Appendix B.8:
Visual Assessment Technical Memorandum

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Visual Assessment Technical Memorandum

Zavoral Property Mine and Reclamation Project

AECOM

August 19, 2011

AECOM

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Executive Summary

The Tiller Corporation, Inc. (Tiller) proposes to operate a sand and gravel mine on the site of a dormant, unreclaimed gravel mine in the City of Scandia, Washington County, Minnesota. The 114-acre site (Zavoral Site or Site) is located along St. Croix Trail North (State Trunk Highway [TH] 95) near its intersection with TH 97. Tiller proposes to mine and reclaim 64 acres of the 114-acre Site, predominately on portions of the Site that were previously disturbed by mining. An 8-acre area that has not been previously mined is included in the proposed mining area. Tiller is also proposing to restore approximately 4 acres of the previously mined area located within the St. Croix National Scenic Riverway and USA Scenic Easement Area (Figure 1).

The Site is within the jurisdiction of the City of Scandia and partially within the designated riverway. The protection of scenic resources within these jurisdictions is guided by the City of Scandia Comprehensive Plan, and the Cooperative Management Plan (CMP) and Environmental Impact Statement (EIS) for the Lower St. Croix National Scenic Riverway. The Washington County Comprehensive Plan also describes a scenic easement that is partially within the Site.

This technical memorandum presents the evaluations completed for Task 17 – Visual Resources for the Project. It identifies potential environmental impacts related to the Project alternatives and identifies measures that could avoid, minimize, or mitigate for these potential impacts. This work was conducted as part of the EIS process to be completed under Minn. R. 4410. The following alternatives are included in the EIS analysis.

- Alternative 1 – Tiller's Preferred Alternative. Mining and reclamation would occur over a 5 to 10-year period.
- Alternative 2 – No Build Alternative.
- Alternative 3 – Reduced Timeframe. Mining and reclamation would occur over an up to 5-year period.

The following goals are included under Task 17 – Visual Resources:

- Review Tiller's visual impact analysis information for the Zavoral Site for accuracy.
- Model site-specific conditions for the Zavoral Site.
- Accurately represent views of the Zavoral Site from key view areas through drawings, photographs, or other imaging methods for ease in understanding by reviewing agencies and the public. Complete a written analysis describing the visual impacts of the Zavoral Site.
- Identify the strategies to avoid, minimize, or mitigate visual impacts at the Zavoral Site to key viewing areas.
- Identify visual impacts that would result from aggregate mined at the Zavoral Site being used at the Scandia Mine.

The following are key findings of the visual assessment:

- Proposed short- and long-term mining activities would introduce new elements into the landscape, and create new contrasts with the existing landscape form, line, color, and texture.
- The Tiller visual impact analysis (revised June 2011) concluded that the proposed Project would not be visible from the St. Croix River or from Wisconsin, and that the greatest potential for visual impact is to the traveling motorist in Minnesota. This analysis was reviewed by AECOM and determined to accurately reflect the existing and proposed Project conditions.
- AECOM selected 3 sensitive viewpoints from which the proposed Project would be most visible and prepared photographic simulations from those viewpoints in leaf-off conditions. These photographic simulations are included as Figures 2 through 4 in the memorandum.
- AECOM prepared a computer-generated representation of Phase 2 Mining and Reclamation showing what the Project would look like during the period when the highest level of disturbance at the Site would occur (Figure 5).
- Views from sensitive viewpoints in proximity to the Site were evaluated. Views into the Site would be limited because the interior would be excavated and mined to a lower elevation than adjacent properties, and stands of trees (in both leaf-on and leaf-off conditions) screen views. Installation of additional screening berms and tree plantings would help screen Project activities from sensitive viewpoints.

Additional mitigation measures identified as part of the AECOM visual assessment that would further reduce negative visual are:

- Establish a maximum stockpile height limit of approximately 880 feet mean sea level (msl). Stockpiles limited to this elevation would be effectively screened by proposed and existing berms. Locating stockpiles on the west side of the Site should be minimized, as the upper slopes of stockpiles would have a greater potential to be within the viewsheds of sensitive viewpoints.
- Limit non-daylight lighting to what is required for safety and security. All such lighting should consist of shielded, downward directed lighting.
- Fully implement and monitor reclamation activities to verify that reclamation is occurring as planned and to meet pre-determined criteria established by the City to confirm the success of reclamation.
- Monitor the proposed transplanting of native white pine trees to verify maintenance and watering and to assess survival rates. If survival rates do not fall within a pre-determined range established by the City, replacement trees should be provided by Tiller.

1.0 Project Background

Tiller proposes to operate a sand and gravel mine on the site of a dormant, unreclaimed gravel mine in the City of Scandia, Washington County, Minnesota. The 114-acre site (Zavoral Site or Site) is located along St. Croix Trail North (State Trunk Highway [TH] 95) near its intersection with TH 97. Tiller proposes to mine and reclaim 64 acres of the 114-acre Site, predominately on portions of the Site that were previously disturbed by mining. An 8-acre area that has not been previously mined is included in the proposed mining area. Tiller is also proposing to restore approximately 4 acres of the previously mined area located within the St. Croix Riverway and USA Scenic Easement Area (Figure 1).

The St. Croix River was designated as a National Scenic Riverway in 1962 in recognition of its outstandingly remarkable scenic, recreational, and geologic values. The St. Croix River District includes all lands within the riverway boundary, as published in the *Federal Register*, between the dam at St. Croix Falls/Taylors Falls and the confluence of the Mississippi River.

The Site is within the jurisdiction of the City of Scandia and partially within the designated riverway. The protection of scenic resources within these jurisdictions is guided by the City of Scandia Comprehensive Plan, and the CMP and EIS for the Lower St. Croix National Scenic Riverway. The Washington County Comprehensive Plan also describes a scenic easement that is partially within the Site. The proposed Project and alternatives would comply with the scenic resource goals and policies of all affected jurisdictions.

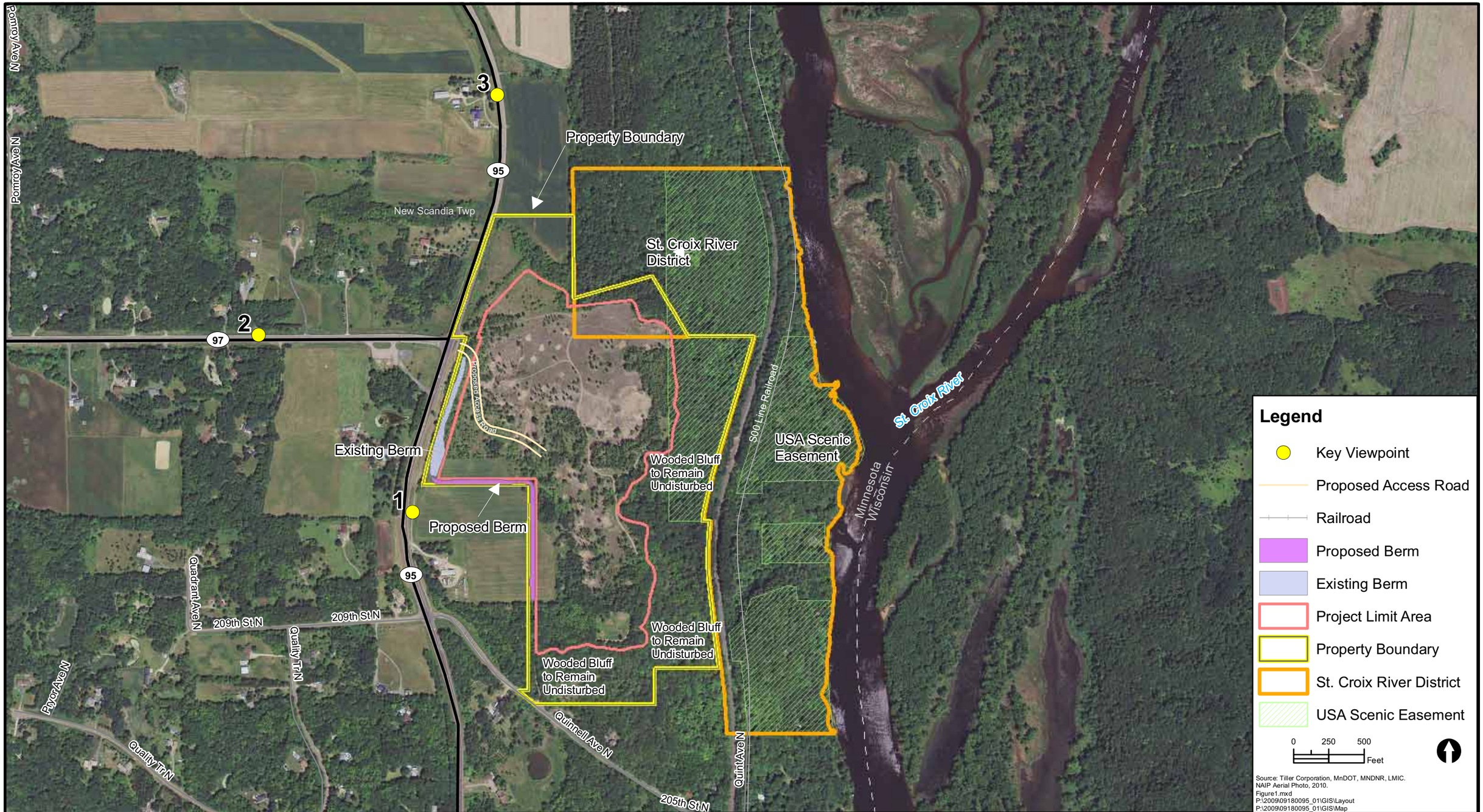
This technical memorandum presents the evaluations completed for Task 17 – Visual Resources for the proposed Project. It identifies potential environmental impacts related to the Project alternatives and identifies measures that could avoid, minimize, or mitigate for these potential impacts. This work was conducted as part of the EIS process to be completed under Minn. R. 4410. The following alternatives are included in the EIS analysis.

1.1 Alternative 1: Applicant's Preferred Alternative – 5 to 10-Year Operation

1.1.1 Zavoral Site Activities

The mining and reclamation would be conducted in phases, with a Project duration of up to 10 years under this alternative.

In general, reclamation of the Site would proceed in increments as areas of mining are completed. The reclamation plan proposes that perimeter areas be sloped and interior areas backfilled and graded to reclamation grades. Topsoil or other organic material would be applied to these areas and vegetation established to reduce erosion. The Environmental Assessment Worksheet (EAW),



Prepared By: AECOM

Prepared For: SCANDIA minnesota

CITY OF SCANDIA
ZAVORAL MINING AND RECLAMATION
EIS PROJECT
WASHINGTON COUNTY, MINNESOTA

Visual Resource Analysis

Figure 1

August 2011

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prepared earlier for the Project, proposed that the previously mined area within the St. Croix Riverway be restored during the final phase of mining operations at the Site. Tiller's letter to the City (April 7, 2009) proposed revising the reclamation and phasing plan to include reclamation of the area within the St. Croix Riverway and scenic easement areas during the first years of operation. This technical memorandum, therefore, evaluates the Project scenario that includes reclamation of the St. Croix Riverway and scenic easement areas during the first 5 years of mining operations on the Site.

1.1.2 Scandia Mine Activities

Raw aggregate material mined at the Site would primarily be transported to the Scandia Mine. The Scandia Mine currently uses or processes aggregate material from the Scandia Mine and materials that are transported to the Scandia Mine from other locations. Tiller has indicated that the materials transported from the Zavoral Site would replace materials hauled to the Scandia Mine from Franconia, Minnesota and the Osceola, Wisconsin, area. The following activities would occur at the Scandia Mine:

- Aggregate material brought in from the Zavoral Site (add-rock) would be blended with aggregate material mined at the Scandia Mine for use in the production of hot mix asphalt.
- A portion of the aggregate material transported to the Scandia Mine may be processed as needed through a series of crushers, screens, conveyors, wash decks, and classifiers to produce commercial grade construction aggregates.
- The finished construction aggregate products would be stockpiled at the Scandia Mine until they are hauled off-site by trucks to various construction sites.

The Scandia Mine operates under a Conditional Use Permit (CUP) and an Annual Operating Permit (AOP) approved by the City of Scandia. The processing activities listed above are included in the activities authorized by these permits. No changes in operations at the Scandia Mine are expected.

1.2 Alternative 2: No-Build Alternative

The No-Build alternative is based on the existing use continuing at the Site. It would remain as an unreclaimed open space. Allowable future uses of the Zavoral Site are agricultural and rural residential.

1.3 Alternative 3: Reduced Time Period - Up to 5-Year Operation

This alternative focuses on the impacts of the proposed activities if the overall time frame for mining at the Zavoral Site is up to 5 years rather than up to 10 years, as proposed in Tiller's Preferred Alternative. This would result in more mining occurring for more weeks each year and more material being mined per year.

Tiller is proposing the following activities at the Zavoral Site with either of the "build alternatives" (Alternatives 1 and 3):

- Clearing and grubbing the Site of vegetation, as necessary.
- Removing overburden from areas to be mined, and stockpiling the material on the Site for potential future use in reclamation.
- Excavating raw aggregate materials.
- Using water from the existing well for dust suppression.
- Storing fuel and related materials, such as oil, anti-freeze, grease, and hydraulic fluid, on the Site.
- Reclaiming the Site through grading, placing topsoil or other organic material, and seeding.

Mining operations would typically be conducted on a seasonal basis from April through mid-November; however, it could occur year-round

Mined aggregate material (pit-run and/or add-rock) would primarily be hauled to Tiller's Scandia Mine near Manning Avenue and 225th Street for use in material produced at that Site.

2.0 Visual Assessment Goals

The following tasks and goals are included in this visual assessment:

- Review Tiller's visual impact analysis information submitted for the Zavoral Site (updated June 2011) for accuracy.
- Model site-specific conditions for the Zavoral Site.
- Accurately represent views of the Zavoral Site from key view areas through drawings, photographs, or other imaging methods for ease in understanding by reviewing agencies and the public. Complete a written analysis describing the visual impacts of the Zavoral Site
- Identify the strategies to avoid, minimize, or mitigate visual impacts at the Zavoral Site to key viewing areas.
- Identify visual impacts that would result from aggregate mined at the Zavoral Site being used at the Scandia Mine.

3.0 Visual Assessment

Scenic landscapes contribute to the quality of life for local communities and can provide economic benefits to communities when they provide high quality, scenic settings for residences and outdoor recreation experiences. Activities in the vicinity of the proposed Project were reviewed to identify potential impacts on the quality of views from nearby areas, such as residences, roadways, a bike path, and the St. Croix Riverway.

Visual resources of the area include existing natural features, such as vegetation, water features, landforms and geology, as well as human-made elements. The visual resource analysis area includes the Zavoral Site and all areas outside of the Site that would provide views of Project activities.

3.1 Existing Environment

This section describes the visual setting, including user sensitivity, scenic quality and integrity of the landscape, and visibility of the Site from sensitive viewing areas.

Landscape character creates a "sense of place" and describes the image of an area that is valued by residents and visitors to the area. The regional landscape of east-central Minnesota, west of the St. Croix River, is characterized by rolling hills interspersed with depressions of small lakes and wetlands, extensively covered by urban and suburban development, as well as pasture and some crops and woodland (EPA 2007). The St. Croix River flows through a broad floodplain covered with forests and braided channels, bordered by heavily wooded bluffs. The Minnesota side of the river includes low density residential areas. The Wisconsin side is natural in character with few signs of development. The overall landscape setting of the Site possesses considerable scenic qualities based on the diversity of landforms, vegetation pattern, and surface water. Characteristic rural residential uses in a scenic setting of dense tree stands interspersed with agricultural uses adjacent to the St. Croix River are shown in the aerial view in Figure 1.

The existing Zavoral Site is an unreclaimed gravel mine characterized by irregular landforms and several stockpiles remaining from past mining activities. Neighboring properties include agricultural and residential land uses. Land cover on undeveloped areas consists of fields, open space, and wooded areas. Past mining at the Site has modified the interior terrain to an elevation that is lower than adjacent properties, which limits visibility into the Site. The scenic integrity, which indicates the degree of intactness and wholeness of the natural character of the landscape, is relatively low because of the presence of past mining disturbance and developed residential land uses on adjacent private land parcels. The scenic integrity of the adjacent St. Croix River corridor is high, as there is little evidence of discordant human activities along the river.

A portion of the Site lies within the St. Croix River Riverway and St. Croix River District, which includes all lands within the riverway boundary (Figure 1). Historically, mining activities occurred on approximately 4 acres that are within the areas now designated St. Croix River District along the west boundary of the riverway.

3.2 Scenic Resource Management (or Special Designations)

As stated, the CMP and EIS for the Lower St. Croix National Scenic Riverway were adopted by the National Park Service (NPS) in 2002. The CMP provides direction to:

- Preserve and protect the riverway's ecological integrity, unimpounded condition, natural and scenic resources, and significant historic resources.
- Accommodate a diverse range of recreational opportunities that do not detract from the exceptional natural, historic, scenic, and aesthetic resources.

- Provide an environment that allows the opportunity for peace and solitude.
- Provide an opportunity for the education and study of the geologic, historic, ecological, and aesthetic values to further enhance stewardship of the river.

As described in the Washington County Comprehensive Plan, the Minnesota Department of Natural Resources (MnDNR) and NPS acquired scenic easements along the St. Croix River. Scenic easements are agreements between a landowner and a government agency to protect and preserve views of scenic river districts or byways. These easements typically consist of a thin corridor along the St. Croix River shore or adjacent bluff tops. A small area of wooded bluff within the Site is within a USA scenic easement, shown on Figure 1. The scenic easement is also within the St. Croix River District and the designated Scenic River corridor.

The Washington County Comprehensive Plan provides policies and associated implementation strategies to protect scenic values in the county (Washington County 2010). Policies and strategies that apply to the Site and proposed activities within the Site are summarized below:

> Policy 6-4: Protect shoreland areas in order to maintain natural habitat and water quality.
>
> Implementation Strategies
>
> - Manage and regulate land uses in the Lower St. Croix Wild and Scenic River corridor in order to protect their scenic, natural, historic, cultural, and recreational aspects in accordance with the Lower St Croix Cooperative Management Plan.

The Lower St. Croix River Bluffland and Shoreland Management Ordinance provide protection strategies that include measures to protect scenic resources (Washington County Planning Commission 1976). These include guidelines for minimum area, setbacks, and other requirements of each district within the riverway; standards and criteria for allowable uses within the riverway:

> Section 5. Uses within the St. Croix Riverway
>
> 501. Purpose. The purpose of establishing standards and criteria for uses in the St Croix Riverway shall be to protect and preserve existing natural, scenic, and recreational values, to maintain proper relationships between various land use types, and to prohibit new residential, commercial, or industrial uses that are inconsistent with the National Wild and Scenic Rivers Act, and the Federal and State Lower St Croix River Acts.
>
> 807. Factors to Be Considered.
> 807.01. When considering a proposal or zoning amendment within the St. Croix River District, the governing body shall address the following items in making its decisions:
> (1) Preserving the scenic and recreational resources of' the St. Croix Riverway, especially in regard to the view from and use of the river.

The Site is located within the municipal boundaries of the City of Scandia. The City of Scandia Comprehensive Plan vision narrative describes the desired long-range outcome of Scandia's future development, investment, and protection efforts; and provides goals, policies, and implementation strategies that connect to the vision (City of Scandia 2009). Land use (LU) goals, policies, and strategies that address visual resources and are applicable to the proposed Project include:

- LU Goal 1: Maintain the City's unique rural and small-town character and its natural landscape while accommodating a reasonable amount of new development that contributes to, rather than detracts from, that character.
    - LU Policy 1.3: Establish standards that protect Scandia's scenic views by minimizing the visual impact of new development.
        - LU Implementation Strategy 1.3.2: Require landscaping along major collector roads to minimize visual impact of new development.
    - LU Policy 1.4: Emphasize sensitivity to community character in new development and redevelopment, whether that character is expressed by historic buildings, agricultural views and activities, natural resource, scenic views, dark skies, a quiet setting, or other elements that are important to the City's residents.

Scandia Ordinance No. 103 provides regulations for the protection of scenic resources during mining operations.

> 7.1 Operating Conditions. The following operating conditions and standards must be met for all mining operations.
>
> Screening, Where deemed necessary by the City, extracting and processing operations shall be screened or located in such a manner as to minimize the impacts on surrounding properties. To minimize noise, dust, odors, erosion and visual impacts on surrounding properties, a continuous screen shall be installed and maintained, either along the street or along the perimeter of the visible portion of the area being operated.
>
> The following shall serve as the minimum performance standards for screening and may be varied as determined by the City:
>
> (A) The screen shall have a total height of not less than six feet and shall consist of one or more of the following types:
>
> (1) Walls. A wall shall consist of concrete, stone, brick, tile, or similar type of solid masonry material a minimum of four inches thick.
>
> (2) Berms. A berm shall be constructed of earthen materials, and it shall be seeded and mulched as shown on the landscape plan. Plans for berms must be provided that avoid impacts, especially surface water, onto neighboring properties. If berms are constructed of topsoil, they must remain until final reclamation. Berms must have a minimum slope of 3:1 and have a silt fence at the base closest to the public road or neighboring property. The silt

fence shall be maintained until vegetation is established, at which time it shall be removed. No haul roads, either temporary or permanent, material stockpiles or other mining-related activities shall occur on the berm.

(3) Fences, Solid. A solid fence shall be constructed of wood and shall form a continuous screen.

(4) Fences, Open. An open weave or mesh-type fence, when not used in combination with a berm, shall be combined with plant materials to form a continuous screen.

(5) Planting. Plant materials, when used as a screen, shall consist of dense evergreen plants or a majority of dense evergreen plant materials combined with deciduous plants provided a continuous screen is established. They shall be of a kind or used in such a manner so as to provide a continuous screen within 24 months after commencement of operations in the area to be screened. Plant materials shall not be limited to a maximum height. The Screening Plan shall be prepared by a licensed landscape architect. Required screening shall be installed prior to commencement of operations.

The City may require that (1), (2), or (3) above shall be installed if, 24 months after commencement of operations in the area to be screened, plant materials have not formed an opaque screen, or if an opaque screen is not maintained.

There are no other state, federal, or local guidelines or regulatory authority for the protection of visual resources on private lands outside of the St. Croix River District and scenic easement. The Scenic Management Objectives described above were included in this visual analysis.

3.3 Review of Tiller Visual Analysis Information

The visual analysis prepared for this report uses information from the Tiller Visual Analysis (updated June 2011), which evaluated the potential visual impacts of the proposed project using two methods: a Photo Visual Impact Analysis and a Computer Aided Visual Impact Analysis. Both methods identified that sensitive viewing receptors could have the potential to be impacted by the proposed Project. The existing conditions photographs used in this memorandum were taken from the Tiller Visual Analysis.

Tiller's Photo Visual Impact Analysis uses photographs taken from potentially sensitive receptors to assess the visibility of the Site. Views of the Site and adjacent properties were photographed and the locations recorded using a GPS during leaf-on and leaf-off conditions to develop a visual impact baseline for traveling motorists, a local bike trail, neighboring residences in Minnesota and Wisconsin, and from the St. Croix River. The photographs were taken at locations surrounding the Site that were most likely to offer a view of the interior of the Project. The locations were determined based on topography, tree coverage, and location.

The Computer Aided Visual Impact Analysis was developed using ArcGIS® 3D Analyst™ 10 to determine the viewshed or area that can be seen from a set of observation points. The model is

based on the expected visual conditions of the proposed Project area and adjacent and surrounding properties. Three viewshed analyses were prepared by Tiller that identified the visibility of the Site from three sensitive viewing areas: 1) roadways along the Minnesota side of the riverway, 2) the St. Croix River, and 3) the Wisconsin bluffs. The key viewpoints were selected to represent sensitive viewing areas that provide the largest potential area of unimpeded views of the Site interior, as well as locations that represent areas where viewers would have a concern for the scenic quality of the landscape. The Tiller viewshed analyses concluded that the proposed Project would not be visible from the St. Croix River or from Wisconsin, and that the greatest potential for visual impact is to the traveling motorist in Minnesota.

This analysis was reviewed by AECOM and determined to accurately reflect existing and proposed Project conditions.

3.4 Identification of Sensitive Viewing Areas

Residents, recreationists on the bike path and St. Croix Riverway, and other visitors viewing the landscapes along the riverway would be sensitive to modifications to the landscape that could impact the visual quality of their view.

The Site has the potential to be viewed from or near sensitive viewpoints on TH 95 (St. Croix Trail North) along the west side of the Site, TH 97, a bike path along TH 95, residences accessed from the highway, and from within the St. Croix Scenic Riverway, including high bluffs along the Wisconsin side of the riverway. Viewshed analyses identified the visibility of the Site from these areas. Very little of the Site under current conditions is visible from sensitive viewpoints at any location because past mining activities have lowered the Site terrain to elevations lower than the river bluff to the west and the rolling terrain to the east. Visibility of the Site is also strongly influenced by screening of the Site from tree stands during both seasonal leaf-on and leaf-off conditions. The Tiller visual impact information (updated June 2011) includes photographs of the existing Site landscape as seen from surrounding sensitive viewpoints.

The upper portions of some existing stockpiles, with an estimated maximum height of 907 feet msl, are either not visible or only partially visible during leaf-off conditions as viewed from sensitive receptors within an approximate ¼-mile distance. Because of the filtering effect of the screening trees during the off-leaf season, the form, line, and color contrasts of the stockpiles become diffused with distance and difficult to discern by most viewers.

The Project would not be visible from the St. Croix Riverway or from the Wisconsin bluffs on the east side of the river. No part of the Project Site is visible from the river, which is located at a lower elevation than the Site. Bluffs vegetated with stands of trees (with an estimated height of 60 feet) along the east side of the Site block all views of the Site from any location on the river. The vegetated bluffs also block views from the bluffs on the Wisconsin side of the river. Any potentially visible portions of the Site unimpeded by tree stands (view corridors across open spaces) are indistinct due to distance from any location along the Wisconsin bluff line. In general, views of the Site interior from Wisconsin are either not present or very difficult to discern through the filtering of distance and vegetation. There are few sensitive viewing areas that provide unimpeded views of the Site during either seasonal leaf-on or leaf-off conditions.

The Site is visible to a limited extent from sensitive viewpoints along roadways and the bike path in Minnesota. As seen from TH 95, south of the highway junction with Quinnell Avenue and north of 220th Street, the Site is screened by stands of trees during both leaf-on and leaf-off conditions. Partially open viewshed corridors and relatively sparse tree stands do occur on TH 97 and a relatively short segment of TH 95 north of the Site. Three key viewpoints were selected to represent sensitive viewing areas that provide the most potential for unimpeded views of the Site interior, as well as locations that represent areas where viewers would have a concern for the scenic quality of the landscape.

Key Viewpoint 1: This viewpoint is located on the bike path along the east side of TH 95 within ¼ mile of the southwest boundary of the Site, as shown in Figure 1. The photograph in Figure 2a represents existing conditions at the Site. It shows that most of the Site is screened by trees even during the seasonal leaf-off condition, with the exception of the top of a stockpile.

Key Viewpoint 2: This viewpoint is located on TH 97 about ¼ mile west of the Site, as shown in Figure 1. The photograph in Figure 3a was taken during leaf-off conditions on TH 97, approximately ¼ mile west of the Site. Trees screen most of the Site. White pines along the east side of the Site are visible; however, the ground surface is not visible because of an elevation difference of about 70 feet. The interior of the proposed Project is at a lower elevation due to past mining activity. The screening berm that remains from previous mining activity is also visible along the right hand side of the photograph across from TH 95.

Key Viewpoint 3: This viewpoint is located on TH 95 approximately ¼ mile north-northwest of the Site, as shown in Figure 1. The photograph in Figure 4a shows the Site during leaf-off conditions. The interior of the Site is not visible. The northern portion of the Site, including a small area of disturbance from past mining activities, is within the viewshed of the viewpoint; however, any disturbed areas are difficult to discern from the surrounding undisturbed landscape because of the partial screening of trees and other vegetation.

3.4.1 Impact Analysis

This section provides an assessment of the direct and indirect short- and long-term potential impacts to visual resources from the proposed Project under the two "build alternatives."

3.4.1.1 Analysis Methods

Short-term visual impacts associated with site preparation activities and long-term impacts from mining and reclamation were assessed by analyzing the contrast between the proposed Project and the existing landscape, as seen from the three sensitive viewing areas. Contrasts were evaluated using photographic simulations of the proposed Project prepared for key viewpoints. The viewshed analysis depicts the portions of the Site that would be visible from within the sensitive viewing areas.

Figure 2a. Existing Condition. Key Viewpoint 1 is on a bike trail located north of Quinnell Avenue North between TH 95 and the proposed Project. It overlooks an agricultural field adjacent to the proposed Project.

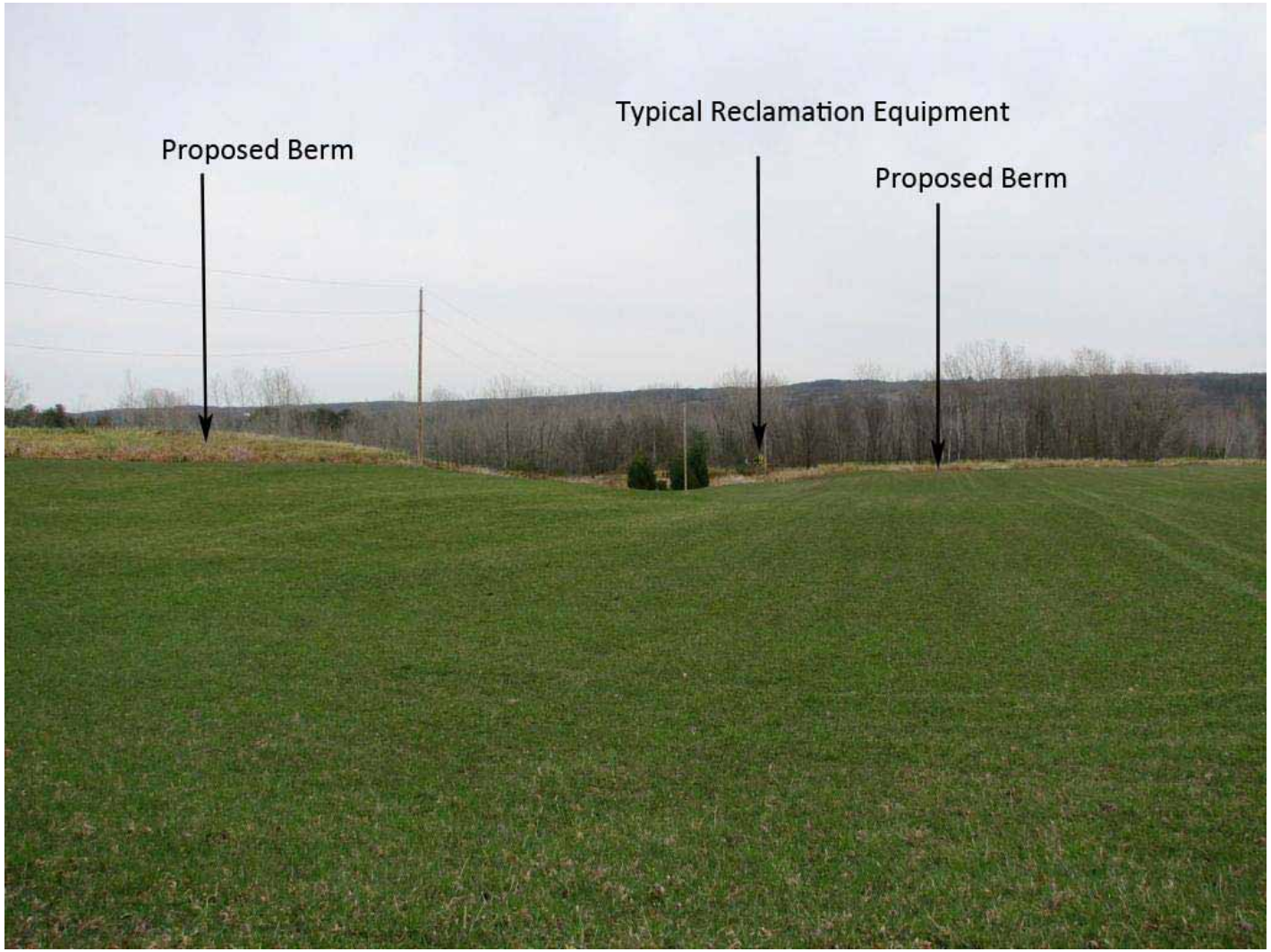


Figure 2b. Simulation: Proposed berms between Key Viewpoint 1 and the tree stands would screen visible activities during leaf-off conditions, including site preparation work, excavation, loading, hauling, grading, and removal of stockpiles, on the western side of the Project area.

Figure 3a. Existing Condition: Key Viewpoint 2 is on eastbound TH 97, approximately ¼ mile west of the proposed Project. The trees screen most of the proposed Project area during leaf-off conditions.

Figure 3b. Simulation: The proposed Project access entrance as seen from Key Viewpoint 2 would be within the line of sight for motorists traveling eastbound on TH 97. The berm screens views of the site interior, although some operations activities may be partially visible, such as the truck shown partially blocked by the berm in the right side of the simulation.

Figure 4a. Existing Condition: The view from Key Viewpoint 3 is to the south-southeast from TH 95, located ¼ mile north of the proposed Project.

Figure 4b. Simulation: Visibility of Phase 1 Mining and Phase 2 Reclamation from Key Viewpoint 3 during leaf-off conditions will be limited due to screening from trees, a vegetated berm, and lowering of interior elevation.

The contrast evaluation assesses changes to the visual quality of a landscape from the introduction of the proposed Project into the existing landscape. The degree of contrast was evaluated according to the criteria shown in Table 1. The contrast of proposed Project facilities is compared with the significance criteria to determine whether the proposed Project would result in a significant impact to the visual resources of the visual analysis area.

Table 1 – Contrast of Proposed Project Activities with the Existing Landscape

Degree of Contrast	Criteria
None	The proposed action is not visible or perceived.
Weak	The proposed action can be seen but does not attract attention.
Moderate	The proposed action begins to attract attention and begins to dominate the characteristic landscape.
Strong	The proposed action demands attention, would not be overlooked, and is dominant in the landscape.

Source: Bureau of Land Management 1986

3.4.1.2 Significance Criteria

The following were used in determining significance criteria.

- Effects on existing scenic integrity and scenic attractiveness resulting from the proposed Project.
- Level of Project visibility from sensitive viewing areas, such as the St. Croix National Scenic River, TH 95 and TH 97 on the Minnesota side of the St. Croix River, and the bluff line on the Wisconsin side of the St. Croix River.
- Compliance with the Scenic Management Objectives of the Lower St Croix CMP, the City of Scandia Comprehensive Management Plan and Ordinance No. 103, and the regulation of scenic resources identified in other state, federal, and local regulations and planning documents.

3.4.1.3 Alternative 1: Up to 10-Year Operation

Direct effects to visual resources would occur as a result of the disturbance of the landscape by Project activities. Direct effects can be short or long term. Indirect effects caused by the proposed Project can occur later in time or farther removed in distance, and could involve indirect changes in local economic tourism and recreation sectors that are dependent on the scenic setting of the St. Croix River.

Short-term direct effects to the visual character of the analysis area would result from site preparation activities and early reclamation activities. Site preparation activities include realignment of the Site access and construction of a turning lane, internal main haul road construction, construction of screening berms, and tree removal. The majority of the visual impact of the proposed Project would result from short-term site preparation activities.

Long-term direct effects result from the mining and reclamation operational phases of the proposed Project. No significant buildings or structures are proposed for construction on the Site. The proposed activities and equipment associated with the proposed Project would introduce new elements into the landscape and create new contrasts with the existing landscape form, line, color, and texture over the operating life of up to 10 years for the proposed Project.

Existing vegetation and the existing screening berms would be preserved along TH 95 and along the southwest perimeter of the Site. In addition, new berms would be constructed. The combination of the new berms, existing berms, and existing vegetation would screen most views of proposed mining and reclamation activities from nearby vehicular, bicycle, and pedestrian traffic in the area. Construction of the new berms would occur as the Site is being mined. In addition, native white pine trees would be transplanted at selected locations within the Site to provide additional screening.

The majority of mining and reclamation would take place on previously mined areas; therefore, the proposed Project would require very little additional overburden removal. Stockpiles present at the Site would be removed under Phases 1 and 3 of the proposed Project. Phased reclamation activity would take place concurrently with mining activity and require the placement of overburden materials, including topsoil reclamation.

In general, long-term effects of mining and reclamation activities would be not be visible, or would be partially visible from sensitive viewpoints. This is because the interior Site terrain would be further excavated to a lower elevation than adjacent properties, which would limit visibility into the Site. In addition, views of the Site are blocked by tree stands in both leaf-on and leaf-off conditions as viewed from TH 95, TH 97, the bike path, and nearby residences.

Non-Daylight Lighting

Mine facilities would be lit at night or under low light conditions (early morning, evening, and during adverse weather conditions) for maintenance activities and safety. No night-time shifts are proposed for the Project. Non-daylight lighting is generally visible for long distances, and would potentially be visible through gaps in screening vegetation as viewed from roads and residences to the north, west, and south of the Site, and from bluffs on the Wisconsin side of the St. Croix River. However, the amount of light projected outside the Site would be minimized with the installation of downward directed lighting to illuminate only the area within the Site. The downward directed lighting would be visible to viewers within the Minnesota and Wisconsin sensitive viewing areas as well as the key viewpoints, but would likely not attract attention as the downward lighting would be screened to some extent by topography, vegetation, and the existing and proposed berms. Visual contrasts from non-daylight lighting would be weak.

Sensitive Viewing Areas

Impacts on the three key viewpoints that AECOM identified as having the highest potential for views of the proposed Project are described below.

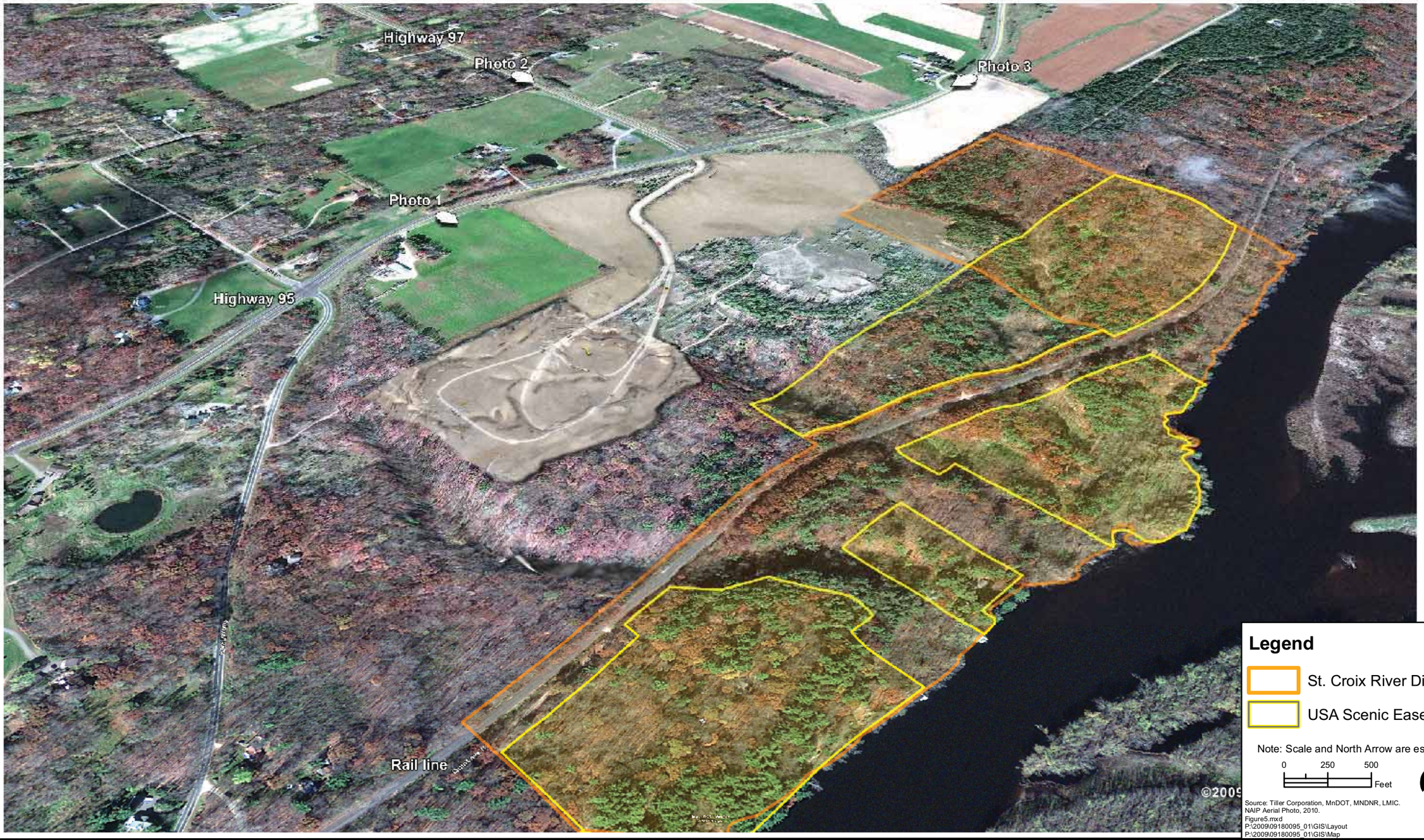
Key Viewpoint 1: This photographic simulation (Figure 2b) provides a view of Phase 2 mining and reclamation activities (Sheet C2) that would be visible to the public using the bike path for about 6 to 12 weeks. Phase 2 (Figure 5) was selected because it represents the most area disturbed by Project activities that could be visible, especially when occurring on the western portions of the Site. Visible activities would include excavation, loading, hauling, grading, and removal of stockpiles. The potential for impacts to the viewshed would decrease as mining reduces the elevation internally within the Site. Most of the activities would be screened by proposed and existing berms, and would be only partially visible over limited periods of time; therefore, the overall contrast of the operational phases with the surrounding landscape would be weak.

Key Viewpoint 2: This photographic simulation (Figure 3b) provides a view of Phase 2 mining and reclamation activities (Sheet C2). A short segment of the access road (junction with the highway shown in Figure 3b) would be visible over the life of the Project, but would repeat the lines, colors, and textures of existing roadways visible from the viewpoint resulting in a weak contrast to the existing landscape. The overall contrast of mining and reclamation equipment associated with operational phases would be weak because most of the activities would be screened by proposed and existing berms, and would be partially and intermittently visible over limited periods of time.

Key Viewpoint 3: This photographic simulation (Figure 4b) provides a view of Phase 1 Mining and Phase 2 Reclamation (Sheets C1-C2). The existing stockpiles would be removed as part of Phase 3 Mining (Sheet C3). The Project would not be visible during leaf-on conditions. The northern portion of the Site is within the viewshed of this viewpoint. Northern areas of the Site and several existing stockpiles may be visible during leaf-off conditions. As shown in Figure 4b, the overall contrast of the operational phases would be nonexistent to weak because most of the activities would be screened by proposed and existing berms, and would be only partially visible over limited periods of time.

As shown in the photographic simulations (Figures 2, 3, and 4) for the three key viewpoints, effects on existing scenic integrity and scenic attractiveness would be negligible. There would be no change in the scenic integrity of the Site as viewed from the key viewpoints, as portions of the existing Site have already been modified by past mining activities.

Visibility: In summary, there would be little change in the scenic attractiveness of the overall landscape viewed from any sensitive viewpoint or area, because overall contrasts of proposed long-term Project activities with the existing landscape would be weak due to complete or partial screening of proposed activities by existing landforms and vegetation or by proposed berms. Once mining and reclamation phases are complete, the Site would be restored to a natural landscape appearance, which could enhance the natural scenic attractiveness of the Site.



Legend

- St. Croix River District
- USA Scenic Easement

Note: Scale and North Arrow are estimates.

0 250 500 Feet

Source: Tiller Corporation, MnDOT, MNDNR, LMIC.
NAIP Aerial Photo, 2010.
Figure5.mxd
P:\2009\09180095_01\GIS\Layout
P:\2009\09180095_01\GIS\Map

Prepared By: AECOM

Prepared For: SCANDIA minnesota

CITY OF SCANDIA
ZAVORAL MINING AND RECLAMATION
EIS PROJECT
WASHINGTON COUNTY, MINNESOTA

Plan View Model of Phase 2 Mining and Reclamation

Figure 5

August 2011

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The first phase of reclamation would be in the northeastern portion of the proposed Project. This previously mined area is located within the St. Croix River District and USA Scenic Easement Areas, and would not be part of any mining activity associated with the proposed Project. Once the existing stockpiles have been removed and the final grading within the Phase 1 reclamation area has been completed, reclamation of this area would begin. The prescribed planting of this area would include a coniferous tree community intermixed with appropriate native prairie seed in openings.

The reclaimed Site condition would be accomplished by grading to achieve a gently rolling landscape that harmonizes with surrounding landforms characterized by gently sloping fields and steeper sloping bluff areas. Proposed reclamation areas would include low-lying areas or depressions located throughout the proposed mining limits, which would develop some ecological diversity and create visual interest. The 64-acre area would be covered by areas of native-dominated dry prairie, mesic prairie, and coniferous woodland that transition to and harmonize with existing, adjacent native plant communities.

The proposed Project would not be visible from most viewpoints in the three sensitive viewing areas, which include residential areas, recreation areas, and highways. Figure 5 presents a computer-generated representation of Phase 2 of the proposed Project. This phase represents the highest level of disturbance at the Zavoral Site. The proposed Project would not be visible to boaters and other recreationists on the St. Croix River or from the bluff line in Wisconsin. The contrast rating analysis concluded that contrasts of the proposed Project with the surrounding landscape would be weak (the proposed Project can be seen but does not attract attention), because most activities would be screened from view from key viewpoints and within the Minnesota sensitive viewing area.

Compatibility with Visual Land Use Goals

The proposed Project would be compatible with the scenic objectives of the Lower St. Croix CMP, because there would be no effect to the riverway's scenic resources, adverse effects to the scenic setting of recreational opportunities, or effects to opportunities to enhance stewardship of the river. It is not anticipated that changes in the visual resources would affect the local economy.

The proposed Project would be compatible with the City of Scandia visual land use goals, policies, and strategies that address visual resources (LU Goal 1, City of Scandia Comprehensive Plan) and with Ordinance No. 103, which provides standards for screening of mining operations. The rural character and natural landscape would be preserved by proposed berm screening and tree plantings. Existing adverse impacts, such as stockpiles, would be removed and the phased reclamation activities would enhance the natural character of viewsheds, which include the Project Site during operations. Once the operating and reclamation phases are complete, the natural character of the Site would be restored to a condition that conforms to the natural landscape, even to a greater extent than current Site conditions. Existing agricultural landscapes within sensitive viewsheds that contribute to the community character would be preserved, and effects to dark skies would be minimized to the greatest possible extent through downward directed lighting.

3.4.1.4 Alternative 2: No-Build Alternative

Under the No-Build alternative, there would be no impacts to visual resources as the proposed Project would not be developed. The area would remain unreclaimed. Future agricultural or rural residential land use would need to comply with city comprehensive plan and zoning.

3.4.1.5 Alternative 3: Up to 5-Year Operation

Alternative 3 would be conducted using the same operational plan (including mining and reclamation phases) and layout. The primary difference is that mining and reclamation would take place up to 10 years with Alternative 1 and up to 5 years under Alternative 3. This would result in more mining occurring for more weeks each year and more material being mined per year.

The visual impacts under Alternative 3 would be identical to those described for Alternative 1, but would occur over a shorter period of time. The overall contrasts from the alternative would be none (facilities not visible) to weak (facilities are visible, but do not attract attention). As described for Alternative 1, no significant impacts, as determined by the significance criteria, were identified from any phase of the proposed Project.

3.4.2 Potential Mitigation Measures

The visual impacts from site preparation, operating phases, and reclamation are anticipated to be negligible because mitigation measures included in the Zavoral Mine Plan provide screening elements such as berms and plantings, as well as ongoing reclamation strategies that mitigate impacts to key viewing areas to the degree practicable. Additional mitigation would ensure that the proposed screening and reclamation strategies are successfully implemented.

- Establishing a maximum stockpile height limit of approximately 880 feet msl. Stockpiles limited to this elevation would be effectively screened by proposed and existing berms. Locating stockpiles on the west side of the Site should be minimized, as the upper slopes of stockpiles would have a greater potential to be within the viewsheds of sensitive viewpoints.
- Limit non-daylight lighting to what is required for safety and security. All such lighting should consist of shielded, downward directed lighting.
- Fully implement and monitor reclamation and activities to verify that reclamation is occurring as planned and to meet pre-determined criteria established by the City to confirm the success of reclamation.
- Monitor the proposed transplanting of native white pine trees to verify maintenance and watering and to assess survival rates. If survival rates do not fall within a pre-determined range established by the City, replacement trees should be provided by Tiller.

4.0 References

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