaissance Festival, Trail of Terror, and other events on these sites are primarily short term, seasonal, weekend, outdoor entertainment events. Traffic is constrained to weekends and does not affect the weekday peak hour analysis. These events were precluded from the detailed future traffic operations analysis during the weekday peak period. Although limestone hauling occurs on Saturdays, it is at a lower volume than during weekdays and Bryan Rock has the ability to reduce the Saturday haul hours during Renaissance Festival days to avoid additional traffic congestion. Sandstone hauling on weekends can be reduced during festival days in a similar manner until the Renaissance Festival and Trail of Terror relocate after 2020.

3.12.2.3 Neighboring Communities Truck Hauling

Haul routes for limestone and sand and gravel are dictated by market demand. An estimated 40% of limestone hauling travels northwest on TH 41 towards Chaska, 40% travels north and 10% travels south on US 169, and 10% travels on CSAH 78 southeast of the intersection of TH41 and US 169. This traffic distribution for construction aggregates is not expected to change as a result of the Project. An estimated 100% of all silica sand hauling is anticipated to travel north on US 169, therefore truck hauling associated with the Project will not have any significant effect to local streets within neighboring communities.

3.12.2.4 Wildlife Refuge Parking:

The Louisville Swamp unit parking lot is accessed off of 145th Street West on the southern end of the Project. Under the current transportation system, use of 145th Street as a haul route for construction aggregates is limited. Under the 2018-2020 regional improvements, the current main Bryan Rock access to US 169 will be reduced to a right in right out movement only and the median will be closed. Bryan Rock will relocate their scale to the southern end of the quarry. Access to the Bryan Rock property will predominantly use the overpass and east and west frontage roads to access US 169. 145th Street will remain at its existing location from the west frontage road to the wildlife refuge parking area where it dead ends and will continue to provide access to the wildlife refuge parking area.

3.12.2.5 Highway/Railroad At-Grade Crossings

Trains routinely run through the Site and at-grade crossings on TH 41 and 145th Street. The following is a summary of the existing rail traffic.⁵²

- The UP runs from St. Paul to Mankato through the Site.
- The crossing at TH 41 is equipped with signals with gates
- Trains per day: 5-7 random times during day and night
- Length of trains 4,500-7,000 feet long
- The rail speed through Shakopee is dictated by the city at 10 mph.
- The rail speed is set at 30 mph to 49 mph generally through other neighboring areas.

The majority (if not all) of sand is anticipated to be shipped by rail.

- The maximum velocity through a turnout is 10 mph.
- Assumed train acceleration of 0.1 foot per second squared.
- Acceleration and deceleration are the same. These times are assumed for loaded cars.
- Crossing signal/gate arms are activated 30 seconds before the train enters the intersection.
- Crossing signal/gate arms open 15 seconds after the train clears the intersection.

With the above assumptions, the crossing blocking time estimates for a 100 car train are as follows:

- The 145th Street crossing would be blocked for approximately 3.03 minutes.
- The TH 41 crossing would be blocked for 5.60 minutes.
- Shipping 90% of the Sand by rail as evaluated in Scenario B of the TIS, results in an average of 3.8 additional 100 car trains per week at random times during the day and night at maximum production capacity of 2.4 MTY.

⁵² First 4 bullets from information presented in MNDOT Environmental Assessment Worksheet TH 169/TH41CSAH78/CSAH14 Intersection Improvements dated April 2017 and noted as obtained from MnDOT's Office of Commercial Vehicle Operations (CVO) and the Federal Railroad Administration crossing database.

- A production capacity of 500,000 tons per year generates an average of 0.9 100 car trains per week.

These are reasonable crossing blocking time estimates. From statistical data available, it is estimated that a railroad crossing blockage of this nature may occur during either the a.m. or p.m. commuter peak hours approximately once per month. These Site-generated crossing blocking time estimates are less than the lawful maximum blocking time of 10 minutes and are not considered to represent a regularly occurring traffic delay. Industry standard has been moving away from unit trains and utilizing strings of 20 to 30 cars which results in shorter crossing times.

As part of MnDOT's evaluation of design alternatives associated with the regional improvements and the divergent diamond interchange at US 169/TH 41, the impact of train crossing on the interchange was evaluated. A total closure time of 6 minutes, plus time for crossing arms to lower and raise was evaluated. The results concluded that the closing time did not generate queues that would impact the proposed ramp terminal intersections for the chosen alternative for either the AM or PM peak hours and left a few hundred feet of remaining storage to the southbound ramp. The evaluation was based on a closing time that is less than what is allowed by law but was based on what was considered to be a worst case crossing scenario. Crossing closings greater than six minutes would potentially begin to impact the US 169/TH 41 intersection. If crossing times exceed six minutes during peak hours, the southbound exit ramp would provide an additional length of approximately 1400 feet of separated storage which remove many of the safety concerns of such high speed differentials between the lanes under the at grade intersection that is being replaced.⁵³

3.12.2.6 Future Frontage Road

The EIS will include a review of how the Dem-Con Drive connection will be made through private property, internal siding and circulation to accommodate a frontage road and future ponds outside of the US 169 clear zone, and the ability to remove any direct traffic off of US 169.

As part of the 2018-2020 regional improvements, Dem-Com Drive will be extended approximately 175 feet to the south to provide access to the Anchor Block property. A driveway will be constructed from a cul-de-sac at the end of Dem-Con Drive to the Diemold Tool property. Dem-Con Drive or a driveway will not be extended through the Anchor Block property to the Bryan Rock property. There will be no northerly access from the Bryan Rock property to Dem-Con Drive or a frontage road constructed through the Bryan Rock property at this time.

Mining and reclamation plans have been developed to accommodate a potential future frontage road from the Anchor Block property through the Bryan Rock property to Red Rock Drive in the event that Anchor Block or a future property owner can provide access through their property. This would

⁵³ MNDOT Environmental Assessment Worksheet TH 169/TH41CSAH78/CSAH14 Intersection Improvements dated April 2017.

accommodate a western frontage road system from TH 41 to 147th Street. The current reclamation plan for the Bryan Rock quarry reserves the future road corridor through the northern and western portion of the quarry (as shown on the No Build Concept Development Plan Figure 3.18.1). The proposed reclamation plan for the Project also preserves a potential future road corridor along the northern and western portions of the Bryan Rock property, on the floor of the quarry, aligning with the newly constructed Red Rock Drive at the southern end of the property (Figure 3.18.2 Alt 1-6 Post Reclamation Concept Development Plan). The Project does not impact US 169 right-of-way. Reclamation plans include berming and benched highwalls along the US 169 corridor as evaluated in Section 3.10 Geologic Hazards and Soils Conditions. The northern access to Bryan Rock will be reduced to right in right out movements and the main access will likely shift to the southern end of the property with access to both northbound and southbound US 169 through the new overpass and frontage road system. These design elements reduce direct access to US 169 from the Bryan Rock property.

The mining and reclamation plans have also been developed to accommodate a future potential local road corridor through the Malkerson Sales property from TH 41 to 145th Street.

The EIS will define the Project alternatives to include different percentages of trucked and railed product.

It is anticipated that the majority (if not all) of the silica sand will be transported from the Site by rail. The UP railroad owns the mainline track that runs adjacent to and through the Site. Railyard and rail load-out facilities will be constructed as part of the Project. Improvements will include construction of switches from the mainline and spur lines to accommodate unit trains. The rail load-out facilities will allow the transport of up to 2.4 million tons of sand annually. However, due to the potential for market changes and final product destinations, silica sand may be hauled by truck to a barge or rail transloading facility or to the final market.

The traffic analysis includes a scenario (Scenario A) that assumes that all of the processed silica sand will be transported from the Site by truck. A second more likely scenario (Scenario B) is also included that assumes that 10 percent of the processed silica sand will be transported by truck and 90 percent by rail car in unit trains.

Traffic generated by the Project was analyzed assuming maximum anticipated production of silica sand, limestone, and sand and gravel and is based on 2,400,000 tons of silica sand, 1,500,000 tons of limestone, and 450,000 tons of sand and gravel production, allowing for projected growth in market demand of limestone and sand and gravel over current production rates. The analysis considers both haul trucks and employee vehicle trips.

Table 3.12.3: Project Site Trip Generation

Vehicle Trip Type	A.M. Peak Hour Trips				P.M. Peak Hour Trips				Daily Trips	
	Scenario A ⁽¹⁾		Scenario B ⁽²⁾		Scenario A		Scenario B		Scenario A	Scenario B
	In	Out	In	Out	In	Out	In	Out		
Trucks	70	70	24	24	56	56	20	20	1,396	490
Employees	34	7	34	7	8	31	8	31	278	278
Totals	104	77	58	34	64	87	28	51	1,674	768
	181		92		151		79			

- (1) Scenario A represents a worst case scenario in which 100 percent of the processed silica sand will be transported by truck.
- (2) Scenario B represents a more likely scenario in which 10 percent of the processed silica sand will be transported from the Site by truck and 90 percent by rail car in unit trains.

The Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition, typically uses 100 peak hour trips as a threshold to determine the need for a detailed traffic operations analysis. Below this threshold traffic impacts are typically negligible.⁵⁴ Scenario B does not meet the minimum threshold for the detailed analysis and no significant traffic-related impacts are anticipated due to the Project under Scenario B. Scenario B was precluded from the detailed future traffic operations analysis presented in the following section.

Train traffic under Scenario A (100% of sand shipped by truck) is zero. Train traffic under Scenario B of the TIS (90% of silica sand hauled by rail) results in an average of 3.8 unit trains per week at maximum plant capacity of 2.4 MTY.

3.12.2.7. Regional Improvements:

Information contained in the Environmental Assessment Worksheet and Findings of Fact document for the TH 169/ TH 41/CSAH 78/CSAH 14 Intersection Improvements was used to summarize the following information regarding the regional improvement project. Additional detail beyond this summary can be found in the MnDOT environmental review documents, incorporated herein by reference.^{55,56}

MNDOT and the County recognized the need for area wide improvements, unrelated to the Project, and is in the construction phase of a 169/41/78/14 improvement project in the study area. The improvements include an interchange at US 169 and TH 41, an overpass at CSAH 14, frontage road connections to the interchange and overpass, and US 169 access closures. Construction began in

⁵⁴ May 26, 2016 Merriam Junction Sands Facilities Louisville Township, Scott County Traffic Impact Study SRF Consulting Group.

⁵⁵ Th 169/TH 41/CSAH 78/CSAH 14 Intersection Improvements Environmental Assessment Worksheet Minnesota Department of Transportation April 2017.

⁵⁶ Minnesota Department of Transportation TH 169 at TH 41/CSAH 78 and TH 169 at CSAH 14 Intersection improvements Findings of Fact and Conclusions. State Project No. 070-596-013, 7005-121, 7009-81, 7010-109 June 7, 2017

2018 with the majority of work to occur in 2019 and 2020. The improvements have been designed with consideration of local and regional traffic forecasts, including the Project, and are expected to increase freight mobility and commuter traffic through the corridor and are expected to improve the no build and build US 169/TH 41 intersection analysis to acceptable levels for 2026 and beyond.

According to MnDOT and the Findings of Fact associated with Environmental Review of the regional improvements, the purpose of the US 169/TH 41/CH 78 project is to develop intersection improvements that address safety, mobility, freight, accessibility, and connectivity needs. The regional improvements are anticipated to reduce congestion in the area. Many of the locations currently exhibiting long delays and operating at an unacceptable Level of Service will be improved by the construction of a diverging diamond interchange. The interchange design was selected to address safety concerns and reduce annual crash costs. In designing the improvements, the large number of freight vehicle trips that originate or are destined for the project area were considered. These specifically included the aggregate mining operations, landfills, recycling operations, and concrete/asphalt plants located within the project area that use US 169 and /or TH 41 to move their product. Additionally, both TH41 and TH 169 have large numbers of freight vehicles making longer regional trips through the project area that were considered in the project design.

Traffic signals constructed as part of the US 169/TH 41 divergent diamond interchange design will be timed and coordinated to minimize delays and stacking of vehicles. The divergent diamond interchange allows both signalized intersections to operate under a two phase cycle which typically provides for a much shorter cycle length, allowing traffic to move more quickly through the signal.⁵³ Modelling by MnDOT indicates that the diverging diamond interchange will operate at a Level of Service A/B during the 2040 AM and PM peak hours compared to an existing level of service of D during AM and PM peak hours and a 2040 No Build condition the level of service is projected to be unacceptable in both the AM and PM peak hours with modelled levels of service of F in the AM and E in the PM.

The traffic study for the regional improvements found that the project would reduce travel times compared to existing conditions and the no build scenario. Mainline (US 169) travel times under the build scenario are anticipated to be shorter than those under existing conditions or the no build scenario for each route and for AM and PM peak periods. On both northbound and southbound TH 169 and in both the AM and PM peak hours, mainline travel times between the CSAH 69 overpass and CSAH 14 are anticipated to improve to 3.4 minutes. Travel times on eastbound TH 41 from the Minnesota River Bridge to northbound TH 169 at the CSAH 69 Overpass would improve to 2.7 minutes in the AM peak hour and 2.6 minutes in the PM peak hour. Travel times from southbound 169 to westbound 41 to the Minnesota River Bridge are also expected to decrease from the existing and 2040 no build for both the AM and PM peak hours.

Modelling for the regional improvements also indicate that the TH 41/Malkerson Sales access will benefit from the improvements at the divergent diamond interchange and at Dem-Con Drive. An additional through lane will be added to the traffic travelling on TH 41 southeasterly towards US 169 at the Dem-Con Drive/TH 41 intersection. These improvements result in a reduction in delays from the private approaches both northeast of TH 41 serving Commercial Asphalt and southwest of TH41 serving the stable area, Renaissance Festival and proposed Project.

MnDOT annually summarizes crash data on over 8,000 highway intersections across the state. The TH 169 and TH 41/CSAH 78 intersection ranked 78th by crash-cost for the 2011-2013 time period (annual crash cost was approximately \$650,000). The intersection has crash and severity rates that are higher than statewide averages for similar intersections. Along with crashes at the intersection of TH 169 and TH 41/CSAH 78, there are direct driveways and public street access off of TH 169 that contribute to safety concerns. Crashes at these locations, including CSAH 14, are expected to increase as traffic volumes (and corresponding delays) increase on TH 169.

Safety considerations were an integral part of the design and the evaluation of alternative designs. Crash data was evaluated to better understand the role heavy commercial vehicles played in crashes at the intersections within the project area. Alternate designs were evaluated including roundabouts were evaluated but eliminated based on considerations of operations, safety and heavy truck movements. MnDOT also indicates that recent studies suggest that divergent diamond interchanges are safer than multi lane roundabouts at ramp terminals. In light of the large proportion of heavy truck traffic in the area, signals were favored over roundabouts for traffic control at the ramp terminal intersections. The diverging diamond interchange was found to have the lowest estimated yearly crashes as well as one of the highest reserve capacity interchange types evaluated due to the reduced conflicts and free turn movements.

The modelling included forecasting which accounts for projected growth within the service areas. These forecasts take into consider comprehensive plans and demographic forecasts. Development is anticipated to occur and accounted for in the model. Future projects, including industrial and commercial development, will be required to meet all applicable regulations. Specific development proposals must go through appropriate environmental review and permitting processes.

3.12.3 Alternatives - Traffic

There are a total of six alternatives and a No Build Alternative being studied in the EIS that evaluate different plant locations and capacities. The various alternatives result in different traffic patterns depending upon which plant sites are developed. Three individual Site Access Options and the No Build Alternative were identified to be studied in the TIS. These three Site Access Options and the No Build Alternative simplify, yet adequately represent traffic impacts associated with the various alternatives. Alternatives were combined for the TIS analysis as follows:

Alternatives 1 and 2 are represented by Site Access Option A. Alternatives 1 and 2 include one 1.2 MTY processing plant located on the Bryan Rock property and one 1.2 MTY processing plant located on the Malkerson Sales property. Alternative 1 and Alternative 2 will generate similar traffic volumes and patterns.

Alternatives 3 and 6 are represented by Site Access Option B with silica sand transported from the Bryan Rock property only.

Alternatives 4 and 5 are represented by Site Access Option C with silica sand transported from the Malkerson Sales property only.

To determine how the existing roadway network will operate in the future, an operations analysis was completed for the a.m. and p.m. peak hours for year 2017 and year 2026 no build and build conditions for Scenario A (worst case scenario where all processed silica sand would be transported from the Site by trucks) and Site Access Options A, B and C. The year 2017 was the assumed start of operations and the year 2026 the ten year forecast. The Project was not completed by 2017 so just the 2026 results are discussed below. (See Attachment 9 for the 2017 results). Traffic forecasting beyond 2026 was not conducted due to the uncertainty in market demand for the materials proposed to be mined and processed at the proposed Site and potential major improvements to the supporting transportation system (i.e., access management/ potential new interchange at TH 169/TH 41 that was pending legislative action and funding at the time the TIS was conducted, is currently under construction and described in detail above).

Under year 2026 no build and build p.m. peak hour conditions, the analysis indicated that the LOS at the TH 169/TH 41 intersection will be degraded to unacceptable levels indicating the need for longer range improvements. Under year 2026 a.m. peak hour conditions, Site Access Option C (all silica sand being transported from the Malkerson Sales property), the LOS at the TH41/Malkerson Sales property access will also be degraded to unacceptable levels. However, many of the study intersections are already approaching capacity and will continue to degrade as traffic growth and development occur within the study area. This is particularly the case for left-turning heavy commercial trucks on the side-street approaches to both TH 169 and TH 41 that will continue to experience long delays and queuing spillback conditions onto privately owned property. The results of the intersection capacity analysis are summarized on Table 3.12.4, *Future Intersection Capacity Analysis*. The intersection analysis presented above and on Table 3.12.4 was completed based on the existing transportation system and does not reflect the 2018-2020 Regional Improvements.

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Table 3.12.4: Future Intersection Capacity Analysis

Study Intersection	Level of Service (LOS)							
	Year 2017				Year 2026			
	No Build	Build - Site Access Option			No Build	Build - Site Access Option		
		A	B	C		A	B	C
A.M. Peak Hour								
US 169/TH 41 ⁽¹⁾	D ⁽³⁾	D ⁽³⁾	D ⁽³⁾	D ⁽³⁾	D ⁽³⁾	D ⁽³⁾	D ⁽³⁾	D ⁽³⁾
US 169/130th Street ⁽²⁾	A/F ⁽³⁾	A/F ⁽³⁾	A/F ⁽³⁾	A/F ⁽³⁾	A/F ⁽³⁾	A/F ⁽³⁾	A/F ⁽³⁾	A/F ⁽³⁾
US 169/Bryan Rock Site Access ⁽²⁾	A/D	A/E ⁽³⁾	A/F ⁽³⁾	A/D	A/E ⁽³⁾	A/F ⁽³⁾	A/F ⁽³⁾	A/E ⁽³⁾
US 169/145th Street ⁽²⁾	A/C	A/C	A/C	A/C	A/C	A/C	A/C	A/C
TH 41/Dem-Con Drive ⁽¹⁾	B	B	B	B	B	B	B	B
TH 41/Malkerson Site Access ⁽²⁾	A/E ⁽³⁾	A/F ⁽³⁾	A/F ⁽³⁾	C/F ⁽³⁾	A/E ⁽³⁾	A/F ⁽³⁾	A/F ⁽³⁾	E/F ⁽³⁾
P.M. Peak Hour								
US 169/TH 41 ⁽¹⁾	D ⁽³⁾	D ⁽³⁾	D ⁽³⁾	D ⁽³⁾	E ⁽³⁾	E ⁽³⁾	E ⁽³⁾	E ⁽³⁾
TH 169/130th Street ⁽²⁾	A/E ⁽³⁾	A/F ⁽³⁾	A/E ⁽³⁾	A/E ⁽³⁾	A/E ⁽³⁾	A/F ⁽³⁾	A/F ⁽³⁾	A/E ⁽³⁾
US 169/Bryan Rock Site Access ⁽²⁾	A/D	A/F ⁽³⁾	A/F ⁽³⁾	A/D	A/E ⁽³⁾	A/F ⁽³⁾	A/F ⁽³⁾	A/E ⁽³⁾
US 169/145th Street ⁽²⁾	A/C	A/D	A/D	A/D	A/C	A/D	A/D	A/D
TH 41/Dem-Con Drive ⁽¹⁾	B	B	B	B	B	B	B	B
TH 41/Malkerson Site Access ⁽²⁾	A/F ⁽³⁾	A/F ⁽³⁾	A/F ⁽³⁾	B/F ⁽³⁾	A/F ⁽³⁾	A/F ⁽³⁾	A/F ⁽³⁾	C/F ⁽³⁾

- (1) A signalized intersection with the overall LOS shown.
- (2) An unsignalized intersection with all-way or side-street stop control, the overall LOS is shown followed by the worst approach LOS.
- (3) Overall LOS D or minor approach LOS E-F (approaching capacity). Overall LOS E_F (over capacity)

Summary

1. The TIS identified an existing traffic safety problem at the US 169/TH 41 intersection that will be resolved with implementation of the 2018-2020 Regional Improvements currently under construction. The remaining study intersections are below critical crash rates for similar intersections. This indicates that roadway conditions at the remaining study intersections are not likely factors contributing to the crashes.

2. Results of the existing intersection capacity analysis indicate that all of the study intersections currently operate at an acceptable overall LOS D or better during the a.m. and p.m. peak hours. The TH 169/TH 41 intersection is approaching an unacceptable overall LOS E during the p.m. peak hour. Many of the study intersections side-street approaches are already at or are approaching capacity.

This is particularly the case for left-turning heavy commercial trucks on the side-street or private driveway approaches to both TH 169 and TH 41 that will continue to experience long delays and queuing spillback conditions onto privately owned property. Routing more of the truck traffic to the southern access on to 145th to US 169 and the regional improvements currently under construction will help to alleviate these delays. The regional traffic improvements currently under construction will also reduce the side street delays and queuing spillback conditions on private property.

3. Scenario B which evaluated 10% of sand hauled by truck does not significantly increase traffic to meet the minimum threshold for a detailed analysis and no significant traffic-related impacts are anticipated due to the Project under Scenario B.

4. Under year 2026 no build p.m. peak hour conditions, the LOS at the TH 169/TH 41 intersection will be degraded to unacceptable levels indicating the need for longer range improvements which are currently under construction.

5. Under year 2026, Build Site Access C a.m. peak hour conditions, (if 2018-2020 Regional Improvements are not implemented) the LOS at the TH 41/Malkerson Sales property access intersection will be degraded to unacceptable levels. Routing more of the truck traffic to the southern access on to 145th to US 169 will help to alleviate these delays.

6. Based on a comparison of the detailed traffic operations analysis between the no-build and build conditions, it is concluded that the Project generated trips are expected to have minimal impact to the study area roadway system. The worst case Scenario A development generated daily trips represent less than a two percent increase in total study area future year 2026 daily traffic volumes.

7. The US 169 corridor is an essential transportation corridor for moving goods as well as commuter traffic. Longer range regional improvements for the US 169 corridor near the Project Area are under construction. Project forecasted traffic was provided to MnDOT and the County as part of the planning and design of the 2018-2020 Regional Improvements. These improvements are expected to increase the efficiency in flow of commercial truck traffic in the area and will enhance regional mobility along the US 169 corridor.

8. The 2018-2020 Regional Improvements will include several access closures along the US 169 corridor in the vicinity of the Project. The median at Bryan Rock's northern access will be closed and the access reduced to right in right out movements only. The access at 145th Street and US 169 will be closed. 145th Street will be routed to a new east and west frontage road system and CSAH 14 overpass. This new system will provide access to US 169 from the southern access points on both Bryan Rock and Malkerson Sales properties.

9. There will continue to be limited acceptable gaps available for left-turning heavy trucks at the TH 41/Malkerson Sales Site access intersection. A review of conditions at this intersection indicates that it would be difficult to justify traffic signal installation due to the traffic volume patterns and the close proximity of the at-grade rail crossing on TH 41. Once limestone and sand/gravel resources associated with the Malkerson Sales property are depleted, there will be a significant reduction in demand to make left-turns from this access. Future development of portions of the Malkerson Sales

property would utilize this access point and their impacts would have to be evaluated as development proposals come forth.

10. The Renaissance Festival and Trail of Terror events plus other smaller events taking place on the Site, are short term, seasonal, weekend, outdoor entertainment events. The focus of this TIS is the typical weekday commuter peak hours. Although limestone hauling occurs on Saturdays, it is at a lower volume and Bryan Rock can reduce the Saturday haul hours during festival days to avoid additional traffic congestion. Sandstone hauling on weekends can be reduced during festival days in a similar manner especially during the high attendance weekends (Weeks 5, 6 and 7), if the Renaissance Festival is still operating at this Site when sandstone mining commences.

11. Based on a review of information provided for the at-grade rail crossings on TH 41 and 145th Street by the Project rail yard design firm, the crossing blocking time estimates are 3.03 minutes for the 145th Street crossing and 5.60 minutes for the TH 41 crossing. These at-grade rail crossing blocking time estimates are for MJS Site-generated trains under the silica sand product transport Scenario B (10 percent trucks/90 percent rail car/unit trains). A detailed review indicates that these are reasonable at-grade rail crossing blocking time estimates. From statistical data available it is estimated that a railroad crossing blockage of this nature may occur during either the a.m. or p.m. commuter peak hours approximately once per month. These Site-generated crossing blocking time estimates are less than the lawful maximum blocking time of 10 minutes and are not considered to represent a significant regularly occurring traffic delay.

3.12.4 Mitigation - Traffic

The EIS will identify potential roadway improvements and/or other mitigation measures which may be necessary to mitigate traffic conditions as determined in the traffic analysis including the evaluation of closing unused access points

1. The 2018-2020 Regional Improvements are expected to enhance regional mobility along the US 169 Corridor. The interchange will eliminate safety concerns and reduce annual crash cost and the US 169/TH 41 intersection, and address capacity issues at intersections within the study area and greatly improve the safety and mobility of truck hauling in the area.

2. To alleviate long delays and queuing of left-turning heavy commercial trucks on the side-street approaches to TH 41 during a.m. peak hour conditions at the Malkerson Sales access, encourage drivers leaving the Malkerson Sales northern access to consider alternate routes that minimize or eliminate the need to make left-turns from the Site during peak periods. This may include routing silica sand truck traffic through the Site to the southern access onto 145th Street. The existing private roadway system within the Site and the recently constructed west frontage road system (Red Rock Drive with access to northbound and southbound US 169) makes this a realistic option.

Regional improvements currently under construction include the addition of a second eastbound lane (while preserving the existing dedicated right turn lane) at the adjacent Dem-Con Drive/TH 41 signalized intersection. The improved efficiency of this intersection will reduce queue lengths on TH

41 and improve delay times and decrease stacking at the minor approaches associated with the adjacent Malkerson Sales access point.

3. Limit hauling limestone, sand and gravel, and silica sand from the Site during high Renaissance Festival attendance on the Site, typically afternoons during the 5, 6 and 7th weekends in September and October each year.

3.13 Vehicle Related Air Emissions

The SDD identifies the following items to be addressed in the DEIS:

a. The EIS will discuss this issue and additional air quality information will be acquired with guidance sought from the MPCA.

3.13.1 Affected Environment – Vehicle Related Air Emissions

The Site is situated adjacent to two major vehicle transportation corridors. Vehicle emissions along these corridors affect air quality by emitting airborne pollutants. Diesel exhaust contains fine particulate matter (PM), ozone forming nitrogen oxides, and toxic air pollutants. Criteria pollutants are a group of common air pollutants regulated by the EPA on the basis of health and/or environmental effects of pollution. Criteria pollutants from vehicle emissions identified by the EPA are ozone, particulate matter, carbon monoxide, nitrogen dioxide, lead, and sulfur dioxide.

3.13.2 Environmental Consequences – Vehicle Related Air Emissions

An increase in traffic and congestion results in an increase in vehicle emissions. The majority of sandstone is anticipated to be transported from the Site by rail, although as described in Section 3.12 Traffic, Scenario A evaluates the worst case where all sand is transported by truck. Under this scenario, generated daily trips represent less than a two percent increase in total study area future year 2026 daily traffic volumes.

The Federal government requires vehicles and equipment to become more efficient over time. More efficient vehicles produce less pollution per mile driven. The Federal government also regulates the chemical make-up of gasoline and diesel fuel. Removing lead from gasoline and reducing sulfur in diesel fuel has significantly reduced vehicle emissions of those pollutants.

SRF evaluated potential air quality impacts from the Project by addressing the criteria pollutants; ozone, particulate matter, carbon monoxide, nitrogen dioxide, lead, and sulfur dioxide.⁵⁷ Potential impacts resulting from these pollutants are assessed by comparing projected concentrations to National Ambient Air Quality Standards (NAAQS). Quantitative analysis of pollutants that are in compliance with NAAQS is not necessary, as it is reasonable to assume that Project impacts will be negligible with respect to compliance with the NAAQS. Results of the analysis are presented below.

⁵⁷ SRF Technical Memorandum March 30,2015 Merriam Junction Sands Mining Environmental Impact Statement Vehicular Air Quality Analysis Documentation

3.13.2.1 Ozone

Ozone is not emitted directly from vehicles but is formed as VOCs and nitrogen oxides (NO_x) react in the presence of sunlight. Transportation sources emit NO_x and VOCs and can therefore affect ozone concentrations. However, due to the phenomenon of atmospheric formation of ozone from chemical precursors, concentrations are not expected to be elevated near a particular roadway.

The EPA sets NAAQS for ozone, including both primary standards to protect public health and secondary standards to protect the environment. In 2015, the EPA strengthened the NAAQS for ozone. The level of both the current primary and secondary eight-hour standards for ozone is 70 ppb.

Minnesota is currently classified by the EPA as an “ozone attainment area.” To meet both the primary and secondary eight-hour ozone NAAQS, the three-year average of the annual fourth-highest daily maximum eight-hour average concentration of ozone must not exceed 70 parts per billion (ppb). The MPCA maintains an ozone monitoring site in Shakopee, MN air monitor in Shakopee, MN. Results for the 2016-2018 average are 63ppb for the 2014-2016 three-year average.⁵⁸ Minnesota is in compliance with the NAAQS for ozone, therefore a quantitative ozone analysis was not conducted for the Project.

3.13.2.2 Particulate Matter

PM is the term for particles and liquid droplets suspended in the air. Particles come in a wide variety of sizes and have been historically assessed based on size, typically measured by the diameter of the particle in micrometers. PM_{2.5} or fine particulate matter refers to particles that are 2.5 micrometers or less in diameter. PM₁₀ refers to particulate matter that is 10 micrometers or less in diameter.

Vehicles emit direct PM from their tailpipes, as well as from normal brake and tire wear. PM_{2.5} can be formed in the atmosphere from gases such as sulfur dioxide, nitrogen oxides, and volatile organic compounds. PM_{2.5} can penetrate the human respiratory system's natural defenses and damage the respiratory tract when inhaled. Scientific studies have linked particle pollution exposure to a variety of health impacts.

On December 14, 2012, the EPA issued a final rule revising the annual health NAAQS for fine particles (PM_{2.5}) by lowering the annual PM_{2.5} standard to 12.0 micrograms per cubic meter (µg/m³), from the previous annual standard of 15.0 µg/m³. The EPA has retained the 24-hour PM_{2.5} standard at a level of 35 µg/m³.

The agency also retained the existing standards for coarse particle pollution (PM₁₀). PM₁₀ is associated with fugitive dust emissions from mining operations and is discussed in Section 3.14,

⁵⁸ July 2019 Annual Air Monitoring Network Plan for Minnesota 2020 MPCA Retrieved online at <https://www.pca.state.mn.us/sites/default/files/aq10-17a.pdf>

Stationary Source Air emissions. The NAAQS 24-hour standard for PM₁₀ is 150 µg/m³, which is not to be exceeded more than once per year on average over three years.⁵⁹

Areas within each state are designated as either meeting PM standards or not meeting them. The area where the project is located has been designated as an unclassifiable/attainment area for PM. This means that this location has been identified as a geographic area that meets or exceeds the national standards for the reduction of PM levels, and therefore is exempt from performing PM hot-spot analyses.

3.13.2.3 Nitrogen Oxides (NO_x)

NO_x is a generic term for a group of highly reactive gases containing nitrogen and oxygen in varying amounts. The two primary components are nitric oxide (NO) and nitrogen dioxide (NO₂). NO_x form when fuel is burned in a combustion process, primarily including motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels. The MPCA monitors NO and NO₂ at five sites in the metropolitan area including two near road monitoring stations. Minnesota currently meets federal NO₂ NAAQS standards with annual and one-hour concentrations at the monitoring sites that are substantially below the NAAQS standards of 53 ppb and 100 ppb, respectively.⁶⁰ Within the Project Area, it is unlikely that NO₂ standards will be approached or exceeded based on the relatively low ambient concentrations of NO₂ in Minnesota and based on the long-term trend toward reduced concentrations of NO_x emissions. Because of these factors, a specific analysis of NO₂ was not conducted.

3.13.2.4 Sulfur Dioxide

Sulfur dioxide (SO₂) and other sulfur oxide gases (SO_x) are formed when fuel containing sulfur, such as coal, oil, and diesel fuel is burned. Sulfur dioxide is a heavy, pungent, colorless gas. Once emitted into the atmosphere, SO₂ can be further oxidized to sulfuric acid, a component of acid rain.

MPCA's *2018 Annual Air Monitoring Network Plan for Minnesota* (July 2017) shows that six sites were monitored for SO₂ in the Twin Cities Metropolitan Area during the period of 2011- 2013. The NAAQS limit for SO₂ is met if the three-year average of the annual 99th percentile daily maximum 1-hour SO₂ concentration is less than 75 ppb. The maximum of the monitoring sites was found to be 14 ppb, well below the 75 ppb threshold.

MPCA also states that about 70 percent of SO₂ released into the air comes from electric power generation (*Air Quality in Minnesota: 2013 Report to the Legislature*, January 2013). Therefore, a much smaller proportion is attributable to on-road mobile sources. The MPCA has concluded that

⁵⁹ Environmental Protection Agency Particulate Matter (PM) Pollution. Retrieved online at (<https://www.epa.gov/pm-pollution>).

⁶⁰ July 2017 Minnesota Pollution Control Agency. Annual Air Monitoring Network Plan for Minnesota 2018. Retrieved online at <https://www.pca.state.mn.us/air/air-monitoring-network-plan>

long-term trends in both ambient air concentrations and total SO₂ emissions in Minnesota indicate steady improvement.

Emissions of sulfur oxides from transportation sources are a small component of overall emissions and continue to decline due to the desulphurization of fuels. Additionally, the project area is classified by the EPA as a "sulfur dioxide attainment area," which means that the project area has been identified as a geographic area that meets the national health-based standards for sulfur dioxide levels. Because of these factors, a quantitative analysis for sulfur dioxide was not conducted for this project.

3.13.2.5 Lead

Due to the phase out of leaded gasoline, lead is no longer a pollutant associated with vehicular emissions.

3.13.2.6 Carbon Monoxide

Carbon monoxide (CO) is the traffic-related pollutant that has been of concern in the Twin Cities Metropolitan Area. In 1999, the EPA re-designated all of Hennepin, Ramsey, Anoka, and portions of Carver, Scott, Dakota, Washington, and Wright counties as a maintenance area for CO. This means the area was previously classified as a nonattainment area but has now been found to be in attainment. This area includes the project area, which is located in Scott County. Evaluation of CO for assessment of air quality impacts is required for environmental approval in NEPA documents.

3.13.2.7 Air Quality Conformity

The EPA issued final rules on transportation conformity (40 CFR 93, Subpart A) which describe the methods required to demonstrate State Implementation Plan (SIP) compliance for transportation projects. On November 8, 2010, the EPA approved a limited maintenance plan request for the Twin Cities maintenance area. Under a limited maintenance plan, the EPA has determined that there is no requirement to project emissions over the maintenance period and that:

"...an emissions budget may be treated as essentially not constraining for the length of the maintenance period because it is unreasonable to expect that such an area will experience so much growth in that period that a violation of CO NAAQS would result."⁶¹

Therefore, no regional modeling analysis for the LRTPP and TIP is required; however federally funded and state funded projects are still subject to "hot-spot" analysis requirements. The limited maintenance plan adopted in 2010 determines that the level of CO emissions and resulting ambient concentrations will continue to demonstrate attainment of the CO NAAQS.

⁶¹ US EPA Limited Maintenance Plan Option for Nonclassifiable CO Nonattainment Areas, October 6, 1995

3.13.2.8 Hot-Spot Analysis

CO "hot-spot" analysis is performed by evaluating the worst-operating intersections in the project area. The EPA has approved a screening method to determine whether detailed analysis is required for hot-spot intersections. The hot-spot screening method uses a traffic volume threshold of 79,400 entering vehicles per day. Intersections with traffic volumes above this threshold must be evaluated using EPA-approved emission and dispersion models. Intersections with traffic volumes below this threshold are not expected to result in CO concentrations that exceed state or federal standards, and detailed modeling is not required.

Entering traffic volumes at the busiest intersection within the project area that will be impacted by the proposed project are shown in Table 3.13-1. The results of the screening procedure demonstrate that all intersection volumes are below the threshold and do not require detailed analysis.

Table 3.13-1 Project Area Intersection Volumes for Year 2026 Build Conditions (Entering Vehicles)

Intersection	North	East	South	West	Total
TH 169/TH 41	10,455	16,560	2,645	15,485	45,145

3.13.3 Alternatives – Vehicle Related Air Emissions

Vehicle emissions are driven by market demand for aggregate products. All of the Alternatives are the same except for the No Build Alternative. The No Build Alternative will still have vehicle related air emissions generated from on-going limestone and sand and gravel production but no vehicle related air emissions resulting from transport of sand.

3.13.4 Mitigation – Vehicle Related Air Emissions

Vehicle related air emissions are not expected to create a significant environmental effect to air quality. The following measures will be adopted to reduce vehicle emissions.

1. Turn off engines when vehicles are stopped for more than a few minutes, especially around people. Do not idle near the air intake of a building.
2. Retrofit engines with pollution control devices and or use cleaner burning fuel.
3. When purchasing new vehicles, buy the lowest emitting vehicles available.
4. Keep engines well tuned and maintained.

3.14 Stationary Source Air Emissions

The SDD identifies the following items to be addressed in the DEIS:

- a) The EIS will include an assessment of the area that may be impacted by air emissions from the Project.
- b) The EIS will identify the quantity, the type, sources and composition of emissions associated with the various plant layouts, locations and capacities.
- c) The EIS will identify pollution prevention techniques and controls on the processing operations.
- d) The EIS will identify fugitive dust prevention and control measures.
- e) The EIS will include a draft ambient air monitoring and mitigation plan. The plan will identify the parameters of testing, equipment, schedule, frequency, etc. The final details of the plan, including the location of monitors will be developed as part of the MPCA air permit. Prior to the release of the DEIS Draft, the Project Proposer will meet with MPCA air quality staff to review the Project details.

3.14.1 Affected Environment – Stationary Source Air Emissions:

The EIS will include an assessment of the area that may be impacted by air emissions from the Project.

Potential air emission calculations and associated air dispersion modeling methods and results for the Project were performed by Barr and presented in their Air Modeling of Project Alternatives Evaluation Report, prepared for Merriam Junction Sands, LLC dated September 2017 (Air Modeling Report)⁶² (Attachment 10). The purpose of the evaluation was to assess the area that may be impacted by air emissions, identify the potential quantity, type and source of air emissions, and identify pollution prevention techniques and controls on the processing equipment. Federal and State ambient air standards are applicable at the property line or anywhere public exposure may occur (ambient air). This includes areas where the public may access portions of the Site through the existing lease agreement with Mid America Festivals, (festival grounds, campground, parking, access roads, Trail of Terror, etc.) as long as the lease is in effect.

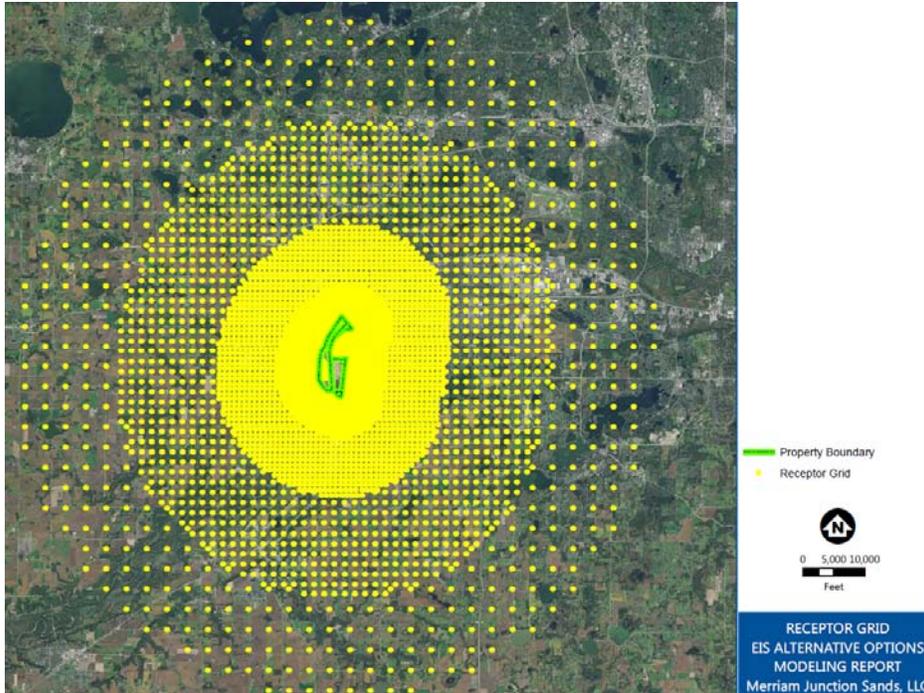
The ambient air boundary establishes where Federal and State ambient air standards must be met, however, the air analysis includes a receptor grid that extends 9.3 miles (15 kilometers) from the Project boundaries. A receptor grid represents the extent of the model. Model results are calculated at each receptor location. The receptor grid is most dense within the Project Area, closest to potential sources of air pollutants. The grid becomes less dense with distance from the Project Area. Within the Project Area there is a 10-meter receptor grid. Model results are calculated at points located 10 meters apart both north and south and east and west. 50-meter spaced receptors extend from the

⁶² Barr Engineering Company Air Modelling of Project Alternatives Evaluation Report. Resource Documentation for Environmental Impact Statement. Prepared for Merriam Junction Sands, LLC. September 2017.

fence line/property boundary out to 1 kilometer. Model results are calculated at points located 50 meters apart in all directions. From 1 km to 2 km, receptors are spaced every 100 meters. From 2 to 5 km, receptors are spaced every 250 meters. From 5 to 10 km, receptors are spaced every 500 meters. From 10 km to 15 km, receptors are spaced 1 km. The extent of the receptor grid used in the primary modelling analysis is indicated below on an excerpt from the Air Modeling Report. The MJS receptor grid follows the current MPCA modeling manual recommendations for receptor spacing and extent.

Two receptor grids were developed to model the scenarios of Renaissance Festival lease in effect and Renaissance Festival lease not in effect. This is necessary because when the Renaissance Festival lease is in effect, receptor locations and model results need to be located across portions of the Site accessible to the public when they are attending the festival or other events. Once the Lease is no longer in effect, the model needs to account for mining related air emission sources coming from the booth area or other areas the public no longer has access to. The two grids are necessary because a receptor and a source cannot overlap.

Ten-meter spaced receptors follow the fence line/property boundary and also cover the Renaissance Festival grounds and stable area during the period when the Renaissance Festival lease is in effect and is operating or defined in the model as operating, even though both areas will be mined in the future as part of the Project. For the scenario when the Renaissance Festival is no longer located on the Project Site, or the terminated lease scenario, the 10-meter spaced receptors on the leased property are removed for the expansion of mining into the booth site, campground and stable area on the Malkerson Sales property. For both scenarios, 50-meter spaced receptors extend from the fence line/property boundary out to 1 kilometer. From 1 km to 2 km, receptors are spaced every 100 meters. From 2 to 5 km, receptors are spaced every 250 meters. From 5 to 10 km, receptors are spaced every 500 meters. From 10 km to 15 km, receptors are spaced 1 km. The extent of the receptor grid used in the primary modelling analysis is indicated below on an excerpt from the Air Modeling Report.



3.14.2 Environmental Consequences – Stationary Source Air Emissions:

The EIS will identify the type, sources and composition of emissions.

Project emission sources consist of multiple plant stacks, material handling and processing, conveying, storage, and wind erosion, and diesel generators.

Point Sources: The dryers in the sand plant(s) are the only stationary combustion sources and the composition of emissions include Particulate Matter (PM, PM₁₀ and PM^{2.5}) Sulfur Dioxide (SO₂), Nitrogen Oxides (NO_x), Carbon Monoxide (CO), Volatile Organic Compounds (VOCs), Carbon Dioxide (CO₂) and Hazardous Air Pollutants (HAPs)⁶³. Other point sources in the dry plant include equipment (screens and conveyors), storage tanks and loadout systems (all controlled by vacuum systems) and baghouses.

Open pit sources generate fugitive dust emissions and include sandstone, limestone, and sand and gravel mining and material handling activities including overburden removal, blasting, mining, crushing, screening, wet plant, winter pile system, dry plant, storage operations, load out activities, fugitive dust from haul trucks on unpaved internal haul roads and an existing mulching operation. Fugitive dust emissions are modeled for PM₁₀ and PM_{2.5}.

⁶³ A Hazardous Air Pollutant (HAP) is a compound that has been included on the EPA list of 188 chemicals that can have detrimental effects on humans and the environment.

Respirable crystalline silica (PM₄ Silica) is a component of particulate matter associated with fugitive dust emissions. Unlike the contaminants listed above, there are no Federal or State ambient air quality standards for PM₄ Silica. The Minnesota Department of Health established a guidance chronic health based value of 3 µg/m³ for respirable silica in July 2013. This guidance is the same as the previously established California Office of Environmental Health Hazard Assessment (OEHHA) chronic inhalation Reference Exposure Level (REL) of 3 µg/m³ and will be used to assess air monitoring results once the Project is constructed and operating.

Diesel generators are sources of combustion emissions associated with operation of the dredge, a riprap plant, scalping screen, and gravel mining generators. Emissions from the generators include PM, PM₁₀, PM_{2.5}, SO₂, NO_x, CO, VOC, CO₂ and HAPs.

3.14.3 Alternatives – Stationary Source Air Emissions:

The EIS will identify the quantity of emissions associated with the various plant layouts, locations, and capacities.

Total potential to emit calculations were performed for each of the alternatives which quantify the maximum emissions associated with running at full capacity. In addition, dispersion modeling was performed for each alternative which provides a conservative estimate of the concentration of criteria air pollutants at the ambient air boundary.

3.14.3.1 Total Facility Potential Emissions:

Potential to emit calculations are used to determine the applicable air permit requirements.

The size and locations of the plants, the phasing of mining activities, the length of haul roads, and the concurrent limestone and sand and gravel mining and mulching activities were considered for each alternative. Potential to emit calculations were performed for each aspect of the mining and processing operations. Results for each individual component of the operations (e.g. dryers, generators, stockpiles, haul trucks, etc.) are included in tables in the Air Modeling Report.

The range of potential annual emissions for the entire facility for the six alternatives is summarized below. Particulate emissions vary among the alternatives depending on if the alternative has one sand plant or two, differences in haul road distances due to plant locations and whether or not the Renaissance Festival lease is in effect, since there will not be any limestone mining or processing on the Malkerson Sales property while the Renaissance Festival continues to operate on-site. Table 3.14.1, Annual Emissions Summary, shows the range of potential emissions covered by all alternatives and compares them with the thresholds for requiring a federal air permit (Title V Permit or Prevention of Significant Deterioration (PSD) major source permit). Alternatives 4 and 6 have the lowest potential to emit and Alternative 2 has the highest potential to emit. The range is such that none of the Alternatives will require a PSD major source permit.

Table 3.14-1 Annual Emissions Summary

Pollutant	Total Facility Potential Emissions – During Renaissance Festival (tpy) ^[1]	Total Facility Potential Emissions - Post Renaissance Festival (tpy) ^[1]	Title V Major Source Thresholds (tpy)	PSD Major Source Thresholds (tpy)
PM	94.4 (4/6) – 168.7 (2)	99.4 (4/6) – 173.7 (2)	100	250
PM ₁₀	39.1 (4/6) – 56.9 (2)	40.0 (4/6) – 57.8 (2)	100	250
PM _{2.5}	20.3 (4/6) – 27.8 (2)	20.5 (4/6) – 27.9 (2)	100	250
SO ₂	0.24	0.24	100	250
NO _x	63.0	63.0	100	250
CO	99.2	99.2	100	250
VOC	2.41	2.41	100	250
CO _{2e} ^[2]	42,191	42,191	100,000	100,000
Total HAPs ^[3]	0.69	0.69	25	--
Individual HAPs (Hexane) ^[4]	0.62	0.62	10	--

[1] Particulate emissions vary depending on the alternative used. Emissions are presented as a range from the alternative with the lowest emissions to the alternative with the highest emissions. The alternatives are identified in parentheses.

[2] CO_{2e} is carbon dioxide equivalent which is the amount of greenhouse gas emissions (i.e. methane) with the same global warming potential as one ton of CO₂

[3] A HAP is a compound that has been included on the EPA list of 188 chemicals that can have detrimental effects on humans and the environment.

[4] the highest individual HAP, hexane is emitted from the dryers.

3.14.3.2 Dispersion Modeling Results -PM₁₀ and PM_{2.5}

Dispersion modelling was performed to demonstrate compliance with the PM₁₀ and PM_{2.5} ambient air quality standards for the different Project alternatives. The modeling of these pollutants from all sources included fugitive dust emissions. PM₁₀ and PM_{2.5} are typically the primary source of air emissions from non-metallic mineral mining operations which have the greatest potential to impact air quality. To most efficiently accommodate these variations, the modeled analysis starts with scenarios that are more restrictive based on design layouts and their proximity to land use agreement specific receptors.

The modeling further considers the existing lease agreement with Mid America Festivals (Festival Lease) for the operation of the Renaissance Festival and other events, such as the Trail of Terror, which result in ambient air receptors within the property.

All six alternatives model compliance with the 24-hour and annual PM₁₀ and PM_{2.5} ambient air standards while the Festival Lease is in effect along with current mining and mulching operations at Bryan Rock and Malkerson Sales. Results show maximum impacts along the property line with immediate decline of concentrations within 1 km of the property boundary. Modeling results show that when the Festival Lease is terminated, all alternatives will pass except for Alternative 2. Alternative 2 is modeled as slightly out of compliance (101% of the standard) of the PM_{2.5} annual ambient air quality standard. Because the results are so close to the standards, design modifications could be made if Alternative 2 is chosen for development and compliance could be achieved.

To account for operations with and without the Festival Lease in effect, the modeling was run for two different receptor grids. The first run, accounts for the continued operation of the Renaissance Festival, which brings the public (and the receptor grid) within the boundaries of the Site including the festival grounds, parking areas, access roads, and the Trail of Terror. This modeling run requires that ambient air standards are met at the locations that the public has access to. The second modeling run establishes a receptor grid based on the condition when the Festival Lease is terminated and the Renaissance Festival has relocated off the Site, which essentially establishes the ambient air boundary at the fence line or Site boundaries.

The modeling analysis includes multiple operations (sandstone mining and processing, limestone mining and processing, sand and gravel mining and processing, and mulching operations) occurring at the same time with relatively little source-receptor distance from the ambient air boundary when the Festival Lease is in effect. Background values taken from the nearest ambient monitor in Shakopee are added to the modeled results and then compared to ambient air quality standards.

1. Festival Lease in Effect

In order to meet ambient air standards when the public has access to portions of the Site, certain operating restrictions will be required. The model showed highest modeled concentrations during the overnight hours when the meteorological boundary layer is stable with low wind speeds and mixing heights. Therefore, specific operating limits once sandstone mining begins on-site were implemented mostly during overnight hours. Operating limits effect hours of operation for material handling and truck traffic. Operating limits incorporated into the model while the Festival Lease is in force and sandstone mining has begun are as follows:

- Overburden material handling operations limited to 6am-10pm (no operations 10pm to 6am)
- Gravel pit truck loadout operations limited to 6am-2am (no loadout 2am-6am)
- Mulching operations limited to 6am-10pm in April-October (no operations 10pm-6am)
- Limestone plant hauling (within the quarry) limited to 6am-2am year-round (no hauling 2am-6am) and further restricted to 7am-7pm during winter months, Dec-Feb (no hauling 7pm-7am during the winter month).
- Limestone delivery traffic limited to 6am-2am year-round (no hauling 2am-6am year-round) and further restricted to 6am-10pm during winter months, Dec-Feb (no hauling 10 pm-6am winter months).

- While the Festival Lease agreement is in effect one of the two limestone plants can process limestone (loaders, jaw crushers, and screens) at a rate of 700 tons per hour in the Bryan Rock pit.

Alternatives 1 through 6 were modeled for the Festival Lease receptor grid and associated operational restrictions to conservatively evaluate the alternatives for comparison with the 24-hour and Annual PM₁₀ and PM_{2.5} ambient air quality standards. Table 3.14.2, Model Results - Festival Lease in Force, shows the modeled results with the background concentrations included. These reflect the operation of the Renaissance Festival and the previously discussed restrictions. The EIS alternatives with sand plants located in the southern portion of the property resulted in the higher modeled results. However, with the operating limits in place, all of the modeled results meet the ambient air quality standards.

The Project includes sand and gravel operations in the northern portion of the Malkerson Sales property both east and west of the railroad tracks (but not concurrently at these locations). Modeling was performed for sand and gravel operations at both locations in Alternative 4 (northern most plant site) and it was determined that operations on the east side of the tracks result in higher modeled concentrations. All of the alternatives and corresponding model results are shown with the more conservative (i.e. worst case) configuration of mining sand and gravel on the east side of the tracks. Results of the additional run of Alternative 4 are included in the table below to demonstrate that sand gravel mining on the east side of the tracks is the most conservative configuration for modeling the sand and gravel operations.

Table 3.14-2 Model Results- Festival Lease in Effect

EIS Alternative Layout	24-hour PM ₁₀ (µg/m ³)	Annual PM ₁₀ ^(a) (µg/m ³)	24-hour PM _{2.5} (µg/m ³)	Annual PM _{2.5} (µg/m ³)
1	128	32	30.1	10.9
2	129	37	31.2	11.7
3	125	30	31.6	11.1
4	119	30	28.2	10.0
4 (Gravel Pit West)	119	30	28.1	9.9
5	131	35	32.1	11.1
6	125	30	31.6	11.1
NAAQS / MAAQS	150	-	35	12

NAAQS: National Ambient Air Quality Standard MAAQS: Minnesota Ambient Air Quality Standard

2. Festival Lease Terminated

After the Festival Lease is terminated, the ambient air boundary becomes the property line and the operating limits that were necessary to meet the ambient air quality standards with the Festival Lease in force can be removed. When sandstone mining and processing operations are running, full limestone operations can be conducted on both the Bryan Rock property and the Malkerson Sales property at 700 tons per hour per plant and a combined total rate of 2 million tons per year.

The limiting alternatives, Alternative 2 and Alternative 5, (determined from the first modeling run with the more restricted ambient air boundary) were modeled in the Festival Lease Terminated runs. Alternative 2 results passed in all modeled categories, except for Annual PM_{2.5}, which was 101% of the standard at receptors along the railroad right of way boundary. The main sources influencing these air concentrations are the BRP and MS sand plants and the in-pit MS limestone haul traffic. In practical terms, the public cannot occupy the railroad tracks for an extended period of time, especially for an entire year, making these impacts at the railroad right of way line unrepresentative of actual exposure and less concerning. If Alternative 2 is the alternative that is ultimately chosen for the Project and associated air permitting, the results are near enough the standards that design changes could be implemented to eliminate the modeled exceedances along the railroad receptors.

Alternative 5 results demonstrate that the 24-hour and annual PM₁₀/PM_{2.5} are below the ambient air standard. Alternative 5 passing demonstrates that the other alternatives that successfully complied with the Renaissance Festival restrictions will also pass without the Renaissance Festival related restrictions. Table 3.14.3 presents the results for Alternatives 2 and 5.

Table 3.14-3 Model Results – Festival Lease Terminated

EIS Alternative Layout	24-hour PM ₁₀ (µg/m ³)	Annual PM ₁₀ (µg/m ³)	24-hour PM _{2.5} (µg/m ³)	Annual PM _{2.5} (µg/m ³)
2	149.5	39	31.9	12.1
5	91	42	32.9	11.9
NAAQS / MAAQS	150	-	35	12

3.14.3.3 Cumulative Effects

An analysis of the potential cumulative effects from the Project with additional sources in the area was conducted as part of the Air Modeling Report. There were three nearby sources that were evaluated for this analysis due to their proximity to the Project: Fairmount’s Shakopee Sands facility (Shakopee Sands), Jordan Aggregates, and FML Sand, LLC’s proposed sand facility (FAM). Shakopee Sands (Air Permit 13900120-3) is located one mile south of Merriam Junction Sands along Highway 169. Jordan Aggregates was a proposed aggregate mining operation south of the Merriam Junction Sands property along Highway 169. The project completed an EIS in 2014 and had applied for an Interim Use Permit Application, which the County denied in 2016, but it is included in the cumulative analysis since the outcome of the permitting process was unknown at the time the analysis was conducted. FAM had proposed a sandstone mining and processing facility that completed a Scoping EAW in July 2015 but is not currently being pursued and has not provided enough detail regarding the project to include it as a probable source to adequately analyze cumulative effects. Therefore, this cumulative potential effect analysis includes the proposed Project, Shakopee Sands, and Jordan Aggregates projects.

The primary source of emissions is fugitive dust generated from mining activities (stockpiling, loading/unloading, and unpaved road vehicle traffic). Air impacts from mine Site fugitive dust emissions are proven to be localized and driven by wind speed and wind direction. The results show 24-hour PM₁₀ maximum concentrations southeast of Shakopee Sands between 7-10 ug/m³ and less than 5 ug/m³ southeast of Jordan Aggregates. Both the 24-hour and annual PM_{2.5} impacts southeast of Shakopee Sands are less than their Significant Impact Level (SIL) of 1.2 ug/m³ and 0.3 ug/m³. (A SIL

is a de minimis concentration value that is specific to an air pollutant and form of ambient standard) Jordan Aggregates was proposed another 3 miles south of Shakopee Sands, so the PM_{2.5} impacts would be even further below the SIL southeast of Jordan Aggregate. Therefore, there is no significant risk for an increase in overall cumulative effects from the projects due to meteorological conditions, the distance between sources, and the source types (fugitive dust) at each facility, which are localized and less likely to overlap with distance.

The modeling results affirm that the potential cumulative emissions discussed in this section will be below ambient air quality standards. The background concentration applied to the MJS modeled concentrations accounts for nearby existing sources in Shakopee, MN. The additional mining facilities evaluated in this section are unlikely to overlap impacts with any significance to the Project due to the meteorological wind patterns, distances between facilities, and the localized impacts of each project due to the primary source of emissions being fugitive dust.

3.14.3.4 PM₄ Silica

There is no State or Federal ambient air quality standard for PM₄ Silica⁶⁴ and PM₄ Silica was not included in the dispersion modeling. It is however a component of both PM₁₀ and PM_{2.5}, which are made up of a variety of minerals, including Silica. Quartz grains found in the Jordan Sandstone are typically greater than 74 microns (µm). Smaller particle sizes can be created as a result of a mechanical breaking of the actual quartz particles. For example, during stone cutting or sand blasting, individual quartz grains can be cut or fractured releasing much smaller particles that are respirable.

Industrial sand is typically processed into coarse and medium sands that compose the marketable fraction of the deposit which range in size from 125-1000 µm. These particle sizes are substantially larger by comparison to what is considered respirable silica dust (4 µm or smaller). The spherical shape of the sand grain is an essential characteristic of industrial sand. Therefore, care is taken in all aspects of the processing to not fracture or break sand grains.

Mining activities such as drilling, crushing and stone cutting can create respirable silica as a byproduct. Respirable silica dust may be invisible to the naked eye and is so light that it can remain airborne for a long time. The greatest potential for PM₄ Silica exposure associated with the Project is within the processing building where dried sand is screened and respirable dust can be inhaled. Silica dust emissions from the dry plant are controlled by enclosing all operations after the sand has been dried. Pollution control equipment such as baghouses will be utilized which provide filters for collecting fine dust in exhaust streams.

With the development of several silica sand mining operations over the past five to ten years, in the Midwest, particularly in Wisconsin, questions were raised regarding potential PM₄ Silica emissions from the sand mines. As a result, PM₄ Silica monitoring was conducted for sites in both Wisconsin and Minnesota. In the Wisconsin study, air monitors specifically for filtering PM₄ Silica were developed. Long term 24-hour monitoring of PM₄ Silica in the ambient air at three active sandstone

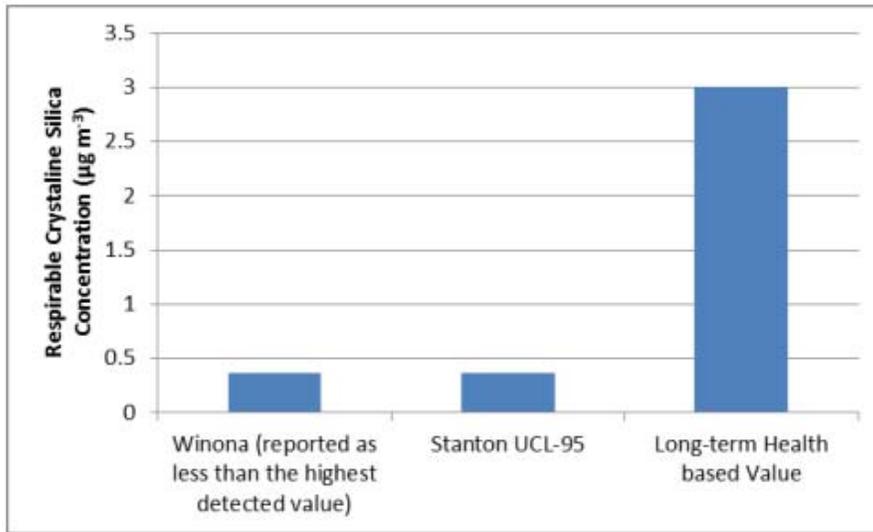
⁶⁴ The California Office of Environmental Health Hazard Assessment (OEHHA) has adopted a chronic inhalation Reference Exposure Level (REL) of 3 µg/m³. The Minnesota Department of Health established a guidance chronic health based value of 3 µg/m³ respirable silica in July 2013.

mines and one active sand processing plant in Wisconsin was conducted by Richards and Brozell.⁶⁵ The data was used to compare the long-term average concentrations of PM₄ Silica at the property line against chronic reference exposure guidelines, specifically the California Reference Exposure Level (REL) of 3.0 µg/m³. The results of the multi-year sampling programs at the facilities indicate that geometric mean (GM) respirable crystalline silica concentrations at the fence lines of the sand facilities were less than 10% of the 3.0 µg/m³. There were very little differences in upwind to downwind PM₄ Silica concentrations, indicating that the sand mining and processing facilities contribute very little, if anything, to the ambient respirable crystalline silica concentrations.

In the Minnesota Study, the MPCA conducted ambient air monitoring for one year (January 1, 2014 – December 31, 2014) to monitor emissions from diesel truck traffic and activities related to silica sand mining⁶⁶. Monitors were placed in the City of Winona where there was concern about potential exposures to air pollutants from silica sand-related facilities and silica sand related transportation facilities. Hourly measurements of PM_{2.5} and 24-hour measurements every six days of PM₄ Silica were collected. The study also placed an air monitor in Stanton, MN where there are no silica sand mining, processing or transportation related facilities contributing to ambient PM₄ Silica concentrations, but there are other sources of airborne silica such as unpaved roads and farm fields. The Stanton monitoring results were used as a reference or “background” location to compare to the Winona results because PM₄ Silica is a fairly ubiquitous pollutant and is not unique to silica sand mining and processing facilities. According to the study, the data does not suggest an elevated airborne level of respirable crystalline silica in the City of Winona in comparison to the reference location. Over the course of the year, only two samples contained concentrations of PM₄ Silica above the method detection limit of 0.3 µg/m³. (These two samples were only slightly above the method detection limit). Based on the monitoring results, the study concluded that the average silica concentration in Winona is estimated to be less than the detection limit of 0.3 µg/m³, while the results for the Stanton control area 95% upper confidence limit of the arithmetic mean (UCL-95%) was 0.4µg/L. These results compared to the Minnesota HBV are illustrated on the graph below from the MPCA’s Winona study.

⁶⁵ John Richards and Todd Brozell, Assessment of Community Exposure to Ambient Respirable Crystalline Silica near Frac Sand Processing Facilities *Atmosphere* 2015, 6, 960-982; doi:10.3390/atmos6080960 July 24, 2015.

⁶⁶ Minnesota Pollution Control Agency. Winona Community Air Monitoring, January 2014–September 2014; May 2015. Available online: <https://www.pca.state.mn.us/sites/default/files/g-85-03.pdf> (accessed on Sept. 20, 2017).



(From Minnesota Pollution Control Agency. Winona Community Air Monitoring, January 2014–September 2014; May 2015. Available online: <https://www.pca.state.mn.us/sites/default/files/g-85-03.pdf> (accessed on Sept. 20, 2017).

PM₄ Silica emissions from the MJS Site are expected to be similar to the results obtained from these two studies and are expected to be similar for all six alternatives. Ambient air monitoring will be conducted at the facility for PM₄ Silica as described in Section 3.14.4 below.

3.14.4 Mitigation – Stationary Source Air Emissions:

3.14.4.1 Air Pollution Prevention

The EIS will identify pollution prevention techniques and controls on the processing operations.

The dry plant will be equipped with industry standard pollution control technology. All operations after the sand has been dried will occur in an enclosed building. The plant will be equipped with a collection system, baghouses and bin vent filters to treat emissions from the plant. Baghouses consist of filter media (bags) suspended inside a housing or casing. Air from dryers, screens and covered conveyors is collected and pulled through the filters capturing suspended particulate matter and solids on the bags and pushing clean air through the outlet. Fine waste from the dry plant will be transported to the mine for below water reclamation in a slurry or covered trucks.

The use of diesel generators will be minimized using line power where practical. Bryan Rock has already converted much of the limestone processing plant operations to line power.

Processing controls may be required to meet ambient air quality standards. More controls are required when the Festival Lease is in effect because the receptors are located within the Site in closer proximity to the sources of air emissions from the mining and processing operations. Table 3.14.4, Operating Limits, indicates operating restrictions for both conditions: when the Festival Lease

is in force and when it is terminated. These operating limits may be adjusted during final design of the processing plant layout.

Table 3.14.4 Operating Limits

Operations	Renaissance Festival Lease in Effect Additional Restrictions
Overburden Removal	Material handling allowed 6am-10pm (no operations 10 pm-6am)
Limestone Processing	Single Limestone plant operating in Bryan Rock Products pit at 700 tons/hr
Limestone Plant Hauling (within quarry)	No hauling 2am-6am year round Winter months (Dec-Feb) no hauling from 7pm-7am
Limestone Product Delivery (Commercial Hauling)	No hauling 2am-6am year round Winter months (Dec-Feb) no hauling from 10pm-6am
Gravel Product Delivery (Commercial Hauling)	No hauling 2am-6am year round
Mulching Operations	No activities (Dec-March) April-November activities limited to 6am-10pm
Operations	Renaissance Festival Lease Terminated
Total Facility	2.4 MTPY Production limit
Limestone Processing	2 Limestone plants each operating at 700 tons/hr Located in Bryan Rock Products Pit and Malkerson Pit
Limestone Product Delivery (Commercial Hauling)	Hauling from Malkerson Pit plant limited to 37 truck trips per hour

3.14.4.2 PM₄ Silica controls:

All mitigation that controls particulate matter emissions will also control PM₄ Silica emissions and exposure. Exposure levels of respirable silica dust in the workplace are regulated by the Mine Safety and Health Administration (MSHA). The permissible exposure limit or threshold limit value (TLV) for mineral dust containing respirable crystalline silica varies depending upon the composition of dust and the percentage of respirable silica within the dust. MSHA regulations require that exposures for airborne contaminants including respirable dust and total dust be controlled insofar as feasible, by prevention of contamination, removal by exhaust ventilation, or by dilution with uncontaminated air. Adequate respiratory protection will be used by on-site workers as it may be required to meet the MSHA guidelines.

MSHA enforces these exposure limits and has rules requiring controls for drills and requires air sampling in certain situations. Other relevant MSHA regulations include respiratory protection, posting of warning signs, housekeeping, recordkeeping or reporting of occupational illnesses, personal protective equipment, and training. Although the majority of the deposit and the Site operations represent no risk for respirable silica, drilling or blasting of the sandstone and processing activities, may produce small amounts of respirable silica. The Site will operate in accordance with MSHA rules.

The following measures will be adopted to control silica dust exposure on-site:

- Implement and maintain a fugitive dust control plan;
- Medical surveillance program/disease reporting;

- Training and information to workers on crystalline silica;
- Availability of air and medical surveillance data to workers;
- Equipment maintenance program;
- Respiratory protection program;
- Isolated personal hygiene facilities, eating facilities, and a clothing change area;
- Record keeping;
- Housekeeping program;
- Construction safety and health program;
- Regulated areas/warning signs; and
- Provide workers with training that includes information about health effects, work practices, and protective equipment for respirable crystalline silica.

The Fugitive Dust Control Plan is described in more detail in the following section.

3.14.4.3 Fugitive Dust Control Plan

The EIS will identify fugitive dust prevention and control measures.

The Proposer has developed a Draft Fugitive Dust Control Plan, included as Section 7.0 in the Air Modeling Report. The fugitive dust control plan covers emissions from sources such as drilling and blasting, mobile equipment operations, material handling, outdoor product storage, crushing and conveying, truck loading, truck hauling and employee vehicle traffic at the proposed mine and processing facility. The plan will be further developed during air permitting when an alternative and plant design is selected. It is presumed that the fugitive dust control plan will be incorporated in to the Site's air permit.

In general stockpiles of limestone and sand and gravel will be located on the floor of the mine below surrounding grade where the mine face acts as an obstacle to particle movement. Raw sand will typically have a high enough moisture content as it is removed from saturated conditions below the water table and transported via conveyor or slurry to the wet plant. The wet processed sand will be transported to decanting piles where the moisture content will typically be reduced to 3-5% prior to transfer to the dryer. The winter pile will be located in a recessed portion of the Site protected by surrounding topography. Because it is a longer-term storage pile, it has the potential to dry out and contribute to fugitive dust emissions. Wind barriers, watering, or dust suppression agents will be used as needed to control dust from the stockpile. All finished silica sand will be stored in enclosures.

Fugitive dust from haul roads will be controlled by paving the Site entrances, sweeping paved surfaces on a regular basis, and watering unpaved haul roads when there is insufficient moisture to control fugitive dust. There will be facility inspection, record keeping and reporting requirements as part of the fugitive dust control plan.

3.14.4.4 Draft Ambient Air Monitoring Plan

The EIS will include a draft ambient air monitoring and mitigation plan. The plan will identify the parameters of testing, equipment, schedule, frequency, etc. The final details of the plan, including the location of monitors will be developed as part of the MPCA air permit. Prior to the release of the DEIS Draft, the Project Proposer will meet with MPCA air quality staff to review the Project details.

The Proposer met with MPCA air quality staff on June 30, 2016 to review Project details, permitting, and modeling methodology.

The Proposer has developed a Draft Ambient Air Monitoring Plan, included as Section 6.0 in the Air Modeling Report. The Draft Ambient Air Plan will be finalized and implemented as part of the air permitting process for sand mining and processing. The MPCA may require different monitoring parameters, such as Total Suspended Solids (TSS) in a final ambient air monitoring plan approved as part of an air permit. Upon completion of construction of the sand plant, the Proposer will conduct ambient air monitoring to address concerns regarding PM₄ Silica dust emissions from the Site. There is no ambient air quality standard set for silica, however, the MDH chronic Health Based Value of 3 µg/m³ which will be used to assess the monitoring results.

Control of silica dust is the same control typically used for particulate matter. Particulate matter less than 4 microns (PM₄) will be collected and analyzed for silica. The overall strategy for measuring particulate emissions from the Project is to monitor ambient air upwind (background) and downwind (impact) from the facility. Monitoring stations will be placed at two locations near the facility property line. One monitoring location will serve primarily as the upwind location, collecting background ambient air concentrations. The second monitoring location will be downwind of the alternative specific emission sources. The Proposer will operate the fence-line monitoring system for two years after start-up. The Proposer will provide information to the MPCA after two years justifying the end of monitoring. Proposed ambient air monitoring reflects or exceeds current industry practice.

3.15 Noise

The SDD identifies the following items to be addressed in the DEIS:

Noise:

- a) The EIS will include noise modeling to demonstrate that anticipated noise emissions will comply with State Standards applicable to all surrounding Noise Area Classifications (NACs) including residential receptors, public lands and surrounding industrial uses.
- b) The EIS will include a discussion of impulse and nuisance noise emissions resulting from blasting, back up alarms and other mining related sources.
- c) The EIS will address potential nuisance noise during nighttime operations.

d) The EIS will provide a noise assessment of impacts to Refuge visitors as well as susceptible wildlife such as colony nesting birds and raptors. Active eagle nests within the immediate area will be mapped and considered.

e) The EIS will include the development of a blast monitoring plan which will include the practice of seismograph monitoring during each blast to verify that air blast levels and ground vibrations do not exceed levels established to protect structures and groundwater wells in the vicinity. The EIS will evaluate the potential for differential ground vibration impacts to area wells and structures in consideration with the different geologic conditions proximate to the Site.

Dust:

f) Fugitive dust will be addressed together with air emissions in Section 3.14. If calcium chloride is proposed to be used for dust control, it will be evaluated as a part of the mitigation measures to reduce the potential for groundwater contamination.

Fugitive Dust is discussed in Section 3.14 Stationary source Air Emissions. Calcium Chloride is not proposed to be used for dust control.

3.15.1 Affected Environment – Noise:

The EIS will include noise modeling to demonstrate that anticipated noise emissions will comply with State Standards applicable to all surrounding Noise Area Classifications (NACs) including residential receptors, public lands and surrounding industrial uses.

A variety of land uses surround the Site. These include residential, commercial, and industrial land uses as well as the historic districts of Chaska and Carver, recreational areas, park land, and trails. Noise modeling was performed by Dr. David Braslau, David Braslau Associates (Braslau) to evaluate potential noise levels at various nearby receptors for compliance with MN Rules Chapter 7030, Noise Pollution Control.

In Minnesota, noise standards depend upon the land use at the receptor. There are four categories of land uses, called Noise Area Classifications (NAC), which each have a different set of noise standards (NAC-1 through NAC-4). NACs are based on the land use at the location of the person who hears the noise (receptor). NACs and noise regulations are discussed in more detail Section 3.15.2.2, Noise Regulations below. A variety of nearby receptor locations were selected by Braslau for evaluation of potential environmental effects resulting from the Project.

Figure 3.15.1 Noise Source Locations and Noise Receptors, illustrates the locations of the 31 receptor sites included in the analysis.

Receptors subject to NAC-1 (residential) that were evaluated in the model include:

- Ten single family residential homes located near the Project. All nearby residential homes are located across US Highway 169;

- Jackson Heights, a mobile home park located approximately 250 feet from the Site and over 2,000 feet from the proposed sand processing area;
- The Chaska Historic District located just under one mile from the Site and across the Minnesota River, which includes residential receptors and businesses;
- The Carver Historical District and the adjacent Riverside Park, which has designated overnight campsites, located across the Minnesota River and over one mile from the Site;
- The Renaissance Festival campground located on the Site; and

Receptors subject to NAC-2 (commercial, parks and recreation) include:

- Five locations along the Minnesota Valley State Trail within the Minnesota Valley State Recreational Area;
- Five locations along the future extension of the Minnesota River Bluffs Regional Trail located just west of the Site;
- Three locations within the Louisville Swamp Unit of the Minnesota Valley National Wildlife Refuge located just southwest of the southern boundary of the Site; and

Receptors subject to NAC-3 (fishing activities and related services)

- Gifford Lake boat launch (Gifford Lake itself falls under “water” and is subject to the less restrictive NAC-4).

Eagle Nesting Receptors

- Three bald eagle nesting sites.

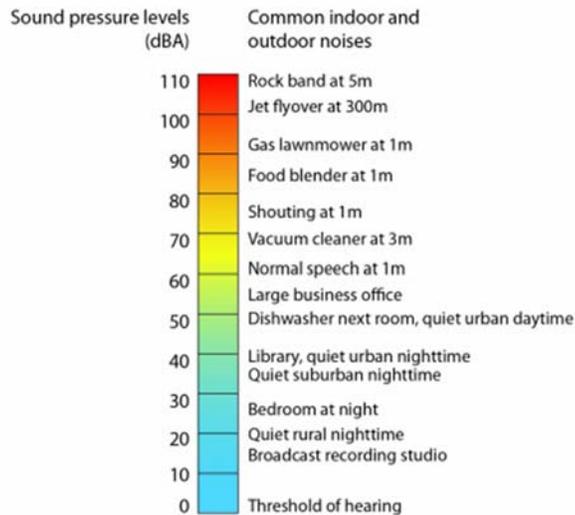
3.15.2 Environmental Consequences – Noise:

3.15.2.1 Overview of Sound

Sound travels as a wave through the air. The wave is generated at the source and travels to the receptor, typically an ear, where it is perceived as a sound. Sound pressure waves may have different amplitudes, frequencies, and durations; all of which affect how a sound is perceived and measured. Sound pressure level is commonly measured in decibels (dB). Because the human ear cannot hear very low or very high frequencies, an adjustment is made to approximate the sensitivity of the human ear. The adjusted sound levels are stated in units of A-weighted decibels or “dBA”.

A general range of decibel levels of common sounds from the MPCA’s Guide to Noise Control in Minnesota, is shown below⁶⁷.

⁶⁷ A.J. Smith, A. Clafin and M. Kuskie. June 2015. A Guide to Noise Control in Minnesota. June 2015 Minnesota Pollution Control Agency. St. Paul, MN Document number p-gen6-01 available: <http://www.pca.state.mn.us/index.php/view-document.htmCl?gid=5355>



Decibels are logarithmic, not linear and so in general, an increase of 3 dBA is considered to be barely detectable, an increase of 5 dBA is considered to be a noticeable change and an increase of 10 dBA is considered to be perceived as twice as loud. There are a number of factors that affect how loud a sound is at a receptor. One of the primary factors of interest in the Project setting is the nature of the topography between the sound source and the receptor. Topography can provide a shield or barrier that prevents sound waves from travelling from a source directly to a receptor. In the case of mining, many noise sources are located on the floor of the mine. The floor may be recessed tens of feet below the surrounding grades. Mine faces can effectively absorb, block, and deflect sound energy. Perimeter berms also serve as barriers that block the direct sound path between source and receiver.

The distance between the sound source and the receptor is another primary factor that affects how loud the sound is at a receptor. As a general rule of thumb, based on geometric spreading, doubling the distance from a point source will result in a 6 dBA decrease. For example, if an excavator creates a sound level of 75 dBA at a point 100 feet from the plant, the sound level will be approximately 69 dBA at a point 200 feet from the plant, 63 dBA at a point 400 feet from the plant, and 57 dBA at a point 800 feet from the plant. At greater distances, sound absorption by the atmosphere also plays a role. Setbacks established in local land use mining ordinances often are established to take advantage of the fact that noise attenuates with distance from the source.

3.15.2.2 Noise Regulations:

Noise pollution is defined in Minnesota Statutes 116.06 as follows:

"Noise pollution" means the presence in the outdoor atmosphere of any noise or combination of noises in such quantity, at such levels, of such nature and duration or under such conditions as could potentially be injurious to human health or welfare, to animal or plant life, or to property, or could interfere unreasonably with the enjoyment of life or property.

Minn. Rule 7030, Noise Pollution Control, regulates noise. These standards have been established on the basis of preservation of public health and welfare and are consistent with speech, sleep,

annoyance, and hearing conversation requirements (Minn Rule 7030.0040. Subpart 1). The rules define a NAC system which establishes applicable daytime and nighttime noise standards based on the land use activity at the location of the receiver or receptor. Standards vary depending upon the NAC. Residential and sensitive land uses, including rural residences, are classified as NAC-1 and are subject to the strictest noise standards. Other sensitive areas in the vicinity of the Project that are classified as NAC-1 include designated camping and picnicking areas, nature exhibitions, mobile home parks and residential hotels. Adjacent land uses that are classified as NAC-2 include commercial land uses, parks and recreational activities (except designated camping and picnicking areas). NAC-3 land uses include industrial land uses, mining activities and agricultural and related activities. NAC-4 land uses are not subject to noise standard and include undeveloped and unused land and water areas.

The rules establish acceptable noise levels for each both the L50, the sound level that must not be exceeded for more than 50% of any given hour (30 minutes) and the L10, the sound level that must not be exceeded for more than 10% of any given hour (6 minutes). There is not a limit on maximum noise. Within NAC-1, there are two sets of standards, one for daytime and one for nighttime. (The NAC-1 daytime standards apply during nighttime if the land use activity does not include overnight lodging.) The Minnesota Noise Standards define daytime hours as 7:00 a.m. to 10:00 p.m. and nighttime from 10:00 p.m. until 7:00 a.m. Some mining related activities will operate up to 24-hours-per-day; therefore, both Minnesota daytime and nighttime standards are applicable in this analysis. Minn. Stat. § 116.07 Subd. 2 (c) establishes that no local governing unit is allowed to set standards describing the maximum levels of sound pressure which are more stringent than those set by the MPCA.

Table 13.15-1 Minnesota Noise Standards

Noise Area Classification	Daytime (7 am - 10 pm)		Nighttime (10 pm - 7 am)	
	L50 dBA	L10 dBA	L50 dBA	L10 dBA
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

The EIS will address potential nuisance noise during nighttime operations.

The noise model accounts for proposed daytime and nighttime activities where applicable and the results compared to both standards for the receptors identified in Section 3.15.1 as applicable

3.15.2.3 Noise Model

Braslau’s modeling protocol followed procedures in ISO 9613-1 and 9613-2 that are well established. The model was originally based on a sound model developed by the New York DOT for non-traffic

sources. The model equations have been checked with ISO 9613-2 and incorporated the ISO ground effects and atmospheric absorption. The model was developed in order to predict sound levels that can be expected from the Project at various receptor locations around the Site. The predicted sound levels are compared to the applicable state noise standards in order to evaluate the potential for significant environmental effects.

Sound levels from mining and processing equipment used in the model are presented in Table 3.15.2 Mining and Processing Equipment. Because the Site is currently an active mine and the majority of equipment that will be operating as part of the Project is operating at the Site, most of the sound level data was obtained from measurements made in the field when the equipment was operating. Equipment that is proposed to operate as part of the Project that is not currently operating at the Site includes a grader, grizzly, sand wet plant and sand dry plant. Sound level data from the grader, grizzly and dry plant was obtained from field measurements at sand processing plants located in Minnesota and Wisconsin. The wet plant sound levels were estimated based on sound power levels and horsepower levels of 18 noise sources distributed in a similar wet processing plant design in Minnesota. Ambient noise level data was also collected at a number of locations surrounding the Site including residential receptors located east of the Site, receptor locations along the Minnesota Valley State Trail and along the future Minnesota River Bluffs Trail extension west of the Site. Ambient monitoring results show that much of the area is dominated by US 169 noise. Ambient sound levels are used to evaluate the magnitude of impacts at various receptors.

Modeling was performed in two stages. The first stage included predictions of sound levels at receptors resulting from individual mining and processing activities. Sound sources were modeled as close to potential receptors as they would ever be expected to occur. This initial analysis was performed to fully understand potential mitigation needs. The second stage modeled all activities occurring simultaneously at various locations throughout the Site for each of the proposed alternatives and incorporated mitigation strategies identified in the first stage.

3.15.2.4 Noise Sources

Project related noise will be generated as a result of mining and processing activities including blasting, excavation, hauling, crushing and screening, processing and rail yard operations. Mobile and stationary equipment will be operated at the Site. For the purpose of the noise modeling, it was assumed that the Site would operate in accordance with mining and processing setbacks established in the Scott County Zoning Code. Mining activities that do or will take place in recessed portions of the Site were modeled accordingly. Processing equipment that will operate within a building or operate by electric power (this includes the wet plant) were considered to be a negligible source of noise emissions. Table 3.15.2 lists groups of equipment and the associated sound pressure levels at a distance of 100 feet from the various mining and processing sources that were used as a basis of the modeling.

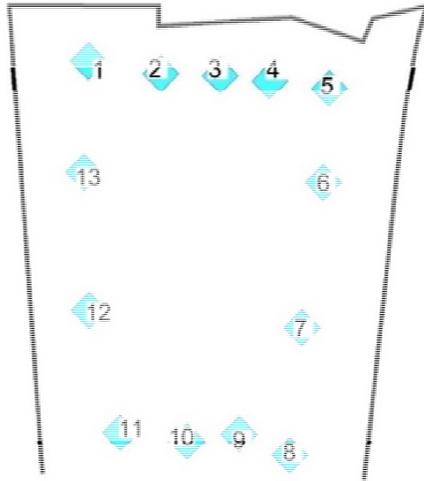
Table 3.15-2 Mining and Processing Equipment

		dBa at 100 feet	Source
Sand and Gravel Mining and Processing	Mining		
	Loader (Gr-Load)	84.6	on-site field measurements
	Excavator (Gr-Exc)	76.3	on-site field measurements
	Haul Truck (Gr-Haul)	85.8	on-site field measurements
	Processing		
	Primary Crusher (Gr-Cr1)	80.1	on-site field measurements
	Secondary Crusher (Gr-Cr2)	80.1	on-site field measurements
	Screens (Gr-Scrn)	81.7	on-site field measurements
	Dozer (Gr-Doz)	88.6	on-site field measurements
Limestone Mining and Processing	Mining		
	Rock Drill (Li-drill)	84.7	on-site field measurements
	Loader (Li-Load)	84.6	on-site field measurements
	Excavator (Li-Exc)	76.3	on-site field measurements
	Haul Truck (Li-Haul)	85.8	on-site field measurements
	Processing		
	Primary Crusher (LiP-Crjaw)	79.9	on-site field measurements
	Primary Screen (LiP Scrn1)	82.2	on-site field measurements
	Secondary Crusher (Cr-V)	78.4	on-site field measurements
	Secondary Screen (LiP Scrn2)	82.2	on-site field measurements
	Riprap Plant (Li-RR)	82.5	on-site field measurements
Transition Removal and Sandstone Mining and Processing	Mining		
	Rock Drill (Tran-drill)	84.7	on-site field measurements
	Sand Dredge (Sa-Dredg)	Electric	
	Excavator (Sa-Exc)	76.3	on-site field measurements
	Haul Truck (Sa-Haul)	85.8	on-site field measurements
	Loader (Sa-Load)	84.6	on-site field measurements
	Dozer (Sa-Doz)	88.6	on-site field measurements
	Grader (Sa-Grad)	85	field measurement Mn mine
	Grizzly (Sa-Grizz)	84	field measurement Mn mine
	Impact Crusher (Sa-Crimp)	76.9	on-site field measurements
	Screener (Sa-Scrn)	82.2	on-site field measurements
	Sweeper (Sa-Sweep)	75	on-site field measurements
	Processing		
	Wet Plant	84.8	field measurement Mn sand mine
	Dry Plant	82.1	field measurement Wi sand plant
Rail Yard (L10)	85.5	field measurement MN sand mine	

Sound sources were grouped into activities described in Table 3.15.2 above that will be taking place together throughout the Site. The groupings included: sand and gravel mining, sand and gravel processing, limestone drilling, limestone mining, limestone processing, limestone riprap plant, transition and sandstone drilling, sandstone mining, sandstone processing and railyard. All sound producing equipment associated with each of the activities was combined. For example, limestone processing includes the operation of a primary and secondary crusher, screening plant and wheel loaders.

The groups of various activities were analyzed throughout the various locations where they are planned to occur, and sound levels predicted at each of the 31 receptors identified above and shown on Figure 3.15.1. For mobile equipment operations, the L50 level is assumed to be 6 dBA below the maximum levels presented in Table 3.15.2 above. The 6 dBA deduction is applied because the values included in Table 3.15.2 above represent the maximum sound pressure level at a closest approach of 100 feet. Mobile equipment was modeled to move around the active mine phase and is often further than 100 feet and often not operating at full power. Therefore, the time history of the measured 100 feet yielded an L50 value that was 6 dBA below the maximum value reported in the Table above. This adjustment was applied to mobile equipment only. Processing levels are continuous and therefore no adjustments are made for processing equipment.

The Project was modeled according to phases where activities would occur. Sound levels from groups of associated mining activity equipment were analyzed at all 31 receptors as shown on Figure 3.15.1, Noise Source Locations and Noise Receptors. operating at multiple locations within a phase. For example, within BRP North, the maximum predicted noise level associated with limestone processing at "House 3" may be associated with mining in the very northern portion of BRP North. Whereas, the maximum predicted noise level associated with limestone processing at "House 7" may be in the southern portion of the phase. All predicted sound levels reported in the results section are the highest modeled sound level associated with that phase for each individual receptor. For example, as illustrated in the diagram below, sound levels were modeled at a number of locations within a given phase. Only the highest sound level result was reported.



Inset 3.15.1 Example: Modeled noise source locations distributed throughout Bryan Rock North. Predicted sound levels at a receptor vary as noise source moves throughout phase. The source location of the highest predicted noise level for one receptor is not the same source location of the highest predicted sound level at another receptor. The highest modeled noise levels for each receptor are reported (not the average).

BRP - N		
Sandstone Wet Mining		
Source Location	Receptor - H4 result (dBA)	Receptor -H7 result (dBA)
1	50	44
2	51	44
3	48	45
4	47	39
5	39	31
6	37	31
7	33	34
8	31	41
9	39	36
10	41	40
11	42	43
12	44	49
13	50	46
Reported Result	51	49

After groups of activities were modeled, the various alternatives were evaluated. An Activity Matrix was developed listing the activities anticipated to occur within each phase of each Alternative. The phases represent sandstone mining phases as laid out in Section 2.0 Project Alternatives, and as illustrated on Figures 4.1-4.6.

As an example, the Alternative 1 Phase 1 analysis includes the following contemporaneous activities: sand and gravel mining and processing on Malkerson Sales, wet and dry sand processing plants and railyards on MS-N and BRP, limestone drilling, limestone mining and limestone processing on Malkerson Sales property, limestone drilling, limestone mining and limestone processing on Bryan Rock Property, transition and sandstone drilling and sandstone mining on Malkerson Sales property, transition and sandstone drilling and sandstone mining Bryan Rock property. The activity matrix for Alternative 1 Phase 1 is provided below. The locations of the activities are identified on Figure 3.15.1 and the matrix for all of the alternatives and phases is included as Attachment 11, Noise Analysis Supplemental Information.

Table 3.15-3 Activity Matrix Alternative 1/Phase 1

Activity ID		A1-1
1	MS Gravel 1 Mining (g1)	
2	MS Gravel 1-Process (g1)	
11	MS Gravel 2 -Mining (g2)	1
12	MS Gravel 2-Process (g2)	1
21	MS1Transition Drilling	
22	MS1 Sandstone Mining	
41	MS2-B LS Top Drilling	1
42	MS2-B Limestone Mining	1
43	MS2-B Transition Drilling	
44	MS2-B Sandstone Mining	
45	MS2-B Limestone ProcA	1
51	MS3 Transition Drilling	1
52	MS3 Sandstone Mining El 710	1
61	BR1-A Transition Drilling - Berm 12ft	1
62	BR1-A Sandstone Mining - Berm 12ft	1
63	BR1-A Limestone Process A- Berm 12ft	
64	BR1-A Limestone Top Drilling	
65	BR1-A Limestone Mining	
71	BR1-B LS Top Drilling - Berm 20ft	1
72	BR1-B Limestone Mining - Berm 20ft	1
73	BR1-B Transition Drilling	
74	BR1-B Sandstone Mining-Berm	
75	BR1-B Limestone Process - Berm 20ft	1
81	BR2 LS Top Drilling - Berm	
82	BR2 Limestone Mining - Berm	
83	BR2-Transition Drilling-Berm	
91	Sandstone Process MS-N Dry	1
92	Sandstone Process MS-N Wet	1
93	Sandstone Process MS-S Dry	
94	Sandstone Process MS-S Wet	
95	Sandstone Process BRP Dry	1
96	Sandstone Process BRP Wet	1

3.15.2.5 Results:

The activities identified in the activity matrix for each phase of each alternative were modeled with all applicable sound producing equipment operating at anticipated locations. This section presents predicted sound levels at surrounding receptors with a comparison to the daytime and nighttime standards that are applicable at that receptor for anticipated activities. Modeled results are valid for year-round operations. Predicted sound levels include minor mitigation strategies including utilization of mine face shielding where appropriate, perimeter berms, and limiting certain activities to daytime hours, as indicated on Table 3.15.3. Modeled sound levels that are within 3 dBA of a standard are not considered to be a significant impact because of the conservative nature of the modeling which assumes downwind sound propagation, regardless of source direction from receptors, and simultaneous mining and processing operations by all sources in each phase.

Locations of various activities that are referred to in the results are illustrated on Figure 3.15.1 Noise Source Locations and Noise Receptors. Individual areas are referred to as MS-N, MS-S, BRP-N, BRP-S north of 145th, BRP-S south of 145th. NAC-1 receptors include all residential uses including the Renaissance Festival campground, the mobile home park, the Chaska Historic District, and the Carver Historic District, and Riverside Park. NAC-2 receptors include locations along the Minnesota Valley State Trail, the future Minnesota River Bluffs Regional Trail, and within the Louisville Swamp Unit of the Minnesota Valley National Wildlife Refuge. NAC-3 Receptors include the Gifford Lake boat launch.

NAC-1 Receptors:

NAC-1 receptors include the single family residences adjacent to the Project as well as the mobile home park (located in the western quadrant of the intersection of US 169 and TH 41), the residences located within the Project Area itself (located on the northern portion of the Malkerson Sales property), , the Carver Historic District and Riverside Park, and the Chaska Historic District. Riverside Park is located adjacent to the Carver Historic District and the results are considered to be similar to those for the Carver Historic District.⁶⁸ Riverside Park has overnight camping and the Historic District have residential land uses and therefore all of these receptor locations are subject to NAC-1 standards. Modeling results for each of these types of NAC-1 receptors are discussed individually in the following section.

Daytime Results

1. Single Family Residential Receptors

Receptors H1-H10: These are the closest single-family residences located adjacent to the Project. They are all located east of US 169 except for H10 which is located just south of the Project and west of US 169. Single family receptors include three houses on the bluff east of US 169 on Skyline Circle and Peregrine Circle.

⁶⁸The NAC-1 Daytime and Nighttime standard is also met at T-1 trail location, located east of the Mn River and a closer distance to the Project than Riverside Park.

The Project is predicted to be within 3 dBA of the daytime L₅₀ standard when all activities are occurring simultaneously, for all phases of all alternatives except for H8. Levels exceeded the daytime standard at H8 between 0 dBA to 3.1 dBA, depending upon the phase and alternative considered. H8 was a residential property located immediately adjacent to US 169 across from BR1b. This residence, (along with H1 and H2), was removed as part of the 2018 frontage road construction Project. Therefore, daytime Project activities will not create a significant noise impact to adjacent single-family residential receptors.

Table 3.15.4 NAC-1 Daytime Results presents the daytime activities results for NAC-1 receptors. Results are discussed following the table. Receptors shaded in pink, H1, H2 and H8, have been removed as part of the regional roadway improvement project.

Table 3.15-4 RESIDENTIAL RECEPTORS - DAYTIME ACTIVITIES													
Receptor	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Mobile Home	Carver Hist	Chaska Hist
L50 Standard =60dBA													
Alt1-1	51.6	52.1	52.1	53	54.5	57.2	58.7	61.1	50.9	50.1	61.9	46.5	44.5
Alt 1-2	51.1	51.4	50.5	52.2	54	58.2	60.9	63.1	53.1	51.8	61.9	45.2	44.0
Alt2-1	48.6	48.4	50.6	52.3	54.3	57.5	58.8	61.1	50.9	50.3	61.7	46.0	42.9
Alt 2-2	47.5	46.6	48	51.4	53.9	58.4	60.9	63.1	53.1	52	61.6	44.4	42.1
A3-1	47.1	45.9	46.4	48.6	49.4	53.8	52.9	50.7	43.6	43.1	61.6	40.2	40.6
A3-2	47.0	45.8	47.4	50.3	53.0	56.5	58.4	60.8	50.2	49.1	61.6	39.9	40.5
A3-3	46.7	44.9	46.4	46.8	50.0	55.9	57.9	58.9	47.6	44.7	61.6	41.9	40.9
A3-4a	46.2	43.9	43.3	47.9	49.1	51.9	50.2	46.1	43.3	38.8	61.6	38.5	40.2
A3-4b	46.5	44.5	43.6	44.7	46.2	50.9	48.8	44.8	39.3	37.4	61.6	39.2	40.4
A4-1	51.9	52.2	50.8	50.0	49.5	51.6	51.6	51.1	44.7	44.3	55.6	47.8	50.0
A4-2	52.1	52.5	50.9	51.1	50.4	50.5	48.1	48.6	42.3	42.5	55.7	47.6	50.0
A4-3	51.9	52.3	51.2	52.0	53.4	55.8	58.1	60.8	50.3	49.3	55.6	47.3	49.9
A4-4	51.8	52.1	50.3	50.7	52.5	57.0	60.5	63.0	52.7	51.6	55.6	47.3	49.9
A5-1	49.1	48.7	48.5	48.6	49.1	52.5	52.1	51.1	44.5	45.3	54.6	47.4	49.6
A5-2	49.5	49.4	48.8	50.0	50.1	51.6	49.3	48.7	42.0	44.0	54.7	47.1	49.6
A5-3	49.3	49	49.1	51.2	53.2	56.1	58.2	60.8	50.3	49.7	54.6	46.9	49.5
A5-4	49.0	48.4	47.7	49.5	52.3	57.3	60.6	63.0	52.7	51.8	54.5	46.8	49.5
A6-1	48.8	48.1	47.6	47.6	48.7	53.3	52.8	51.2	44.4	43.8	54.8	46.1	49.5
A6-2	49.2	48.9	47.9	49.4	49.7	52.6	50.4	48.9	41.8	41.7	54.8	45.7	49.5
A6-3	48.9	48.4	48.3	50.6	53.1	56.5	58.4	60.9	50.2	49.1	54.7	45.4	49.4
A6-4	48.6	47.8	46.6	48.7	52.1	57.6	61.2	63.1	52.9	51.9	54.7	45.3	49.4

Nighttime Results:

During nighttime hours, there will be no drilling, but all other activities were modeled as occurring at the various locations associated with individual alternative and phase combinations. Table 3.15-5 presents the results for NAC-1 receptors for nighttime operations with no drilling.

Table 3.15-5 RESIDENTIAL RECEPTORS - NIGHTTIME ACTIVITIES - No Drilling													
Receptor	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	Mobile Home	Carver Hist	Chaska Hist
L50 nighttime standard = 50 dBA													
Alt1-1	51.3	51.7	50.9	51.9	53.1	56.1	57.6	59.3	49.6	48.5	61.9	45.5	44.1
Alt 1-2	51.0	51.3	50.3	51.6	52.9	57.4	59.7	60.6	50.8	49.7	61.9	45.0	43.9
Alt2-1	47.9	47.3	48.8	51.0	53.0	56.5	57.7	59.3	49.4	48.9	61.7	44.8	42.4
Alt 2-2	47.4	46.4	47.6	50.7	52.8	57.6	59.7	60.6	50.8	50.0	61.6	44.2	42.0
A3-1	47.0	45.6	45.8	47.9	48.4	53.1	52.1	50.0	42.8	42.5	61.6	40.0	40.5
A3-2	46.7	45.2	46.4	49.3	52.0	55.6	57.5	59.1	49.0	47.9	61.6	39.4	40.4
A3-3	46.4	44.1	45.4	45.3	47.7	54.9	56.8	55.8	44.9	43.2	61.6	41.2	40.7
A3-4a	46.1	43.7	42.8	47.1	48.3	51.5	49.7	45.6	42.5	38.1	61.6	38.2	40.1
A3-4b	46.3	44.1	43.0	44.2	45.1	50.7	48.6	44.1	38.5	36.2	61.6	38.7	40.3
A4-1	51.8	52.1	50.5	49.4	48.5	50.4	50.4	50.1	43.6	43.1	55.6	47.6	50.0
A4-2	52.0	52.4	50.6	50.7	49.4	49.5	47.3	47.9	41.6	42.0	55.7	47.5	50.0
A4-3	51.8	52.2	50.8	51.4	52.5	54.8	57.1	59.1	49.2	48.2	55.6	47.2	49.9
A4-4	51.8	52.1	50.2	50.3	51.4	56.1	59.2	60.4	50.2	49.4	55.6	47.2	49.9
A5-1	48.9	48.4	47.9	47.7	48.0	51.6	51.1	50.1	43.4	44.4	54.6	47.2	49.6
A5-2	49.4	49.2	48.4	49.4	49.0	50.9	48.7	48.1	41.3	43.6	54.7	47.0	49.6
A5-3	49.1	48.7	48.5	50.4	52.3	55.1	57.2	59.1	49.2	48.7	54.6	46.8	49.5
A5-4	49.0	48.3	47.5	49.0	51.1	56.4	59.4	60.4	50.2	49.7	54.5	46.7	49.5
A6-1	48.6	47.7	46.9	46.5	47.5	52.5	51.9	50.2	43.2	42.5	54.8	45.8	49.5
A6-2	49.1	48.7	47.4	48.7	48.5	52.0	50.0	48.3	41.0	41.1	54.8	45.6	49.5
A6-3	48.7	48.1	47.5	49.7	52.2	55.6	57.5	59.2	49.0	47.9	54.7	45.3	49.4
A6-4	48.5	47.7	46.3	48.0	50.8	56.7	59.5	60.4	50.1	49.2	54.7	45.2	49.4

Modeling results also show that all of the proposed activities can occur within some alternative/phase configurations (shaded in blue on Table 3.15.6 below) without creating a significant noise impact, while other alternative/phase configurations are predicted to produce greater than 3dBA over the nighttime standards at some of the residential receptors. Exceedances over 3dBA are predicted at receptors H6, H7, and H8. As described above, H8 will be removed as part of the frontage road project. H6 and H7 vary from 0-9.7 dBA above the nighttime standard. Because of these predicted exceedances, the activities were further analyzed at the H6 and H7 receptors to determine what activities could occur during nighttime during individual phases. Table 3.15-6 below summarizes these results:

Table 3.15-6 Nighttime Activities/Restrictions NAC-1 Standards

Alternative -Phase	Allowed Activities	or	Allowed Activities	Not Allowed Nighttime ³
Alt 1-1	LS mine and process on MS only, SS mine on MS and BRP ¹ , and SS process both plant sites	or	SS mine on MS and BRP ² and SS process both plant sites	LS mine or LS process on BRP
Alt 1-2	SS mine on BRP and MS ¹ and SS process both plant sites	or	LS mine on BRP, SS mine on MS ¹ and SS and process both plant sites	LS process on BRP
Alt 2-1	SS mine on MS and BRP ¹ , SS process both plant sites and LS mining and processing on MS only	or		LS Process on BRP
Alt 2-2	SS mine on MS and BRP ¹ and SS process both plant sites	or	LS mine on BRP, SS mine on MS ¹ and SS process both plant sites	LS process on BRP
Alt 3-1	SS mine ² and SS process	or	LS mine and process on BRP, SS mine on MS ¹ and SS process	
Alt 3-2	SS mine ² and SS process	or	LS Mining on BRP and SS mine ¹ and SS process	LS process on BRP
Alt 3-3	SS mine ² and SS process	or	LS mine and process and SS mine ¹ and SS process	
Alt 3-4a	No Restriction on Proposed Activities			
Alt 3-4b	No Restriction on Proposed Activities			
Alt 4-1	No Restriction on Proposed Activities			
Alt 4-2	No Restriction on Proposed Activities			
Alt 4-3	LS mine on BRP, SS mine ² and SS process			LS process on BRP
Alt 4-4	LS mine on BRP, SS mine ² and SS process			LS process on BRP
Alt 5-1	No Restriction on Proposed Activities			
Alt 5-2	No Restriction on Proposed Activities			

Alt 5-3	LS mine on BRP, SS mine ² and SS process			LS process on BRP
Alt 5-4	LS mine on BRP, SS mine ¹ and SS process			LS process on BRP
Alt 6-1	No Restriction on Proposed Activities			
Alt 6-2	No Restriction on Proposed Activities			
Alt 6-3	SS mine ² and SS process		LS mining on BRP, SS mine ¹ and SS process	LS process BRP
Alt 6-4	SS mine ¹ and SS process	or	LS mine on BRP and SS process	LS process BRP

LS = Limestone

SS= Sandstone

¹ Sandstone Crusher on Barge shielded

² Sandstone Crusher on Barge not Shielded

³ Nighttime restriction on limestone processing is limited to processing activity occurring in BRP S north of 145th Street. The processing activity was modeled in the central portion of this phase where mine face shielding is not maximized and exceedance of nighttime standards at R6, R7 and R8 were predicted. It is possible that positioning the limestone processing activities closer to the eastern perimeter would increase the effectiveness of mine face shielding and reduce sound levels sufficiently to meet nighttime standards. Keeping limestone processing activities in BRP north would also keep sound levels below nighttime standards. If processing limestone during nighttime hours in BRP South north of 145th is requested as part of the permitting process, additional design and modeling would be required at the time of permitting to demonstrate compliance with nighttime standards.

Mitigation for Single Family Residential Receptors:

The following mitigation was considered when developing the noise model and applying it to the single-family residential NAC-1 receptors.

- 12-foot high perimeter berm along the northern portion of Bryan Rock along US169
- 20-foot high perimeter berm along southern portion of Bryan Rock along US 169
- Shielding crusher on barge for nighttime operations under some Alternative/Phases.

2. Mobile Home Park:

Daytime Results:

The Jackson Heights mobile home park is located near proposed sand and gravel mining and sand processing on MS-North (Alternatives 1 and 4). Limestone mining and processing activities and sandstone mining are located too far from this receptor to influence predicted sound levels at these locations. Noise modeling results show that sand and gravel mining and processing on either g1, the gravel mining area northwest of the tracks (stable area), or on g2, the gravel mining area southeast of the tracks (adjacent to inactive MnDOT gravel mine), with sand processing at any plant location and meet daytime standards with a 12-foot berm along the eastern edge of the g2.

Nighttime Results:

The nighttime results shown on Table 3.14-5 included 24 hour sand and gravel mining and processing. Under these circumstances, nighttime standards are expected to be exceeded at the mobile home park due to the proximity of the sand and gravel mining and processing noise sources, By restricting hours of operation of the sand and gravel mining and processing to daytime hours only, the modeled sound levels at the mobile home park are within 3dBA of nighttime standards as shown on Table 3.15-7. Mitigation will include restricting the sand and gravel hours of operation to daytime hours. This mitigation has the effect of a modest reduction in reduction in sound levels at some of the other residential receptors, but for the most part, the sand and gravel operations are sufficiently setback from the other residential receptors to have minimal impact.

Table 3.15-7 Mobile Home Park NIGHTTIME ACTIVITIES ONLY NO DRILLING - NO SAND AND GRAVEL MINING AND PROCESSING	
Receptor	Mobile Home
L50 nighttime standard = 50 dBA	
Alt1-1	50.5
Alt 1-2	50.1
Alt2-1	45.7
Alt 2-2	44.1
A3-1	43.7
A3-2	43.0
A3-3	43.6
A3-4a	42.2
A3-4b	42.6
A4-1	49.6
A4-2	49.7
A4-3	49.4
A4-4	49.3
A5-1	41.7
A5-2	42.4
A5-3	40.5
A5-4	37.9
A6-1	43.7
A6-2	44.2
A6-3	43.0
A6-4	42.6

Mitigation for Mobile Home Park:

- 12-foot high berm along eastern perimeter of g2 sand and gravel mine
- No nighttime sand and gravel mining and processing operations

3. Malkerson Sales Residential Properties:

The residences that are located within the Malkerson Sales property are located within the actual g2 mine area and predicted sound levels exceed daytime noise standards for sand and gravel mining and processing in g2. These residences are owned by the Project proposer and they may be removed through the course of sand and gravel mining or they may remain and be mined around.

4. Renaissance Festival Campground:

The Renaissance Festival operates a campground for seasonal employees associated with the festival. The campground is subject to NAC-1 daytime and nighttime standards. Activities which may occur when the Renaissance Festival campground is occupied include: limestone mining and processing on Bryan Rock property, transition drilling, sandstone mining and processing on the Bryan Rock or Malkerson Sales properties, and sandstone processing and railyard operations at any of the three plant site locations. Limestone mining is nearing completion on the Malkerson Sales property until the Renaissance Festival (and campground) is relocated and the booth area is mined. Current mining activity is limited to a small area in the festival parking lot during non-festival days. Therefore, activities associated with limestone mining on the Malkerson Sales property are not included in the evaluation.

The model was run assuming that activities on MS-S (sandstone mining adjacent to the campground) and BRP-N (transition drilling, limestone mining and processing and sandstone mining) would have the most impact on the campground. The modeling results predict that sound levels from these activities will meet daytime NAC-1 standards but not nighttime standards for some activities located within the BRP-N Phase .

Sandstone processing at the MS-S plant site (Alternatives 2 and 5) is not expected to meet daytime or nighttime standards. Sandstone processing on BRP (Alternatives 1, 2, 3, and 6) may meet daytime standards during some phases depending upon the contribution of other Project sources such as sandstone mining and limestone mining and processing. If the plant site is established on the Bryan Rock property and the campground is still located on the Malkerson Sales property, additional modeling will be required to determine daytime and nighttime activities and restrictions that may be necessary in order to meet noise standards.

The results reported below represent the highest levels predicted within the phase. There are other locations within the phase where both daytime and nighttime standards are met.

Table 3.15-8 NAC-1 Renaissance Festival Campground

Activity	Predicted Level (dBA)	Daytime L ₅₀ Standard (dBA)	Nighttime L ₅₀ Standard (dBA)
Transition Drilling MS-S	47	60	50
Sandstone Mining MS-S	49	60	50
Limestone Mining and Processing BRP-N	57	60	50
Transition Drilling BRP-N	42	60	50
Sandstone Mining BRP-N	57	60	50

Mitigation for Festival Campground:

- Restrict limestone mining and processing and sandstone mining and processing on BRP-N to daytime hours during periods of campground use.
- Conduct additional noise modeling for cumulative effect of all proposed activities for the plant site on Bryan Rock property if campground is still active.
- Eliminate overnight camping on the property (Campground expected to be relocated off site after 2020 when the Renaissance Lease expires)

5. Chaska and Carver Historical Districts and Riverside Park:

These receptors are located over one mile from proposed sandstone mining or processing plant locations. Riverside Park is located adjacent to the Carver Historic District and the results are considered to be represented by the results the Carver Historic District. Modeled sound levels at the Chaska and Carver Historic Districts and Riverside Park are all below both daytime and nighttime standards for all phases of all alternatives (see Tables 3.15.3 and 3.15.4). Maximum predicted sound levels associated with each phase of each alternative range from 39.4 dBA to 49.9 dBA. No significant negative impacts with respect to noise are anticipated and no mitigation measures are necessary.

NAC-2 Receptors:

The EIS will provide a noise assessment of impacts to Refuge visitors as well as susceptible wildlife such as colony nesting birds and raptors. Active eagle nests within the immediate area will be mapped and considered.

NAC-2 receptors include parks (except designated overnight campsites such as Riverside Park). Modeling was conducted for five receptors located along the Minnesota Valley Trail System adjacent to Gifford Lake, five locations along the future Minnesota River Bluffs Regional Trail system planned along the old railroad right of way located just west of the Site, three locations within the Louisville Swamp Unit of the Minnesota Valley National Wildlife Refuge located southwest of the southern boundary of the Site and at three Bald Eagle nesting sites in the Project vicinity. NAC-2 standards are the same for both daytime and nighttime hours (L₅₀ of 65dBA). Modeling results predict that the Project will meet the daytime and nighttime noise standard for sound levels at all NAC-2 receptor locations. Table 3.15-9 includes model results for NAC-2 and NAC-3 receptors.

Table 3.15-9 NAC-2 and NAC-3 RECEPTORS - DAYTIME ACTIVITIES

Receptor	NAC-3			NAC-2													
	BL*	G1	G2	G3	G4	G5	T1	T1	T3	T4	T5	LS1	LS2	LS3	EA1	EA4	EA5
	Daytime and Nighttime Standard for NAC2: L50 = 65 dBA, Daytime and Nighttime Standard for NAC-3 : L50=75 dBA																
Alt1-1	54.6	55.7	58.1	53.6	55.5	57.1	48.9	53.3	56.5	59.2	57.2	50.9	55.1	55.1	54.4	51.3	45.0
Alt 1-2	54.4	52.8	56.9	52.8	55.1	56.8	47.5	51.5	52.8	54.3	57.6	50.6	56.0	57.3	53.9	52.4	43.8
Alt2-1	51.3	56.9	55.8	50.3	50.2	51.2	48.4	53.2	58.2	60.3	57.7	51.6	55.4	55.3	50.3	51.6	45.7
Alt 2-2	50.8	54.9	53.5	48.5	48.6	50.3	46.7	51.3	56.0	57.1	58.2	51.3	56.3	57.4	48.8	52.6	44.7
A3-1	50.1	47.7	47.3	44.3	45.2	48.5	42.0	45.5	48.9	51.9	51.7	45.6	47.7	47.1	46.9	44.1	39.8
A3-2	50.1	47.0	46.5	43.7	44.8	48.4	41.7	45.0	48.3	51.5	55.5	47.9	54.1	54.5	46.7	50.2	40.7
A3-3	50.2	52.2	49.9	45.7	45.9	48.7	44.1	48.5	54.4	58.4	53.4	48.4	49.6	48.6	47.3	45.9	42.3
A3-4a	49.9	47.2	46.3	43.0	44.2	48.1	40.5	44.4	48.9	51.8	48.5	43.6	44.7	43.6	46.4	41.3	37.5
A3-4b	50.1	49.1	50.7	44.9	46.0	48.9	41.5	46.3	49.2	48.5	48.7	42.4	44.7	44.0	47.8	41.6	37.2
A4-1	69.6	55.2	58.2	55.5	58.9	64.8	49.9	53.5	55.8	58.7	52.9	48.3	48.8	47.0	59.8	45.1	44.2
A4-2	69.6	54.3	58.5	55.6	59.0	64.8	49.7	53.2	53.4	51.0	49.7	45.0	46.4	45.4	59.8	43.3	42.7
A4-3	69.6	53.1	57.8	55.4	58.9	64.7	49.4	52.6	52.2	51.5	55.1	47.8	54.0	54.4	59.7	50.1	43.2
A4-4	69.6	52.9	57.8	55.3	58.9	64.7	49.3	52.5	51.9	50.9	57.1	49.7	55.7	57.1	59.7	52.0	43.9
A5-1	69.6	56.5	56.0	53.8	57.2	64.2	49.5	53.4	57.7	59.9	54.3	49.5	49.9	48.3	58.9	46.3	45.1
A5-2	69.6	55.8	56.5	53.8	57.3	64.2	49.2	53.1	56.3	55.6	52.2	47.2	48.2	47.1	59.0	45.0	43.9
A5-3	69.5	55.1	55.4	53.5	57.2	64.2	48.9	52.5	55.8	55.8	56.0	49.1	54.4	54.6	58.9	50.5	44.2
A5-4	69.5	55.0	55.2	53.4	57.1	64.2	48.8	52.4	55.6	55.6	57.7	50.6	56.0	57.2	58.8	52.3	44.8
A6-1	69.5	53.7	53.8	53.0	56.9	64.1	48.0	51.2	55.1	58.7	53.5	48.5	49.3	47.8	58.8	45.6	43.6
A6-2	69.5	52.3	54.5	53.0	57.0	64.2	47.6	50.7	52.1	51.1	50.9	45.3	47.2	46.5	58.9	44.0	42.0
A6-3	69.5	50.4	52.7	52.6	56.8	64.1	47.1	49.6	50.3	51.6	55.5	48.0	54.1	54.5	58.8	50.2	42.5
A6-4	69.5	50.0	52.5	52.6	56.8	64.1	47.0	49.3	49.8	51.1	57.5	49.9	55.9	57.3	58.8	52.2	43.4

* = Boat Launch

The Project is not expected to have any negative impact as a result of noise on refuge visitors, park visitors, or trail users and no mitigation is needed. Mitigation adopted for the NAC-1 receptors can be expected to reduce sound levels at NAC-2 as well.

NAC-3 Receptors:

Gifford Lake boat launch (fishing and related services), the Renaissance Festival grounds (festivals) and surrounding industrial land uses are subject to NAC-3 standards. Gifford Lake itself (water) is under the less restrictive NAC-4 standards. The public boat launch is located on the northwest side of Gifford Lake. The NAC-3 standard is the same for both daytime and nighttime activities with an L50 level NAC-75 dBA.

The public access on the northwest portion of Gifford Lake is situated across from the sand and gravel mining and processing area. Sound levels are predicted to be highest when sand and gravel mining

is active in g1 and are estimated to range between 69.5 dBA to 69.6 dBA at the boat launch. When sand and gravel mining and processing is active in g2, levels at the boat launch are expected to decrease to 50 dBA to 54.6 dBA depending upon the alternative and phase considered. Sound levels at adjacent industrial uses are expected to be below the NAC-3 standards. The Louisville and Dem-Con Landfill provides topographic shielding of the industrial buildings associated with and adjacent to the Dem-Con campus. Sound levels at adjacent industrial buildings are expected to be no greater than those predicted at H8, (the residential receptor located closest to proposed activities) and these levels are all well below the NAC-3 standards for all phases of all alternatives. No potential significant effect from noise are anticipated at any NAC-3 receptors.

Eagle Nest Receptor Locations

The biological survey indicated the location of three eagle nests. While there is not a specific state noise standard for bald eagle nests, the Project will follow federal guidelines for activity near bald eagle nests that have been developed for mining and associated activities. These guidelines recommend that for areas where there is similar activity closer than one mile from the nest, maintain a buffer from the activity of 330 feet if the activity will not be visible from the nest or 660 feet if the activity will be visible from the nest. Similar activity has been previously established within one mile of two of the eagle nest sites (EA1 and EA4) due to the proximity of the existing mining operations on the Site and within the area including the Shakopee Sands mine located south of the Site. Mining activity will be set back over 1,500 feet from these two nests. The recommendation is to maintain a 660-foot buffer if no similar activity is occurring within one mile of the nest. The third eagle nest site (EA5) is located over one mile from current mining activity. Project limits are approximately one mile from this nest. The eagle nests are located on a land use subject to NAC-2 and as illustrated on Table 3.15-9, sound levels are anticipated to meet the NAC-2 standard.

The Project is not expected to have any negative impact as a result of noise on eagle nesting sites given the setbacks of the Project and no mitigation is needed.

Periodic and Impulse Noise

The EIS will include a discussion of impulse and nuisance noise emissions resulting from blasting, back up alarms and other mining related sources.

Periodic noise associated with locomotive horns occurs for short time periods and is therefore not controlled by the state L10 noise standard which covers levels occurring for more than six minutes in an hour. Federal regulations require trains to sound their horns for 15-20 seconds before entering all public at grade crossings, but not more than one-quarter mile in advance. There are public at grade crossings at the north end of the Project at TH 41 and at the south end of the Project at 145th Street. This source of noise will continue to occur for the No Build Alternative as well as all of the Project alternatives. There is also a UP switching yard located at the south end of the Project where siding tracks are used to store cars along a number of siding tracks that run parallel to the mainline both north and south of 145th Street. These siding tracks are utilized and will continue to be utilized in a number of switching operations independent of the operation. The UP maintains ownership and switching activity along the southern end of the Malkerson Sales property, even though it turned up

tracks further to the west where the bridge failed over the Minnesota River. There will be no additional public at grade crossings as a result of the Project and train horns will not be used in the railyards.

Back up alarms are required standard safety equipment associated with many of the pieces of mobile mining equipment and haul trucks. Noise from back up alarms, because of its tonal characteristics, can be easily detectable for some distance, even with existing background levels from motors and traffic. While not contributing significantly to the L10 or L50 levels, they are often considered a nuisance. Broadband alarms are newer technology that meets state and federal safety requirements. Broadband alarms produce multi-frequency sound as opposed to the traditional narrow frequency beepers. As a result, sound from a broadband alarm dissipates more quickly and are typically inaudible off-site. All company owned mining equipment used on-site will be fitted with broadband (white noise) back up. Private haul trucks coming to the Site to load aggregates or sand may not be equipped with broadband alarms. Loading will be performed in a manner that utilizes a circular traffic pattern and minimizes haul truck backing movements.

Impulsive noise is a sudden loud noise that is short in duration, typically one second or less. Impulse noises associated with the Project will be predominantly occasional sporadic basis and will include noise from blasting, railroad coupling and uncoupling noises which may occur when trains are delivered and loaded. Coupling/uncoupling activities generate noise between railcars when the couplers are compressed and when the slack is taken up. Coupling noise can be reduced with proper railyard design and operations. Strings of rail cars are pushed uphill as they are loaded reducing noise associated when slack is taken up. Rail yard layouts allow for longer strings of railcars to reduce the number of coupling and uncoupling that is required. Site layouts have been optimized to the extent possible to minimize noise impact through the use of natural screens, perimeter berms and distance attenuation.

Blasting

The EIS will include the development of a blast monitoring plan which will include the practice of seismograph monitoring during each blast to verify that air blast levels and ground vibrations do not exceed levels established to protect structures and groundwater wells in the vicinity. The EIS will evaluate the potential for differential ground vibration impacts to area wells and structures in consideration with the different geologic conditions proximate to the Project Site.

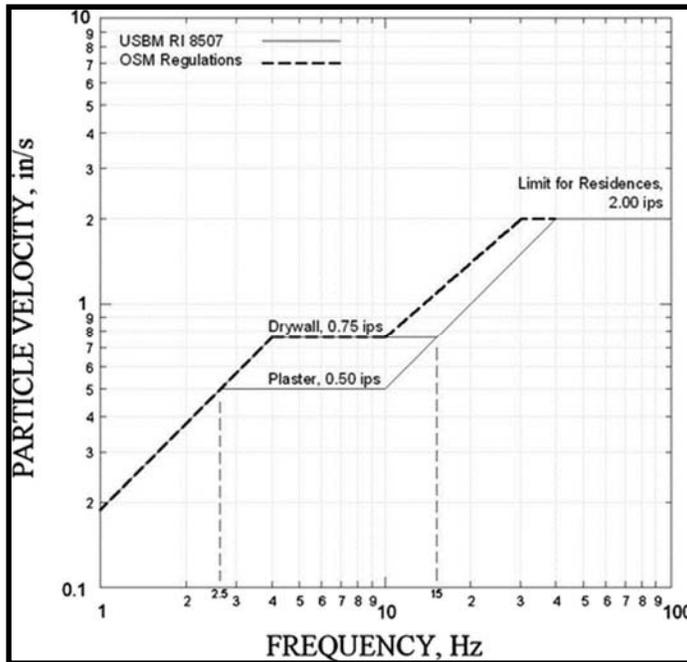
Blasting of limestone has occurred on the Site for decades. The Project will include the continuation of blasting to remove the remaining limestone resources located on the Site on both Bryan Rock and Malkerson Sales properties as well as blasting to loosen the underlying sandstone to allow these materials to be extracted for processing. A Blast Monitoring Plan has been developed for the Project and is included as Attachment 12.

Blasting is performed in order to break the rock up into manageable pieces. All blasting is performed by a licensed blasting contractor. Explosives are not stored on the Site. The blasting process involves

drilling small vertical holes into the rock units in a regular pattern. Typically, 25-60 holes are drilled for each blasting event. The holes are filled with a blasting agent. The blaster determines the drilling pattern based on the size and depth of bedrock to be excavated, the distance to adjacent structures, and the geology of the rock formations. Blast designs for the limestone will be different from blast designs for the sandstone. This is because, in general, the limestone is more consolidated and is blasted to fracture the rock whereas the sandstone is loosely cemented, and the blast is designed to break the cement that holds individual sand grains together. Blasts for both rock types are designed to achieve the optimum hole size/drill pattern ratio to maximize production while minimizing ground vibration and the potential to generate fly rock. Each hole will have lines connecting to a blasting cap which has been inserted into a booster placed in the column of the blasting agent. The upper portion of the hole will be filled with crushed rock (called stemming) which helps control noise and fly rock.

Time delay caps will be used to sequentially fire the shot in a manner that limits the amount of blasting agent detonating at any given instant. Properly timed delays prevent the vibration from the blast within individual holes from being cumulative. Therefore, time delays reduce the overall ground vibration generated from the blast.

The energy released in a blast is designed to be directed to breaking up the rock face and pushing the rock out horizontally into the quarry floor. Residual amounts of energy travel in wave forms through the earth, known as ground vibration and through the air known as airblast. Ground vibration results from a very small amount of the energy released during the blast as it travels away from the blast in waves through the ground. At high enough levels, ground vibration can cause damage to nearby structures. Decades of research by the United States Bureau of Mines (USBM) and the Office of Surface Mining and Reclamation Enforcement (OSMRE) resulted in the development of blasting standards with built in factors of safety to provide protection to nearby structures. The standards measure the peak particle velocity and vary with the frequency of the ground vibration. The maximum peak particle velocity, measured in inches per second, that has been determined to be protective of structures varies according to the frequency of the wave and the type of construction of the structure. Lower frequency waves have a lower peak particle velocity threshold for damage. Plaster and lath construction has a lower standard than modern sheetrock construction. For the frequencies typical of limestone blasting, maximum peak particle velocities vary from 0.75 inches per second to 2.0 inches per second. Even though ground vibration is maintained at levels that protect the integrity of nearby structures, the vibration may still be perceptible by neighbors.



Peak particle velocities that plot below the dashed line on the attached graph above meet the protective standards for modern structures and below the solid line meet the protective standards for lath and plaster construction, including historical structures. These standards have also been applied to below ground utilities including wells.

Air overpressure or “airblast” describes air movement (pressure change) created by the breaking and movement of the rock through the expansion of the blasting agents. This pressure change travelling through the air is perceived as noise from a blast. Airblast is measured in dB based on a logarithmic scale. On a

logarithmic scale, a doubling of sound pressure results in an increase of approximately 3 dB. Most of the energy is below the frequency range of human hearing and although the airblast may not be audible, it may be felt. The lower frequency air pressure may cause windows to rattle, which is a sound that is noticed by the receptor.

The USBM research ⁶⁹ indicates that the potential for window breakage is very small below 140 dB and recommends a maximum safe air overpressure of 134 dB. The safe levels specified by the USBM for both airblast and ground vibration levels are based on the worst cases of damage and response and are therefore conservative levels for average blast effects.

Data collected from monitoring the blasts at the existing limestone quarry operations indicate that the quarry has and will continue to conduct blasting that controls ground vibration and air over pressures at levels that are protective of nearby structures. Monitoring stations have been established at many of the surrounding residences and industrial buildings. The geology and stratigraphic sequence of bedrock of the areas is well documented. Each blast will be monitored in accordance with the Blast Monitoring Plan. A minimum of two seismographs set at nearby structures will record air over pressure and peak particle velocities. Because energy dissipates with distance from the blast as the wave travels through the ground, monitoring stations are typically located adjacent to the nearest structures which may be located on the Site itself or off-site. Monitoring stations may be periodically revised to monitor at other nearby structures or as blasting locations change within the Site.

⁶⁹ Siskind, Strachuram Stagg and Kopp. Structure Response and Damage Produced by Airblast From Surface Mining Report of Investigations 8485 United States Department of Interior, Bureau of Mines, 1980.

Pre-blast surveys will be offered to document the existing condition of nearby structures and log any pre-mining defects and structural issues to establish a starting point for independent professional review should any damage be claimed. The pre-blast survey requires inspection of the interior of houses and buildings. The condition of drywall, foundation, etc. is photo documented. Existing cracks are measured, logged and photo documented. Copies of the pre-blast survey will be forwarded to the property owner and the County upon request.

3.15.3 Alternatives - Noise:

The noise modeling was performed for anticipated activities associated with each phase of each alternative at all 31 receptor locations. The results were presented in Section 3.15.2.4 above. Because receptors are located all around the Project Area, one alternative might result in lower sound levels for one receptor while another alternative may result in lowest sound levels at a different receptor. None of the alternatives are expected to create a significant noise impact when some minor mitigation measures are adopted. Under the no Build Alternative noise will continue to be generated through current limestone and sand and gravel mining and processing activities which include blasting noise and have no operating hour restrictions.

3.15.4 Mitigation - Noise

The noise modeling assumed the following mitigation measures would be implemented into mine operations. Modeling results show that with these measures in place, no significant environmental effects related to noise are anticipated and noise levels at the Site will be under on-going regulatory of the MPCA and the state Noise standards.

Mitigation for Single Family Residential Receptors:

- 12-foot high perimeter berm along the northern portion of Bryan Rock along US 169.
- 20-foot high perimeter berm along southern portion of Bryan Rock along US 169.
- Shielding crusher on barge for nighttime operations under some Alternative/Phases.

Mitigation for Mobile Home Park:

- 12-foot high berm along eastern perimeter of g2 sand and gravel mine.
- Restricting sand and gravel mining and processing in g2 to daytime hours.

Mitigation for Festival Campground:

- Restrict limestone mining and processing and sandstone mining and processing on BRP-N to daytime hours during periods of campground use.
- Conduct additional noise modeling for cumulative effect of all proposed activities for the plant site on Bryan Rock property if campground is still active.
- Eliminate overnight camping on the property.

In addition to the mitigation measures above, the Site will operate using best management practices to reduce sound levels at the Site. These will include:

- a) Conducting mining and processing operations in accordance with the setbacks established in the Scott County Zoning Ordinance;
- b) Broadband back up alarms on all company owned equipment;
- c) Circular routes for truck loading to minimize backing movements;

- d) Establish internal speed limits;
- e) Converting limestone processing plants to electricity;
- f) Operate noise producing equipment in recessed portions of Site as practical;
- g) Utilize mufflers and other standard noise reduction equipment;
- h) Any new equipment to be acoustically rated for noise generation and the ratings be considered in the final purchase decision;
- i) Longer strings of cars to reduce coupling and uncoupling noise
- j) Uphill railcar loading;
- k) No locomotive horns in railyard; and
- l) Blast monitoring for ground vibration and airblast.

3.16 Nearby Resources

The SDD identifies the following items to be addressed in the DEIS:

Archaeological, historical or architectural resources:

- a) The EIS will evaluate potential archeological, historical or architectural resources;
- b) The EIS will include a Phase 1 cultural resources survey in order to adequately define the Project's potential to impact unidentified cultural resources including historic properties, architectural history sites, and archaeological resources.
- c) The EIS will identify strategies to avoid, minimize or mitigate identified potential impacts as a result of the Project to cultural resources, including the historic districts in Carver and Chaska, deemed to be protected by state or federal laws.

Designated parks, recreation areas or trails:

- a) The EIS will discuss the potential for impacts to nearby parks, recreation areas, and trails, including the adjacent US Fish and Wildlife Preserve, The Minnesota Valley Trail, trail connections to Chaska and Carver City Parks, and the proposed regional trail that will connect Scott County and Carver County along the abandoned Union Pacific Railroad spur corridor, portions of which runs adjacent to the proposed mining area. The EIS will discuss and analyze the potential impacts of the Project, including proximity of quarry walls to public trails.

Scenic views and vistas:

- a) The EIS will address the potential for impacts by the Project on the visual quality and integrity of the surrounding area.

Other unique resources:

a) The EIS will address the timing and removal of the Renaissance Festival and parking facilities and the resulting potential economic impacts to the surrounding communities.

3.16.1 Affected Environment – Nearby Resources:

The EIS will evaluate potential archeological, historical or architectural resources

3.16.1.1 Archaeological, Historical, or Architectural Resources:

The Project is located within the Minnesota River valley where there is potential for cultural resources to exist due to the proximity to the river. The Project Area and an additional one-mile buffer was included in a literature review to evaluate potential archeological, historical and architectural resources. Five archaeological surveys have been previously conducted within the Project Area in conjunction with trunk highway projects and federal inventory assessments, numbered THY-73-01, SC-98-07, MULT-79-06, MULT-88-03, MULT-06-08. The Trunk Highway 41 Minnesota River Crossing Phase I and II Archeological Investigations were also prepared by The Louis Berger Group, Inc. in June 2006 as part of the Environmental Impact Statement for the TH 41 Minnesota River Crossing project.

The Carver Historic District, which is in the National Register of Historic Places (NRHP), is located over one-mile from proposed mining and processing activities. The Walnut Street Historic District in Chaska, which is also in the NRHP, is located over one-mile from all proposed limestone or sandstone mining or processing activities, and is located just over 5,000 feet from the proposed sand and gravel mining and processing, which is planned to occur under all of the alternatives including the No Build Alternative.

3.16.1.2 Designated Parks, Recreation Areas or Trails:

The Minnesota Valley State Corridor Trail runs through the MnDNR State lands associated with the Gifford Lake area and located west of the Site. There is a parking area and public access to Gifford Lake on the northwest side of Gifford Lake. The USFWS has acquired land along both sides of the Minnesota River establishing the Minnesota Valley National Wildlife Refuge. Refuge units are located along the river valley from the City of Bloomington to Henderson, Minnesota.⁷⁰ The Louisville Swamp Unit is located south of the Site and the Rapids Lake Unit and Chaska Lake Unit are located southwest and northwest of the Site on the west side of the river.

The Louisville Swamp Unit is developed with trails, parking lots, and other infrastructure and contains approximately 2,600 acres of land adjacent to the Minnesota River. There are several established trails through the Louisville Swamp Unit. There are three year-round access and parking areas and two seasonal parking areas associated with the Louisville Swamp Unit. The main access and parking area is located off of US 169 via 145th Street which runs along the southern portion of the Project

⁷⁰ https://www.fws.gov/refuge/Minnesota_Valley/about.html

Area. 145th Street also serves as an access point to the Renaissance Festival and is used by the current mining operations as a local haul route. The Chaska Unit and the Rapids Lake Unit of the National Wildlife Refuge and the City of Carver's Riverside Park are located on a floodplain across the river. There is an extensive trail network associated with these units as well.

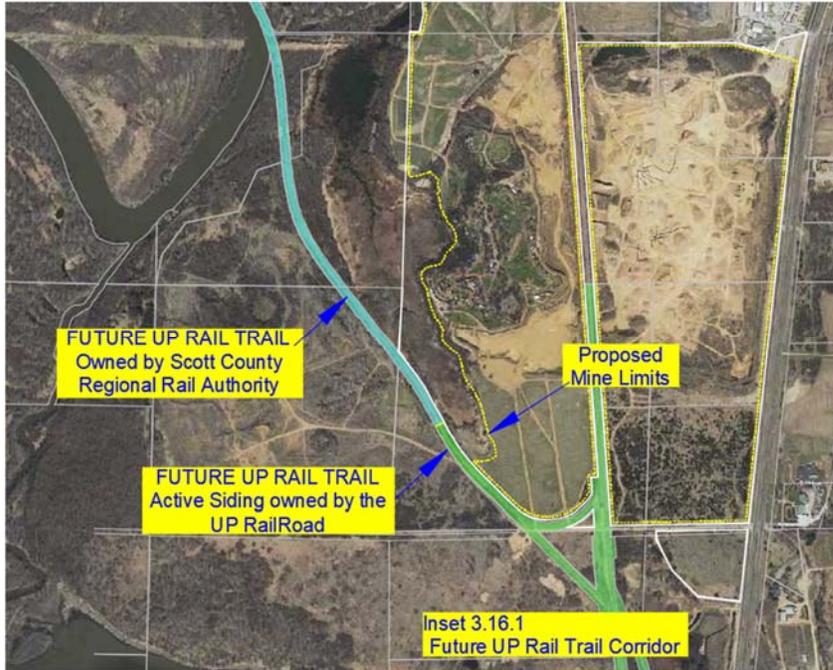
The Minnesota Bluffs Regional Trail currently ends in the City of Carver. The Minnesota River Bluffs Extension and Scott County Connection Regional Trail Master Plan⁷¹, identifies an approximately 4.2 mile long multi-use regional trail extension from Athletic Park in Chaska over the Minnesota River at the City of Carver and ending at Merriam Junction in Louisville Township (UP Rail Trail). The future extension of the trail is planned to follow the UP railroad right-of-way as it crosses over the Minnesota River at the City of Carver and continues to Merriam Junction in Louisville Township. The future trail will provide a recreational connection between Scott County and Carver County. A portion of the future trail corridor from the Minnesota River to Merriam Junction is now owned by the Scott County Regional Rail Authority and was acquired through a rail banking program. The trail is one of several public uses that could be supported on the rail corridor.

While the most likely future use of this corridor is to be incorporated into the trail system, the rail banking program also provides the opportunity for rail service to return at some point in the future. Alternatively, the corridor could be converted to a road. This area is also designated by the 2040 Comprehensive Plan as a potential future site for a wastewater treatment plant. This plant would utilize the rail corridor for access to discharge treated wastewater to the Minnesota River.

A portion of the future trail extension is owned by the UP and is actively used as a rail siding associated with Merriam Junction. The active portion of the UP right-of-way extends from 145th approximately 1,500 feet along the right-of-way and includes the portion of the right-of-way that is adjacent to the proposed mining on the southern end of the Malkerson Sales Property as illustrated in inset 3.16.1 below.

The timing of the future trail connection depends upon the ability of the Regional Railroad Authority, Scott County and Carver County to identify and secure funding sources needed to replace the former railroad bridge. According to the Minnesota River Bluffs Extension and Scott County Connection Regional Trail Master Plan, the planned regional trail segment within Scott County (from the Minnesota River Bridge to Merriam Junction) is not long enough to provide a destination for trail users and this segment, which is closest to the Project, will likely have a long-term development timeline that will not be completed until the bridge reconstruction is completed and a connection point has been established.

⁷¹ Minnesota River Bluffs Extension and Scott County Connection Regional Trail Master Plan prepared in partnership by Scott County Parks & Trails and Carver County Parks February 2011. Retrieved online at <https://www.scottcountymn.gov/DocumentCenter/View/1357>



3.16.1.3 Scenic views and vistas:

There are scenic views and vistas from limited areas along the trails established through the surrounding park lands. The Site is screened from view from the existing public trail systems and Gifford Lake by dense vegetation along the trails.

3.16.1.4 Other unique resources:

The Renaissance Festival, an outdoor festival that is held seasonally in late summer and in the fall of each year, is located on a portion of the Site. The festival has an annual attendance of approximately 300,000. The event is held primarily only on weekends and takes place from mid- to late-August through early October each year from 9 a.m. to 7 p.m.

3.16.2 Environmental Consequences – Nearby Resources:

The EIS will include a Phase 1 cultural resources survey in order to adequately define the Project's potential to impact unidentified cultural resources including historic properties, architectural history sites, and archaeological resources.

3.16.2.1 Environmental Consequences - Cultural Resources

A Phase 1 Cultural Resources Survey and Archaeological Assessment was conducted by Summit Envirosolutions (Attachment 13). The purpose of the cultural resources study was to identify any archaeological sites or architectural historic properties that could be impacted by the Project.

Historic Properties and Architectural Sites

Background research was conducted for previously inventoried properties to determine if any properties listed in the NRHP may be affected by the Project. Seven historic facility resources were identified within one-mile of the Project Area. Figure 3.16.1 Historic Properties and Architectural Sites, shows the locations of these structures. None of these structures are listed on the NRHP. These historic facilities include:

SC-LOU-012	Malkerson Stables (within the Project Area)
SC-LOU-001	Merriam Junction Depot
SC-LOU-004	A group of structures in extreme state of ruin
SC-LOU-005	A stone structure ca. 1860
SC-LOU-006	A group of 3 standing stone structures
SC-LOU-007	A stone residence and barn
SC-LOU-011	Bridge No. 6763

The State Historic Preservation Office (SHPO) records include a Minnesota Architecture-History Inventory Form for the Malkerson Stables. This form, prepared by Camilla Deiber on 11/30/2004, recommends that the Malkerson Stables are not eligible for nomination to the NRHP. Mining plans include removing these buildings in conjunction with future sand and gravel mining in this area.

The Merriam Junction Depot is identified in the SHPO database, however, aerial photographs from Scott County GIS show that the Depot is no longer present.

SC-LOU-004 is a group of 5 structures in a state of ruin. The SHPO records include a letter dated 5/7/1980 from Ted Lofstrom, SHPO Archeologist, and Charles W. Nelson, SHPO Historical Architect which determines that the structures are not eligible for nomination to the National Register. The letter recommends that the structures are removed immediately. In the same letter, it is stated that SC-LOU-005 would probably not qualify for National Register listing. It recommends that this structure is photo-recorded prior to demolition. The letter determines that SC-LOU-006 is likely eligible for nomination to the NRHP. It recommends that the three structures are preserved. Aerial Photography from the Scott County GIS confirms that the structures are still present, however, they are not listed in the NRHP. The letter determines that due to the extent of deterioration of the structures, SC-LOU-07 does not appear to be eligible for nominating to the NRHP. Review of Aerial photography shows that the structures have collapsed or are otherwise demolished.

Bridge No. 6763 was reviewed for eligibility to the National Register in 1996. A letter from Jeffery Hess, Minnesota Department of Transportation determines that the bridge does not meet the requirements to be eligible for the NRHP.

The Carver Historic District and the Walnut Street Historic District in Chaska are located across the Minnesota River from the Project Area. The Walnut Street Historic District is located almost one and one-half miles from the closest proposed processing plant location and almost one mile from proposed sand and gravel mining limits. The Carver Historic District is located approximately one mile from the mining limits of closest potential processing plan location. There will be no direct impacts to either of the historic districts. Potential noise impacts to the historic districts are discussed in Section 3.15 Noise which conclude that the Project will meet the residential daytime and nighttime standards at both historic districts. Potential viewshed impacts to the historic districts are discussed in Section 3.17 Visual Impacts. The views from both historic districts are completely screened by the heavily vegetated river valley located between the historic districts and the Site.

Archaeological Resources

The Phase 1 archaeological investigation included both a literature search and a field survey. The archeological field survey was conducted in those portions of the Project Area considered to have moderate to high archaeological potential. The archaeological field investigation consisted of a systematic pedestrian survey, systematic shovel testing, and soil auger testing. The use of these methods was based on ground surface visibility, slope, distance to water, degree of previous disturbance, terrain, and vegetation as found within the survey areas.

Portions of the Project Area that were found to be disturbed through past mining, construction or other modern land use practices, steeply sloping, or permanently wet areas were determined to be unlikely to contain cultural resources and excluded from the field survey. These areas included the vast majority of the Site. However, four areas were identified that had a moderate to high potential for archaeological potential. These four areas were all located on Malkerson Sales property and included an area by Gifford Lake, the Renaissance Festival grounds, the Renaissance Festival southern parking lot, and an area in the northern portion of the Project east of the railroad tracks. Systematic shovel testing involved the manual excavation of small holes 30 to 40 centimeters (12-16 inches) in diameter, typically at regular intervals of 15 meters (49 feet), to identify subsurface archaeological materials.

No state or federally protected historic properties, architectural or archaeological sites were identified within the Project Area. No cultural materials were encountered in any of the shovel tests; based on these negative results, no additional archaeological investigation was recommended. It is concluded that there is no significant potential to impact existing archeological sites and avoidance or mitigation is not relevant.

The EIS will identify strategies to avoid, minimize or mitigate identified potential impacts as a result of the Project to cultural resources, including the historic districts in Carver and Chaska, deemed to be protected by state or federal laws.

The Carver Historic District and the Walnut Street Historic District in Chaska are located across the Minnesota River approximately one mile or more from the Project Area. There will be no direct

impacts to either of the historic districts. Potential noise impacts to the historic districts are discussed in Section 3.15 Noise. Potential viewshed impacts to the historic districts are discussed in Section 3.17 Visual Impacts.

3.16.2.2 Environmental Consequences - Designated parks, recreation areas or trails:

The EIS will discuss the potential for impacts to nearby parks, recreation areas, and trails, including the adjacent US Fish and Wildlife Preserve, The Minnesota Valley Trail, trail connections to Chaska City Parks, and the proposed regional trail that will connect Scott County and Carver County along the Union Pacific Railroad spur corridor portions of which are adjacent to proposed mining areas. The EIS will discuss and analyze the potential impacts of the Project, including proximity of quarry walls to public trails

The Project is compatible with the adjacent park lands, recreational areas and trails. Setbacks from property lines as developed in the Scott County Zoning Ordinance will be maintained throughout the Project Area. The three processing plant locations are all situated with even greater setbacks from parks trails and recreational areas. Figure 3.16.2 illustrates the locations of the U.S. Fish and Wildlife Preserve, the Minnesota Valley Trail, trail connections to Chaska, the City of Carver parks, and the proposed regional trail extension with respect to mining limits and proposed plant sites.

The existing trail systems are generally well screened from any views of the Project Area as a result of topography, distance, and vegetation. The MS-South and BRP plant sites are situated on the floor of the existing limestone quarry which limits the visibility of the plant sites from the adjacent public lands. The MS-North plant site is also well screened by existing vegetation. Visual impacts are discussed in more detail in Section 3.6.2.1 (Visual Impacts of MS-North plant site within shoreland district) and Section 3.17, Visual Impacts, which provide viewshed models from vantage points along the trails. Potential noise impacts were evaluated at several locations along the Minnesota Valley Trail adjacent to Gifford Lake, within the US Fish and Wildlife Preserve and along the future Minnesota River Bluffs Regional Trail extension that may eventually connect Scott County and Carver County along the abandoned Union Pacific Railroad spur corridor. The noise modeling results are described in detail in Section 3.15. The results indicate that the state noise standards developed for parks and recreational areas will be met along all of the existing and future trail systems.

The Project will not impact the rail corridor or any future uses within the corridor. Development of the extension of the Minnesota Bluffs Regional Trail is a likely future use within the rail corridor, although it is not anticipated to occur in the near future. Sections of this trail if constructed in the rail corridor would be located adjacent to the Project Area as a segment of the railroad right-of-way is adjacent to the southern portion of the Site. The southern wetland complex provides a buffer between much of the potential future trail and the mine limits with the exception of just under 1,000 feet where the future trail could be located adjacent to the mine. This portion of the future trail is still an active rail siding in use by the UP. There are no plans to provide access to the Site from the future trail.

If the trail is developed while the mine is active, the majority of the trail located adjacent to active mine areas is well screened by a vegetation between the future trail and the proposed mine limits. There are only a few locations along the proposed trail that would have a view into the mine. Section 3.17, Visual Impacts, illustrates views along the future trail corridor.

During mining operations, the highwall perimeter areas of the Site will be posted and bermed to discourage trespassing. Reclamation grading will not leave a quarry highwall adjacent to the trail. The elevation at the property line adjacent to the future trail corridor is at an elevation of 738 feet above msl. The reclamation grade will slope down from this elevation at 3:1 slope approximately 10 feet to a backfilled upland area that will slope more gradually from 727 to 720 feet above msl and then a 3:1 slope to the water's edge with a normal water level of approximately 715 feet above msl. The edge of the end use lake will be over 200 feet from the future trail. The reclamation grades incorporate a safe exit at the southern end of the end use lake. The safe exit is designed in accordance with the MDNR's draft silica reclamation rules which include a slope no steeper than 3:1 horizontal to vertical that extends to a depth of six feet below the lowest seasonal water level.

3.16.2.3 Environmental Consequences - Scenic Views and Vistas

The EIS will address the potential for impacts by the Project on the visual quality and integrity of the surrounding area.

The Project is not going to have any significant impact on the visual quality and integrity of the surrounding land. The Site is zoned industrial and is adjacent to industrial and commercial land uses to the northeast, east, and south with major transportation corridors along the eastern and northwestern boundaries of the Site. Existing perimeter berms will be extended along the eastern perimeter of the Bryan Rock property that will screen the Site from view along US 169. New screening berms and existing vegetation will screen the Site along TH 41. The Site is screened from view along the Minnesota River by extensive vegetation. Section 3.17 Visual Impacts, includes a viewshed analysis of several key viewing areas and provides more detail regarding potential impacts to scenic views and vistas.

3.16.2.4 Environmental Consequences - Other Unique Resources

The EIS will address the timing and removal of the Renaissance Festival and parking facilities and the resulting potential economic impacts to the surrounding communities.

The Renaissance Festival operates on the Malkerson Sales property under a lease agreement. Currently the lease expires in 2020. The festival booth site is situated on limestone resource and therefore the lease will be terminated under the No Build Alternative as well all of the alternatives within the same timeframe.

Currently the lease is valid through 2020. The Renaissance Festival is developing plans to relocate south of the City of Jordan in Scott County, thereby minimizing potential economic impact to local suppliers or communities. The relocation occurs regardless of alternative including the No Build Alternative so impacts resulting from the Project itself are not significant.

3.16.3 Alternatives – Nearby Resources:

Since all of the alternatives consider mining the same footprint, the environmental consequences are similar for all of the alternatives associated with individual alternatives. Since the No Build Alternative continues with mining operations at both properties the potential impacts to nearby resources for the No Build Alternative are similar to the build alternatives. Exceptions to this are the potential differences in plant site locations that may result in different noise or visual impacts to nearby resources, the duration of mining, and the timing of the relocation of the Renaissance Festival.

Noise and Visual Impacts: Although the different plant sites result in different predicted L50 sound levels, the results all indicate no significant impact to nearby resources. Individual alternative results for predicted sound levels are presented in section 3.15.3 Alternatives- Noise. Viewshed analysis of the different plant sites are presented in Section 3.17.3 Alternative – Views and Vistas.

Renaissance Festival Relocation: The current lease is valid through 2020. Many circumstances unrelated to the Project that are not within the scope of this DEIS are the controlling factors as to whether or not the lease could be extended and for how long. Assuming however that the lease would be extended until mining requires the closures of the Renaissance Festival at this location, the length of time that the festival could operate depends upon a number of factors including for example:

- The phasing associated with each alternative;
- The rate that limestone within the entire Project Area is mined and marketed;
- The rate that sandstone is mined and marketed;
- The ability to continue to provide parking and access to the festival grounds; and
- For the no-build alternative, obtaining permits to mine the remainder of the Bryan Rock property.

Phasing that begins mining in Malkerson Sales South is likely to result in the shortest possible duration of potential festival operations, unless the phase is further subdivided to exclude the booth site. A maximum estimate for the length of time the Renaissance Festival can remain at its current location for each alternative, assuming permits for the Project are obtained in 2020 and that Malkerson Sales and the Renaissance Festival agree to a new lease is provided on Table 3.16.1 below:

Table 3.16.1 Timeframe of Possible Renaissance Festival Lease Extension per Alternative

Alternative	Years
1	10-15
2	10-15
3	10-15

4	2-5
5	2-5
6	2-5
7 (No Build)	2-5

It should be noted again that the Renaissance Festival may move to a new site south of Jordan if their current lease is not renewed irrespective of the Project.

3.16.4 Mitigation – Nearby Resources:

3.16.4.1 Mitigation -Archaeological, historical or architectural resources:

No state or federally protected historic properties, architectural, or archaeological sites were identified within the Project Area. No cultural materials were encountered in any of the shovel tests; based on these negative results, no additional archaeological investigation was recommended. It is concluded that there is no significant potential to impact existing archeological sites and avoidance or mitigation is not relevant.

3.16.4.2 Mitigation - Designated parks, recreation areas or trails:

Maintain mining setbacks established per the Scott County Zoning Ordinance;
 Post warning and no trespassing signs along perimeter highwalls;
 Construct perimeter berms around active mine areas; and
 Reclaim mine site adjacent to public access areas according to the Reclamation Plan.

3.16.4.3 Mitigation - Scenic Views and Vistas

See Section 3.17 Visual Impacts for specific analysis of visual impacts. The Project will not create significant visual impacts. And no specific mitigation is proposed. Visual Impacts are discussed in further detail in section 3.17

3.16.4.4 Mitigation - Other Unique Resources

The Renaissance Festival operates on a lease that currently allows operation of the Renaissance Festival at its current location through 2020. No single alternative, including the No-Build alternative, will guarantee that the lease will be extended. Depending upon a number of factors which include the phasing of sandstone mining operations, the rate of limestone mining, and the possibility of the Renaissance Festival moving to a new site south of Jordan, the lease may be extended an estimated 2-15 years. The site operates within an active mine operation and the Project does not significantly impact or change the existing operating conditions with respect to festival. No mitigation is proposed.

3.17 Visual Impacts

The SDD identifies the following items to be addressed in the DEIS:

- a) The effect of lighting will be addressed in the EIS, including potential impacts to scenic views and vistas mentioned in item 3.16 above;
- b) A viewshed analysis will be performed that addresses key view areas (likely to be the trail system, trail access parking areas, State Highway 41 and U.S. Highway 169 corridors, Carver County Road 40 in the City of Carver, the river itself, and the bluffs across the Minnesota River in Carver County). The analysis will include the development of a model of site-specific conditions such as topography, vegetation, equipment, stockpiles and proposed Site structures. Key view areas will be represented through drawings, photos or other imaging methods
- c) The EIS will identify the strategies to avoid, minimize or mitigate visual impacts to key viewing areas.

3.17.1 Affected Environment – Visual Impacts:

The Cities of Chaska and Carver are located west and northwest of the Site across the Minnesota River, and include residences, historical districts, parks, and trails. The elevation of these areas and extensive vegetation along the river corridor provide screening of the Site from these areas. To the west of the Cities of Chaska and Carver, the bluffs rise in elevation approximately 200 feet above the river, potentially providing views into the Site from residential areas situated on top of the bluffs. A trail system runs through the State lands located along the Minnesota River including Gifford Lake and Louisville Swamp. The trail system is heavily vegetated with extremely limited views into the Site. A viewshed analysis of the MS-N plant site located within the Shoreland District was presented in Section 3.6 Water Related Land Use Management District.

A future trail corridor has been identified along the railroad right of way that runs along the southwestern portion of the Site. This trail will provide a connection between Carver and Scott Counties. Portions of the future trail segment immediately adjacent to the Site continue to be used by the UP as an active rail siding associated with Merriam Junction.

The northern portion of the Site is bounded by the TH 41 corridor which runs from northwest to southeast across the Minnesota River towards US 169. The Project includes sand and gravel mining along the northernmost portion of the Site adjacent to TH 41. There are potential views into the sand and gravel mining area from TH 41. The US 169 corridor borders the eastern portion of the Site, including the currently active Bryan Rock Quarry. Views into the quarry are screened by existing berms along the highway. Further east of US 169, a bluff rises in elevation approximately 100-125 feet. Rural residential land uses are situated along this bluff. There are potential views into the Site from the rural residential uses situated on the top of the bluff.

3.17.2 Environmental Consequences – Visual Impacts:

3.17.2.1 Effect of Lighting

The effect of lighting will be addressed in the EIS, including potential impacts to scenic views and vistas

The Project includes lighting to safely conduct mining and processing operations that may be required as the days become shorter, or to conduct 24-hour mining and processing operations. Security lighting around the plant site will also be required. Lighting in the mining area will be used only when mining operations extend past daylight hours. Mining and wet processing typically occurs during the non-frozen months but may occur 24 hours per day during the mining season. 24 hour operation of the dry plant is expected to occur year round.

Portable light towers and/or lighting attached to the mast of the equipment will be used to illuminate mining and processing areas. The light towers have masts that elevate the lights 20-30 feet above the ground surface. The lights on the masts are maneuverable to direct the light as needed to specific portions of the work area below. Lighting will be shielded and downcast to focus the light where it is needed. The maneuverability of the light fixtures reduces the potential for lighting to be cast in unintended spaces or create a nuisance condition (light spill or light trespass). The light towers will be situated on the floor of the mine. Even though the light fixtures are elevated 20 – 30 feet above the floor, they will still be recessed below surrounding grade, as shown by Inset 3.17.1 below.

Glare is created by excess, uncontrolled brightness. Glare can also cause off site nuisance issues. Controlling glare is also important from a safety standpoint for mining operations so that it does not impair the vision of an operator. Glare can be minimized by proper positioning of the light system which should be aimed downward at the work and rotated outward no greater than 30 degrees from straight down. More recently the increased use of LED lights, which are gaining popularity in all kinds of lighting practices including nighttime construction, also reduces glare compared to more traditional light sources.

Inset 3.17.1 Nighttime Lighting of Mining Operations



Sky glow is the halo of light associated with urban areas at night. Currently the more populated cities adjacent to the Site including Carver, Chaska, Shakopee, and Jordan, as well as the TH 41 and US 169 corridors are nighttime sources of light across the Site and surrounding area. Portions of the Minnesota River corridor south of Carver and north of Jordan are less impacted than portions of the

Inset 3.17.2 2012 Night Light Map of Site and Surrounding Area



The night-lights maps of Earth are created by combining satellite data compiled by the Earth Observation Group at the US National Geophysical Data Center and made available from blue-marble using Google Maps API.

corridor running through Chaska and Shakopee as illustrated on Inset 3.17.2 the 2012 nighttime satellite image to the left⁷².

Light pollution is considered harmful to human health affecting circadian rhythms and melatonin production in humans causing sleep disorders and other potentially negative health effects.⁷³ Light pollution can also be harmful to wildlife by impacting nocturnal breeding rituals, bird migration, increased predation risks, and changes to foraging patterns.⁷⁴

Minimizing glare and light trespass from lighting used on the Site will reduce the potential adverse impact to surrounding receptors. Depending upon the activity being performed, nighttime mining and processing activities typically require a minimum of 5-10 foot candles⁷⁵ (unit measurement of light that falls on a given area) of light for adequate worker

safety depending upon the activity being performed.

Fixtures with shrouds, backing, and directional lighting can be used to prevent light from areas where it is not needed or wanted. Shielding of the light fixtures limits the light's impact on the environment beyond target areas. Shielding reduces the impact of glare and limits the extent of the affected area. Lighting height, fixtures and intensity will comply with requirement in the Zoning Ordinance, Section 4-5 Exterior Lighting Standards.

3.17.2.2 Viewsheds

A viewshed analysis will be performed that addresses key view areas (likely to be the trail system, trail access parking areas, State Highway 41 and U.S. Highway 169 corridors, Carver County Road 40 in the City of Carver, the river itself, and the bluffs across the Minnesota River in Carver County). The analysis will include the development of a model of site-specific conditions such as topography, vegetation, equipment, stockpiles and proposed Site structures. Key view areas will be represented through drawings, photos or other imaging methods

⁷² Retrieved on line <https://blue-marble.de/nightlights/2012>

⁷³ Chepesiuk R. Missing the Dark: Health Effects of Light Pollution. *Environmental Health Perspectives*. 2009;117(1):A20-A27.

⁷⁴ 2006. Ecological Consequences of Artificial Night Lighting edited by Catherine Rich, Travis Longcor. Island Press. Washington DC

⁷⁵ 29CFR 1926.56(a) Safety and Health Regulations for Construction

The Project will be a continuation of existing mining activity across the Site with the additional processing equipment and associated buildings. The new processing equipment associated with the wet plant and dry plant will include silos, buildings, material stockpiles, and exhaust stacks. The heights of the plant components are listed in Table 3.17.1. The Maximum structure height in the I-1 Industrial zoning district is 45 feet, and structures exceeding 45 feet will require variances.

Table 3.17-1 Height of Structures

Structural Element	Height
Dry Plant Building	75
Dryer Exhaust Stack	80
Batch Tanks	65
Bucket Elevators to Batch Tanks	84
Storage Silos	88
Bucket Elevators to Storage Silos	116
Rail Loadout Structure	74
Truck Loadout Structure	51
Wet Plant Equipment (not enclosed)	75
Decanting Stockpiles	65
Winter Stockpile	50

The Scoping EAW identified key viewsheds to be analyzed for potential impacts. The potential impact to these key viewsheds will vary depending upon alternatives and their associated plant locations. A viewshed analysis was performed which includes the development of a three-dimensional model of the mine site and processing areas. Processing equipment and stockpiles were placed at the appropriate locations for the three different plant sites. Google Earth renderings taking into account topography, vegetation and existing structures were developed to model the visual effects of the proposed mine and plant sites.

Buildings and stockpiles are depicted as magenta and white in the analysis to make them more visible against the vegetation and sky. Upon construction, plant components will be painted to blend in with surroundings, and not stand out. Figure 3.17.3: MS-S Plant Overview, shows an aerial depiction of the components of the plant site and stockpiles that were rendered in Google Earth. This figure represents the plant site at MS-S and the same components were used to model the plant site as MS-N and BRP. Because of modelling constraints, stockpiles are illustrated as vertical entities to their maximum height across their entire footprint. In reality, these stockpiles would be sloped to their maximum heights. Therefore, the model exaggerates the potential for visual impacts.

Key components of the model include the wet plant structures, the decanting piles of washed and sized sand, the winter pile at its maximum extent, the dry plant building, finished product storage silos and loadout structures. For simplicity stockpiles were modelled at their maximum height across the entire base of the stockpile even though only portions of the stockpile will reach the maximum height. The modeled components of the plant layouts are shown on Insets 3.17.3, 3.17.4, and 3.17.5, which depict the plant site layouts at the MS-N, MS-S, and BRP plant sites.



Figure 3.17.3: MS-N Plant Overview



Figure 3.17.4: MS-S Plant Overview



Figure 3.17.5: BRP Plant Overview

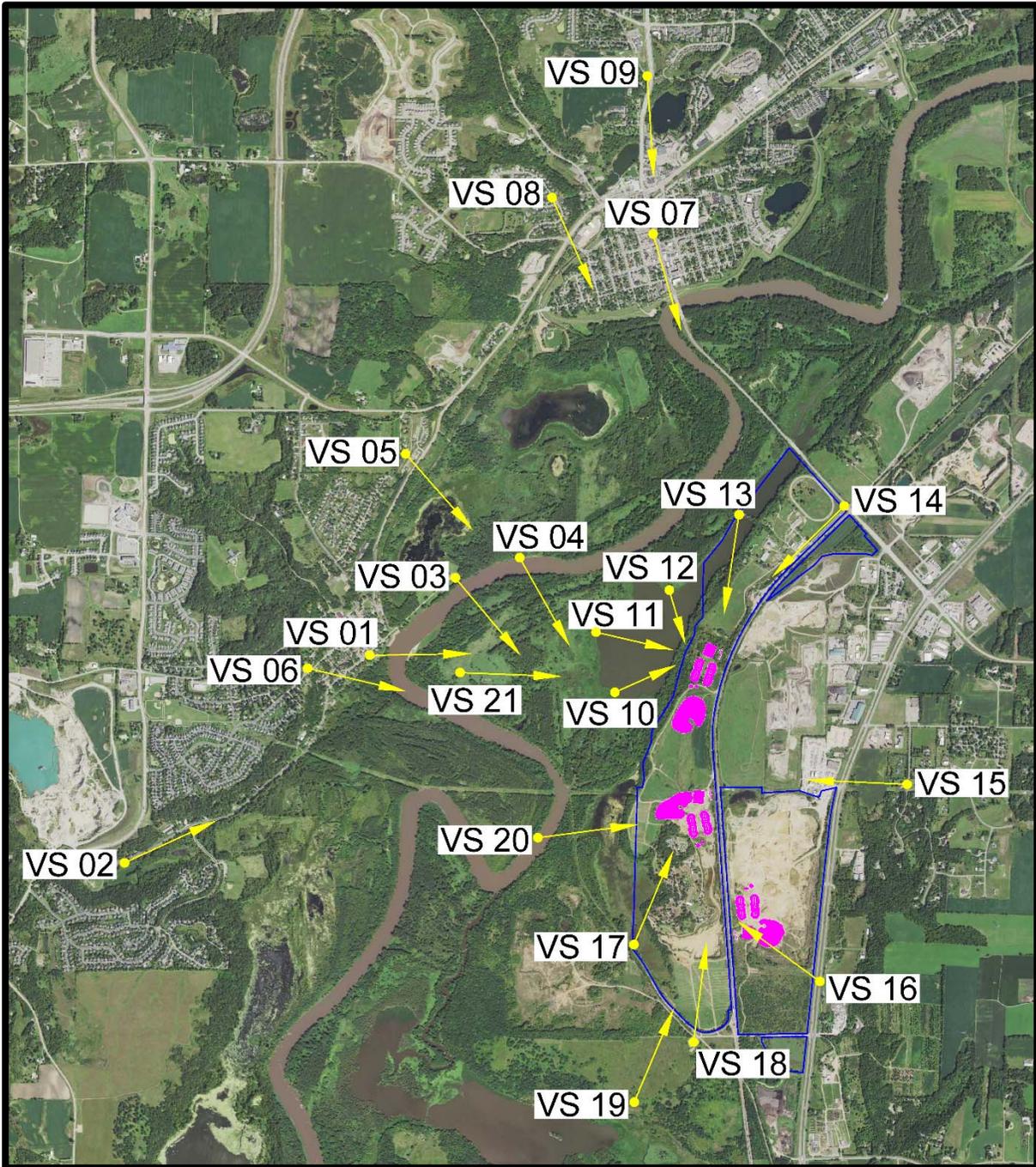
The viewshed analysis focuses on the plant sites because they have vertical components that may rise above the elevation of the surrounding grade, increasing their visibility from surrounding areas. The plant sites will also be located in the same area for the duration of the Project. Much of the area that will be mined as part of the Project has already been screened and/or lowered in elevation below the surrounding grade. For example, along the US169 corridor east of the active Bryan Rock quarry, screening berms and the recessed mine floor eliminate views into the quarry and of processing operations.

The analysis included 21 different viewsheds from the surrounding area for each of the three different plant site locations. Viewsheds were selected based on key viewing areas identified in the EAW including the trail system, trail access parking areas, TH 41 and US 169 corridors, Carver County Road 40 in the City of Carver, the river itself, and the bluffs both east and west of the Site. Locations that represented the highest potential for views of the Site were selected. The locations of the 21 viewshed stations are noted as VS 01, VS 02, etc. on Inset 3.17.6 *Viewshed Overview Map*.

At each plant site, a 2.4 MTY plant was assumed. This assumption maximizes the plant size, stockpile and building extents. Views were modelled at viewshed station looking towards the site. Each station location is represented by the dot at the end of the line with the viewshed looking in the direction that the arrow is pointing. Views were modelled at an elevation of approximately 6 feet off of the ground surface. The views are presented below along with a description of the viewshed station and results of the modelling analysis. The location of where each of the plant sites would be located, even if it is not visible from the viewshed station, is noted on the rendering. If components of a plant site are visible, the area is circled to make it more readily identifiable. The base of the Viewsheds Overview Map and all of the following renderings are generated from Google Earth Pro imaging and 3d analysis.

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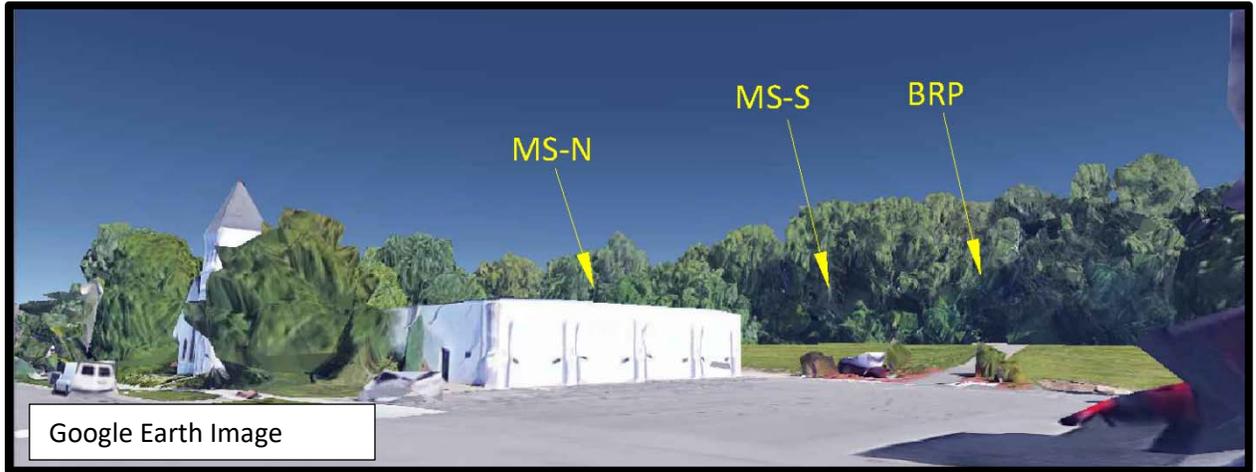
Inset 3.17.6: Viewsheds Overview Map



VS 01 – This viewshed station is located within the Carver Historic District and is representative of views from the area of the city located near the Minnesota River at the base of the bluff. The Carver Historic District encompasses several blocks predominantly situated at the base of the bluffs about thirty feet above the elevation of the Minnesota River. Viewshed 01 illustrates the view from the

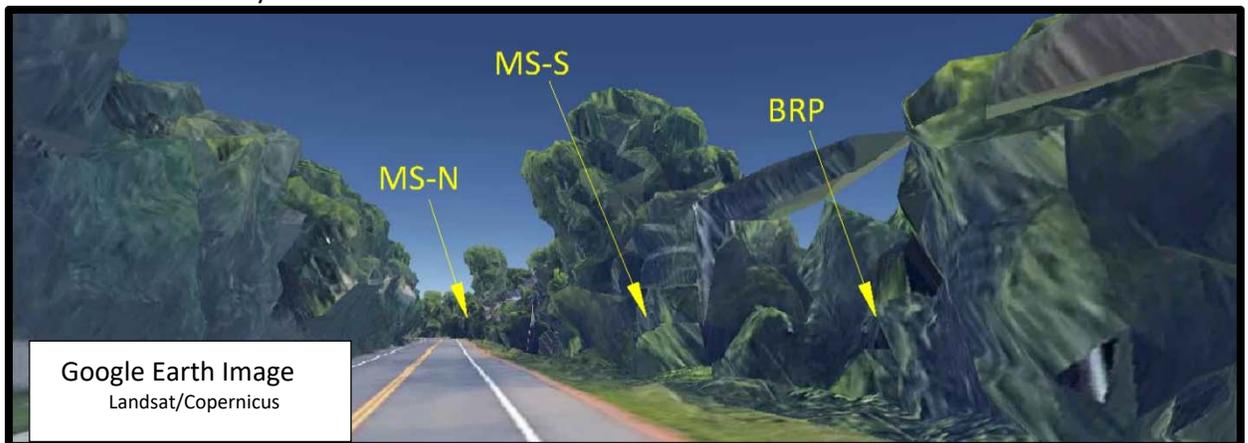
Historic District where it is close to the river and has no buildings to screen the view. Even at this most exposed area, existing vegetation on the east side of the river completely blocks the view of the plant sites. The location of where the plant sites are located is noted on the figure. The Site is located just over one-mile from the Site. Views of the Site from Carver Historic District are entirely screened by existing vegetation.

Viewshed 01 - Carver Historic District



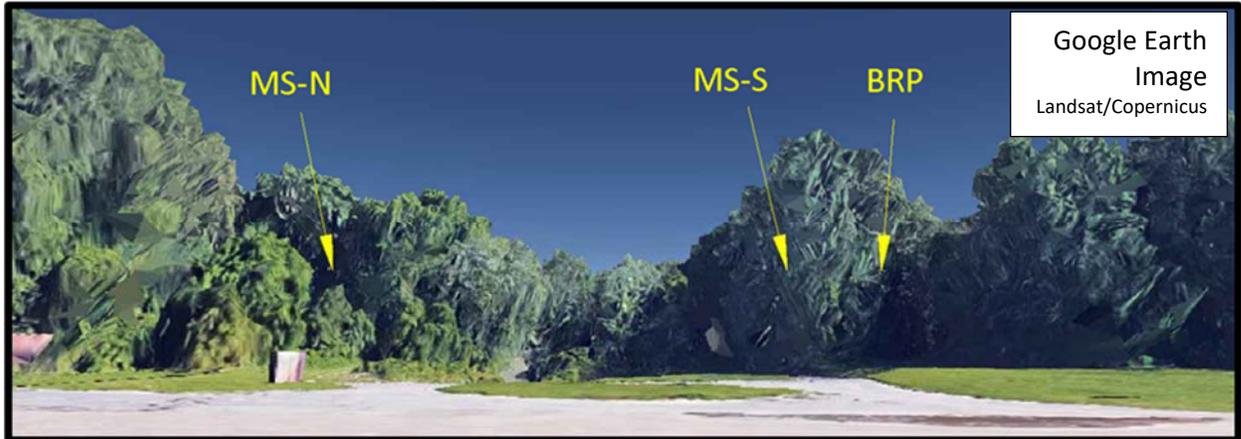
VS 02 – The Scoping EAW identified County Road 40 as a key viewing area. County Road 40 slopes down a long hill as it approaches downtown Carver from its junction with Jonathon Carver Parkway. The elevation changes from 744 feet above msl to 722 feet above msl approaching downtown Carver. This segment of County Road 40 is located between 1.2 and 2.2 miles from the Site. Viewshed 02 illustrates the view from County Road 40 at higher elevation looking directly into the Site. Vegetation screens the view along the entire length of County Road 40 south and southwest of downtown Carver. The section of County Road 40 north of downtown Carver is discussed in VS-05.

Viewshed 02 – County Road 40



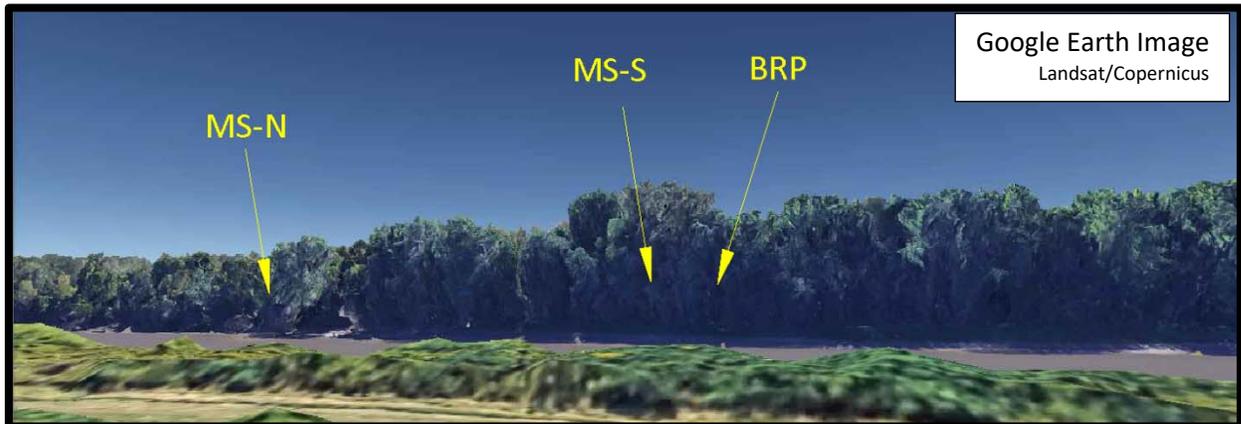
VS 03 - This viewshed station is located at Carver Riverside Park. The view from the parking area was analyzed. The parking lot is screened by trees on both sides of the Minnesota River. Viewshed 03 shows the view from the park's parking lot and the location of the plant sites all located over one mile from the city park.

Viewshed 03 – Riverside Park Parking Lot



VS 04 - This viewshed station illustrates the view of the Site from the trail system that connects Riverside Park with the City of Chaska. The trail system runs along the west side of the Minnesota River. The trail system is mostly wooded but there is a 600 foot stretch of trail which runs along the river with limited vegetation on the west side of the river. Trees on the southeast side of the river provide extensive screening of the Site. Viewshed 04 illustrates the view from this location.

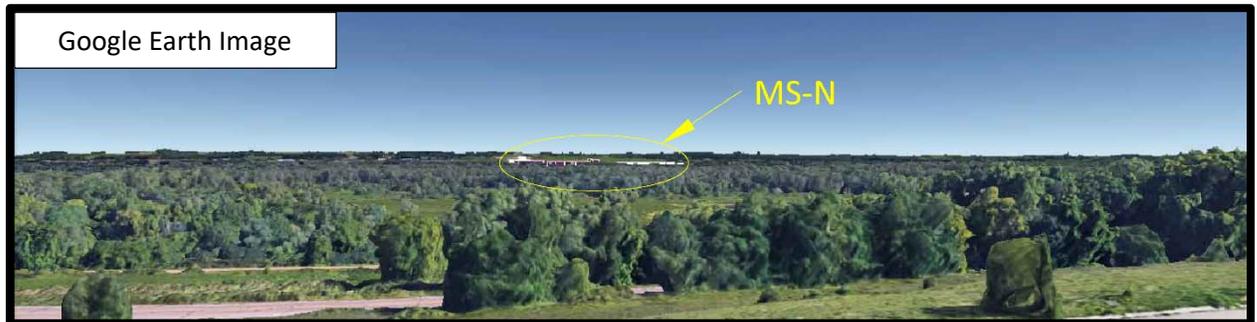
Viewshed 04 – Riverside Park Trail



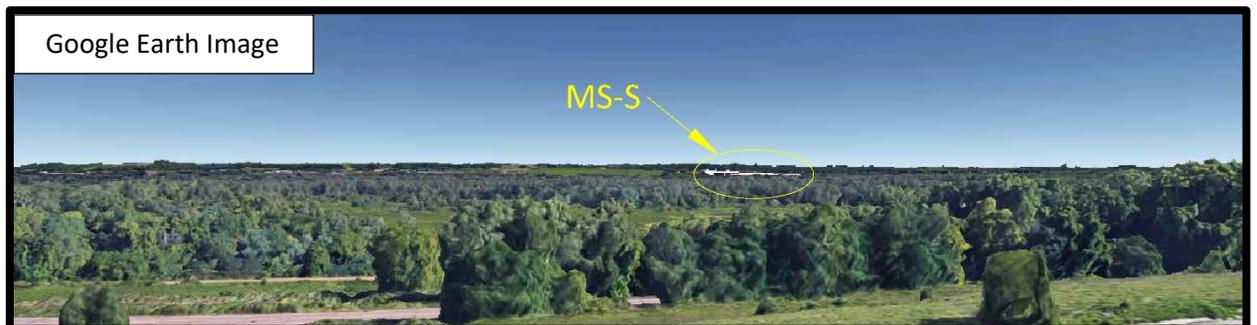
VS 05 – This viewshed station is located just west of County Road 40 north of downtown Carver, along Lano Lane. There are five residential homesites located along this local street which are situated high enough on the bluff to have a view of the river valley and see over the existing vegetation in the river valley. All three plant site locations would be visible from this station.

Viewsheds 05a through Viewshed 05c show the views of the plant from this vantage point looking towards MS-S, MS-N and BRP respectively. In each case, the plant structures will be below the horizon line. This means that topography or vegetation will form the backdrop along with the plant site structures. The MS-N plant site is the closest to this viewshed station at 1.4 miles away. The BRP plant site is 2.2 miles away. Because of the distance and the location, the visual impacts of the plant structures are minimal.

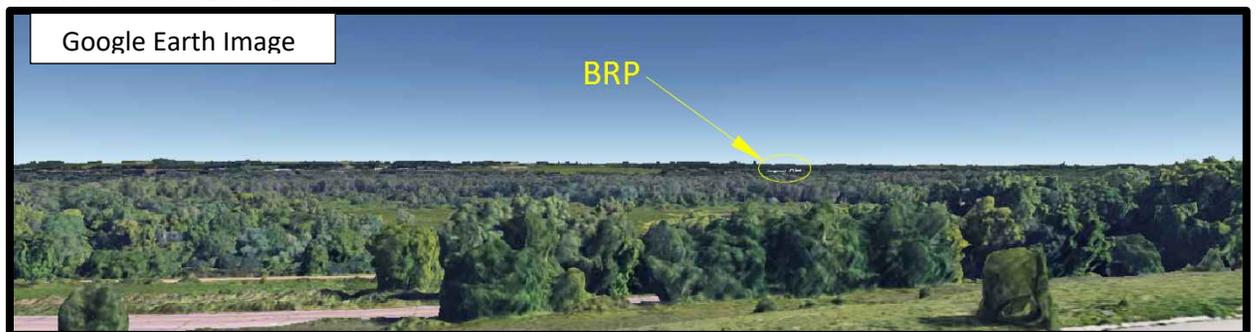
Viewshed 05a – Lano Lane MS-N



Viewshed 05b – Lano Lane MS-S

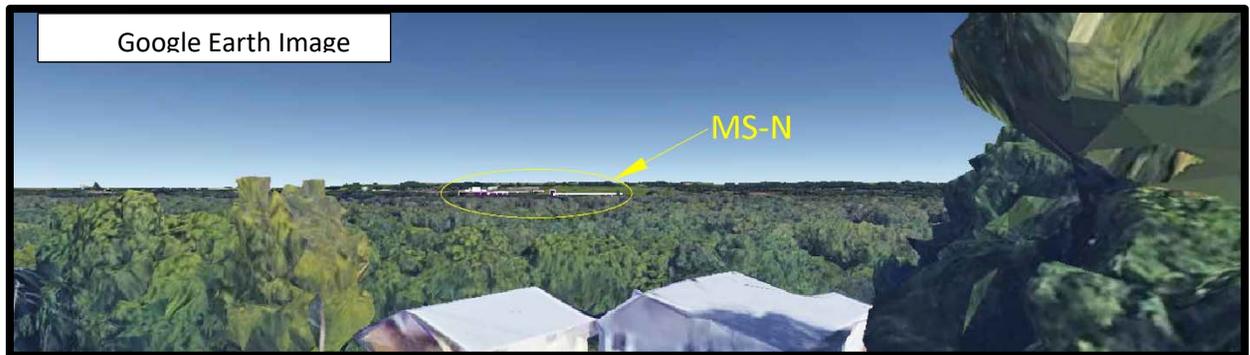


Viewshed 05c – Lano Lane BRP

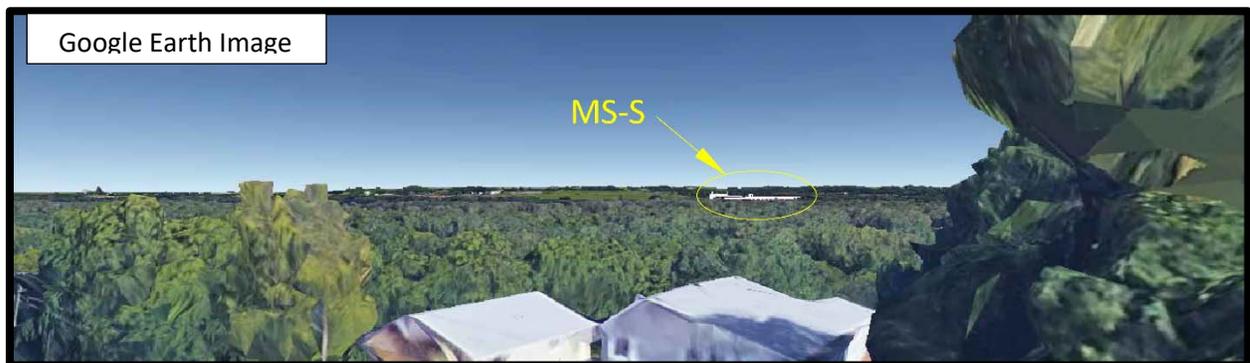


VS 06 – This viewshed station is located at the St. Nicholas Church parking lot along West 4th Street. This parking lot is elevated relative to the southeast with limited vegetation to screen the view of the river valley. Viewshed 06a through Viewshed 06c show each plant layout from this location. The plant sites are 1.4 to 1.9 miles away, located below the horizon line, and have a minimal visual impact.

Viewshed 06a – St. Nicholas Church MS-N



Viewshed 06b – St. Nicholas Church MS-S

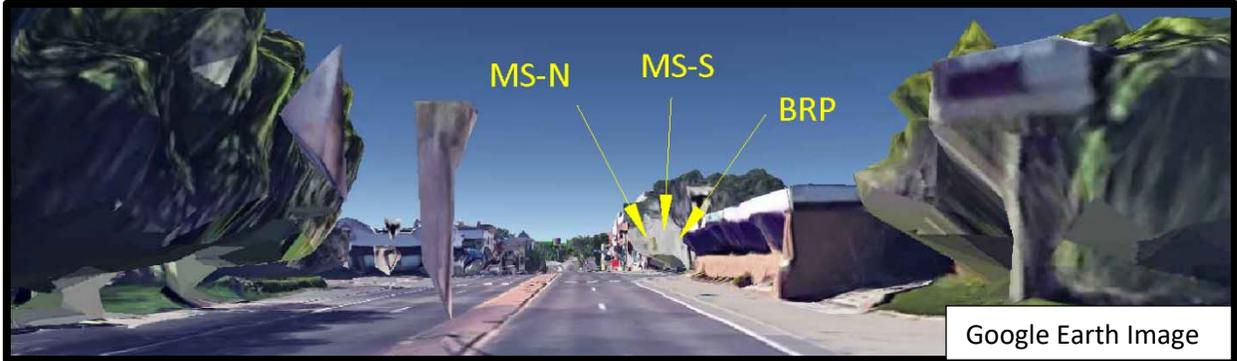


Viewshed 06c – St. Nicholas Church BRP



VS 07 – This viewshed station is located in the Walnut Street Historic District. The Site is screened from this viewshed station. The location of the plant sites are identified, but they are all located well over one mile from the Walnut Street Historic District and are not visible.

Viewshed 07 – North Chestnut Street



VS 08 and VS 09 – These viewshed stations are located on top of the bluffs northwest of downtown Chaska where there is enough elevation to see across the valley. Most of this area is screened by vegetation. Two locations were identified with limited vegetation and a potential for views of the Site. VS-08 is near a residential area along a 300 foot section of Cascade Dr. that is orientated to face the site when driving southeasterly along the road. Viewshed 08a through Viewshed 08c illustrate the viewshed from this location. Views from the second story of some of the homes along Tupelo Way and Cascade Drive (located along the right side of the following photos) would be expected to have a similar view with the closest plant site location, MS-N, located approximately 1.75 miles and the furthest plant site location, BRP located 2.75 miles from the homes. At this distance, it will be very difficult to distinguish the plant components from the surroundings.

Viewshed 08a – Cascade Drive MS-N



Viewshed 08b – Cascade Drive MS-S

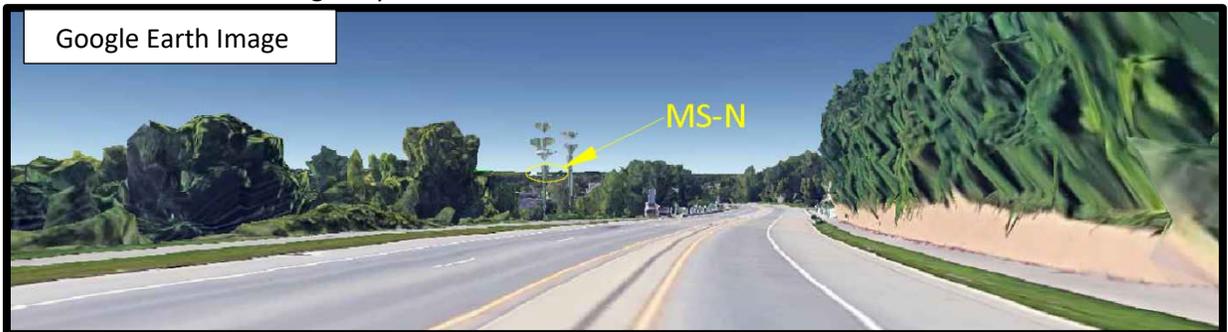


Viewshed 08c – Cascade Drive BRP



VS 09 is another key view located along TH 41 travelling south as it runs down the bluff towards downtown Chaska. There is a gap in the vegetation, and it will be possible to see the MS-N and MS-S plant locations behind existing transmission towers as illustrated in Viewsheds 09 and viewshed 09b. The BRP plant site will not be visible from this vantage point.

Viewshed 09a – Chaska Highway 41 MS-N

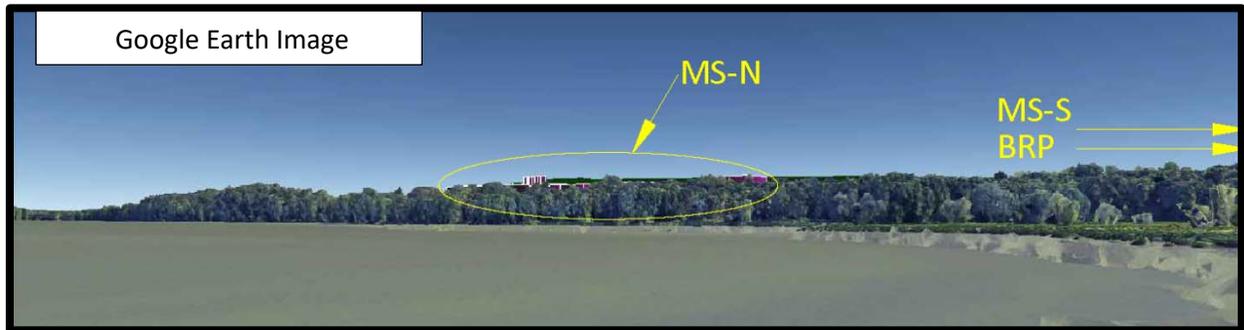


Viewshed 09b – Chaska Highway 41 MS-S



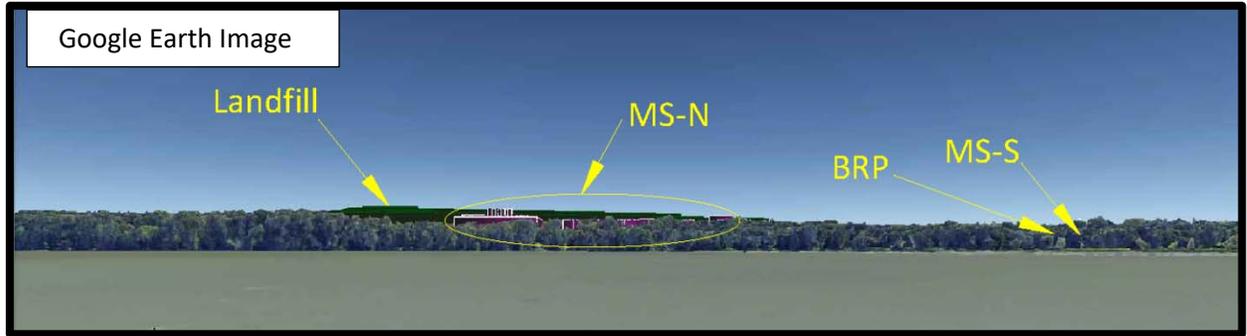
VS 10 through VS13 - These viewshed stations represents views of the Site from the various vantage points on Gifford Lake and the boat access. Views of the MS-N plant site from various locations on Gifford Lake were presented in Section 3.6 Water Related Land Use Districts related to the need for a height variance for structures at the MS-N plant site located within the Shoreland District. Gifford Lake is close enough to the MS-N plant site that the tallest plant components are visible above the trees from the west side of the lake. The Minnesota River is screened by vegetation and topography along the Site and has no view of the plant sites. Viewshed 10 shows the view from the south end of the lake looking northeast at the MS-N plant site. The MS-S and BRP plant sites are not in the frame of this viewshed analysis, but they were determined to not be visible from this viewshed station due to vegetation to the southeast.

Viewshed 10 – Gifford Lake South



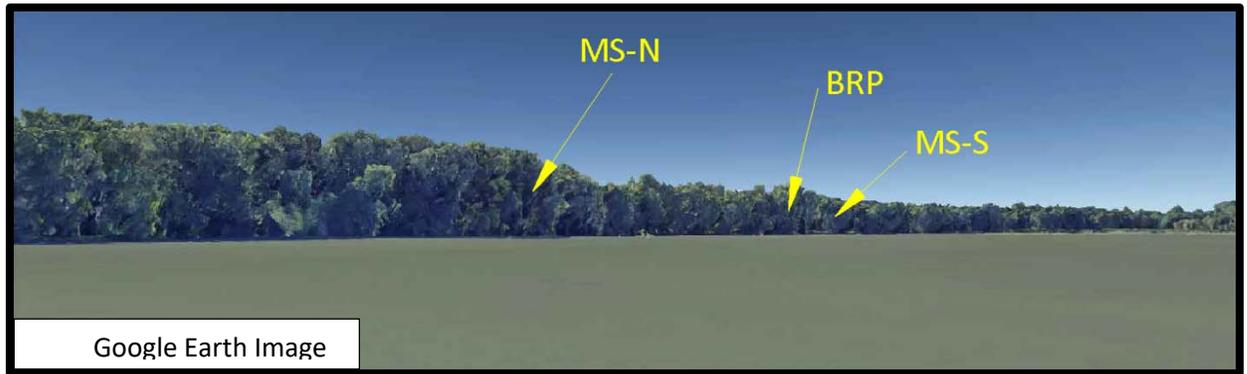
VS11 – This viewshed station is located along the west side of Gifford Lake. Viewshed 11 shows the view of the MS-N plant site from the west side of Gifford Lake. This is the location on the lake where the plant components will be most visible. In this view, the final elevation of the Dem-Con Landfill was also rendered to illustrate that the plant components will be below the horizon line when the landfill reaches its final height. The MS-S and BRP plant locations are screened by vegetation and are not visible from this location.

Viewshed 11 – Gifford Lake West



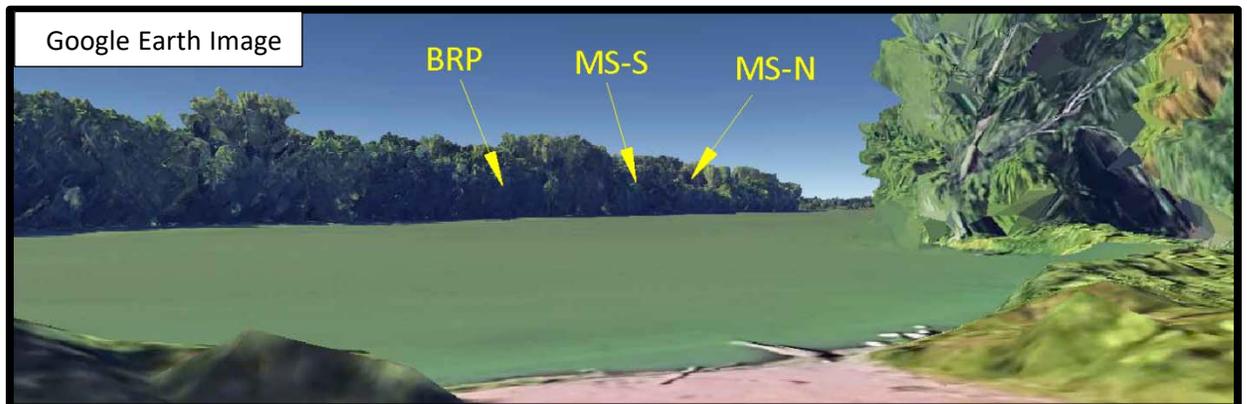
VS 12 – This viewshed station is located toward the north end of Gifford Lake where it has been determined that the vegetation increases in height and screens all three plant sites from view. Viewshed 12 shows the view from the north, with no visual impact.

Viewshed 12 – Gifford Lake North



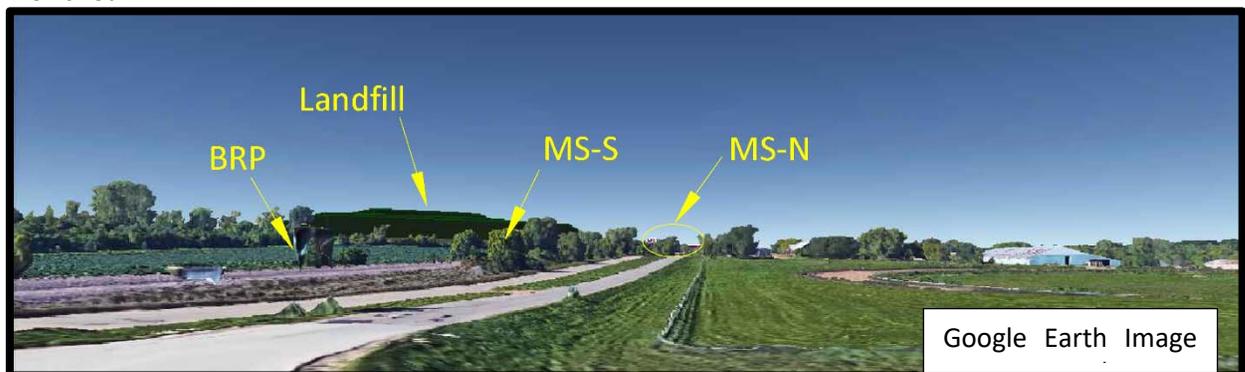
VS 13 – This viewshed station represents views from the public boat launch. The viewshed analysis for this vantage point is shown on Viewshed 13. The trees on the east side of the lake provide visual screening for each plant site with no visual impact from the Site.

Viewshed 13 – Gifford Lake Boat Launch



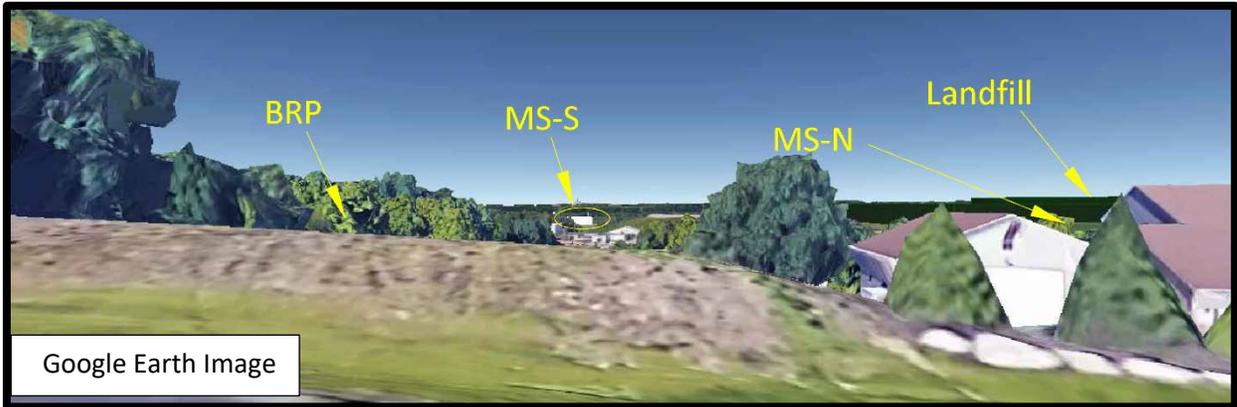
VS 14 – This viewshed station is located along TH41 on the north end of the Project. From this station, the existing stable area is visible. Viewshed 14 shows the view from TH41 as it crosses the railroad along the north end of the Site. Parts of the MS-North plant will be visible from this location, setback approximately three quarters of a mile from the highway with no significant visual impact. The MS-South and BRP plant sites are not visible from this vantage point. Sand and gravel mining activity will be occurring closer to the highway in the stable area and the agricultural field southeast of the current access road into the Site. Screening berms will be established along the road right of way where current vegetation does not provide adequate screening. Mining will be conducted in phases so that the entire area will not be disturbed at one time. Sand and gravel mining activity will occur for a shorter period of time than the limestone and sandstone mining activity and will be reversible in nature as any visual impact is eliminated once the area has been reclaimed.

Viewshed 14 – TH 41



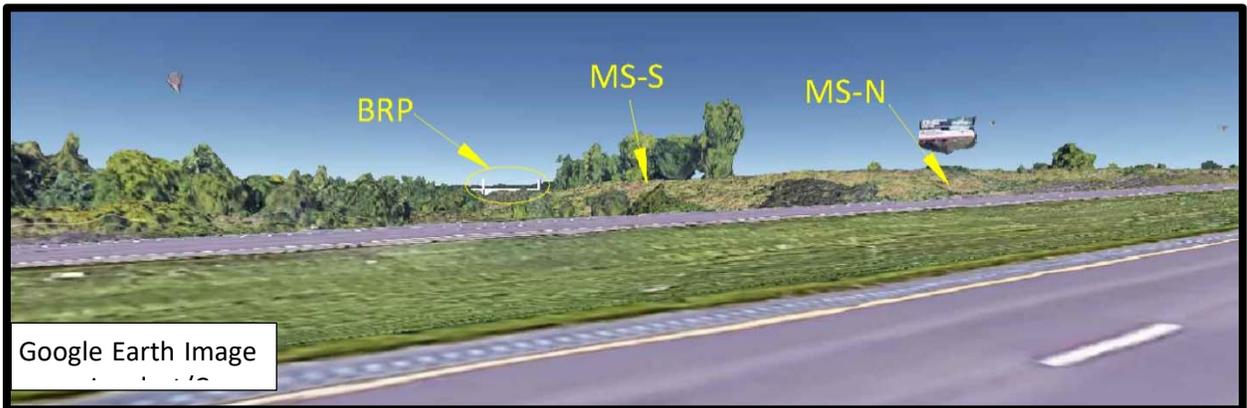
VS 15 – This viewshed station is located east of US 169 in the residential area located on the bluffs east of the Site. Views of the Site from this residential area which includes Skyline and Peregrine Circles are screened with existing vegetation. After analyzing this neighborhood, one gap in the vegetation along the existing transmission line allows a potential view of the MS-S south along Skyline Circle as illustrated on Viewshed 15 below. The MS-North plant location will be screened by the final elevation of the Dem-Con Landfill and the BRP plant location would not be visible from this viewshed station.

Viewshed 15 – Skyline Circle Transmission Line Corridor



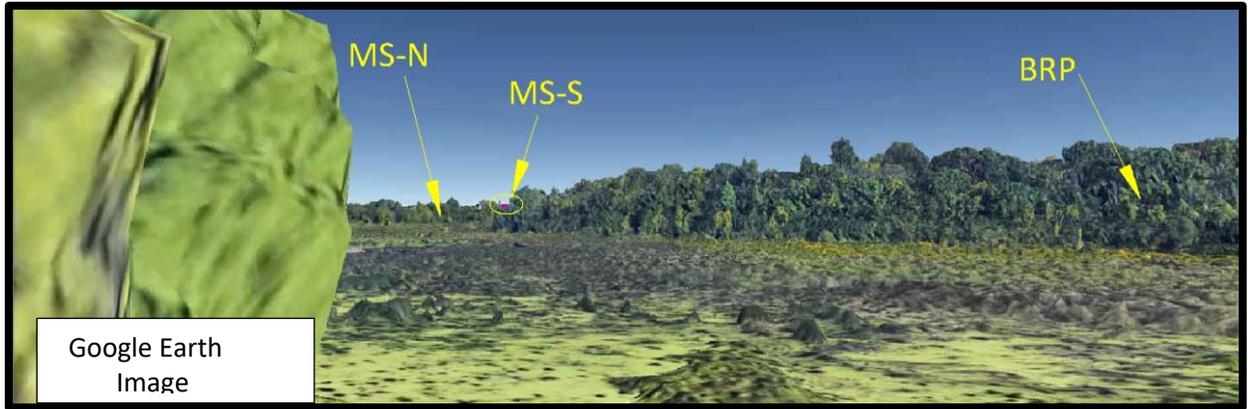
VS 16 – This viewshed station is located along the US169 corridor, along the southern portion of the Site. At the southern part of the Bryan Rock Property, there is a vantage point along US 169 northbound where portions of the BRP plant location would be visible under current conditions. However, future screening berms will completely screen this vantage point. Viewshed 16 illustrates the viewshed from this location. The other plant locations are screened by vegetation and existing topography along the entire US 169 corridor.

Viewshed 16 – US 169



VS 17 - This viewshed station is located along the future trail corridor. Existing vegetation exists along the majority of the right of way, but where the vegetation is thinner, the mining activity and plant components may be visible. Viewshed 17 shows the viewshed from the trail looking across the wetland complex to the Site. The mining operation will alter the topography and remove some of the current vegetation, and the plant site will likely be more visible from this section of the trail once mining reaches that point, if the trail is built by that time.

Viewshed 17 – Future Trail



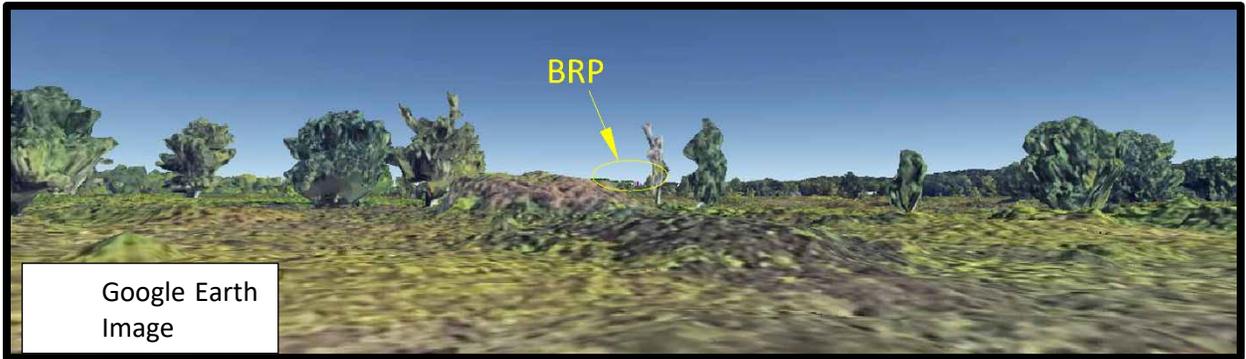
VS 18 – This viewshed station is located at the parking lot for the USFWS Louisville Swamp Unit trail system, located southwest of the Site and the UP rail siding and just south of 145th Street W. From this vantage point, all three plant locations are completely screened from view. Viewshed 18 illustrates the view from the Louisville Swamp Parking Lot, with railcars visible in the righthand side of the image.

Viewshed 18 – Louisville Swamp Parking Lot



VS 19 – The USFWS Louisville Swamp Unit trail system is well screened by vegetation. The analysis indicates that only the tallest components of the BRP plant site may be visible from the trail system. The MS-N or MS-S plant sites should not be visible at all. Viewshed 19 shows the extent to which the BRP site, located about three quarters of a mile northeast of the trail will be visible along the trail.

Viewshed 19: Viewshed 19 – Louisville Swamp Trail



VS 20 – The Minnesota River is a key viewshed identified by the Scoping EAW to be analyzed. The banks of the river are typically heavily vegetated and undeveloped in the Project vicinity. The vegetation along the river is sufficient to screen each plant site completely along the entire stretch of the Minnesota River in the vicinity of the Site. Viewshed 20 is an example of a typical view from the river looking toward the plant Sites.

Figure 3.17.26: Viewshed 20 – Minnesota River



VS 21 – This viewshed station is located within the Gifford Lake Unit of the Minnesota Valley State Trail System. The trail is extensively screened by vegetation. Views were analyzed all along the trail. Viewshed Station 21 was selected because it represents a section of the trail that runs through an open meadow and therefore has a higher potential for views of the plants sites. As Viewshed 21 illustrates, the plant sites are not visible from the trail.

Viewshed 21 – MN River Valley Trail



3.17.3 Alternatives – Visual Impacts:

The three plant locations are all located in areas where vegetation, topography, and distance from the viewshed station provide screening of the majority of the plant site. The visual model illustrates that when visible, only portions of the plant components will be visible. As a result, the impact on viewsheds all around the Site is minimal as demonstrated in the figures above.

The analysis indicates that portions of each of the three plant locations will be visible from outside the Site from certain vantage points. The MS-N plant site has components that may be visible from viewsheds predominantly located to the north and west. The final grade of the landfill located east of MS-N screens the plant site from the northeast, east and southeast. The MS-S plant site is located on the floor of the existing quarry on the Malkerson Sales property. At this recessed location, the visibility of the majority of the plant site viewed from the north, east, and south is almost entirely eliminated. The elevation of the MS-S plant will be at approximately 730 feet above msl, which compares to the elevation of the railroad right of way immediately east of the plant site at an elevation of 766 above msl and the berms along US 169 at 810 feet above msl. The MS-S plant site is also setback a significant distance from most surrounding areas further reducing visibility, particularly with views from the north, south and east. The BRP plant site is located on the floor of the existing Bryan Rock quarry. Like the MS-S plant site, this eliminates the visibility of all but the tallest components of the plant site from views from all directions.

Table 3.17.2 lists the respective plant site locations associated with each alternative, viewshed stations where the plant site may be visible, and the distance from the viewshed station to the plant site. Viewshed stations where the plant sites are screened from view are not listed on the Table.

Table 3.17.2 Alternatives

	<i>Viewshed Station</i>	<i>MS-N</i>		<i>BRP</i>
		<i>Distance from plant site (miles)</i>		
<i>Alternative 1</i>	<i>5 - Lano Lane</i>	1.4		2.2
	<i>6 - St. Nicholas Church parking lot</i>	1.5		1.9
	<i>8 - Cascade Drive</i>	1.7		2.8
	<i>9 - TH 41 into downtown Chaska</i>	2.3		
	<i>10- Gifford Lake South</i>	0.25		
	<i>11- Gifford Lake West</i>	0.4		
	<i>14 -TH 41 North of Site</i>	0.7		
	<i>16 - US 169</i>			0.2
	<i>19 - Louisville Swamp Trail</i>			0.8
	<i>Alternative 2</i>			<i>MS-S</i>
		<i>Distance from plant site (miles)</i>		
<i>5 - Lano Lane</i>			1.7	2.2
<i>6 - St. Nicholas Church</i>			1.5	1.9
<i>8 - Cascade Drive</i>			2.3	2.8
<i>9 - TH 41 into downtown Chaska</i>			2.9	
<i>15 - Skyline Cir transmission corridor</i>			0.7	
<i>16 - US 169</i>				0.2
<i>17 - Future trail corridor</i>			0.5	
<i>Alternative 3 and Alternative 6</i>				<i>BRP</i>
		<i>Distance from plant site (miles)</i>		
	<i>5 - Lano Lane</i>			2.2
	<i>6 - St. Nicholas Church</i>			1.9
	<i>8 - Cascade Drive</i>			2.8
	<i>16 - US 169</i>			0.2
<i>Alternative 4</i>		<i>MS-N</i>		
		<i>Distance from plant site (miles)</i>		
	<i>5 - Lano Lane</i>	1.4		
	<i>6 - St. Nicholas Church parking lot</i>	1.5		
	<i>8 - Cascade Drive</i>	1.7		
	<i>9 - TH 41 into downtown Chaska</i>	2.3		
	<i>10- Gifford Lake South</i>	0.25		
	<i>11- Gifford Lake West</i>	0.4		
<i>Alternative 5</i>			<i>MS-S</i>	
		<i>Distance from plant site (miles)</i>		
	<i>5 - Lano Lane</i>		1.7	
	<i>6 - St. Nicholas Church</i>		1.5	
	<i>8 - Cascade Drive</i>		2.3	
	<i>9 - TH 41 into downtown Chaska</i>		2.9	
	<i>15 - Skyline Cir transmission corridor</i>		0.7	
		0.5		

3.17.4 Mitigation – Visual Impacts:

The viewshed analysis illustrates that the Project will not create significant visual impacts. Plant site components have been developed to minimize building heights and reduce the variance required. Only portions of plant site components will be visible and only from limited locations. Additional mitigation to reduce impacts to viewsheds includes:

- Topographic shielding,
- Existing vegetation
- Setbacks and distance from key viewing areas all mitigate the potential for impacts to views.

Mitigation of potential impacts from lighting include:

- Lighting used to illuminate non-daylight mining and processing activity will occur at recessed elevations of the mine, set below the surrounding grade. This will reduce the potential for light spill onto adjacent properties or viewsheds.
- Lighting will be equipped with shields to deflect light from areas where light is not needed or desired.
- Lighting units will be portable and adjustable and can be adjusted should a nuisance condition be reported.
- The recessed nature of the mining and processing area lighted activities will serve to minimize impacts to surrounding areas. The processing area is on the floor of the existing mine and so even though the masts of the light towers extend 20-30 feet above grade, they will still be recessed below the surrounding grade.
- Mining and processing setbacks established in the County Mining Ordinance will be observed allowing the dissipation of nighttime lighting to non-nuisance levels beyond the Site property line.

3.18 Compatibility with Plans and Land Use Regulations

The SDD identifies the following items to be addressed in the DEIS:

- a) The EIS will address future land use including frontage roads, future developable lots and future septic system locations and will include a review of potential long-term economic impacts to the community as a result of the Project.

3.18.1 Affected Environment – Compatibility with Plans and Land Use Regulations

The Project is located in Louisville Township, Scott County. Scott County approved their 2040 Comprehensive Plan (2040 Plan) on December 18, 2018 and after Metropolitan Council review, formally adopted the plan on June 18, 2019. The 2040 Plan, the current Scott County Zoning Map, Zoning Ordinance No. 3, and the Scott County Subsurface Sewage Treatment System Ordinance No.

4 are the primary reference documents used in evaluating the Project's compatibility with Plans and Land Use Regulations.

The Site is currently zoned I-1, Rural Industrial District. According to the Scott County Zoning Map, Louisville Township contains the largest land area of industrially zoned land within unincorporated areas of the County. Mining is considered an allowed interim use within the I-1 zoning District. As an interim use, the expectation is that mine site reclamation will position the Site for ultimate development consistent with the current industrial zoning designation upon conclusion of mining.

3.18.1.1 Existing Development Potential -Permitted, Conditional, and Interim Uses

Existing land uses on the Site are consistent with the current I-1 Zoning and include agricultural buildings, agricultural uses, stables, billboards, fair and fairgrounds, fences, properties with more than one principal structure, residential, yard and tree waste composting site, and mining.

Permitted Uses in the I-1 District under the current Zoning Ordinance include:

- Agricultural Buildings
- Agricultural Uses
- Commercial free-standing satellite dish
- Drainage systems, flood control
- Essential services- infrastructure
- Railroad ROW

Conditional Uses in the I-1 District under the current Zoning Ordinance include:

- Auto, truck major repair, body shop
- Billboard/advertising signs
- Commercial bulk liquid storage
- Concrete mixing plant
- Contractor yard
- Essential services-government uses, buildings, storage
- Essential services – transmission/utilities/substations
- Fair and fairgrounds
- Freight transportation terminal
- Grain terminal
- Industrial accessory building 50-70% gross sq ft
- Lumber yard and landscape supply
- Motor vehicle repair garage
- Properties with more than one principal structure
- Railroad yard
- Recycling center
- Salvage yard
- Sanitary or demolition landfill

- Sexually oriented uses
- Solid and hazardous waste transfer facility
- Solid waste processing facility
- Wind energy conversion systems – commercial
- Yard and tree waste composting site

Interim Uses in the I-1 District under the current Zoning Ordinance include:

- Community solar energy system, ground mounted
- Large assembly for greater than 500 individuals
- Mining

Accessory Uses in the I-1 District under the current Zoning Ordinance include:

- Community solar energy system, rooftop
- Fences
- Industrial accessory building up to 50% gross sq ft
- On-site parking and loading
- Outdoor parking of semi-tractor trailers
- Outdoor storage accessory to principal use
- Satellite dishes and antennas
- Signs

Administrative Uses in the I-1 District under the current Zoning Ordinance include:

- Grading permit
- Indoor commercial recreation
- Indoor storage space or garage rental
- Large assembly for 250-499 individuals
- Manufacturing, processing, packaging or assembly
- Offices and professional buildings
- Sales display access to principal use (in/outdoor)
- Security structure
- Temporary outdoor promotional event and sales
- Temporary structure
- Towers less than 35 feet for personal use
- Warehousing
- Wholesaling
- Wind energy conversion systems - non-commercial
- Wireless communication towers and antennas

3.18.1.2 Existing Development Potential - Sewer and Water

Key considerations for any future development include sewer and water availability or the ability to construct private subsurface sewage treatment systems (SSTs). Currently the Site is located outside

of a municipal service area. The 2040 Plan does not anticipate municipal services to the Project Area until post 2040. Water supply is readily available to serve future development through on-site private wells. Suitable SSTS sites are the limiting factor in future development of the Site. SSTS sites must comply with Minnesota Rules Chapter 7080-7083 Subsurface Sewage Treatment Systems and Scott County Subsurface Sewage Treatment System Ordinance No 4. Under the applicable Rules, SSTS are subject to specific size and location requirements. Scott County requires that a suitable Type 1 septic site of 5,000 square feet be identified along with an alternate site of 5,000 square feet for a total of 10,000 square feet on any lot proposed for development. In addition to the minimum size requirement, the rules also require site soils to meet certain soil condition criteria including:

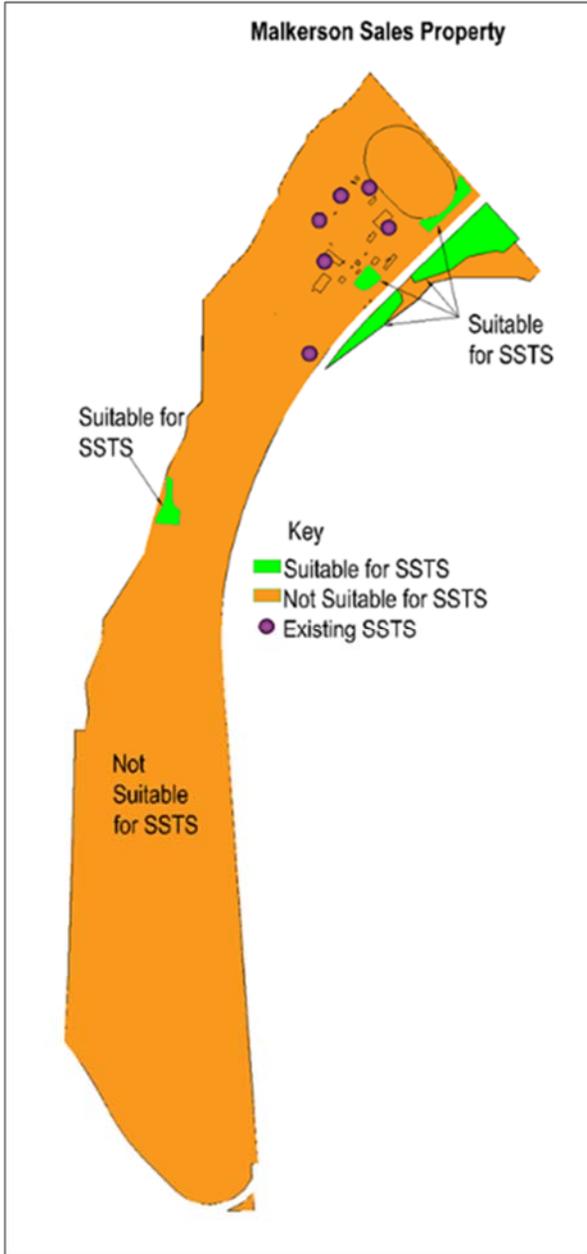
1. A minimum of 12 inches of natural undisturbed soil.
2. Non-hydric soil

Under the rules, areas of the Site where bedrock or rocky soils are within 12 inches of the ground surface are not suitable for SSTS development. Areas where the natural soils have been disturbed due to any number of activities are also not suitable for SSTS development. Prior to any activity on the Site, shallow bedrock conditions were characteristic across the majority of the Site. These conditions were favorable to the development of limestone quarrying and sand and gravel mining but not favorable to SSTS site development. The Site has been disturbed by past mining, agricultural, festival use, or other activity that has resulted in removal or disturbance of the natural soil.

There are currently six septic systems located on the Malkerson Sales property serving the northern portion of the Malkerson Sales property including the stable area, old scale house, commercial and residential buildings. The Renaissance Festival booth site and campground are served using holding tanks and portable waste containment systems. There are no existing SSTS sites on the Bryan Rock Property. Mining areas on both the Malkerson Sales property and the Bryan Rock property are served with portable containment systems.

Feser Environmental conducted a site evaluation to identify all areas existing on the Site that are currently suitable for development of an SSTS that meet both State and County regulations. Identification of suitable septic site locations was used to guide mine planning, mine site reclamation, and end use development plans for the Project. Feser Environmental's report, Site Suitability for Septic Systems, dated June 24, 2019 (Feser Report) is included as Attachment 5. A field review was made across the entire Site. Field work included visual observation, soil probes and test pits to determine the potential for SSTS development. Areas that were not visibly disturbed were probed to determine soil depths and potential suitability as an SSTS site.

The results of the field evaluation on the Malkerson Sales property indicate that the majority of the property has been disturbed from past mining, soils have been compacted from past land use including festival and other parking and cattle and horse yards, have shallow bedrock within 12 inches of the ground surface, or have hydric soil. There are six SSTSs in the northern portion of the Malkerson Sales property that serve the existing residential and commercial buildings in this area.

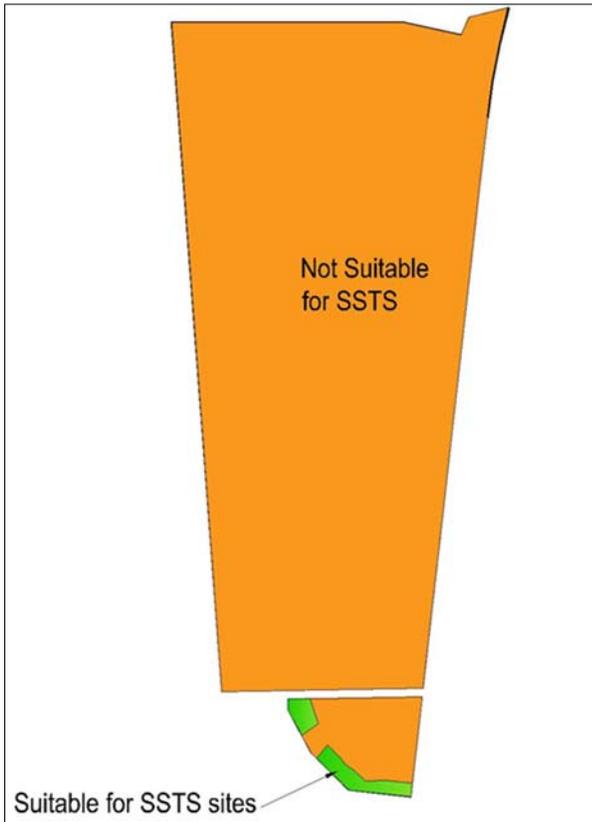


These SSTSs were developed prior to the current ordinance and they do not have a required alternate site. They are not considered to be suitable for future development under the current compliance criteria.

The field investigation identified four areas suitable for SSTS development on the Malkerson Sales property. Inset 3.18.1 *Malkerson Sales Property SSTS Suitability*, illustrates all of the areas identified that could support a SSTS site. These areas include portions of the triangle shaped parcel located southeast of the railroad tracks that is currently wooded and used for crop production, an undisturbed area near the southeastern outside edge of the horse track, an open grassy area adjacent to a residential structure in the stable area, and an area on a western facing slope adjacent to the proposed MS-N plant site location. The remaining area of the Malkerson Sales property was determined to not be suitable for SSTS sites based on shallow bedrock and excessive compaction of soils in the Renaissance Festival parking lot in the southern portion of the Site, shallow bedrock in the Renaissance Festival booth area, hydric soils along the southwestern portion of the Site associated with the wetland complex, disturbed natural soil throughout the limestone quarry and sand and gravel mining areas, and rocky and/or compacted soils in the remaining portions of the stable area from past use as parking, equipment storage, and lots for cattle and other livestock.

Inset 3.18.1 Malkerson Sales Property SSTS Sites

Inset 3.18.2 Bryan Rock Property SSTS



The results of the field work indicate that the majority of the Bryan Rock property has been disturbed from existing permitted mining operations. Setback areas around the mine limits have been disturbed from berming activities, stormwater drainage systems, and access roads. The majority of the southern portion of the property, which is not within the current permitted mine limits but is intended for future mining, has very shallow bedrock, either outcropping at or within 12 inches of the ground surface. Soil probing and test pits verified that the shallow limestone resource extends nearly to the southern boundary of the Bryan Rock property before both the bedrock and existing grade start to drop off. This area, which is located south of 145th Street, was the only area identified across the entire Bryan Rock property as being suitable for development of an SSTS. The area suitable is located below the 760 contour. Inset 3.18.2, *Bryan Rock Property SSTS Suitability*, illustrates the portion of the Bryan Rock property that is suitable for SSTS site development.

Table 3.18.1 Area Suitable for Future SSTS development shows that under existing conditions, less than 3% of the Site is suitable for SSTS development.

Table 3.18-1 Area Suitable for Future SSTS

Property	Not Suitable for Septic (Acres)	Suitable for Septic (Acres)	Total (Acres)
Bryan Rock	235	3	239
Malkerson Sales	427	13	443
Site Total	662	16	682

The discussion above focuses on SSTS sites. It is possible that a Community Sewage Treatment System (CSTS) could be developed to serve multiple industrial lots. Scott County’s current Zoning

Ordinance allows CSTS in residential land use zones (UER-C, RR-1C, RR-2) but does not explicitly prohibit them in the I-1 zoning district. If a CSTS were to be developed to serve industrial land uses, it would require that the Township become a sewer subordinate district and assume the responsibility of managing the district.

Municipal sewer and Water: It is anticipated that eventually sewer and water will serve the Project Area. The 2040 Comprehensive Plan indicates that in order to meet the long-range (post 2040) needs of the growing population of the southwest metro area in Scott County, the Metropolitan Council is considering construction of a future wastewater treatment plant to serve the western portion of the county. Two potential future wastewater treatment plant sites have been identified which are located between US 169 and the Minnesota River. One is located just to the southwest of the Site in the old Green Quarry and the other is located approximately one mile south of the southern boundary of the Site on the Shakopee Sands mine site. Parcels along this segment of Highway 169 are ultimately guided for commercial and industrial development connected to urban sewer and water and accessed by a frontage road along the highway. Any potential interim or final site development in this search area should incorporate this planned frontage road system.

The City of Shakopee's Sanitary Sewer Master Plan⁷⁶ also addresses long range municipal sewer and water service to Louisville Township in anticipation of a future annexation agreement with Louisville Township. The plan envisions sewer and water serving the Township post 2040 with sewer mains running north to the Blue Lake wastewater treatment plant.

3.18.1.3 Existing Development Potential – Frontage Roads

Currently the Malkerson Sales property west of the UP mainline is served by an access off of TH41 and two access points off of 145th Street W. The portion of the Malkerson Sales property located southeast of the UP mainline is accessed from a private rail crossing that connects the two Malkerson Sales parcels. The crossing was established as part of the original, but long abandoned alignment of TH41 which ran through the stable area, approximately 1,400 feet southwest of the current TH41 alignment.

The Bryan Rock property has a main, full access off of US 169 and two access points off of 145th St. W. to the north and one to the south. The Highways 169/41/78/14 Interchange Design Project (Interchange Project) began construction in the fall of 2018. The Interchange Project will reduce Bryan Rock's main full access to US 169 to a right in right out. A new frontage road (Red Rock Drive), overpass (147th St), and access to US 169 will be constructed south of 145th St. W. as shown on Inset 3.18.3 below. The Interchange Project does not involve any additional frontage roads through the Bryan Rock property. During the design phase of the Interchange Project, it was determined that it was not feasible to extend Dem-Con Drive through the Anchor Block and Diemold tool properties at this time. Long range plans by the County however, do contemplate the potential for a future frontage road extending from Dem-Con Drive through the Anchor Block and the existing Bryan Rock Quarry connecting to Red Rock Drive at 145th Street.

⁷⁶ January 2019. City of Shakopee Sanitary Sewer Master Plan. Advanced Engineering and Environmental Services, Inc.

Inset 3.18.3 Interchange Project adjacent to Bryan Rock



3.18.2 Environmental Consequences – Compatibility with Plans and Land Use Regulations:

The EIS will address future land use including frontage roads, future developable lots and future septic system locations and will include a review of potential long term economic impacts to the community as a result of removal of portions of the Site.

3.18.2.1 Post Reclamation Development Potential - Permitted, Conditional, and Interim Uses

Under both the No Build and Build Alternatives, sand and gravel mining is expected to continue on the Malkerson Sales property under portions of the stable area and across the railroad track on the triangle shaped parcel. Limestone quarrying is expected to continue across the Renaissance Festival booth area and southern parking lot. Under the Project, new mining activity includes mining limestone from the current southern limits of the Bryan Rock quarry to the southern extent of the Bryan Rock property and mining sandstone beneath all areas of past and future limestone mining across the Site.

The Project is consistent with land use plans and regulations. Chapter VIII of the 2040 Plan, Water, Natural & Agricultural Resources, addresses non-metallic mineral mining. Goal VIII-18 of the 2040 Comp Plan, Preserve and protect non-metallic mineral deposits⁷⁷, includes the need to identify significant deposits of non-metallic minerals (sand, gravel, and aggregate) and “where appropriate,

⁷⁷ Scott County 2040 Comprehensive Plan Chapter VIII – Water, Natural & Agricultural Resources Board
Approved: December 18, 2018

consider preservation and protection for future access and resource-based activities that provide for a diverse, regional, and sustainable economy and environment.”

The Project includes a substantial amount of data collection used to define the sand and gravel, limestone and sandstone resources present within the Project area. The mine plan has been designed to utilize those areas of remaining deposits. The Project allows the Proposer to continue to supply aggregates to the surrounding area and on a more regional basis, to maintain and create additional jobs, and to generate additional aggregate tax which supports a sustainable economy, while identifying and mitigating potential environmental effects and reclaiming in a way that results in land that can be developed with uses that are in conformance with the comprehensive plan.

The 2040 Plan also identifies mining as an allowed interim land use as appropriate within the zoning districts established in the County Zoning Ordinance. The Project is located within an I-1 zoning district. Mining is generally compatible with other I-1 land uses and the Scott County zoning ordinance establishes mining as an allowed interim use within the I-1 district.

The 2040 Plan requires extraction to follow strict standards for operations and end use reclamation. A new policy in the 2040 Plan calls for end use reclamation that provides compatibility with nearby land uses and leaves at least 25% to 50% of the net developable acreage of the property under mining permit in a condition that allows for future extension of roads and/or utilities to develop the aggregate mining site for tax-generating land uses typical of those within the zoning district in which the site is located. The mine plan and reclamation plan have been developed to minimize the reduction in buildable land as a result of the mining operations. The mine plan will establish sufficient setbacks to protect the suitable septic sites, (the limiting factor in future site development) that have been identified on the Site.

Section 3.1 Land Use, provides additional information with respect to land use and the Project itself. This section focuses on post reclamation conditions of the Project with respect to long term future land use.

Upon conclusion of mining and completion of reclamation, portions of the Site will be left in a buildable condition designed to support future development. Development is expected to be consistent with the current I-1 zoning of the property. The Reclamation Plan (Attachment 14) and the slope stability analysis, discussed in Section 3.10 Geologic Hazards and Soil Conditions of the DEIS, detail the reclamation condition of the Site. Primary goals included in the Reclamation Plan are to protect suitable SSTS sites, establish grades and final elevations in upland areas that will be suitable for future development, and to establish safe and stable final slope configurations across the different geologic units that consider long term slope stability considerations, such as US 169 and the UP mainline. Future development will be required to meet the requirements of applicable County ordinances.

Reclamation will leave a portion of the Site as privately held open space and end use lakes. The total area of end use lakes is proposed to be 250 acres (130 Acres on Malkerson Sales property and 120 Acres on Bryan Rock property) or 37% percent of the Project Area. However, the vast majority of the

end use lakes will be created over portions of the Site that are not currently buildable under County Ordinance due to the lack of suitable SSTS sites.

3.18.2.2 Post Reclamation Development Potential - Sewer and Water

The Scott County Land Subdivision Ordinance No. 7 requires that each lot created under the provisions of the ordinance must be suitable in its natural state for the proposed use with minimal alteration. Suitability analysis shall consider susceptibility to flooding, existence of wetlands, soil and rock formations with severe limitations for development, severe erosion potential, steep topography, inadequate water supply or sewage treatment capabilities, important fish and wildlife habitat, presence of significant historic sites, or any other feature of the natural land likely to be harmful to the health, safety, or welfare of future residents of the proposed subdivision or of the County.

To evaluate the impacts of the Project on future long-term development, concept development plans for existing conditions and post reclamation conditions were prepared. "Buildable Land" as defined by County Ordinance is non-hydric land having a size and configuration capable of supporting principal and accessory buildings, with an approved domestic wastewater treatment system and potable water system. Suitable areas for SSTS development identified in the Feser Report in conjunction with the criteria identified in the paragraphs above were used as the basis for identifying buildable land and preparing the concept development plans.

The concept development plans are included as Figure 3.18.1 *No Build Concept Development Plan*, and Figure 3.18.2 *Alt 1-6 Post Reclamation Concept Development Plan*. Both concept plans assume that areas identified as necessary to serve future SSTS development are protected for future use. However, under the existing conditions or No Build Alternative, there is no protection of the suitable SSTS areas. Figure 3.18.3 *Sewer and Water Concept Development Plan* illustrates conceptually how the site might develop under standard city-sizes lots and layouts for industrial development on public sewer and water. It should be noted that the layout does not conform to any county ordinance as the zoning code and subdivision ordinance do not contain regulations for sewer industrial property.

Continuation of existing land uses, particularly on the Malkerson Sales property, could disturb these areas rendering them unsuitable for SSTS development. Under the Alternatives 1-6, protecting areas needed for future SSTS sites to serve future development is identified as a mitigation measure in Section 3.18.4 below. Both the existing conditions and post reclamation concept plans assume that the frontage road improvements would be completed and the 145th easement vacated to Bryan Rock Products as the County has planned.

These plans are conceptual in nature and are based on what the physical features of the Site can accommodate. Lot sizes for these concept plans were determined by reviewing platted lots zoned I-1 throughout the townships within Scott County using Scott County's GIS data. The review indicates that the average I-1 zoned platted lot size is 5.3 Acres and the median lot size is 2.9 Acres. At the time of the platted industrial zoned parcel size review (October 2018), there were only two I-1 zoned

platted lots over 15 acres in size located within the unincorporated areas of the County. The minimum lot size is 2.5 acres per the County Zoning Code for an I-1 parcel. There are certain to be other potential land uses, layouts, and parcel sizes, for both the existing conditions and post reclamation conditions, but ultimately development potential is tied to available SSTS sites and market demand created by buyers or lessees of the parcels. The concept lot sizes developed in the Existing Conditions Concept Development Plan are substantially larger than the lot sizes included in a typical industrial park. Therefore, the Existing Conditions Concept Development Plan is generous in its calculation of buildable land within the Project Area. If the average lot size of 5.3 acres was used for the analysis, then the buildable land for each property would be substantially smaller and the reclamation condition would result in no lost buildable land.

The analysis described below demonstrates that by protecting areas that are suitable for SSTS development, the Project does not significantly reduce the area of buildable land within the Project Area. Protection of the suitable septic areas will insure sustainable future land use development and tax base to the community. The railyard(s) developed as part of the Project will remain after reclamation, adding end use value to the Project Area by serving potential future industrial development.

The potential impact that the Project will have on future development of the Site after mining and reclamation has been completed by comparing how the Site could be developed under the existing conditions with how the Site could be developed upon conclusion of mining and reclamation. The concept development plans were prepared to be consistent with the County's land use plans and regulations. Land use is shown to be consistent with the 2040 Land Use Plan and I-1 zoning under both the Existing Conditions Concept Development Plan and the Reclamation Conditions Concept Development Plan.

3.18.2.3 Existing Development Potential Based on Compatibility with Land Use Plans and Regulations

A concept development plan was prepared for existing Site conditions. The concept lot layout is illustrated on Figure 3.18.1, *No Build Concept Development Plan*. This plan establishes the basis for evaluating the Project impacts.

On the Malkerson Sales property, shallow bedrock conditions, hydric soils, and lack of areas that are suitable for SSTS development limit the current development potential (area of buildable land) of the property as defined by County Ordinance. The Feser Report identified the ability to develop at least four and possibly up to six primary and secondary SSTS sites located exclusively in the northern portion of the main Malkerson Sales property with an additional one to three primary and secondary SSTS sites located on the smaller triangular shaped parcel east of the railroad tracks. Concept lot sizes range from approximately 14-27 acres in size, with an average lot size of 19.5 acres and a median lot size of 17.9 acres. Actual size of future platted lots will depend upon proposed uses and needs. These lot sizes are substantially larger than the average 5.3 acre and median 2.9 acre I-1 zoned lots that have been platted within the Townships throughout the County. The demand for such large lots is unknown. The concept development plan also includes a future road corridor extending from

TH41 southerly through the buildable area with a potential future road corridor extending south through the extent of the Malkerson Sales property to 145th Street. The portion of the Malkerson Sales property to the south of the concept development is not considered buildable due to hydric soils and lack of suitable area for domestic wastewater treatment systems, due to disturbed soils and shallow bedrock. The concept lot layout includes 136.7 acres of possible platted lot area and 22.6 acres of future/potential right of way for a total of 159.2 buildable acres.

On the Bryan Rock property lack of areas that are suitable for SSTS development, due to shallow bedrock and disturbed soils, limit the current development potential (area of buildable land) of the property. The Feser Report identified the ability to develop up to three primary and secondary SSTS sites to serve three future lots. These areas are located exclusively in the southernmost portion of the Bryan Rock property. Concept lot sizes range from 5 to 36 acres in size. These lot sizes are similar or substantially larger than the average 5.3 acre and median 2.9 acre I-1 zoned lots that have been platted within the Townships throughout the County. The concept layout also includes a section of future frontage road that will be needed to provide access to the future lots and a potential future road corridor extending through the Bryan Rock property assuming the extension of Dem-Con Drive through the Anchor Block property with a connection to the future Red Rock Drive. The portion of the Bryan Rock property located north of the concept development is occupied by the current Bryan Rock quarry and is not considered buildable under the current County ordinances due to lack of suitable SSTS sites. The concept layout includes 49.1 acres of possible platted lots and 18.4 acres of future/potential right of way for a total of 67.5 buildable acres.

3.18.2.4 Post Reclamation Development Potential Based on Compatibility with Land Use Plans and Regulations

A concept development plan was prepared for the proposed reclamation conditions. The concept lot layout is illustrated on Figure 3.18.2 *Post Reclamation Concept Development Plan*.

On the Malkerson Sales property, the same portion of the property that was identified as buildable under the Existing Conditions Concept Development Plan will remain buildable in the post reclamation condition. Proposed lots are located over portions of the Site that have been previously mined for sand and gravel. The Project involves additional sand and gravel mining in this area and reclaiming to grades that can accommodate future development. Mining limits and reclamation grades will be established to preserve the SSTS sites needed to accommodate future development. The same areas will be available for end use development under post reclamation conditions as long as the SSTS sites are preserved during mining (see mitigation Section 3.18.4). A potential future road corridor will be preserved extending from the developable portion of the property to 145th Street. The concept lot layout includes 136.7 acres of possible platted lot and septic area and 22.6 acres of road corridor, for a total of 159.2 buildable acres.

The southern portion of the Bryan Rock property will be backfilled and reclaimed to a buildable condition that is able to support three lots, as in the existing conditions. As a mitigation measure identified in this DEIS, the mining setbacks will be increased in the southern portion of the property to preserve the areas identified as suitable SSTS site locations in the Feser Report. Post Reclamation

lots will range in size from 4.7 acres to 19.4 acres. The lots will be accessed by a new segment of frontage road and will access a 4.0 acre SSTS area by easement. A potential future road corridor will be preserved that assumes an extension of Dem-Con Drive through the Anchor Block property south to the new access location onto Red Rock Drive. The concept layout includes 32.5 acres of possible platted lot and septic area and 14.6 acres of right of way for a total of 47.4 buildable acres.

Table 3.18-2 compares the existing buildable land area with the post reclamation buildable land area.

Table 3.18-2 Buildable Land Existing Conditions Vs. Reclamation Condition

Concept Plan	Number of I-1 Lots based on suitable SSTS sites	Total acres of buildable land	Net amount of buildable land compared to existing condition
Existing Condition	10	226.7 Acres	-
Post Reclamation	10	208.4 Acres	91.93%

The table illustrates that as long as the mining limits are adjusted to protect the suitable SSTS locations identified to serve the future development, approximately 90% of the buildable area will be retained under reclamation conditions. Mining maximizes value to the local community by mining available resources while providing high paying jobs, an industrial use tax base, and aggregate taxes from property that otherwise has limited potential for agricultural production due to poor soil conditions or development due to inadequate sewage treatment capabilities. Because of the substantial limitations existing on the Site today, the Project does not create a significant difference in buildable land as defined by current land use plans and regulations when compared to the No Build condition as long as the areas needed for septic site development are protected until future development can occur.

Sewer and water is not anticipated to serve the area until sometime after 2040. The City of Shakopee’s Draft 2040 Comprehensive Plan (Envision Shakopee) discusses a Rural Transition Planning District that includes Louisville Township. Envision Shakopee describes land use of the areas as primarily of agricultural, residential, and natural open spaces. The plan notes that the Metropolitan Urban Service Areas (MUSA) doesn’t extend centralized sewer to this area and that MUSA is not planned to extend to this area during the life of the 2040 plan. The Shakopee Draft 2040 Comprehensive Plan also discusses the US 169 South corridor and notes that “Though well traveled, because there is no access to centralized sewer, significant development in this corridor is unlikely in the near or long-term.”

Envision Shakopee also discusses the quarries located between the Minnesota River and US 169. The plan notes that “earth works and aggregate extraction have significantly altered the physical landscape creating both a scenic landscape with rocky outcrops, quarry lakes, and westward vistas of the Minnesota River Valley, as well as challenges for future development.” The plan states that “long term redevelopment opportunities after silica sand mining operations should include business

park/office campuses and or high density residential which can capitalize on the area's unique landscape."⁷⁸

The Scott County 2040 Plan also discusses future sewer and water in this area post 2040 and discusses a search for a future Scott County WWTP site near the Louisville/Sand Creek township line, between Highway 169 and the Minnesota River. The plan notes that the area is generally guided and zoned for industrial uses and that parcels along this segment of Highway 169 are ultimately guided for commercial and industrial development connected to urban sewer and water and accessed by a frontage road along the highway. Any potential interim or final site development in this search area should incorporate this planned frontage road system.

3.18.2.5 Post Reclamation Development Potential – Frontage Roads

The public frontage road system serving the southern portion of the properties is currently being constructed. The system was evaluated and designed taking into consideration the existing mining activity on the Bryan Rock Property as well as other existing developments along the US 169 Corridor including the Dem-Con Landfill, Anchor Block, and Diemold Tool properties and the future I-1 land use designations. It was determined that extension of a frontage road from Dem-Con Drive through the Anchor Block and Bryan Rock properties is not feasible or necessary at this time with the construction of the new overpass and freeway access to County Road 14 to the south.

Changes to the current public frontage road system design are not anticipated to be necessary during the Project but may be needed post reclamation as part of ultimate buildout of the area and consistent with the 2040 Plan. The reclamation plan accommodates a roadway corridor through both the Malkerson Sales property and the Bryan Rock property in the event such a system is needed through one or both of these properties in the future. Reclamation grades allow for the roadway to pass through and be built upon the quarry floor.

3.18.3 Alternatives – Compatibility with Plans and Land Use Regulations

Alternatives 1-6 have the same mining limits and reclamation plan. The Alternatives have different railyard locations which may continue as a use after reclamation that would support end uses developed on the Site. The existing conditions analysis represents the No Build Alternative while the post reclamation development plan represents Alternatives 1-6. Figure 3.18.1 includes additional detail of the No Build Alternative and illustrates the Suggested Development Plan included in the current Bryan Rock CUP. This plan was prepared in the early 90's and requires updating. Most notably no development could occur within this area until municipal sewer and water is available as discussed above, and planned access locations onto US 169 are no longer feasible. The plan does show a roadway network extending north south through the property which is carried through in the existing conditions plan.

⁷⁸ Envision Shakopee City of Shakopee 2040 Comprehensive Plan. Retrieved from online at <https://envisionshakopee.com/latest-draft-of-envision-shakopee/> on June 17,2019

3.18.4 Mitigation – Compatibility with Plans and Land Use Regulations

Mitigation includes the protection of suitable SSTS areas that have been identified to serve future development of the Project Area. This means that limestone and sandstone mining limits along the southern portion of the Bryan Rock property and sand and gravel mining limits on the Malkerson Sales property in the stable area and the triangle area will be reduced to protect and preserve septic sites for future development.

- a) Establish mining limits to protect SSTS areas for future development

3.19 Public Infrastructure

The SDD identifies the following items to be addressed in the DEIS:

- a) The EIS will discuss this topic in terms of transportation and future infrastructure needs during the Project and as it may relate to the reclamation plan and end use plan.

3.19.1 Affected Environment – Public Infrastructure

The Project is served by US 169 and TH 41. Electricity and natural gas are available at the Site. Municipal sewer and water do not serve the Project or surrounding area and are not anticipated to be extended to serve the Project until sometime after 2040.

Currently the Malkerson Sales property west of the UP mainline is served by an access off of TH41 and two access points off of 145th Street W. The portion of the Malkerson Sales property located southeast of the UP mainline is accessed from a private rail crossing that connects the two Malkerson Sales parcels. The crossing was established as part of the original, but long abandoned alignment of TH41 which ran through the stable area, approximately 1,400 feet southwest of the current TH41 alignment.

The Bryan Rock property has a main, full access off of US 169 and two access points off of 145th St. W. to the north and one to the south. The Highways 169/41/78/14 Interchange Design Project (Interchange Project) currently underway will reduce Bryan Rock's main full access to US 169 to a right in right out. A new frontage road (Red Rock Drive), overpass (147th St), and access to US 169 will be constructed south of 145th St. W. The interchange project does not involve any additional frontage roads through the Bryan Rock property. During the design phase of the Interchange Project, it was determined that it was not feasible to extend Dem-Con Drive through the Anchor Block and Diemold tool properties at this time. Reclamation plans include a potential future road corridor through the Malkerson Sales property to 145th Street and a potential future road corridor from an extension of Dem-Con Drive through Anchor Block through the Bryan Rock property to Red Rock Drive.

3.19.2 Environmental Consequences – Public Infrastructure:

The EIS will discuss this topic in terms of transportation and future infrastructure needs during the Project and as it may relate to the reclamation plan and end use plan.

The Project does not require any additional improvements to the existing public transportation system. The Project will include the construction of a rail yard(s) for the loading and transport of processed silica sand product to market. Natural gas will be extended to the Site from the north and additional electrical service will be brought to the Site as needed to serve the mining and processing needs. These are all private utilities.

Municipal sewer and water, currently do not serve, are not planned to serve, and are not needed to serve the Project. The Reclamation Plan assumes that municipal services are not available for post reclamation development but preserves future roadway corridors which can be developed in support of denser ultimate development at some point in the future when municipal services are extended to this area.

3.19.3 Alternatives – Public Infrastructure

Each Alternative has the same mining limits and reclamation plan and utilizes the same transportation network. The Alternatives or the Reclamation Plan do not require municipal services. The only difference among alternatives will be the location and ultimate size of the processing plant(s) and the need to extend gas and electricity services to the specific plant sites.

3.19.4 Mitigation – Public Infrastructure

There are no significant impacts to public infrastructure as a result of the Project and therefore public infrastructure mitigation is not needed.

3.20 Social and Economic Impacts

The SDD identifies the following items to be addressed in the DEIS:

- a) The EIS will determine the areas and types of potential economic and social impacts of the proposed Project.
- b) EIS will quantify the social and economic impacts on the local community, including impacts to the local economy.

3.20.1 Affected Environment – Social and Economic Impacts:

Mining provides an important economic benefit to the community, increasing tax base, providing head of household jobs, and supporting local goods and services with economic multipliers that

create demand for local jobs and services. Chapter 10 of the Scott County 2040 Comprehensive Plan Update⁷⁹ (2040 Plan) indicates that in 2016, there were roughly 48,020 jobs in Scott County. Compared to the Twin Cities region, Scott County's average annual wages are lower than the rest of the Seven County Metropolitan Area. (approximately \$46,000/year average annual for Scott County compared to \$57,000 per year average annual for seven county area).

The 2040 Plan identifies a gap between the number of county residents with industry skills and the number of jobs located within Scott County, identifying 711 new jobs needed in Agriculture and Mining to "retain" local skills. To prevent residents from leaving and to simultaneously attract new residents, local economic maintenance and growth must be stimulated by the creation of jobs.

The 2040 Plan indicates that in 2016 there were 68 mining jobs in Scott County. Mining has occurred in the area and on the Site for the past several decades. Currently Bryan Rock operates a limestone quarry on the Project Site. Bryan Rock is a family owned business that has been mining in Minnesota since 1941. The company was started by W.L. (Red) Bryan and his father. Red Bryan was President from 1941 to 1982. In 1982 Bill Bryan, Red's son, became president and still is today. Bill has two sons that represent the fourth generation in the family business. Matt is Vice President of operations and Eric is Director of Marketing.

Bryan Rock currently operates in three limestone quarries in Scott County near Shakopee, MN and two limestone quarries in Washington County, MN. Bryan Rock has been a fixture in the Shakopee area for approximately 65 years. Much of Bryan Rock's success can be attributed to a loyal and talented work force consisting of both union and non-union employees. The average length of employment at BRP is close to 25 years, a testament to the value of the jobs Bryan Rock creates.

Malkerson Sales is a family-owned company that has owned and operated a farm in Scott County since 1950. The company was started by Lester Malkerson and his wife, Betty Malkerson. The family has also used the property for mining of aggregates, raising cattle, operation of a horse stable and the Renaissance Festival. Four generations of the Malkerson family have from time to time lived and worked on the property. The company is now owned and operated by the five children of Lester and Betty Malkerson.

3.20.2 Environmental Consequences – Social and Economic Impacts:

3.20.2.1 Area and Type of potential economic and social impact

The EIS will determine the areas and types of potential economic and social impacts of the proposed Project.

Areas and types of direct economic impacts that the Project will have include:

⁷⁹ 2040 Comprehensive Plan Scott 2040 available online at <https://www.scottcountymn.gov/439/2040-Comprehensive-Plan>

- The direct creation of local head of household jobs;
- Increased tax revenues including:
 - local property tax;
 - payroll tax;
 - sales tax;
 - aggregate tax; and
- Increased purchases of fuel, supplies, and services from local businesses.

Indirect economic impacts are also realized as every dollar generated by MJS will have a several fold ripple effect on the local economy. Jobs created in the mining industry have been shown to create additional jobs, primarily in the private services and industrial sectors within the local community.⁸⁰ The construction phase of the Project will also create local jobs in the construction industry.

Both mining and construction jobs have a positive impact on the local economy. The USGS indicates that minerals are fundamental to the U.S. economy, contributing to the real gross domestic product at several levels, including mining, processing, and manufacturing finished products. In 2017, industrial sand, valued at about \$3.5 billion was produced by about 200 companies from 340 operations in 35 States. The value of production of industrial sand in 2017 increased by 32% compared to 2016 due primarily to increased activity in the oil and gas sector.

The Project represents an expansion of mining activities. The local region that will experience some portion of the Project's socio-economic effects includes Scott County, neighboring Carver County, as well as the surrounding communities including Shakopee, Chaska, Jordan, and Carver, which are considered the local primary economic market.

The state of Minnesota will also enjoy a portion of the economic benefit of the Project. According to the USGS's 2018 mineral commodities data, industrial sand was produced by 191 companies from 321 operations in 35 States. Leading States in order of tonnage produced in 2018 were Wisconsin, Texas, Illinois, Missouri, Minnesota, Oklahoma, North Carolina, Mississippi, Iowa, and Arkansas. Minnesota was the fifth largest producer of construction sand and gravel in the country in 2018 and Minnesota was ranked 5th in value of nonfuel minerals produced in 2018 (iron ore, sand and gravel (construction) industrial sand, crushed stone and dimension stone)⁸¹

An increase in economic activity from the construction portion of the Project results in other rounds of spending. For example, building infrastructure to serve the plant and railyard will lead to an increased market demand for aggregates, asphalt and concrete. Workers benefiting from these increases in turn tend to spend a portion of their wages at local businesses. These are indirect benefits typically described in terms of multipliers. Other benefits from the construction and operation of the Project may be considered intangible, such as an increase in public health due to

⁸⁰ Moritz, T., Ejdemo, T., Söderholm, P. et al. *Miner Econ* (2017) 30:53. <https://doi.org/10.1007/s13563-017-0103-1>

⁸¹ U.S. Geological Survey, 2019, Mineral commodity summaries 2019: U.S. Geological Survey, retrieved online at https://prd-wret.s3-us-west-2.amazonaws.com/assets/palladium/production/atoms/files/mcs2019_all.pdf

available health care as a result of a new job, an increase in the quality of life, or a reduction in vehicle miles travelled due to local availability of a head of household job.

3.20.2.2 Quantify social and economic impact

EIS will quantify the social and economic impacts on the local community, including impacts to the local economy.

Quantifying the social and economic impacts utilizes economic indicators such as demographics, results of retail/service and housing market analysis, demand for public service, and changes in employment and income levels. These contributions and effects include employment, donations, purchase of goods and services, and income to governments through taxes.

The estimates of economic impacts of the Project are based on data extrapolated from the existing mining operations conducted by Bryan Rock and Malkerson Sales and input from design build contractors and operators of sand mining and processing facilities. Estimates are based on an assumed range of market conditions resulting in silica sand production levels ranging from 800,000 tons per year to 2,400,000 tons per year. Actual production will be determined by market demand.

a) Employment

Depending upon annual production, the Project is anticipated to create an additional 30 to 85 jobs. The range reflects production levels ranging from 800,000-2,400,000 tons per year. These jobs are in addition to the current jobs generated by Bryan Rock's existing quarry operations. Bryan Rock currently provides 15 union and 9 nonunion jobs. These jobs will continue into the foreseeable future as a result of the Project involving mining the remaining limestone resources available within the Project Area. Without the Project these jobs will be eliminated when the currently permitted limestone resource on the Bryan Rock property and the remaining limestone resource on the Malkerson Sales property are exhausted.

The average wage of employees at the MJS site is anticipated to be \$34 per hour with an additional \$17/hour associated with benefits including health insurance, retirement, profit sharing and paid time off.⁸² During construction an estimated 60-80 construction jobs will be created. Table 3.20.1 compares the anticipated average wage of an MJS employee with that in Scott County and the State of Minnesota and illustrates that the proposed Project will provide an opportunity for high-paying employment opportunities within the County. This is a positive socioeconomic benefit for Scott County which lags behind the rest of the Seven County Metropolitan Area and the state of Minnesota with respect to average annual income.

⁸²Based on current Bryan Rock hourly wages and cost of benefits.

Table 3.20-1 Income Comparison

Location	Average Hourly Wage
MJS	\$34.00
Scott County ⁸³	\$22.28
State of Minnesota ⁸⁴	\$25.35

*Average weekly wage divided by 40 hours per week.

4.22.2.2 Tax Revenues

There are several tax streams that will be generated from the Project.

- a) State and Federal personal income tax on wages and income earned by employees
- b) Property taxes on land utilized for mining and industrial operations
- c) Aggregate tax to Scott County and Louisville Township based on amount of aggregates sold each year
- d) Sales tax on aggregates sold (new in 2015)
- e) State and federal corporate tax on company profits
- f) Indirect taxes generated from local contractors, independent truck drivers and goods and services purchased to support operations.

State and federal income tax: Labor costs are estimated to range from \$3,200,000-\$7,200,000 depending upon production levels. Payroll creates income tax revenue to the state and federal governments. Federal income tax revenues generated from these wages are estimated to range from \$258,000-\$589,000⁸⁵ and state income tax revenues are estimated to range from \$108,000-\$245,000 based on average \$34/hr wage.

Property Tax: Mining constitutes an industrial land use and generates a significant portion of tax revenue. Property taxes paid in 2018 on the 682 acres Project Area exceeded \$250,000.

Aggregate Tax: An aggregate production tax⁸⁶ is imposed on all aggregates produced and sold from the Site. The tax is currently set at 21.5 cents per cubic yard or 15 cents a ton. Proceeds of aggregate production tax are allocated as follows:

The county auditor may retain an annual administrative fee of up to five percent of the total taxes collected in any year.

The balance of the taxes, after deduction of the administrative fee, are credited as follows:

⁸³ US Department of Labor, Bureau of Labor Statistics. May 2017 County Employment and Wages in Minnesota Third Quarter 2107 https://www.bls.gov/regions/midwest/news-release/countyemploymentandwages_minnesota.htm

⁸⁴ US Department of Labor, Bureau of Labor Statistics. May 2017 State Occupational Employment and Wage Estimates -all occupations. https://www.bls.gov/oes/2017/may/oes_mn.htm#00-0000

⁸⁵ Based on \$60k/yr 2018 state and federal tax calculator <https://www.taxformcalculator.com/state-tax/minnesota/60000.html>

⁸⁶ MN Statute § 298.75, Aggregate Material Removal; Production Tax, 2019. Available online: <https://www.revisor.mn.gov/statutes/?id=298.75>.

(1) 42.5 percent to the county road and bridge fund for expenditure for the maintenance, construction and reconstruction of roads, highways and bridges;

(2) 42.5 percent to the general fund of the city or town in which the mine is located, or to the county, if the mine is located in an unorganized town, to be expended for maintenance, construction and reconstruction of roads, highways and bridges; and

(3) 15 percent to a special reserve fund which is hereby established, for expenditure for the restoration of abandoned pits, quarries, or deposits located within the county.

If there are no abandoned pits, quarries or deposits located within the county, this portion of the tax is used for any other unmet reclamation need or for conservation or other environmental needs. In the past, the County and Township have collected aggregate tax from the limestone and sand and gravel operations located on the Site. Aggregate tax revenue from the Project Area represents over 1/3 of the total aggregate tax revenue collected within the entire County (based on 2017 reports). Table 3.20-2 indicates the annual aggregate tax paid to the County and Township since 1983 from limestone production.

Table 3.20-2 Aggregate Production Tax Paid by Proposer

Year	Total		Year	Total
1983	\$45,445.05		2001	\$88,003.06
1984	\$37,711.38		2002	\$90,748.27
1985	\$30,790.62		2003	\$92,117.24
1986	\$75,889.80		2004	\$91,678.81
1987	\$71,797.74		2005	\$89,273.01
1988	\$64,188.81		2006	\$88,795.45
1989	\$90,310.91		2007	\$60,735.70
1990	\$90,648.45		2008	\$42,461.68
1991	\$70,377.41		2009	\$70,326.37
1992	\$89,796.43		2010	\$65,797.98
1993	\$90,524.52		2011	\$71,970.11
1994	\$92,260.29		2012	\$71,655.69
1995	\$90,928.18		2013	\$82,791.32
1996	\$102,390.83		2014	\$99,095.61
1997	\$103,841.95		2015	\$112,452.86
1998	\$94,292.47		2016	\$109,251.43
1999	\$88,897.40		2017	\$109,663.62
2000	\$80,449.02		2018	\$91,053.51
		TOTAL	\$2,938,412.98	

Almost \$3,000,000 in aggregate taxes have been paid to date. Future mining is anticipated to generate aggregate tax revenue from sand and gravel, limestone and sandstone. Based on the total volume of aggregate resource estimated to be remaining at the Site, the potential future aggregate production tax over the life of the mine including sand and gravel, limestone and sandstone is estimated at over \$12,000,000.

3.20.2.3 Goods and Services

Outside services and parts and supplies will be purchased throughout the life of the Project. These goods and services will be purchased from a variety of local businesses including fabrication, grounds maintenance, fuel services, drilling and blasting, electrical, plumbing, heating, construction, etc. Subcontractors will be part of the daily plant operation at the Site. Many of the subcontractors currently supporting Bryan Rock's operations are locally owned businesses. It is anticipated that these local relationships will continue throughout the life of the Project.

Subcontractors performing work also purchase a portion of their goods and services locally. Based on Bryan Rocks experience of operating a quarry in the area and a review of their past hiring of subcontractors as well as information provided by TPS, a mining and mineral processing design build firm, each year the estimated amount of money spent on goods and services is anticipated to range from \$4,000,000-\$12,000,000. This includes general contractors, welding repair, retail building materials, fuel services, fabrication, electrical contractors, construction and mining machinery, conveyors and equipment manufacturers, HVAC and water/sewer system contractors, heavy construction, and engineering services. Quantification of the quantity of taxes generated from the use of outside contractors, goods and services is beyond the scope of this analysis.

3.20.3 Alternatives – Social and Economic Impacts:

There are no significant differences between the alternatives. Production is ultimately based on market demand which will drive the total volume of material removed from the Project Area.

3.20.4 Mitigation – Social and Economic Impacts:

No negative social and economic impacts are likely to result from the Project and therefore mitigation is not applicable.

4.0 Cumulative Potential Effects

The SDD identifies the following items to be addressed in the DEIS:

a) The EIS will identify and evaluate adjacent land uses that may contribute to a cumulative impact related to air emissions and air quality.

b) The EIS will identify and evaluate adjacent land uses (including one existing mining project, Shakopee Sands and one proposed mine Jordan Aggregates) that may contribute to a cumulative impact related to air emissions, air quality, noise, groundwater and traffic (road and rail).

c) The EIS will identify and evaluate potential cumulative impacts associated with the proposed Project and one other proposed mining project (Jordan Aggregates) located along the Minnesota River within the County, including specifically potential cumulative impacts associated with groundwater and surface water resources as well as those that may result from the additional rail or truck traffic associated with these projects.

[This item is no longer applicable. The Jordan Aggregates project, a proposed sand and gravel mine site located approximately 3.5 miles south of the Project, ultimately was not permitted. There are currently no plans for the project to proceed.]

d) The EIS will identify and evaluate potential cumulative traffic impacts from existing entertainment uses on the Site, expanding mining operations proposed for the area and expanded reliance of rail transport of product from this mining operation and Shakopee Sand. The need for improvements to the Union Pacific Railroad and associated crossings within Scott County will be assessed.

Cumulative potential effects result when the effects of the Project are added to or interact with effects on the environment from other land uses or planned projects. The cumulative effects analysis focusses on the combination of these effects, and any resulting environmental degradation.

4.1.1 Adjacent land uses that may contribute to a cumulative potential effect related to air emissions and air quality, noise, groundwater and traffic.

The EIS will identify and evaluate adjacent land uses that may contribute to a cumulative impact related to air emissions and air quality.

The EIS will identify and evaluate adjacent land uses (including one existing mining project, Shakopee Sands and one proposed mine Jordan Aggregates) that may contribute to a cumulative impact related to air emissions, air quality, noise, groundwater and traffic (road and rail).

The cumulative effects analysis predominantly evaluates proposed projects that may be planned within the environmentally relevant area that might reasonably be expected to affect the same environmental resources. In general, the rules specify that when analyzing the contributions of past projects to cumulative potential effects, it is sufficient to consider the current aggregate effects of past actions through an evaluation of existing conditions. However, in some instances detail of contributions from past projects may be necessary to fully describe cumulative effects. This is the case of Shakopee Sands, an existing operation where specific details of its contributions to traffic and air are included in the cumulative potential effects evaluation.

The Scoping EAW specifically identified anticipated future projects that were reasonably expected to occur that could contribute to cumulative effects related to air emissions, air quality, noise, groundwater and traffic. These projects were located within the same environmentally relevant area and included both an existing sand mine (Shakopee Sands) and a proposed aggregate mine (Jordan Aggregates). After the Scoping EAW was prepared, a third silica sand mine (FML) with the potential for cumulative effects was proposed and so it too was to be included in the cumulative effects analysis. In addition, the Renaissance Festival, operating within Project Area is to be included in the cumulative traffic analysis.

Subsequently, the Jordan Aggregates project was denied a permit and the FML project did not proceed with completing environmental review or permitting. Ownership of the Shakopee Sands site was transferred to Covia, (formerly Unimin) the operator of the silica sand mines in Le Sueur County. The Shakopee Sands Site is currently idled.

Because a substantial amount of time has passed since the Scoping EAW was prepared, the proposer was asked to identify any other projects that have been proposed which should be included in the cumulative potential effects analysis. Future projects to be considered must be expected to affect the same environmental resources and must be considered to be reasonably likely to occur. One potential future project was identified. The Shakopee Mdewakanton Sioux Community (SMSC) is looking at potential sites to construct an Organics Recycling Facility (ORF). One potential site is located in the northern portion of the Malkerson Sales property within the Project Area. Anticipated cumulative potential effects would be related to traffic.

Minn. Rules 4410.0220 Subp. 11a defines cumulative potential effects as those that are actually planned or for which a basis of expectation has been laid. The Minnesota Environmental Quality Board has issued guidance with respect to determining whether a project is:

1. reasonably likely to occur; and whether or not
2. sufficiently detailed information is available about the project to contribute to the understanding of cumulative potential effects.

EQB's guidance document Guide to Minnesota Review Rules May 2010⁸⁷ provides the following as sources of information that should be reviewed relative to this question.

1. Whether any applications for permits have been filed with any units of government; (note that this includes units of government other than the RGU);
2. Whether detailed plans and specifications have been prepared;
3. Future development indicated by adopted comprehensive plans, and zoning or other ordinances;

⁸⁷ May 2010, Guide to Minnesota Environmental Review Rules , produced by staff of the Environmental Quality Board. Retrieved on line at <https://www.eqb.state.mn.us/sites/default/files/documents/Guide%20to%20MN%20ER%20Rules-May%202010.pdf>

4. Historic or forecasted development trends; and

5. Any other factors found to be relevant by the RGU (one possible example might be the status of funding for the project).

Permit applications have not been filed with the County or the MPCA for the ORF. A concept ORF site plan and concept industrial plat has been shared with the public in order to give a general idea of the project layout, however, it has been noted that changes to the ORF project design plans and industrial plat plan are being considered.

The second half of the test is whether sufficiently detailed information is available about the project to contribute to the understanding of cumulative potential effects. Note that the rule states that this half of the test only needs to be applied if the first half is met. The EQB Guidance states that “This half of the test reflects the fact that identifying cumulative potential effects is not some academic exercise, but rather a practical effort to predict potential environmental effects as accurately as possible.” In this case, information regarding traffic has not been developed or submitted to the County. There is no information available on which to conduct a meaningful evaluation.

The EQB guidance document goes on to state “If in a given case it appears to the RGU that a certain other project is “reasonably likely to occur” but very little specific information is available about its potential impacts, then that project would fail this half of the test and not be considered to have a basis of expectation laid for it; thus, it would not be considered when the cumulative potential effects are evaluated.”

The potential cumulative effects are limited to traffic. The ORF has met with MnDOT, the County, and Township to discuss access to the site. Detailed information was not presented but it was noted that trips would be distributed throughout the day with the majority occurring off-peak and weekends. Representatives from the SMSC have indicated that if their project proceeds, they will complete a traffic impact study as part of the permitting process which will detail the proposed traffic, including traffic from the proposed mine activity and from Commercial Asphalt’s plant to the north of the Malkerson Sales access to TH 41. Recommendations by the County would be to include the proposed lots from the plat in the traffic impact study. As a part of the platting process a traffic study may be requested by the County as per section 5.3.2 in the Scott County Zoning Ordinance. The SMSC traffic impact study will be used to inform the design of intersection improvements that may be associated with the ORF project. Representatives from the SMSC have also indicated to the RGU that they would pursue a voluntary Environmental Assessment Worksheet if they proceed with their permitting work. Cumulative potential effects is a specific required section within the EAW. Traffic and any other potential cumulative effect from the Project and the ORF as well as any other projects that are reasonably likely to occur would be appropriately studied at that time.

4.1.2 Identify and evaluate adjacent land uses that may contribute to cumulative air emissions and air quality effects:

Three potential nearby sources were evaluated for this analysis due to their proximity to the Project:

- Fairmount Santrol's (now Covia) Shakopee Sand facility (Shakopee Sand) located one mile south of the Site along Highway 169,
- Jordan Aggregates, a proposed sand and gravel mine located over three miles south of the Site, and
- Fairmount (FML Sand, LLC's now Covia) proposed silica sand facility located immediately southwest of the Site.

The Shakopee Sand facility is currently idled, but site operations are permitted under Air Permit 13900120-3. Shakopee Sand was required to conduct air monitoring during their initial years of operation to demonstrate compliance with ambient air standards at their property line. Although this is an existing land use, the detail of specific contributions from this facility was modeled to fully evaluate cumulative effects.

The Jordan Aggregates Facility was a proposed sand and gravel mine at the time the scoping EAW was published. The Jordan Aggregates Site was ultimately denied an IUP from the County and will not contribute to cumulative effects. The decision on the permit came after the cumulative effects air analysis was performed and therefore the Jordan Aggregates project was included in the cumulative effects on air emissions and air quality analysis. Including the Jordan Aggregates project even though it was not built does not meaningfully effect the conclusions.

The FML Sand Site was in the process of preparing a scoping EAW when the scoping EAW for this Project was prepared. It was anticipated that due to the proximity of the Site and the similar types of potential environmental effects that this proposed land use would be included in the cumulative effects analysis for the Project. However, the FML project has not moved forward and there have not been submittals of any kind to the County since the scoping EAW was prepared in 2015. Permit applications, plans, specifications, or pertinent project details necessary to evaluate air emission cumulative effects are not available. The FML project was therefore not considered in the evaluation of cumulative effects prepared for the Project.

Potential cumulative effects resulting from the combination of the Project and these adjacent mines are presented in Section 3.14.3. and are summarized below.

Cumulative potential effects to air quality were evaluated by using dispersion modeling tools that consider potential emissions from the proposed Project and the other nearby sources as well as regional/background sources. The primary source of emissions is fugitive dust (PM10 emissions) generated from mining activities (stockpiling, loading/unloading, and unpaved road vehicle traffic). Air impacts from fugitive dust emissions are proven to be localized and driven by wind speed and wind direction. The predominant wind directions were evaluated in the cumulative analysis and the areas of overlap were found to occur north of the Merriam Junction Sands property or south of the Jordan Aggregates property. The results show maximum impacts southeast of Shakopee Sands

Predicted 24-hour PM10 maximum concentrations southeast of Shakopee Sands are between 7-10 ug/m³. This is below the ambient air 24-hour state and federal standard of 150 ug/m³. The analysis

also predicted that both the 24-hour and annual PM_{2.5} impacts southeast of Shakopee Sands will be less than the state and federal ambient air quality standards (24 hour 35ug/m³ and annual 12 ug/m³).

Cumulative effects from the combined adjacent mining sources of criteria pollutants show full compliance with federal and state ambient air standards (NAAQS and MAAQS). The air emissions analysis concludes that the additional mining facilities evaluated in the cumulative analysis are unlikely to overlap impacts with any significance due to the meteorological wind patterns, distances between facilities, and the localized impacts of each facility.

4.1.3 Identify and evaluate adjacent land uses that may contribute to cumulative noise effects:

Adjacent land uses that may contribute to cumulative effects includes noise associated with the adjacent US 169 highway corridor. The existing mining activities occurring on the Site itself were evaluated as part of the Project impacts. Potential cumulative effects resulting from the combination of the Project and the highway noise are summarized in Section 4.2.2 below.

Background sound levels associated with the US 169 corridor were collected for daytime and nighttime hours. The predicted sound levels were added to the background sound levels at each of the residential receptors included in the noise analysis that are located along US 169 corridor.⁸⁸

The analysis shows that the cumulative sound levels produced by both the highway and the proposed mining and processing operations meet daytime standards at all of the receptors, except H1, H2 and H8. Receptors H1, H2 and H8 were located immediately adjacent to US 169. Sound levels at these locations from highway noise alone exceed the daytime standards. These three houses were purchased by the County as part of the frontage road improvements and have been or will be demolished as part of the construction project. Table 4.1 identifies the average predicted sound levels from the mining and processing operations, the measured sound levels from the highway and the cumulative predicted sound levels at the residential receptors for each alternative. Predicted cumulative sound levels meet daytime standards for all remaining residential receptors.

Nighttime operations used in the cumulative effects analysis for nighttime operations assumed shielding of the sandstone crusher on the barge. The analysis shows that cumulative sound levels produced by both the highway and the proposed mining and processing operations are within 3 dBA of the nighttime noise standard of 50 dBA at all of the residential receptors except receptor H6 in Alternative 2 which predicts a cumulative sound level of 53.2 dBA. Modelled sound levels that are within 3 dBA of a standard are not considered to be a significant impact because of the conservative nature of the modeling which assumes downwind sound propagation, regardless of source direction from receptors, and simultaneous mining and processing operations by all sources in each phase. Table 4.2 identifies the average predicted sound levels from the mining and processing operations, the measured sound levels from the highway and the cumulative predicted sound levels at the residential receptors for each alternative.

⁸⁸ Receptors at locations H1, H2 and H8 were removed from the analysis because these houses were purchased from the County and have been or will be demolished as part of the current frontage road project along US 169.

Mitigation: Shield crusher on barge for nighttime sandstone crushing operations.

Table 4.1- Predicted Daytime Cumulative Noise Effects

Unshielded sandstone mining and processing and transition drilling – Average all levels by phase							
Alt	H3	H4	H5	H6	H7	H9	H10
A1	49.8	50.9	51.8	54.9	54.4	53.6	42.9
A2	46.8	49.8	51.6	55.3	54.8	45.4	44.3
A3	42.0	45.3	47.7	52.6	51.6	42.1	39.1
A4	49.0	48.7	48.5	50.5	49.7	42.4	40.8
A5	44.8	46.5	47.9	51.8	51.0	42.1	42.9
A6	42.0	44.7	47.4	52.8	52.2	42.1	39.9
Average Daytime L50 levels associated with US 169							
	49.9	49.8	49.4	49.5	50.1	45.8	51.8
Cumulative Totals - Daytime L50 standard = 60 dBA							
A1	52.9	53.4	53.8	56.0	55.8	48.7	52.3
A2	51.6	52.8	53.6	56.4	56.1	48.6	52.5
A3	50.6	51.1	51.6	54.3	53.9	47.3	52.0
A4	52.5	52.3	52.0	53.0	52.9	47.4	52.1
A5	51.1	51.5	51.7	53.8	53.5	47.3	52.3
A6	50.6	51.0	51.5	54.4	54.3	47.3	52.0

Table 4.2- Predicted Nighttime Cumulative Noise Effects

Shielded sandstone mining and processing – Average all levels by phase							
Alt	H3	H4	H5	H6	H7	H9	H10
A1	48.9	48.8	48.4	51.5	50.2	41.4	39.6
A2	44.6	46.7	47.8	52.5	51.0	41.1	42.1
A3	38.6	41.9	44.1	50.2	48.7	37.8	34.7
A4	48.4	47.7	46.1	45.6	44.3	38.8	37.9
A5	43.3	44.7	45.1	48.5	47.0	38.3	41.2
A6	38.8	41.7	44.0	50.2	48.8	37.7	34.8
Average Nighttime L50 levels associated with US 169							
	45.7	45.6	45.2	45.3	45.8	41.7	46.9
Cumulative Totals - Nighttime L50 standard = 50 dBA							
A1	50.6	50.5	50.1	52.4	51.5	44.5	47.6
A2	48.2	49.2	49.7	53.2	52.1	44.4	48.1
A3	46.5	47.1	47.7	51.4	50.5	43.2	47.1
A4	50.3	49.8	48.7	48.5	48.1	43.5	47.4
A5	47.7	48.2	48.2	50.2	49.4	43.3	47.9
A6	46.5	47.1	47.6	51.4	50.6	43.1	47.1

4.1.4 Identify and evaluate adjacent land uses that may contribute to cumulative groundwater quality effects:

Adjacent land uses that may contribute to groundwater quality cumulative effects consists of the Louisville Landfill. The Louisville Landfill is a closed unlined landfill that is associated with downgradient groundwater quality impairments. Two different aspects of potential cumulative effects associated with the Project and the Louisville Landfill were evaluated. The first was cumulative effects related to downgradient water quality and downgradient water users resulting from overlapping of the Project's proposed dewatering activity and the landfill's area of inferred groundwater impairment. The second was the potential for the creation of end use lakes in the reclamation condition to alter the flow path of groundwater within the landfill's inferred area of impairment to provide a contaminant flow path to future hypothetical municipal wells during normal and drought conditions. The evaluations were presented in Sections 3.1.2 and Section 3.5.2.2 of the DEIS and detailed in Appendix B and C of Attachment 1 - Groundwater Modeling of Mine Plan Alternatives Predictive Simulations Report. The cumulative effects evaluations and results are summarized below.

The Louisville Landfill is located just north of the Bryan Rock property and just east of the central portion of the Malkerson Sales property. Routine groundwater monitoring detected the presence of groundwater contamination and a remedial investigation was conducted in 1987. VOCs were found in the groundwater sampled along the western edge of the landfill and low levels of 23 VOCs were found in off-site downgradient wells. The Louisville Landfill was covered with an enhanced cover and a landfill gas extraction system in 2003. Concentrations of most contaminants in the groundwater have declined since that time but downgradient monitoring wells continue to detect low levels of VOCs.⁸⁹

Groundwater flows from the landfill westerly across the Project Area and discharges into the Minnesota River. Concentrations of contaminants are expected to decrease due to natural attenuation (dispersion, adsorption, biodegradation, etc.) as it moves across the Project Area from the landfill to the river.

⁸⁹ The Louisville Landfill capture analysis was based on review of water quality data from the monitoring period 2007-2015. Since that time the MPCA has conducted additional monitoring as part of their on-going monitoring responsibilities of the closed landfill. The analysis was based on an average concentration of vinyl chloride in wells W-9 and DC-117 117 of 1.36 ug/l. There have been five events that have sampled for vinyl chloride in W-9 and DC-117 since 2015. DC-117 was non detect in two of those events. For the three events where vinyl chloride was detected in both wells, the average concentration was always lower than the average concentration used in the capture analysis. The averaged concentrations ranged from 0.54 ug/l to 1.30 ug/l with the lowest average occurring at the most recent 5/13/2019 sampling event. The recent monitoring results are similar enough to the concentrations used in the analysis that conclusions are still valid.

4.1.5 Cumulative effects evaluation of inferred groundwater impairments associated with the Louisville Landfill:

A landfill capture analysis was conducted that evaluated whether the proposed dewatering activities through post-mining reclamation would change the observed concentrations in groundwater or might somehow place other receptors at risk. The conclusion of the analysis is that the main effect of mining activities (dewatering and creation of end use lakes) will be to move contaminants from the inferred area of groundwater impact into the mining areas while reducing their concentrations in every scenario relative to what they would otherwise be in groundwater. There are no known receptors that would be exposed by moving the contaminants into the dewatering areas.

The analysis concludes that the Project will have no significant adverse environmental impacts related to the existing groundwater impairments associated with the Louisville Landfill. The basis for these conclusions is as follows:

- For contaminants of concern with concentrations that have been determined to be below a regulatory standard, it can be concluded that the Project will not create any additional negative environmental effect as dewatering from mining will further dilute that concentration and it will be found at lower concentrations than are currently present. No further evaluation was performed.
- For vinyl chloride, the one contaminant that is currently at concentrations that exceed the health based standard, dewatering reduces the concentrations reaching dewatered areas. In every alternative the Project results in reduced concentrations of contaminants reaching the dewatering areas and mine pit lakes compared to the current concentrations in the impacted area near the Landfill.
- The Project will not cause an increased risk to adjacent water supply wells by modifying contaminant transport from the landfill. There are no water supply wells currently located downgradient of the Landfill. The nearest potable water supply wells that may be impacted due to changing flow directions induced by dewatering activities include the two Renaissance Festival wells located to the southwest of the Landfill and the stable well located northwest of the Landfill. There is no risk to these wells because the proposed dewatering will only affect the migration of contaminants in the Jordan Aquifer that is being mined. The existing wells are cased through the Jordan Aquifer and are separated by a confining unit. Municipal water supply wells and drinking water supply management areas are located well outside of the Project Area and there are no plans to use the mine pit lakes as potable water supplies.
- The Project will not increase the migration of existing groundwater contaminants into lower portions of the Jordan Aquifer in any of the Alternatives. As an area is dewatered, groundwater is drawn from the surrounding area towards the dewatering pit. Dewatering is proposed to be limited to the upper portion of the Jordan Sandstone. As a result, dewatering increases the upward gradient in the lower portions of the Jordan Sandstone and will not increase the migration of existing groundwater contaminants to deeper portions of the aquifer.

4.1.6 Cumulative effects evaluation of end use lakes and future municipal well operations:

A municipal well capture analysis was conducted to determine if the end use lakes would have an impact on or limit future potential municipal well locations based on a hypothesis that higher transmissivity flow through water in the lake than in the native sandstone could create a preferential pathway for contaminants to reach a future municipal well.

The City of Shakopee Public Utilities Commission (SPUC) was consulted regarding potential future water supply to determine the most likely location of future municipal well locations and pumping capacities to serve western Shakopee and Jackson Township. Louisville Township does not currently have plans to install a municipal well so the simulated well location was chosen based on input from SPUC and Scott County with the future well location east of the bluff and near the center of the Township, screening the well in the Jordan aquifer, and avoiding the area immediately upgradient of the Louisville Landfill, which would be a generally accepted and prudent practice regardless of whether the Project were completed while planning the hypothetical municipal well.

Steady-state pumping rates for the future municipal wells were set to pump at an average rate of 600 gpm, and the well in the Tunnel City Group aquifer was set to pump at an average rate of 200 gpm. The analysis was also run under drought conditions which included an adjustment that accounted for a 25% increase in municipal water use and a decrease in groundwater levels consistent with the 1988-1999 drought.

The results of the simulations demonstrate that the capture radius for the future wells is distant from and entirely outside of the end use lakes. Pumping of the future municipal wells will not impact groundwater flow patterns near the end use lakes and the future municipal wells will not draw water from the end use lakes under normal or drought conditions. Based on the model simulations, the presence of the Project's end use lakes next to the Louisville Landfill will not affect the water quality of future municipal supply wells and the Project will not result in any additional restrictions on the location of the future municipal wells.

4.1.7 Identify and evaluate adjacent land uses that may contribute to cumulative groundwater quality effects:

Nearby land uses that may contribute to cumulative groundwater quantity effects include the adjacent Shakopee Sands Site. Other existing facilities within the area of overlapping effects are assumed to be fully incorporated into the simulations as part of the groundwater model development. Potential cumulative effects resulting from this land use were analyzed in Section 5.5 of Attachment 1 - Groundwater Modeling of Mine Plan Alternatives Predictive Simulations Report and are summarized below.

The method of evaluating cumulative impacts was to consider the range of all effects on the resource. To simplify the evaluation, only the most extreme pumping stresses were considered and the extent of groundwater pumping effects for each were considered in aggregate:

- Maximum extent of aquifer drawdown from the mine simulations

- Reported extent of pumping influence from permitted mine operations (Shakopee Sands) within two miles of the proposed project

The Shakopee Sand mine does not dewater. The only water used in the operation is consumption of make-up water for its wash operation and the mine does not dewater. Groundwater level monitoring data collected during active operations at the Shakopee Sands mine (Barr Engineering Co. 2016) indicate that the effects of the mine's groundwater use do not extend off the mine's property. The maximum extent of dewatering impacts modelled for all of the phase/alternative combinations were evaluated and none of the scenarios predict interference effects that extend to the Shakopee Sands property.

Because none of the predicted operational and long-term effects extend far enough off-site to areas where there are known or potentially high capacity groundwater users, there is no potential for significant cumulative effects related to groundwater use from the Project.

4.1.8 Identify and evaluate adjacent land uses that may contribute to cumulative traffic (road and rail) effects:

The EIS will identify and evaluate potential cumulative traffic impacts from existing entertainment uses on the Site, expanding mining operations proposed for the area and expanded reliance of rail transport of product from this mining operation and Shakopee Sand. The need for improvements to the Union Pacific Railroad and associated crossings within Scott County will be assessed.

Adjacent land uses that may contribute to cumulative traffic effects that were evaluated include the Shakopee Sands site and the Minnesota Renaissance Festival. The Shakopee Sand site generates a limited amount of truck traffic and utilizes rail as the predominant mode of transporting sand from the mine to market. The Renaissance Festival operates seasonally generating traffic within the Project Site. To analyze cumulative potential effects related to traffic and rail, SRF reviewed environmental documents for adjacent land uses. Trip generation estimates were compared to background growth rates previously assumed in TIS. The adjacent projects analyzed included: Shakopee Sand, formerly Great Plains Sands (GPS); Jordan Aggregates; Minnesota Valley Sands (MVS); and the Minnesota Renaissance Festival. The analysis is presented in SRFs Traffic Study Addendum dated May 26, 2016 (Attachment 9). Since the analysis, the Jordan Aggregates and MVS sites did not proceed. The traffic generated from these projects that was added to the analysis will not be generated so the results of the analysis are conservative but still relevant.

Environmental documentation that was referenced for the adjacent projects included:

- Great Plains Sands (GPS) IUP Expected Traffic Description
- Jordan Aggregates Traffic Technical Report
- Minnesota Valley Sands Scoping EAW

Based on these reports and previous information in the TIS, daily and peak hour expected trips were combined in order to compare to the background growth rate assumed in the TIS. These adjacent land uses to the Merriam Junction Sands are located along Valley View Dr and 145th St W. As with

the Merriam Junction Sands TIS, most of these trips from adjacent development use Hwy 169/145th St W and TH 41/Valley View Dr Intersections to access the regional network.

Truck and employee trip generation estimates analyzed for adjacent land use to the MJS facility. Daily and weekday peak hour trips were compared to the background growth assumed in the TIS.

Table 4.3 Trip Generation Estimates (Daily and Peak Hour) of Adjacent Projects

Daily Traffic	MJS (comparison)	Adjacent Land Uses			Total
		Great Plains Sand	Jordan Aggregates	Minnesota Valley Sands	
Employees	278	74	20*	20*	114
Trucks	1,396	38	220*	150*	408
Vehicle Trips	1,674	112	240*	170*	522
Railroad Cars (90-110 Tons)	-	23	0*	100*	123

*The Jordan Aggregates and Minnesota Valley Sands projects did not proceed. The traffic generated from these projects that was added to the analysis will not be generated, therefore the results of the analysis are conservative but still relevant.

Peak Hour Traffic	MJS (comparison)	Adjacent Land Uses			Total
		Great Plains Sand	Jordan Aggregates	Minnesota Valley Sands	
Employees	41	20	10*	10*	40
Trucks	140	10	22*	15*	47
Vehicle Trips	181	30	32*	25*	87
Railroad Cars (90-110 Tons)	-	-	-	-	0

*The Jordan Aggregates and Minnesota Valley Sands projects did not proceed. The traffic generated from these projects that was added to the analysis will not be generated, therefore the results of the analysis are conservative but still relevant.

Table 4.4 Daily Trip Generation Evaluation

Roadway Segment	Existing AADT Volume	Year 2026 No Build AADT Volume	Background Growth (daily trips assigned)	Adjacent Land Use (daily trips assigned)	Percentage of Background Growth
TH 169 N of TH 41	29,500	32,450	2,950	372	13%
TH 169 S of TH 41	28,000	30,800	2,800	93	3%
TH 41 W of TH 169	18,400	20,240	1,840	46	2%
Chestnut Blvd E of	4,650	5,115	465	11	2%

Results of the trip generation comparison shown in Table 4.4 indicate that trip generation of the adjacent land use is expected to be covered in the assumed background growth in the TIS. The largest impact of the trip generation is to Hwy 169 north of TH 41, but this impact is only about 13% or the assumed background growth in the TIS. With the removal of the Jordan Aggregates and MVS traffic from the analysis, the percentage of growth is less than forecasted in Table 4.4 above.

The potential impacts of the weekday daily and peak hour trips from the adjacent developments to the Merriam Junction Sands mining and processing facility will be minimal. Daily and peak hour vehicle trips generated will be less than 522 and 87 vehicles respectively and can both be absorbed into the background growth assumed in the Traffic Impact Study.

As concluded in the TIS, the LOS at the TH 169/TH 41 intersection will be unacceptable by the year 2026 no build conditions indicating the need for longer range improvements. These improvements have been funded and the improvement project is underway with an expected completion date of late fall 2020.

Minnesota Renaissance Traffic: The Minnesota Renaissance Festival was analyzed due to the amount of traffic that the event generates. The traffic is primarily only on weekends from late August through early October. Annual attendance reaches approximately 300,000. The majority of traffic related to the Renaissance Festival is generally constrained to weekends and does not affect weekday peak hour analysis. The Renaissance Festival has its own traffic control through a series of one-way approaches. Because the majority of the festival traffic does not overlap with Project related traffic, cumulative effects are minimized. However, some limestone and sand and gravel hauling does occur on Saturdays and sandstone hauling is planned to be allowed on weekends as well. The operators can regulate their weekend trips to avoid the peak hours of Renaissance Festival traffic with most deliveries completed in the morning. The Renaissance Festival is planning on relocating from the

Project Area at the end of 2020 and any cumulative effects that may exist will not be permanent or irreversible and are not considered significant.

Sever's Festival: Since the SDD was prepared for the Project, a fall festival relocated within the vicinity. The Environmental Assessment Worksheet prepared for the Sever's Festival included cumulative impact analysis and evaluated the potential cumulative effects of the Renaissance Festival because it is a nearby weekend attraction. Truck traffic generated by current aggregate hauling operations was included in the Sever's traffic impact analysis as part of existing conditions. Sever's Festival is a weekend venue with only a few weekends overlapping with the Renaissance Festival. Since the Minnesota Renaissance Festival's attendance peaks in middle to late September and Sever's Festival's attendance peaks middle to late October, it was concluded that there would not be a long-term significant cumulative traffic impact associated with Sever's Festival and the Minnesota Renaissance Festival. The conclusions regarding the potential impact of the Renaissance Festival Operations on the Project are therefore not impacted by Sever's Festival.

Rail: Cumulative effects of the Project and the Shakopee Sands facility on rail traffic was evaluated. The Shakopee Sands facility also ships the majority of their finished product by rail. Both sites are situated on the UP mainline. The Shakopee Sand site has a rail loadout facility and siding tracks. The Shakopee Sand mine is estimated to produce an average of 600,000 tons per year. The Shakopee Sand mine builds strings of approximately 15-30 cars which are picked up from the facilities siding tracks and brought to marshalling yards in Shakopee or Mankato. At the marshalling yards, the cars are built into unit trains and sent to final destinations. A production level of 600,000 tons per year results in about one unit train per week.

Full build out of the Project will result in four to five additional trains per week. According to information from the Minnesota Department of Transportation's Office of Freight and Commercial Vehicle Operations, published in January 2015⁹⁰ the Twin Cities Area Freight Railroad Map indicates that the line rail line from Merriam Junction south to Mankato has a volume of five trains per day and the Shakopee leg is also five trains per day. Train traffic from Shakopee Sands is accounted for in this estimate as the facility began operation in 2013.

A number of federal laws control railroads including the Interstate Commerce Commission Termination Act of 1995, the Federal Railroad Safety Act of 1970, and the Noise Control Act of 1972. Train traffic is dictated by supply and demand of the general freight industry which must comply with federal regulations. The most significant impact of increased rail traffic is at rail crossings which have the potential to block traffic at rail crossings. Regulations allow the lawful maximum blocking time of 10 minutes and are not considered to represent a regularly occurring traffic delay. Delays associated with the Project at TH 41 are expected to be 5.60 minutes and at the 145th Street crossing to be 3.03 minutes, both well under the federal regulation. It should be noted that the above calculations are based on 100 car unit trains. Changes in the rail industry that may result in longer or shorter train lengths that may result in somewhat different intersection blocking times, however, the lawful crossing blocking time must always be met.

⁹⁰ Available on line at <https://www.dot.state.mn.us/ofrw/maps/MetroRailMapLarge.pdf>

5.0 Mitigation

Section 3.0 provided information about the extent of potential environmental impacts, covering in detail 20 individual topics identified in the SDDD. Potential measures to reduce impacts were developed and presented at the end of each topic as applicable. This section summarizes these measures. It is intended to be used as a guide for decision makers and permit writers.

5.1 Land Use

Three specific aspects of land use were evaluated in the EIS as identified in the SDD relating to existing groundwater quality impacts associated with adjacent land uses, land use in the areas adjacent to the Project, and planned end use of the Project. The following measures could be considered by permitting authorities to reduce potential impacts related to land use:

Existing groundwater quality impacts associated with adjacent land uses

- a) The Project will dilute and therefore reduce the concentration of contaminants in the groundwater downgradient of the Louisville Landfill. There are currently no potable water supply sources located downgradient of impacted groundwater. If future water supply sources are established downgradient of the impacted groundwater water quality testing is recommended. The MPCA is the responsible party for the closure and post closure care of the Louisville Landfill. This includes groundwater monitoring associated with the landfill.

Land use in the areas adjacent to the Project (Renaissance Festival)

- b) Continue to limit aggregate hauling by truck from the Site during peak traffic periods on Renaissance Festival days while the festival is operating at its current location.

Planned end use of the Project

- c) Comply with performance standards established in Chapter 10 of the Scott County Zoning Ordinance.
- d) Approve a Reclamation Plan that incorporates progressive reclamation of the site to open space and natural areas as well as potential future development as the Site transitions from mining uses to final uses.

5.2 Cover Types

One measure that may reduce or eliminate potential cover type impacts was identified:

- a) Require a Reclamation Bond to provide certainty of Site stabilization and development of the proposed land covers associated with the approved Reclamation Plan.

5.3 Fish, Wildlife, and Ecologically Sensitive Resources

The Project avoids the majority of the contiguous natural habitat which is located along the western edges of the Site. The following measures have been incorporated into the Project to reduce environmental effects related to wildlife and ecologically sensitive resources.

- a) Maintain 75 feet of existing second growth forest along the eastern edge of Gifford Lake to maintain bat colony roosting and foraging habitat adjacent to the open water.
- b) No lighting of the tree line along Gifford Lake
- c) If in the future, if a northern long eared bat hibernaculum or maternity roost trees are identified within the area, follow USFWS regulations regarding tree removal during pup rearing season.
- d) Keep mining and processing activity at least 660 feet from known eagle nests during the nesting season (late January through late July).
- e) Maintain vegetative buffer along wetland complex.
- f) Reclaim the Site in accordance with the Reclamation Plan incorporating provisions to separate regional stormwater flows from the end use lakes and revegetation of upland areas including native grasses along the western and southern perimeter of the Site.

5.4 Physical Impacts on Water Resources

To reduce the potential for impacts to surface water and groundwater levels the following mitigation measures are proposed.

- a) Develop mitigation options to replenish water supply to seepage wetland. Mining is progressive, starting with a very small dewatering area and very low dewatering rate so that changes to water levels will occur gradually. Mitigation options are expected to vary as to phase and extent of dewatering progress across the mine site and may include:
 - Direct discharge
 - Drip Irrigation
 - Exfiltration Trench
 - Infiltration Cell or Basin
 - Infiltration with Cutoff Wall
- b) Implement a Water Level Monitoring Plan

5.5 Water Use

To reduce the potential for impacts to water use the following mitigation measures are proposed.

- a) Implement a Water Level Monitoring Plan
- b) Offer well agreements to well owners within the five-foot drawdown contour.

5.6 Water Related Land Use Management District

To reduce the potential for impacts to the water related land use management district, the following mitigation measures are proposed.

- a) Design buildings within the plant site to minimize height to the extent practical.
- b) Do not disturb existing vegetation between the limits of grading of the plant site and the shoreline of Gifford Lake.

5.7 Erosion and Sedimentation

The following measures will reduce potential impacts from erosion and sedimentation.

- a) Operate the Site in compliance with the NRP approved by the County in conjunction with land use permits for the Project.
- b) Develop the Site utilizing BMPs designed to minimize the potential for erosion and sedimentation, thereby protecting adjacent surface waters.
- c) Operate the Site under an MPCA NPDES stormwater permit and a site specific SWPPP.
- d) Review and update the SWPPP at least annually to reflect changes in Site conditions as a result of the progression of mining and reclamation activities
- e) Sample and monitor stormwater and dewatering discharges in accordance with the NPDES permit to verify compliance with intervention limits.

5.8 Water Quality: Surface Water Runoff

The following measures will reduce potential impacts to surface water runoff, thereby protecting surface water quality.

- a) Operate the Site in compliance with the NRP approved by the County in conjunction with land use permits for the Project.
- b) Construct and operate the Site utilizing BMPs designed to minimize the potential for erosion and sedimentation, thereby improving the water quality of surface runoff discharging from the Site.
- c) Promote infiltration of stormwater where feasible.

- d) Operate the Site in compliance with the MPCA NPDES stormwater permit and a site specific SWPPP.
- e) Review and update the SWPPP at least annually to reflect changes in Site conditions as a result of the progression of mining activity.
- f) Sample and monitor stormwater and dewatering discharges in accordance with the NPDES permit to verify compliance with intervention limits.
- g) Construct a stormwater conveyance channel designed to accommodate runoff accounting for future development of the upstream watershed through the Site.

5.9 Water Quality: Wastewater

The following measures will reduce potential impacts related to wastewater.

- a) On-site SSTS systems will be designed in accordance with State and County requirements. Portable sanitary waste containment systems will be used throughout the mine.
- b) Water treatment chemicals will be consistent with those commonly used in the treatment of drinking water. They will be used to maximize reuse of process water.
- c) End of season discharge of the process water will occur a minimum of 7 days after the last application allowing time for the reduction of any residual acrylamide monomer concentration.
- d) The end of season water treatment system will be discharged to an upland area of the Site. The discharge is contained and allowed to infiltrate and will be managed so that it is not directly to the mine lakes or surface water.
- e) Off-site discharges will be subject to best management practices including pretreatment, controlled outlet structure, and outlet energy dissipation.
- f) Dewatering discharge will be subject to MPCA NPDES permit and associated monitoring and reporting requirements and will include at a minimum, monitoring for acrylamide in the groundwater during at least the initial years of mining to illustrate no impact to groundwater. Monitoring conditions will be established as part of permitting.

5.10 Geologic Hazards and Soil Conditions

The following measures will reduce potential impacts related to geologic hazards and soil conditions.

- a) Maintain excavation and reclamation slopes presented in the slope stability analysis.
- b) Implement a groundwater quality monitoring plan.

- c) Develop and implement an SPCC Plan for the Site.

5.11 Solid Wastes, Hazardous Wastes, Storage Tanks

The following measures will reduce potential impacts related to solid waste, hazardous wastes and storage tanks.

- a) New tanks used to store petroleum products at the dry plant site will be double walled construction. All above ground storage tanks will comply with MPCA regulations.
- b) The Site will operate under a SPCC Plan developed to prevent spills, effectively control a release should a spill occur, and identify proper clean up and reporting protocols in the event of a spill.
- c) Flocculants will be used and managed in accordance with the NPDES permit.
- d) Implement a groundwater quality monitoring plan.

5.12 Traffic

The following measures will reduce potential impacts related to traffic.

- a) To alleviate long delays and queuing of left-turning heavy commercial trucks on the side-street approaches to TH 41 during a.m. peak hour conditions at the Malkerson Sales access, encourage drivers leaving the Malkerson Sales northern access to consider alternate routes that minimize or eliminate the need to make left-turns from the Site during peak periods. This may include routing silica sand truck traffic through the Site to the southern access onto 145th Street onto the west frontage road and CSAH 14 overpass.
- b) Limit hauling limestone, sand and gravel, and silica sand from the Site during high Renaissance Festival attendance on the Site, typically afternoons during the 5, 6 and 7th weekends in September and October each year.

5.13 Vehicle Related Air Emissions

The following measures will reduce potential impacts from vehicle related air emissions.

- a) Turn off engines when vehicles are stopped for more than a few minutes, especially around people. Do not idle near the air intake of a building.
- b) Retrofit engines with pollution control devices and or use cleaner burning fuel.
- c) When purchasing new vehicles, buy the lowest emitting vehicles available.

- d) Keep engines well-tuned and maintained.

5.14 Stationary Source Air Emissions

- a) Air Pollution Prevention: utilize industry standard pollution control technology.
- b) Minimize the use of diesel generators by using line power where practical. Bryan Rock has already converted much of the limestone processing plant operations to line power.
- c) Utilize processing controls as required to meet ambient air quality standards. More controls are required when the Festival Lease is in effect because the receptors are located within the Site in closer proximity to the sources of air emissions from the mining and processing operations.
- d) PM₄ Silica controls Comply with MSHA regulations regarding worker exposure to PM₄ Silica. In addition adopt the following measures to reduce silica dust exposure on-site:
 - 1. Implement and maintain a fugitive dust control plan;
 - 2. Medical surveillance program/disease reporting;
 - 3. Training and information to workers on crystalline silica;
 - 4. Availability of air and medical surveillance data to workers;
 - 5. Equipment maintenance program;
 - 6. Respiratory protection program;
 - 7. Isolated personal hygiene facilities, eating facilities, and a clothing change area;
 - 8. Record keeping;
 - 9. Housekeeping program;
 - 10. Construction safety and health program;
 - 11. Regulated areas/warning signs; and
 - 12. Provide workers with training that includes information about health effects, work practices, and protective equipment for respirable crystalline silica.
- e) Adopt a Fugitive Dust Control Plan
- f) Adopt an Ambient Air Monitoring Plan

5.15 Noise

The noise modelling assumed the following mitigation measures would be implemented into mine operations.

- a) Mitigation for Single Family Residential Receptors:
 - 12-foot high perimeter berm along the northern portion of Bryan Rock along US 169.

- 20-foot high perimeter berm along southern portion of Bryan Rock along US 169.
 - Shielding crusher on barge for nighttime operations under some Alternative/Phases.
- b) Mitigation for Mobile Home Park:
- 12-foot high berm along eastern perimeter of g2 sand and gravel mine.
 - Restricting sand and gravel mining and processing in g2 to daytime hours.
- c) Mitigation for Festival Campground:
- Restrict limestone mining and processing and sandstone mining and processing on BRP-N to daytime hours during periods of campground use.
 - Conduct additional noise modelling for cumulative effect of all proposed activities for the plant site on Bryan Rock property if campground is still active.
 - Eliminate overnight camping on the property.
- d) Conducting mining and processing operations in accordance with the setbacks established in the Scott County Zoning Ordinance;
- e) Broadband back up alarms on all company owned equipment;
- f) Circular routes for truck loading to minimize backing movements;
- g) Establish internal speed limits;
- h) Converting limestone processing plants to electricity;
- i) Operate noise producing equipment in recessed portions of Site as practical;
- j) Utilize mufflers and other standard noise reduction equipment;
- k) Any new equipment to be acoustically rated for noise generation and the ratings be considered in the final purchase decision;
- l) Longer strings of cars to reduce coupling and uncoupling noise;
- m) Uphill railcar loading;
- n) No locomotive horns in railyard; and
- o) Blast monitoring for ground vibration and airblast.

5.16 Nearby Resources

The following measures will reduce potential impacts to nearby cultural resources

- a) Maintain mining setbacks established per the Scott County Zoning Ordinance;
- b) Post warning and no trespassing signs along perimeter highwalls;
- c) Construct perimeter berms around active mine areas; and
- d) Reclaim mine site adjacent to public access areas according to the Reclamation Plan.

5.17 Visual Impacts

The viewshed analysis illustrates that the Project will not create significant visual impacts. Plant site components will be visible from only limited locations. Topographic shielding, existing vegetation and distance from key viewing areas all mitigate the potential for impacts to views. Mitigation of potential impacts from lighting include:

- a) Lighting used to illuminate non-daylight mining and processing activity should occur at recessed elevations of the mine, set below the surrounding grade. This will reduce the potential for light spill onto adjacent properties or viewsheds.
- b) Lighting will be equipped with shields to deflect light from areas where light is not needed or desired.
- c) Lighting units will be portable and adjustable and so can be adjusted should a nuisance condition is reported.
- d) Mining and processing setbacks established in the County Mining Ordinance will be observed allowing the dissipation of nighttime lighting to non-nuisance levels beyond the Site property line.

5.18 Compatibility with Land Use Plans

The following measures will reduce potential incompatibility with land use plans.

- a) Protect areas identified as suitable SSTS areas that have been identified to serve future development of the Project Area.

5.19 Public Infrastructure

There are no significant impacts to public infrastructure as a result of the Project and therefore public infrastructure mitigation is not needed.

5.20 Socioeconomic Impacts

No negative social and economic impacts are likely to result from the Project and therefore mitigation is not applicable.

6.0 Governmental Approvals

Scott County has identified the relevant local ordinances, permits and approvals which may be applicable to the proposed Project. Permit applications have not been submitted, but coordination and consultation with the appropriate jurisdictions has and will continue to occur.

Unit of Government	Type of Application	Status
U.S. Army Corps of Engineers	Section 404 Permit, Clean Water Act	To be applied for if required
Minnesota Pollution Control Agency	Discharge Permit (Water Quality Permit)	To be applied for if required
	Air Emissions Permit	To be applied for
	NPDES/SDS MN G490000 General permit for non-metallic	To be applied for
	Section 401 Water Quality Certification	To be applied for if required
Minnesota Department of Natural Resources	Amendment to existing Water Appropriations Permit or new Water Appropriations Permit	To be applied for
Minnesota Department of Health	Drilling/Sealing of Wells	To be applied for
Scott County	Interim Use Permit (IUP)	To be applied for
	Variance for height of buildings	To be applied for
	Conditional Use Permit for rail yard(s)	To be applied for if required
	Septic system, building permits, etc.	To be applied for
Scott Water Management Organization	Interim Use Permit Review Authority	To be applied for
Union Pacific Railroad	Approval of rail yard(s) design	To be applied for
Louisville Township	Wetland Conservation Act	To be applied for
Lower Minnesota River Watershed District	Grading permit, if applicable	To be applied for
State Historic Preservation Office	Section 106 Review	To be completed if federal permits are required

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Comment	Response
<i>Thom Boncher</i>	
Will mining take place below the water table?	Thank you for your comment. As discussed in the Section 1.0 Project Description of the EIS, mining will occur both above and below the water table.
Will the mining take place in a flood plain?	Thank you for your comment. No mining is proposed in the current floodplain of the Minnesota River. The current quarry floor has been mined below the elevation of the 100-year floodplain as part of on-going mining operations but is separated from the Minnesota River floodplain by topography. Currently as parts of the existing quarry floor are reclaimed, fill is placed, bringing the area back to elevations above the 100-year flood elevation. Sediment laden floodwaters have a high potential to deposit fine sediment, (mud, silts and clays) that negatively impact the quality of both construction aggregates and silica sand. Preventing floodwaters from entering the quarry is important to keep the materials produced within the required specifications. Any end use lake created as a result of the Project will be separated from the floodplain by topography so that floodwaters cannot enter the mining areas or the end use lakes. All mining will be performed to separate the mining operations from the regional floodplain and to maintain the regional surface water drainage system to the Minnesota River.
What will be done to protect groundwater?	Thank you for your comment. Section 3.10 and 3.11 of the EIS detail measures to protect groundwater quality. These measures include operating the site under a spill prevention and response plan, conducting routine groundwater quality monitoring as appropriate. In addition, the site will operate under the appropriate MPCA and MDNR permits related to the protection of groundwater and will be subject to on-going regulatory permitting as a requirement of approval.
<i>Ann Shelton</i>	

<p>Water level Well problems Water problems (testing)</p>	<p>Thank you for your comments. Section 3.5 of the EIS discusses water levels and potential well interference issues in detail. Section 3.5.4 provides specific information regarding monitoring and mitigation.</p>
<p><i>Bruce Enger</i></p>	
<p>-Well Water quality -River impact from mining sand -Aquifer impact used during sand mining process -Wildlife impact</p>	<p>Thank you for your comments. Well Water Quality: Section 3.5 of the EIS includes an evaluation of Well Water Quality is addressed in Section of the EIS. Groundwater flows from the mine area to the Minnesota River. There are no private water supply wells located between the mine site and the Minnesota River.</p> <p>Mn River impact from sand mining: Section 3.4 of the EIS includes an evaluation of potential impacts to adjacent surface water resources, including the Minnesota River. The Site will operate under a NPDES permit and a stormwater pollution prevention plan designed to control untreated stormwater discharges from the site. If dewatering discharge occurs to the MN River, the dewatering discharge will be monitored and discharged in accordance with permit conditions developed to protect water quality. The project will not increase stormwater runoff to the Minnesota River, or result in changes to the current floodplain.</p> <p>Aquifer impact used during sand mining: Sections 3.1, 3.4 and 3.5 address groundwater in detail, including the results of modelling that was performed as part of the EIS and analyzes existing groundwater quality, potential impacts to groundwater quality and quantity from dewatering.</p> <p>Wildlife Impact: Section of the 3.3 of the EIS addresses potential wildlife impacts and discusses the results of the vegetation, wildlife, and protected species field study, as well as a stick nest survey conducted across the site. No protected</p>

	<p>species were found on the site and the plan includes mitigation to protect bat populations which may be present along Gifford Lake.</p>
<p>MPCA</p>	
<p>Section 3.4 Physical Impacts on Water Resources The Final EIS needs to include the MPCA 401 as a regulating entity that may require protection (and mitigation) to surface waters through best management practices (BMPs) during expansion of mining operations. The MPCA uses the definition of “Waters of the State” as defined in Minn. Stat. ch. 115.01 subd 22. To determine what waters are regulated by the MPCA. This definition is broader than the definition of “Waters of the U.S.” used by the US Army Corp of Engineers (USACE). Some waters that are not regulated by the USACE or under the Wetland Conservation Act (WCA), are regulated by the MPCA. When making an application for wetland impacts for a proposed project, the applicant needs to include all impacts to all surface waters, even if those waters have been determined to be non-jurisdictional by the USACE or are WCA exempt. Indirect impacts to nearby wetlands, (including wetlands B5, B6, and B9 outside of the Project area), caused by the drawdown of groundwater would appear to significantly impact many of these wetlands. Although the USACE has made a non-jurisdictional determination of some of these waters, they are by definition waters of the state and therefore regulated by the MPCA. Impacts to these wetlands may require mitigation. For further information about the 401 Water Quality Certification process, please contact Jim Brist at 651-757-3325 or jim.brist@state.mn.us.</p>	<p>Thank you for your comments. The FEIS incorporates these comments and response to comments. The potential need for an MPCA 410 water quality certification is noted and will be obtained at the time of permitting. The MPCA 401 Certification protects water quality by applying state water quality standards to projects. All permit requirements for surface water, including those regulated by the MPCA, will be addressed as part of future permitting.</p>
<p>Section 3.15 Noise The MPCA appreciates the Project proposer’s thorough analysis of existing and expected noise in the vicinity of the proposed expansion areas. Based on the information provided in the Draft</p>	<p>Thank you for your comment. Any updates to the mining plan that may affect noise mitigation strategies will be coordinated with proper agencies.</p>

<p>EIS, including Figure 3.15.1 and the noise analysis from Appendix 11, and assuming that mining activities follow mitigation options outlined in Section 3.15.4 (pages 191 and 192), there are no concerns regarding noise at this time.</p> <p>Any unanticipated changes to the mine plan alternatives that would impact the efficacy of the proposed mitigation – particularly for the residential receptors in the Jackson Heights mobile homes, the single family homes, and the historical areas surrounding the Project area – should be given additional scrutiny prior to being implemented. Ambient local noise is already high (near residential standards) in the area, and any changes to planned mitigation could lead to an exceedance of the noise standards due to the additional proposed activities. For noise related questions, please contact Fawkes Steinwand at 651-757-2317 or fawkes.steinwand@state.mn.us</p>	
<p>Section 3.4.2 Environmental Consequences – Water Resources</p> <p>The MPCA is just beginning the investigation in to the extent and magnitude of the Manganese (Mn), 1,4-Dioxane and Polyfluoroalkyl Substances (PFAS) contamination at the Louisville Closed Landfill (SW-32) and have not yet determined the source(s). The MPCA is currently expanding its monitoring well network around the landfill to investigate the extent and magnitude of groundwater contamination in excess of regulatory standards for these contaminants. To date, the MPCA has detected Mn, 1,4-Dioxane and PFAS contamination in the MPCA monitoring well DC117, which is located near the Merriam Junction Sands production well located directly south of the landfill. Please note that Figure 3.5.2 does not show all the MPCA landfill monitoring wells.</p> <p>The MPCA is concerned about the following issues that are not addressed in the Draft EIS:</p> <ul style="list-style-type: none"> • Specific locations of proposed dewatering areas • The method(s) used for dewatering • Proposed locations of dewatering wells (if used) 	<p>Thank you for your comments. Section 3.1.2.1, discussing existing groundwater quality impacts from the Louisville Landfill has been updated in the FEIS to include information on MPCA’s current groundwater investigation. The Proposer met with the MPCA staff and the hydrogeologist for the Louisville Landfill at the onset of the project. The source of groundwater contamination has been recognized for decades by the MPCA as the Louisville Landfill. The hydrologist indicated that the proposed dewatering would result in a form of treatment to the impacted groundwater quality. Until there are proposed downgradient water users in the impacted area, it was understood that MPCA would not have to pursue pump and treat options to remediate the off-site migration of groundwater impacts. Therefore, it is the expectation that the MPCA will take appropriate actions with respect to emerging contaminants of concern and share them with impacted landowners as soon as they are available.</p> <p>Figures 2-14 of the Groundwater Modelling of Mine Plan Alternatives Predictive Simulations Report (PSR) included as</p>

- The discharge of contaminated groundwater from dewatering activities
- Sampling of dewatering water discharge for contaminants of concern from the landfill
- Cross contamination of wells and aquifers as a result of dewatering activities

Due to the extensive groundwater contamination in the area, significant care and investigation is required with regard to the dewatering activities to prevent spreading groundwater contamination outside its current plume or contaminating other aquifers. This action could associate the mining activities with the groundwater contamination, making the Project proposer a potentially responsible party and liable for investigation and cleanup costs related to groundwater contamination for the landfill. This issue should be more fully addressed in the Final EIS. The MPCA recommends the Project proposer work with Mark Umholtz with the MPCA Closed Landfill Program to address these concerns. Mark can be reached at 651-757-2308 or mark.umholtz@state.mn.us.

Attachment 1 of the EIS include the location of the proposed dewatering areas for each phase of each alternative. These represent worst case scenarios that allow for reasonable assessment of potential effects on the contamination from Louisville Landfill.

The method used for dewatering is anticipated to be a dewatering sump and pump and will be detailed as part of any water appropriation permitting process, if dewatering and mining of sandstone is pursued. Use of dewatering wells is not anticipated. If the site begins to dewater, the dewatering discharge will be monitored prior to discharging from the site. Impacted groundwater from the landfill is currently discharging to the MN River untreated.

Based on currently available information and the modeling of Louisville Landfill (provided in Appendix C of the PSR included as Attachment 1 of the EIS), the potential for migration appears unlikely to be exacerbated by the proposed dewatering. The net effect is that groundwater would be pulled away from wells, receptors, and other aquifers into the mine pit areas. Furthermore, the modeling indicates that the mine pit lakes would provide dilution of any contaminants which may be present in the groundwater that has been impacted by the Louisville Landfill.

Figure 3.5.2 depicts monitoring wells located on the Project Site or proposed to be within the Project's network. It does not attempt to illustrate the MPCA's Louisville Landfill monitoring network. The MPCA's landfill monitoring wells located on this figure are limited to those that are located on the Project Site itself. Figure 23 of the PSR indicates locations of the Louisville Landfill and Dem-Con Landfill monitoring well networks in place at the time the report was prepared. It is expected that

	<p>the MPCA may modify their monitoring well network overtime.</p> <p>The Proposer will work directly with the MPCA's closed landfill program to address any concerns prior to initiating dewatering activity on the site. Parameters to be monitored for in the dewatering discharge will be determined as part of the permitting process, either through an individual NPDES permit or through the approved water quality monitoring plan associated with the Site. Section 3.9.3.3, discussing dewatering discharge, has been updated in the FEIS to include a statement that the Proposer will coordinate with the MPCA's closed landfill program to develop a monitoring plan for dewatering discharge potentially impacted by groundwater contamination associated with the Louisville Landfill. It is expected that the MPCA will provide information on the results of their remedial investigation and proposed remedial action for the Louisville Landfill that will inform permitting the surface water discharge and monitoring requirements.</p>
<p>Section 3.14 Stationary Source Air Emissions</p> <ul style="list-style-type: none"> • The proposed Project is expected to emit particulate matter (PM), PM₁₀ and PM_{2.5}. The Project proposer modeled PM₁₀ and PM_{2.5}, but did not model Total Suspended Particulate (TSP). Minnesota has an ambient air standard for TSP at Minn. R. 7009.0080. The Project proposer should either model TSP or add TSP to its proposed monitoring plan. • Table 3.14.4 lists operating limits that were relied upon for air dispersion modeling. The Project proposer should expect all limits assumed in the modeling, including the limits in Table 3.14.4, to be included in the air permit associated with this project. • The Project proposer performed air dispersion modelling for PM₁₀ and PM_{2.5}, but the MPCA does not have access to 	<p>Thank you for your comments. Section 3.14.4.4, discussing the draft ambient air monitoring plan, has been updated in the FEIS to indicate that the ambient air monitoring plan will be finalized as part of the air permitting process for the sand mining and processing and may include additional parameters such as TSS. The EIS air modeling analysis was completed following current MPCA modeling guidance for evaluating PM₁₀ and PM_{2.5} NAAQS ambient air concentrations. Methods and modelling protocol were discussed with MPCA staff during meetings held at the MPCA as part of the development of the air modelling used in the EIS., it is expected that all of these comments will be addressed as part of the air permitting process. It is expected that MPCA will require an air monitoring associated with the frac sand mining and that revisions to the</p>

<p>the underlying files that support this work. The MPCA cannot verify the accuracy of the modeled information without these files. To support the permitting work for this project, the Project proposer should submit an air dispersion modeling protocol for MPCA review and approval before submitting a permit application with modeling results.</p> <ul style="list-style-type: none"> • The PM₄-silica monitoring frequency is listed as once every 12 days. The “Tools to Assist Local Governments...” document recommends a frequency of at least once every 6 days. The proposed monitoring frequency should be adjusted to at least once every 6 days. • The proposed mitigation measures includes water application, bin vents, and baghouses. The Draft EIS does not discuss the use of high efficiency particulate air (HEPA) filters as a possibility. Other members of this industry do use this type of control technology: see air permit 07900009-002 for UNIMIN – Kasota (now Covia – Kasota) at https://www.pca.state.mn.us/air/air-permits-issued-minnesota. The Final EIS should discuss alternative mitigation methods such as HEPA filters. For air permitting or modeling related questions, please contact Jeff Hedman at 651-757-2416 or jeffre.hedman@state.mn.us. 	<p>draft air monitoring plan provided in the EIS, including parameters and frequency, may be required as part of the air permitting process. The proposer will continue to coordinate with Jeff Hedman with respect to any air permitting related questions and modelling files will be supplied to the MPCA in conjunction with any air permit application submitted to the MPCA. The air permitting process will address specific air quality control measures, including HEPA filters as may be appropriate.</p> <p>As indicated in Attachment 10, Air Modeling of Project Alternatives Evaluation Report, the existing sand and gravel and limestone mining and processing operations will continue to operate under the Minnesota State General Permit Nonmetallic Mineral Processing General Permit until such time as construction of an industrial sand plant (sand plant) and sandstone mining is initiated.</p>
<p><i>Scott WMO</i></p>	
<p>1. As noted in the EIS the submitted NOD for Boundary/Type and No-Loss was issues in 2012 and is expired. A new wetland delineation will need to be performed and Decision obtained. Previous boundary/type cannot be assumed due to the age of the previous approval and rainfall events since 2011. Staff strongly recommends the WCA process be completed prior to moving forward with permitting and applications as this may have notable impacts on timing and land use. This is important to efficiently assist the Applicant through the process</p>	<p>Thank you for your comments. The Project proposes to avoid any direct impacts to wetlands. Dewatering may not be initiated for over five years. Wetland delineations will be updated as part of permitting for dewatering activity to reestablish wetland types and boundaries prior to the start of any dewatering activity, so that the permitting activity is based on delineation information that is current at the time of permitting.</p>

<p>2. 6.0 Government Approvals. Recommend adding SWMO under Scott County. While the SWMO is not a permitting agency staff will be reviewing applications in conjunction with Scott County's review. The SWMO may provide additional coordination and support during the permitting process</p>	<p>Thank you for your comment. The FEIS incorporates these comments and response to comments. The SWMO will be added to the list of government approvals in the FEIS by reference to these comments. It is expected that the SWMO will provide additional review of the project throughout the IUP permitting process.</p>
<p>3. 3.3.2.3 Native Cover. All disturbed areas need to be revegetated with native cover. The timeline for potential future development is unknown. Non-native cover impacts the success of adjacent native cover.</p>	<p>Thank you for your comment. Establishing native cover over reclaimed areas of a mining operations is not a requirement under the Scott County Mining Ordinance. Some areas may be returned to agricultural production, but this issue can be addressed during IUP permitting. Native cover is proposed in areas adjacent to wetlands as well as end use lakes. Some areas may return to agricultural uses, such as hay production, prior to final development.</p>
<p>4. Vegetative Buffers. 3.3.2.2 proposed native buffers are acceptable. Please reference 3.3.2.2 when discussing vegetative buffers elsewhere to ensure consistency (e.g. 3.3.2.4 pg 46 vegetated buffers). Additionally, the Reclamation Plans proposes End Use Lakes with "excellent water quality" and "increased habitat diversity along shorelines..." These end use lakes will require vegetative buffers consistent with water resources of exceptional value. Roads and slopes exceeding 3:1 would not be permitted in the buffer.</p>	<p>Thank you for your comment. Buffer requirements around future end use lakes will be addressed as part of IUP permitting and approved reclamation plan. Near vertical bedrock faces were analyzed for long term stability as a part of the DEIS and because this is a quarry, special circumstances exist which require slopes steeper than 3:1 adjacent to any future end use lake.</p>
<p>5. Please be certain to be consistent with identifying all existing and historic water resources and surface water conveyance systems on site. Alternative 2 would not be recommended as it would significantly impact the surface water conveyance system connecting the east and west sections near the center of the site.</p>	<p>Thank you for your comment. Known existing and historical water resources and conveyances are included in the DEIS. If Alternative 2 is developed, the conveyance system can be rerouted/piped through the plant area to maintain drainage capacity. This is an issue that can be addressed during the IUP permitting process as appropriate.</p>
<p>6. Cumulative water and natural resource impacts will need to be continuously assessed and updated throughout the project rather than only assessing the individual impacts of each phase</p>	<p>Thank you for your comment. The water level monitoring plan will be finalized and approved as part of the DNR Water Appropriations permitting process for any future dewatering activity. The goal of the plan will be to provide a robust</p>

	<p>monitoring network to identify any potential impacts through active monitoring and provide ample time to employ mitigation efforts to avoid any impacts to natural resources.</p>
<p>7. Dewatering 3.9.2.3 pg 112 the SWMO concurs that additional dewatering discharge and groundwater monitoring will be required should a General Permit be issued. Dewatering discharge must meet water quality standards, rates/volumes, and permits must be obtained prior to discharging offsite or into jurisdictional waters</p>	<p>Thank you for your comment. Dewatering discharge will need to meet water quality standards prior to discharge into any water of the state and all required permits will be obtained prior to discharging off-site or into jurisdictional or regulated waters. Dewatering discharge will be subject to on-going regulatory authority by the MPCA.</p>
<p>8. Wetland hydrology. There are several proposed factors impacting surface and groundwater hydrology. While considerable efforts have been made to investigate impacts, it is still unclear at this time that there is a solid, coordinated, plan in place to ensure wetland hydrology and plant communities are maintained (especially for the seepage wetland). Staff recommends working with the SWMO, preferably prior to the permitting process, to develop a plan to maintain long-term stability of wetland hydrology and plant communities during and after mining.</p>	<p>Thank you for your comment. Environmental review is not intended to be exhaustive in defining the design details. The modeling and assessments conducted have provided information that suggests that mitigation may be necessary when dewatering is proposed. Design details will be further developed through the DNR water appropriations process. Dewatering activity will be subject to on-going regulatory authority by the DNR. Monitoring of both vegetation and groundwater are anticipated to be an outcome of the water appropriations permitting process. Dewatering discharge will be subject to on-going regulatory authority by the MPCA.</p>
<p>9. Contamination of groundwater supply 3.9.2.2 and 3.10.1.2 the SWMO concurs that additional monitoring for groundwater parameters will be required should a General Permit be issued. The SWMO remains concerned regarding groundwater contamination susceptibility due to the highly permeable soils and proximity to water table. Rigorous monitoring, response procedures, financial assurances, and mitigation measures should be approved and in place prior to permits being issued.</p>	<p>Thank you for your comment. Aggregate mines are almost always located in areas that are highly susceptible to groundwater contamination due to the permeable nature of the resource that is being mined. The industry has developed best management practices to protect groundwater under these circumstances. Sections 3.10 and 3.11 describe measures to protect groundwater including a spill prevention control and countermeasure plan, groundwater quality monitoring as may be appropriate, proper storage and handling of fuel, use of only permitted chemicals in the processing of the mined materials.</p>
<p>10. Applicant should have financial and capacity resources to ensure monitoring, maintenance, and mitigation for 30 years consistent with County/SWMO requirements. The</p>	<p>Thank you for your comment. Section 1.0 Project Description has been updated in the FEIS to indicate that financial assurance will be provided in accordance with the Scott County</p>

<p>Applicant should be the responsible party for the lifetime of the requirement. Assurances and contracts should be in place prior to permits being issued.</p>	<p>Zoning Ordinance and will be coordinated between the County and Proposer as part of the IUP permitting process.</p>
<p>11. The EIS repeatedly identifies issues with availability and quantity of topsoil (Table 3.10-1 is one example) therefore a Topsoil Management Plan will be required at time of permitting, and may be phased. The Topsoil Management Plan shall include the following information: (1) Topsoil Standard. This section will identify the topsoil standard being utilized for the project. (2) Topsoil Stripping and Stockpiling Methods. This section shall include the following: (a) Estimated quantity of topsoil available on the site. (b) Quantity of topsoil needed to restore green space areas. (c) Estimated depth of topsoil available on the site. Also note that the site will need to meet regulatory standards at time of permitting, and water resource related standards</p>	<p>Thank your comment. Topsoil management will be addressed as part of IUP permitting process.</p>
<p><i>Louisville Township</i></p>	
<p>1. Please note that we are not asking for a delay in the completion of the EIS for Merriam Junction Sands with the understanding that there is a commitment on the part of the organic recycling facility (ORF) project proposer to address items 2 and 3 below, with a full traffic study utilizing current conditions and data as well as all potential projects in this subject property to be completed prior to any land use decisions (subdivisions, site plans, etc.) being issued by Scott County for the ORF project.</p>	<p>Thank you for your comment. Comment noted.</p>
<p>2. The traffic impact study does not reflect current conditions (road projects under construction) near the site and should be fully updated. In addition, it does not appear to include the traffic generated by the proposed industrial subdivision on the northern portion of the Malkerson site (Parcels 1 through 8 shown on Figure 3.18.1 of the DEIS) that is owned by Malkerson, within the boundary of this DEIS, and currently under discussion for</p>	<p>Thank you for your comment. The traffic section of the DEIS was updated after the Townships last comment letter during the preparation of the final DEIS to include information on the road projects under construction. In addition, the EAW prepared for the TH 169/TH 41/CSAH 78/CSAH 14 Intersection Improvements (Road Project EAW) which reflects the current road projects under construction is incorporated by reference</p>

<p>development and likely to be developed prior to the proposed expanded mining operation.</p>	<p>in the DEIS. All of the traffic information prepared for the MJS project was provided to the County when they prepared their Traffic Impact Study (TIS) for the Road Project EAW. The intersection at Malkerson Sales and TH 41 (Sales/TH41 intersection) was included in the TIS which evaluated current condition, future forecasts with and without the road improvement project, que lengths and crash data for the Sales/TH 41 intersection as well as all of the surrounding intersections and access points to US 169 within the project area. (Including Bryan Rock /Anchor Block shared access). The Road Project EAW considered mining traffic from not just Malkerson Sales and Bryan Rock but all of the other adjacent mining operations and industrial uses located in the area and it considered growth of not only the local truck traffic generated in the areas but on US 169 and TH41 as major freight routes which will experience growth on a regional basis.</p>
<p>3. The Traffic Impact Study should address all projects in the area for which a reasonable expectation has been laid with current (under construction) traffic volume information and road geometry so that one TIS can be available that provides information related to 1) a potential road intersecting with TH 41 in the vicinity of the existing driveway on the Malkerson portion of the site that is a possible location for hauling out material and 2) should also evaluate whether and where internal through road connections may be required for development of the area.</p>	<p>Thank you for your comment. The DEIS is complete with respect to traffic associated with the MJS Proposed Project. The MJS Proposed Project is sand and gravel mining, limestone mining and Sandstone mining on the subject properties. Other proposed projects within the environmentally relevant area that were identified in the Scoping EAW to be analyzed as part of the Potential Cumulative Effects with respect to traffic were the Fairmount Frac Sand Mine proposed by Minnesota Valley Sands on the Mid America Festival Property (Old Green Quarry), Shakopee Sands, and Jordan Aggregates. The Organics Recycling Facility (ORF) and associated Malkerson Sales Plat (Plat) were not proposed at the time the Scoping EAW was prepared, but more importantly they do not meet the criteria to be included in the DEIS when it was published, or currently.</p> <p>The Proposer is in complete agreement with the Township that future development of the northern portion of the Malkerson</p>

	<p>Sales will represent a project within the same environmentally relevant area. The Proposer also believes that the basis of expectation for the MJS project has occurred, so that when a development project on the Malkerson Sales property, or any other future project within the same environmentally relevant area (i.e. not just limited to Malkerson Sales property) does come forward, that future project will be required to include the MJS project in their potential cumulative effects analysis.</p>
<p><i>MN DNR</i></p>	
<p>1. Page 2, Project Description. Bryan Rock Products has a DNR Water Appropriation Permit 1994-6195 for washing sand and gravel on the property. Please note that a separate DNR Water Appropriation Permit will be required for the dewatering of the property. If the wet plant for processing the sand is located in a different location than the point of taking for DNR Water Appropriation Permit 1994-6195, then and additional DNR Water Appropriation Permit will be required for the wet plant.</p>	<p>Thank you for your comment. The proposer will continue to operate under their existing water appropriations permit for aggregate washing and will apply for a separate DNR Water Appropriation Permit prior to any dewatering activity at the site.</p>
<p>2. Page 6, Alternative Technologies. Mining activities using wet mining technologies using a dragline or excavator are not required to be approved under a DNR Water Appropriation Permit. If hydraulic dredging is employed, then the water that is removed from the mine must return to the mine, or a DNR Water Appropriation Permit will be required for the hydraulic dredging.</p>	<p>Thank you for your comment. Comment noted.</p>
<p>3. Page 8, Affected Environment: Figure 3.1.2, Scott County Zoning Map Excerpt. Gifford Lake has a Natural Environment Shoreland Classification. Thus, all area within 1000 feet of the lake ordinary High Water Level (OHWL) is within the Shoreland overlay. Industrial uses are not allowed in the Shoreland of natural environment lakes according to state statutes. The project should use this setback as a guideline while Scott County updates their ordinances. For more information please visit: https://www.dnr.state.mn.us/waters/watermgmt_section/shorland/mod-ord.html</p>	<p>Thank you for your comment:</p> <p>Extractive uses are allowed through a conditional use permit in the shoreland district of a natural environmental lake (Gifford Lake) in both the MNDNR Model Shoreland Ordinance and the Scott County Zoning District. Extractive uses are defined separately from industrial uses in the MNDNR Model Ordinance. In addition, extractive uses are a currently established grandfathered use in the Shoreland District.</p>

The project will meet the extractive use standards in the MNDNR's model shoreland ordinance as follows:

5.4 Extractive Use Standards. Extractive uses are conditional uses and must meet the following standards:

5.41. Site Development and Restoration Plan. A site development and restoration plan must be developed, approved, and followed over the course of operation. The plan must:

A. Address dust, noise, possible pollutant discharges, hours and duration of operation, and anticipated vegetation and topographic alterations.

B. Identify actions to be taken during operation to mitigate adverse environmental impacts, particularly erosion; and

C. Clearly explain how the site will be rehabilitated after extractive activities end.

5.42 Setbacks for Processing Machinery. Processing machinery must meet structure setback standards from ordinary high water levels and from bluffs

Scott County is the delegated regulator of development within the shoreland District. The project will meet the County's standards for mining within the shoreland district established per ordinance as follows:

70-8-12 Mining Standards

1. Site Development and Reclamation Plan. A mining and reclamation plan must be developed, approved, and followed over the course of operation of the site. The plan must address dust, noise, possible pollutant discharges, hours and duration of operation, and anticipated vegetation and topographic alterations. It must also identify actions to be taken during operation to mitigate adverse environmental impacts,

	<p>particularly erosion, and must clearly explain how the site will be rehabilitated after mining activities end.</p> <p>2. Setbacks for Processing Machinery. Processing machinery must be located consistent with setback standards for structures from ordinary high water levels of public waters and from bluffs.</p>
<p>4. Page 9, Adjacent Residential Land Uses. Should the water use of the mining facility deprive a residence, or the mobile home park, of their domestic water supply (well interference), in conjunction with a valid well interference substantiated by the DNR, then the mining company is required to cease operation until the mining company has furnished the residence with a new water supply. State Rules detail the procedures that are to be followed for potential well interference, as a result of mining.</p>	<p>Thank you for your comment. The well interference rules (Minnesota Rules 6115.0730 <i>Well Interference Problems Involving Appropriation</i>) are referenced in Section 3.5.4 of the EIS. Well interference agreements will be offered to all potentially impacted well owners prior to the beginning any dewatering activity on site. This includes wells serving mobile home parks. The well interference agreement will spell out steps that the operator will be financially responsible for with respect to investigating water supply issues and restoring or providing a new water supply. Groundwater monitoring as dewatering activities progress through the site will provide data to identify wells that are likely to experience problems with water supply before they occur so that a new supply can be established before issues occur.</p>
<p>5. Page 19, Residential Uses. This section does not appear to discuss possible impacts to the mobile home park, or its residents.</p>	<p>Thank you for your comment. The last paragraph of page 18 discusses possible impacts to the mobile home park residents. In addition, all of the studies with respect to noise, air, and groundwater included the mobile home park as a potential receptor. Specific noise mitigation measures are proposed for sand and gravel mining activity occurring in closest proximity to the mobile home park. This mitigation will become a condition of any sand and gravel IUP issued by the County.</p>
<p>6. Page 34, 3.3.1.2 Threatened or Endangered Species; Page 41, 3.3.2.1 Rare Features. A Natural Heritage Review (NHIS) must be requested in order to determine if any rare species occur within the vicinity of the project. For environmental review purposes, a</p>	<p>Thank you for your comment. The NHIS was requested to complete the scoping EAW as required. The NHIS review was used to help scope the DEIS, which did not include providing a current NHIS review.</p>

<p>NHIS review is good for 12 months. The most recent NHIS review on file for this project, dated June 6, 2015, stated that the northern long-eared bat is a species covered under the Endangered Species Act (ESA). The site is within a township containing documented northern long-eared bat maternity roost tree(s). If any part of the project is within 150 feet of the known roost tree in this township, the U.S. Fish and Wildlife Service (USFWS) may regulate tree removal or other activities. Note that currently this species is the subject of a 4(d) rule that is currently under reconsideration. Please contact Rich Baker (DNR) and stay in close contact with the USFWS field office as it relates to regulations of this species.</p> <p>The 2015 NHIS letter also stated that new surveys may be required to determine the presence of rare species. Please submit a new query for Natural Heritage Review in order to discuss the potential impact to rare species and Native Plant Communities using the most up to date information.</p>	<p>A natural resource survey work plan was prepared and approved by the MNDNR. A Vegetation, Wildlife and Protected Species Survey Report was prepared and submitted to the MNDNR for review prior to publication of the DEIS. The MNDNR submitted a reply to the proposer indicating that the Vegetation, Wildlife, and Protected Species Report for the Merriam Junction Sands Mine (ERDB #20110462) satisfied the Division of Ecological and Water Resources request for rare species surveys.</p> <p>This report was referenced in the DEIS and pertinent information from the report included in the DEIS text, but the report itself was not included as an attachment. The Vegetation, Wildlife and protected Species Report, as well as a Bald Eagle Stick Nest Survey Report are included as Attachments 15 and 16 of the FEIS.</p> <p>USFWS guidelines and regulations will be followed with respect to tree removal and other activities that may impact bat roost trees.</p>
<p>7. Page 45, 3.3.2.4 Habitat Changes Associated with End Use Lakes; Page 72, 3.5.1.1 Proposed Water Use. Would flocculants and coagulants (ie. acrylamide, DADMAC) or similar products used to separate fine particles be completely recycled within the wet plant? Could some materials stored in sedimentation basins be released to end use lakes? Surface water sampling and monitoring wells should be used to monitor for these contaminants as well as water pH in end use lakes.</p>	<p>Thank you for your comment. Any use of flocculants and coagulants will be regulated by the MPCA's NPDES permit. Sediment (or water need to verify the recycle loop) from the wet plant will not be released to the end use lakes. The water quality monitoring plan will include monitoring for flocculants or coagulants used in sand processing.</p>
<p>8. Page 56, Water Resources. Please note that it is possible that the dewatering of the mine could also dewater Gifford Lake, DNR Public Water 70-0118-00P. It is likely that the DNR Water Appropriation Permit for the dewatering of the quarry will require the monitoring of water levels in both the bedrock aquifer (using</p>	<p>Thank you for your comment. The modeling indicates that Gifford Lake is unlikely to be significantly affected by dewatering. Water level monitoring of groundwater and Gifford Lake are included in the proposed monitoring plan provided with the DEIS. Details of monitoring locations will be</p>

<p>wells) and in Gifford Lake itself. It is also possible that the DNR may require that the dewatering discharge occur into Gifford Lake.</p>	<p>subject to the MNDNRs water appropriation permit and approved water level monitoring plan. Discharge locations to surface waters will be determined at the time of permitting and Gifford Lake has been identified as a potential discharge location. The project site has direct access to the lake.</p>
<p>9. Page 73, Water Use. Please note that Minnesota Statutes requires the volume of water that is appropriated under a DNR Water Appropriation to be measured within a 10% accuracy of the actual volume of water appropriated. This volume is required to be reported to the DNR on an annual basis. The volume of water that is reported must be the total volume of water pumped or diverted, and not the volume of water consumed.</p>	<p>Thank you for your comment. Comment noted.</p>
<p>10. Page 75, Nearby Water Supply Wells. The analysis of the appropriation on nearby wells will need to be submitted to the DNR as part of the application for the DNR Water Appropriation Permit for dewatering.</p>	<p>Thank you for your comment. Comment noted.</p>
<p>11. Natural Resources Plan, 3.2.1 Wetlands and Public Waters; 14.0 Wetland Conservation. The plan states that permanent significant adverse impacts to regulated wetlands are not anticipated. What the proposer has identified as “seepage” wetlands (fens) are fed through groundwater, and could be significantly impacted by dewatering activities. Attachment 1, PSR, 2.5.3, Thresholds for Impacts to Water Resources discusses how significant impacts to seepage wetlands can occur if dry conditions persist for more than one growing season. Water balance is not the only potential impact to consider in regards to fen plant communities. Many fen plant species are specifically adapted to the nutrient composition of local groundwater sources, and altering this composition by changing site hydrology to a surface water-driven source could potentially impact this type of plant community. Please note that we do not anticipate that Seminary Fen, located on the other side of the Minnesota River, would be impacted by this project.</p>	<p>Thank you for your comments. The plant community, according to DNR classification, is a “seepage meadow/carr”. DNR staff conducted a site visit and met with the proposer’s wetland specialist as part of the wetland delineation and protected species survey. The DNR concluded that the wetland is a wet meadow/seepage meadow, significant for its high quality and that it qualifies as a rare natural community under WCA (Minnesota Rule 8420.0515, Subpart 3). Because the wetland community is considered a rare natural community, it has protection under WCA above and beyond the protection of other wetlands.</p> <p>Comments regarding potential impacts of using surface water sources to mitigated watering impacts are noted. The source and quality of water used as mitigation is an important element of the design of the mitigation system. Methods of delivery that do not run the supplemental water over the ground, where it could potentially pick up nutrients, sediment, phosphorus, etc. are key elements of mitigation strategies. Details</p>

	of the mitigation will be addressed in the Water Appropriation permitting process.
12. Natural Resource Plan, 3.2.2 100-Year Floodplains. Due to increased annual precipitation and frequency in large-scale flood events, it is likely that flood elevations in Minnesota will be re-evaluated and set at higher elevations. End use lakes should be designed with the potential to meet future flood elevations.	Thank you for your comment. Potential future regulatory action is not subject to analysis in the DEIS but may become relevant as part of future County and DNR permitting. Of note is the revised preliminary floodplain elevation which actually contemplates lowering the elevation of the 100 year floodplain of the Minnesota River adjacent to the Project as opposed to setting them at higher elevations. The revised preliminary floodplain elevations are expected to become effective in the fall of 2020.
13. Natural Resources Plan, Public Waters and 14.0 Wetland Conservation. Construction of an ISTS system is mentioned as a reason to potentially impact wetland buffers. Groundwater-driven seepage wetlands (fens) could be impacted by the installation of an ISTS so close to wetland boundaries.	Thank you for your comment. Section 3.9.2 and Attachment 5, the Site Suitability for Septic System report of the DEIS indicates that there are no appropriate SSTS sites adjacent to any of the on-site wetlands or the seepage wetland. No SSTS sites will be constructed within a wetland buffer.
14. Attachment 1, PSR, 3.4.4. The statement that the Kraemer Quarry has operated for decades with no significant impact to the Black Dog Fen is inaccurate and should not be used as a justification for dewatering activities near seepage wetlands.	Thank you for your comment. The PSR has been updated to remove reference to the Black Dog Fen. The FEIS includes the updated PSR as Attachment 1.
15. Wetland delineations are considered current for five years. The most recent wetland delineation is from 2011. A new survey would be required before development proceeds to determine exact wetland boundaries and setbacks. A wetland delineator who is specifically skilled in the identification of fen indicator species should be used to ensure the proper characterization of fen plant communities in the project area.	Thank you for your comment. The Project proposes to avoid any direct impacts to wetlands. Because dewatering may not start for over five years, wetland delineations will be updated as part of permitting for dewatering activity. The delineations will reestablish wetland types and boundaries prior to the start of any dewatering activity. A wetland delineator who is specifically skilled in the identification of fen indicator species will be used to ensure the proper characterization of plant communities in the project area.
16. The project area is directly adjacent to a National Wildlife Refuge. Due to entanglement issues with small animals, use of erosion control blanket should be limited to 'bio-netting' or 'natural netting' types, and specifically not products containing	Thank you for your comment. These recommendations will be incorporated into the IUP permit conditions for the project.

<p>plastic mesh netting or other plastic components. These are Category 3N or 4N in the 2016 & 2018 MnDOT Standards Specifications for Construction. Also be aware that hydro-mulch products may contain small synthetic (plastic) fibers to aid in its matrix strength. These loose fibers could potentially re-suspend and make their way into Public Waters. As such, please review mulch products and do not allow any materials with synthetic (plastic) fiber additives in areas that drain to Public Waters.</p>	
<p>17. Preliminary SWPPP, 4.1.3. Stabilization of soil after regrading should happen as soon as possible and only appropriate, BWSR-approved native seed mixes that are “noxious weed-free” should be used in order to prevent the spread of invasive species.</p>	<p>Thank you for your comment. The proposed Reclamation Plan specifies native seed mixes around areas of the site adjacent to wetland and end use lakes. Other portions of the site may be utilized for agricultural production, hay, pasture, etc. until final development occurs.</p>
<p>18. Preliminary SWPPP, 4.1.5. Overland sheet runoff should be rerouted away from wetlands through stormwater management practices. Upland buffers should not be the only method of filtering pollution and sediment from overland sheet runoff before it reaches a wetland.</p>	<p>Thank you for your comment. Additional BMPs beyond upland buffers will be used around the perimeter of areas which currently sheet flow off site towards wetlands before the area is initially disturbed (topsoil and overburden removal prior to mining). These measures which may involve diversion berms or swales, silt fence, biologs, etc. will be maintained until the mining activity reroutes the overland flow to internal drainage.</p>
<p><i>MnDOT</i></p>	
<p>Traffic Analysis MnDOT is concerned with the safety implications of trucks turning left onto MN 41 towards Chaska from the Malkerson Sales Access. Trucks should avoid this turning movement during the AM and PM peak hours, and use the new 147th St overpass to reach CSAH 14’s access with US 169.</p> <p>Due to the concept level nature of the DEIS, the information determined in the traffic impact study can only be considered as a general indication of environmental impact. The development scenarios many times change after the EIS is completed, therefore rendering the traffic analysis incomplete. Review of the DEIS does</p>	<p>Thank you for your comments. All trucks hauling sand will be taking right hand turns. Trucks hauling limestone will be encouraged to avoid a left turn movement onto TH 41 towards Chaska from the Malkerson Sales Access during the AM and PM peak hours and utilize the southern access to 147th St overpass.</p> <p>As noted, development scenarios change over time. Updates to traffic studies will be performed to reflect the detailed hauling scenarios or other potential development within the Site. For example, proposed development associated with the northern portion of the Malkerson Sales property would require a traffic impact study that evaluates the mine site</p>

<p>not constitute approval of a regional analysis and is not a specific approval for access or new roadway improvements.</p> <p>When detailed plans and associated hauling scenarios are developed the traffic analysis should reflect the proposed development. Our agency would request the opportunity to review any updated information, as well as meet with the County and developer to discuss potential traffic issues.</p> <p>Please contact Almin Ramic, South Area Traffic Safety, at 651-234-7824 or almin.ramic@state.mn.us with any questions.</p>	<p>traffic as well as any proposed development traffic at the site access to TH 41.</p> <p>At the time of permitting the proposers along with Scott County will include MnDOT in any traffic management planning.</p>
<p><i>Metropolitan Council</i></p>	
<p>Land Use Item 3.1.3.1 (Colin Kelly, 651-602-1361) An extension of the Minnesota River Bluffs Trail is planned on the west side of the project area. There is a 2011 Metropolitan Council-approved Minnesota River Bluffs Extension and Scott County connection Regional Trail Master Plan, It is available here: https://ww.co.carver.mn.us/home/showdocument?id=5472. See map 5C on pdf page 29.</p> <p>Council staff recommend the proposer and the RGU (Scott County Environmental Services) coordinate with Scott County Parks, the Regional Parks Implementation Agency for this segment of the Minnesota River Bluffs Extension and Scott County Connection Regional Trail, prior to the expansion of construction aggregate mining and ancillary activities and the addition of industrial silica sand mining and processing operations in the project area to assess the potential impacts to the planned regional trail corridor.</p>	<p>Thank you for your comment. Sections 3.16.1.2 and 3.16.2.2 of the EIS discusses the Regional Trail Master Plan, future trail corridor, and potential impacts to the trail in detail. There will be no direct impacts to the trail corridor and mining activities will be required to maintain certain setbacks from the property line/trail corridor. Evaluation of potential impacts included noise modelling along the future trail corridor and visual assessment of screening of the project from the trail. The EIS concludes that the Project will not impact the rail corridor, or any future uses within the corridor.</p>
<p><i>State Historic Preservation Office</i></p>	
<p>We have reviewed the information included in the Draft EIS for this project as well as the cultural resources report titled Phase 1 Cultural Resources Investigation for the Merriam Junction Sands Project, Louisville Township, Scott County, Minnesota, Final Report (March 2015 Summit Envirosolutions). Based in the results of the</p>	<p>Thank you for your comments. The project proposer met with the OSA to establish appropriate setbacks from the mound sites as part of initial work on the DEIS. Early mining planning included property immediately adjacent to the mound sites. Subsequent removal of certain parcels from the Project Area,</p>

<p>investigation we conclude that there are no properties listed in the National or State Registers of Historic Places, and no known or suspected archeological properties in the area that will be affected by this project. However, we recommend that the County consult with the Minnesota Office of the State Archeologist (OSA) regarding the 2 mound sites, 32SC0021 and 21SC0029, that are located adjacent to the proposed mining to ensure that there is sufficient buffer established around these sites to ensure that they are not impacted by mining activities.</p>	<p>resulted in a reduction of mining limits. Mining limits associated with the project are setback over 1,000 feet between mining and the mound sites. The project will not impact the mound sites.</p>
<p>Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36 CFR § 800. If this project is considered for federal financial assistance, or requires a federal permit or license, then review and consultation with our office will need to be initiated by the lead federal agency. Be advised that comments and recommendations provided by our office for this state level review may differ from the findings and determinations made by the federal agency as part of the review and consultation under Section 106.</p>	<p>Thank you for your comment. Comment noted.</p>