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TILLER
CORPORATION®

**2014 APPLICATION FOR THE
ANNUAL OPERATORS PERMIT**

Zavoral Mining and Reclamation Project

Scandia, MN



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APPLICATION FOR ANNUAL OPERATORS PERMIT
TILLER CORPORATION
ZAVORAL MINING AND RECLAMATION PROJECT
CITY OF SCANDIA
WASHINGTON COUNTY, MINNESOTA

I. INTRODUCTION

The following Annual Operators Permit (AOP) application is submitted on behalf of Tiller Corporation (Tiller) in compliance with the City of Scandia's Ordinance No. 103 and Chapter 4 of the Development Code: Mining and Related Activities Regulations, Section 6, adopted by the City of Scandia on August 28, 2007.

Activity began at the Site in September of 2013 with the installation of erosion control measures followed by the subsequent removal of vegetation to prepare the Site for mining and reclamation activities. By mid-October of 2013, crews were working on Phase 1 Reclamation, construction of the screening berm and the internal main haul road. Upon receiving the Minnesota Department of Transportation (Mn/DOT) permit near the end of October 2013, the construction of the access realignment and right-turn lane began and was completed near the end of November 2013. Trucks began hauling material out of the Site to the Scandia Mine on November 25, 2013.

II. ANNUAL REPORT

A. Operating Conditions

The site operates in accordance with operating conditions regulated by Section 7 of the Scandia Ordinance 103.

1. Setbacks: No mining, stockpiling or land disturbance activities, with the exception of screening activities, are proposed to take place within the setback areas. Minimum setback areas are maintained as follows:
 - a) 50 feet from an adjoining property line.
 - b) 200 feet from any occupied structures not owned by the operator or owner.
 - c) 100 feet from any contiguous property subdivided into residential lots of 5 acres or less.
 - d) 100 feet from any road right-of-way.
2. Fencing: A portion of the Site along State Highway 95 is fenced with a four foot high chain link fence. The fence is currently used in conjunction with an in place screening berm to control access screening from State Highway 95. There is a locking metal gate at the entrance to the site.
3. Hours of operation: Mining activities as defined in the City's ordinance are conducted from 7:00 a.m. to 7:00 p.m. Monday through Thursday and between 7:00 a.m. to 2:00 p.m. on Friday, excluding Federal holidays, during daylight hours, or one hour before sunrise and one hour after sunset during seasons when

daylight is not available between 7:00 a.m. and 7:00 p.m., unless the City authorizes other hours or days for mining activities.

4. Screening: Screening berms, wooded buffer areas, a state highway and agricultural fields separate the mining activity from surrounding properties. Mining operations are conducted in recessed portions of the site to minimize visibility. The proposed screening berm in the Site Plan of the CUP Application was constructed along the west and southwest perimeter of the property boundary from October to December, 2013. The berm was constructed of topsoil and overburden materials encountered during site preparation activities and Phase 1 Mining. The berm exceeds the six foot minimum height requirement for screening berms. Due to the timing and the conditions upon the completion of the berm, seeding and mulching on the berm will occur at the earliest opportunity in either late winter or early spring.
5. Dust control: An approved Dust Control Plan revised April 18, 2013 has been prepared for the Site and is on file with the City.

A portion of the main haul road has been paved as part of the construction of the realignment of the site entrance and the right turn lane. Asphalt millings have been applied to the main haul road from the edge of the asphalt to near the base of the main haul road. As mining is completed in the vicinity of the proposed main haul road, progress on the main haul road construction will continue.

A water truck was used to water unpaved portions of the Site to control dust. During periods of increased trucking activity, a non-chloride organic polymer may be applied to provide additional dust control, though this additional dust control was not necessary during the 2013 operating season. Once temperatures dropped below 35 degrees Fahrenheit, paved and milled portions of the haul road are not able to be washed and unpaved internal haul roads cannot be watered. Instead, precipitation in the form of snow traps particles and/or binds particles together minimizing the potential for dust.

The Site entrance is swept on a regular basis. Haul trucks are covered with tarps and a 10 mph speed limit is posted within the Site. These practices will continue into 2014.

6. Noise: All activities are conducted so as to be in accordance with all Federal, State and City noise standards. An on-site circular traffic pattern is implemented for haul trucks to minimize the need to back-up, which triggers a back-up alarm. Broadband back-up alarms are installed on all Tiller-owned equipment.
7. Depth of excavation: Maximum mining depth will be to 840 feet above msl. Reclamation grades will vary from 848-890 feet above msl. A benchmark has been established to monitor the elevation of the mine floor. The benchmark allows the operators to continually monitor the elevation of the mine floor with respect to the maximum depth of mining or 840 feet above msl.
8. Site clearance: Site clearing activities commenced in September of 2013 with the removal of vegetation within the Site. Most of the vegetation was fed through a chipper and converted into wood chips that were stockpiled until they could be

hauled off-site. The majority of the wood chips were transported to the biofuel plant in St. Paul, MN. Some of the tree trunks and roots that had been removed currently remain on-site and are arranged neatly in the north portion of the Site. The tree trunks have been set aside to dry out and will likely be processed during the 2014 operating season to be converted into wood chips for erosion control logs.

Overburden material encountered within Phase 1 Mining was used to construct the screening berm and main haul road during initial site preparation.

9. Appearance/condition: All equipment at the site is maintained in a neat and orderly condition. Any unnecessary equipment is removed from the site.
10. Sanitary Facilities: Portable sanitary facilities are provided in the operating areas as required by the Mine Safety and Health Administration.
11. Waste Disposal: Waste generated from the operation is disposed of in a 4-cubic yard covered waste bin and maintained in accordance with Federal, State and City requirements.
12. Water Quality Monitoring: An approved Groundwater Quality Protection Plan (GWPP) revised April 18, 2013 has been prepared for the Site and is on file with the City.

In accordance with the GWPP, a background or baseline groundwater sample was taken from the on-site monitoring well (MW-1) by Tiller's groundwater sampling consultant on September 10, 2013 before the commencement of Site activity. A water level reading was also taken and recorded at this time. The baseline sample was analyzed for Diesel Range Organics (DRO), Gasoline Range Organics (GRO) and benzene. The analytical results of the baseline groundwater sample have been submitted to the City.

In addition to the baseline sampling event, the GWPP requires that a groundwater sample be collected and analyzed for DRO on an annual basis from MW-1. Near the end of October 2013, a 500-gallon double walled diesel fuel tank was brought on site as a fuel source for the operating equipment. A groundwater sample was taken and a groundwater level recorded from MW-1 by Tiller's groundwater sampling consultant on January 15, 2014. The sample was analyzed for DRO. Gasoline was not stored at the Site, therefore GRO and benzene were not analyzed. The analytical results will be submitted to the City when they become available.

Groundwater results for the 2013 sampling event are included as Attachment 1, 2013 Groundwater Sampling Results.

13. Fuel and Chemical Storage: On-site fuel storage consists of a portable 500-gallon double walled above ground storage tank, which is used to fuel the operating equipment. In accordance with MPCA rules, an AST Notification form was submitted within 30 days of tank installation. Fueling occurs over a hard-surfaced pad constructed out of compacted millings. The location selected for placement of

the tank was such that the tank is upgradient of the on-site monitoring well and the tank is located more than 500 feet from any surface waters. The location of the tank is indicated on *Site Plan 2014 Activity*.

All fuel and chemicals stored on-site are stored in accordance with Federal and State standards.

14. Contingency Response Plan: The site operates under an Emergency Contingency Response Plan that was provided to the City in conjunction with the CUP application. There are no proposed changes to the Plan at this time.

Tiller accommodated local emergency response personnel at the Site in mid-December 2013 to familiarize local responders with the Site layout and access.

15. Added Provisions: The operator will comply with other such reasonable requirements that the City may find necessary to adopt for the protection of health, safety and welfare and/or prevention of nuisance.
16. Processing: Processing is not conducted at this site.
17. Recycling: Recycling is not conducted at this site.
18. Trucking Operations: The site has access to State Highways 95 and 97. The main haul route from the Site is State Highway 97 westbound and then northbound on County Road 91 (Lofton Avenue), which is a paved 9-ton road, to the Scandia Mine. A northbound left turn lane from State Highway 95 into the Site was constructed in 2013.
19. Asphalt Plants: Asphalt is not produced at this site.

B. Compliance with Conditions of the CUP

1. The Conditional Use Permit is granted only for the Project identified in the plans and application submitted to the City on November 14, 2008, and updated on October 9, 2012, and revised as required by these conditions.

As required by the following conditions, the GWPP, Dust Control Plan and Reclamation Plan were revised April 18, 2013. The revised Plans are on file with the City.

2. The applicant shall comply at all times with the City's ordinances and all applicable rules and regulations of Federal, State, County and local agencies, including the Carnelian-Marine-St. Croix Watershed District, and shall maintain existing permits granted by those agencies for all operations at the site.

The Site is operated in accordance with the City's ordinances as well as the applicable rules and regulations of Federal, State, County and local agencies. The permits required to operate the Site have been obtained and are on file with the City.

3. The maximum depth of mining shall be 840 feet above mean sea level (amsl). Modeling completed for the EIS indicated that the separation between the maximum depth of mining and existing ground water level is 25 feet or more. The City or its consultant shall monitor ground water levels as specified in the AOP, and if the separation between the maximum depth of mining and ground water level is less than 25 feet, the consultant shall report this information to the City Council. The City shall inform the Minnesota DNR, Carnelian- Marine-St. Croix Watershed District, and Washington County if the separation between the maximum depth of mining and ground water level is less than 25 feet, the City may require additional monitoring, may require that the applicant cease mining operations, or take other appropriate actions based on potential negative impacts to groundwater or groundwater- related resources. The City shall report ground water levels on the site on a quarterly basis to the Minnesota Department of Natural Resources.

A benchmark has been established to monitor the elevation of the mine floor. The benchmark allows the operators to continually monitor the elevation of the mine floor with respect to the maximum depth of mining or 840 feet above msl.

The City has determined that the elevation of the mining activities should be monitored by the City's consultant. Tiller has cooperated with the City's consultant to conduct the required monitoring of the mining elevations to comply with this condition.

4. **No mining of silica sand for industrial purposes ("frac sand mining") shall be permitted at this site.**

There was no mining of silica sand at the Site for industrial purposes in 2013. Mining into bedrock is not identified in the Project plans and is not occurring.

5. **No dewatering shall be permitted.**

There was no dewatering of the Site in 2013. Dewatering is not identified in the Project plans and is not occurring.

6. **Daily pumping from the Zavoral Site Well shall not exceed 10,000 gallons at a maximum pumping rate of 1,200 gallons per minute. Annual pumping shall not exceed 1 million gallons.**

The Zavoral Site well was pumped twice in 2013. On both occasions, 8,000 gallons of water were pumped into the water truck. The water was used for dust control and watering transplanted trees. Records of the pumping of the Zavoral Site Well are maintained by Tiller and provided as Attachment 2, *Zavoral Site Well Water Use*.

7. **To establish that Condition No. 6 above is being met, the applicant shall keep records of when the Zavoral Site Well is pumped, and provide the records to the City, WCD, Washington County Department of Public Health and Minnesota Department of Natural Resources for groundwater monitoring activities. The records shall document both the daily use and total annual pumped volume from the Zavoral Site Well.**

Records of the pumping of the Zavoral Site Well are maintained by Tiller and provided as Attachment 2, *Zavoral Site Well Water Use*. The records have been submitted to the WCD, Washington County Department of Public Works and the Minnesota Department of Natural Resources.

8. **The applicant shall revise the *Groundwater Quality Protection Plan (GWPP)* (October 2012) to address the corrections and issues identified in the Leggette, Brashears, and Graham Inc. (LBG) letter to the City dated November 15, 2012. The applicant shall revise the locations of the proposed borings and monitoring wells as requested by LBG. All such revisions shall be submitted to and are subject to the approval of the City and failure to obtain such approval shall be a violation of this condition.**

The approved Groundwater Quality Protection Plan was revised April 18, 2013 to address the corrections and issues identified by LBG. The locations of the proposed piezometers and monitoring well were revised per comments received by LBG. The revised GWPP has been approved by and is on file with the City.

9. **The applicant shall maintain the groundwater observation wells or piezometers installed on the mine site at the current locations or as approved by the City. The applicant shall coordinate the number and locations of the observation wells and/or piezometers and frequency of monitoring in consultation with the City and its consultants.**

The required two piezometers (PZ-1, PZ-2) and monitoring well (MW-1) have been installed. The purpose of the wells is to determine and monitor the elevation of the groundwater and to measure groundwater parameters throughout the duration of the Project.

The City has determined that will be conducted by the City's consultant. Tiller has coordinated and cooperated with the City and/or its consultant to ensure access to the Site as needed to comply with this condition.

10. **The City's consulting hydrogeologist shall make scheduled site visits to download groundwater monitoring data and collect manual measurements. The hydrogeologist shall evaluate the data and report the results to the City at least annually with the AOP application, or more frequently if the consultant identifies issues or problems during the monitoring activity.**

The City has determined that monitoring will be conducted by the City's consultant. Tiller has cooperated with the City and/or its consultant to ensure access to the Site as needed to comply with this condition. The condition requires that the City's consulting hydrogeologist evaluate the data and report the results to the City.

11. **The City shall review and evaluate the GWPP on an annual basis or more frequently if a significant change in the groundwater conditions occurs. The applicant shall modify the GWPP as needed to address concerns identified by the**

City.

Data collected to date does not indicate a significant change in groundwater conditions. The City has not indicated to Tiller that they have identified any concerns with the current version (April 18, 2013) of the GWPP.

12. **If diesel fuel is stored at the site, the applicant shall sample and analyze groundwater for diesel range organics. If gasoline is stored at the site, gasoline range organics and benzene shall be added to the analyte list.**

In accordance with the GWPP, a background or baseline groundwater sample was taken from the on-site monitoring well (MW-1) by Tiller's groundwater sampling consultant on September 10, 2013 before Site activities commenced. The analytical results of the baseline groundwater sample has been submitted to the City

Near the end of October 2013, a portable 500-gallon, double-walled diesel fuel tank was brought on site as a fuel source for the operating equipment. A groundwater sample was taken from the on-site monitoring well (MW-1) by Tiller's groundwater sampling consultant on January 15, 2014. The analytical results of the groundwater sample will be submitted to the City when they become available.

Gasoline was not stored at the Site, therefore Gasoline Range Organics (GRO) and benzene were not analyzed. The analytical results of the groundwater sample did not indicate the presence of DROs. Groundwater results for the 2013 sampling event are included as Attachment 1, *2013 Groundwater Sampling Results*.

13. **The applicant shall meet Federal, State and City requirements for storage of fuels on the Site.**

A portable 500-gallon, double-walled diesel fuel tank is located on-site as a fuel source for the operating equipment.

All fuels are stored in compliance with Federal, State and City requirements.

14. **Equipment fueling for the Project shall be conducted in a designated area over a hard-surfaced fueling pad.**

A hard-surfaced fueling pad has been constructed out of compacted millings. Equipment is fueled over the hard-surfaced pad.

15. **The applicant shall provide spill cleanup equipment on-site when other equipment is present.**

Tiller's Spill Prevention Policy is implemented at the Site. A spill kit is stored on-site when the Site is active or there is equipment on-site.

16. **The applicant shall obtain the required agency permits for stormwater management prior to beginning any operations at the site, and provide to the City copies of the permits approved by the CMSCWD and the Minnesota**

Pollution Control Agency.

The Site has been issued and is operated in accordance with the National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) General Permit MNG490000 for Nonmetallic Mining and Associated Activities and the CMSCWD Stormwater Management and Erosion and Sediment Control Permits. Copies of all of these permits have been provided to the City.

17. **The applicant shall review, update, provide to the City, obtain the City's approval and thereafter implement the Best Management Practices (BMP's) included in the Storm Water Pollution Prevention Plan (SWPPP) (July, 24, 2012), Surface Water Plan (October 2012), and CMSCWD permit to protect surface waters and manage erosion and sedimentation.**

The Site is operated in accordance with the National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) General Permit MNG490000 for Nonmetallic Mining and Associated Activities, and the associated Stormwater Pollution Prevention Plan (SWPPP), the Surface Water Plan and the CMSCWD Stormwater Management and Erosion and Sediment Control Permit.

Prior to vegetation removal within the Site, a combination of siltfence and silt logs were installed along all perimeter areas that demonstrated a potential for off-site drainage. These BMPs are regularly inspected and maintained.

Phase 1 Mining commenced in 2013. The area that has been opened for mining in the Phase 1 Mining area is all internally drained. Prior to the progression of mining into Phase 2 Mining, a diversion berm or swale will be constructed along the southern perimeter of the project limit to redirect stormwater internally, promote on-site infiltration and minimize off-site discharges.

Inspections with the CMSCWD to verify compliance with the CMSCWD permit is conducted twice per month and inspections to verify implementation of the SWPPP and Surface Water Plan on an as-needed basis with the City's consultant.

18. **The applicant shall obtain the required Air Emissions Permit from the Minnesota Pollution Control Agency prior to beginning any operations at the site, and provide a copy of the approved permit to the City.**

The Site operates in accordance with Air Emission General Permit (Permit number 05301018-001). A copy of the permit has been provided to the City.

19. **The applicant shall obtain an Endangered Species Take Permit before removing any Butternut (*Juglans cinerea*) trees identified on the site, if the Minnesota Department of Natural Resources (DNR) reclassified Butternut trees from a Special Concern to Endangered species.**

The Butternut tree was listed from Special Concern to Endangered, effective August 19, 2013. Some diseased Butternut trees were removed from the Site prior to this date. One healthy Butternut tree has been identified and is located outside of the Project Limit, but within the Property.

The City has determined that the City's consultant will verify the location of the healthy Butternut tree annually and monitor the Threatened and Endangered Listing Status of the Butternut tree. Tiller has cooperated with the City and/or its consultant to ensure access to the Site as needed to comply with this condition.

20. **The applicant shall comply with the "Summary of Recommendations for Avoiding and Minimizing Impacts to Blanding's Turtles Populations" included in Appendix C of the Zavoral Mine and Reclamation Project EIS. Tiller Corporation shall provide the City or its consultant with its Blanding's Turtle Standard Operating Procedures guidelines for review and comment. The City or its consultant will conduct annual site visits to verify compliance.**

The Site is operated in accordance with the Blanding's Turtle Standard Operating Procedures Plan dated September 2013. The Plan includes photos to help identify the species and protocol on what to do if a Blanding's Turtle is spotted on-site. The Plan is kept on-site while the Site is active and is provided to all contractors who are working on-site.

No Blanding's Turtles were identified on-site in 2013.

The City has determined the City's consultant will conduct an annual site visit to verify compliance. Tiller has cooperated with the City and/or its consultant to ensure access to the Site as needed to comply with this condition.

21. **The applicant shall inspect all trees for raptor nests prior to tree clearing. Trees with active nests may not be cleared while the nest is actively used.**

Critical Connections Ecological Consultants, Inc. conducted a raptor stick nest survey prior to tree clearing on September 9, 2013. There were not any active nests identified during the survey. The stick nest survey results are included as Attachment 3, *Stick Nest Survey Results*.

22. **The applicant shall construct the proposed berm on the south end of the Site as close to the mining and reclamation limits as possible to reduce off-site peak flow rates.**

Prior to the progression of mining into Phase 2 Mining, a diversion berm or swale will be constructed along the south perimeter of the project limit to redirect stormwater internally, promote infiltration, and minimize off-site discharges.

23. **The applicant shall minimize the amount of unnecessary equipment on the Site and reduce soil tracking by off-site by vehicles.**

The Site operates with a minimum amount of necessary equipment. Soil tracking is reduced by routine sweeping, watering of haul roads and a paved Site entrance, in accordance with the site specific SWPPP and the Zavoral Mine Dust Control Plan.

24. **The applicant shall monitor all on-site construction equipment for leaks and**

complete regular preventive equipment maintenance. Fueling and maintenance of vehicles shall occur within the area of active mining and no "topping off" of vehicle fuel tanks shall be allowed.

Tiller routinely monitors all on-site construction equipment for leaks and performs regular preventative maintenance of equipment. The Site operates under Tiller's Spill Prevention Policy which prohibits "topping off" of vehicle fuel tanks.

25. **Any above-ground storage tank (AST) at the Site shall be located more than 500 feet from surface waters.**

A portable 500-gallon, double-walled diesel fuel tank is located on-site as a fuel source for the operating equipment. The location of the tank is more than 500 feet from surface waters and is indicated on *Site Plan 2014 Activity*.

26. **In accordance with MPCA rules, the applicant shall notify the Minnesota Pollution Control Agency of all AST's within 30 days of installation by submitting an AST Notification Form.**

An AST Notification Form was submitted to the MPCA within 30 days of installation of the portable diesel fuel tank.

27. **The City or its consultant shall monitor the potential impacts of mining activities on the water resources at the site. The monitoring locations, protocols, and methodology shall be specified in the AOP. The City shall submit all status reports and ground and surface water monitoring reports to the CMSCWD, WCD and the Minnesota DNR.**

The City has determined the City's consultant will conduct the monitoring of potential impact of mining activities on the water resources at the Site. Tiller has cooperated with the City and/or its consultant to ensure access to the Site as needed to comply with this condition.

28. **The monitoring point installed by the WCD for the EIS pump test that gathers baseline data in Zavoral Creek shall be maintained and monitored for the lifetime of the project. Monitoring shall include water quality and quantity parameters.**

The City has determined the City's consultant will conduct the monitoring of potential impact of mining activities on the water resources at the Site. Tiller has cooperated with the City and/or its consultant to ensure access to the Site as needed to comply with this condition.

29. **The City or its consultant shall install a monitoring station upstream of or near Crystal Springs in order to isolate potential effects due to mining from other effects due to unrelated activities within the watershed. The City or its consultant will analyze the data to determine the effect, if any, to the springs due to the Zavoral Mine operation, and identify any negative impacts. The results of the analysis shall be provided at least annually to the City for use during the review of the AOP for the Project.**

The City has determined the City's consultant will conduct the monitoring of potential impact of mining activities on the water resources at the Site. Tiller has cooperated with the City and/or its consultant to ensure access to the Site as needed to comply with this condition.

30. **The City or its consultant shall complete an annual field review of the wetland boundaries of wetlands within the project area, including black ash seepage swamps (Wetlands A, B, and C as shown in the CCES wetland delineation report dated January 14, 2011), to determine if the mining activities have any impact on the wetlands. The review shall occur within the growing season as defined by the U.S. Army Corps of Engineers Wetland Delineation Manual (North Central and Northeast Regional Supplement), and shall be coordinated with the applicant and when active mining operations are occurring.**

The City has determined the City's consultant will conduct the monitoring of potential impact of mining activities on the water resources at the Site. Tiller has cooperated with the City and/or its consultant to ensure access to the Site as needed to comply with this condition.

31. **The applicant shall obtain the required Minnesota Department of Transportation (Mn/DOT) Access permit (TP 1721) for the Project.**

The Mn/DOT Access permit was issued near the end of October 2013. A copy of the permit is on file with the City.

32. **The applicant shall construct the new driveway access directly across from TH 97 as required by Mn/DOT for safe access.**

Upon receiving the Mn/DOT Access permit, work began on the construction of the new access alignment and right-turn lane during the last week of October 2013. Work was completed on the new access alignment and right-turn lane by mid-November 2013.

33. **The applicant shall construct a new north-bound right-turn lane as required by Mn/DOT (letter to the City of Scandia, January 22, 2009). The design of the right-turn lane shall be consistent with the design of the existing left-turn lane.**

See response to Condition #32 above.

34. **The City or its consultant shall complete traffic monitoring of the Project. The traffic monitoring protocol and requirements shall be identified in the AOP.**

The City has determined the City's consultant will conduct the traffic monitoring of the Project. Tiller has cooperated with the City and/or its consultant to ensure access to the Site as needed to comply with this condition.

35. **The applicant shall record and report the numbers of trucks hauling Class C add-rock from the Zavoral Mine site and the number and source location of trucks hauling Class C add-rock to the Scandia Mine to the City quarterly to ensure that additional truck traffic would not result from hauling from the Zavoral Site at**

peak demand concurrently with other sites. The applicant shall submit annual truck number and source reports with the Annual Operating Permit application.

Hauling materials from the Zavoral Mine to the Scandia Mine began in the 4th quarter of 2013. Approximately 3,620 truck loads of Class C add-rock were hauled to the Scandia Mine from the Zavoral Mine. No other Class C add-rock was hauled to the Scandia Mine during the 4th quarter of 2013. This information will be submitted to the City on a quarterly basis in 2014 and summarized and presented in the AOP on an annual basis.

36. **Traffic generated by the Project shall not exceed the maximum levels analyzed in the EIS for Alternatives 3 (average 334 to 400 round trips per working day; 600 peak round trips per day.)**

During the 2013 haul event, there was an average of 402 trips per working day. The peak number of trips per day was 598. Traffic generated in 2013 did not exceed the maximum levels analyzed in the EIS for Alternative 3.

Prior to the start of the 2013 haul event approximately 50 loads of millings were brought on-site for construction of the main haul road and fueling pad and approximately 25 loads of blending material for the engineered topsoil were brought on-site.

37. **All truck traffic generated by the project for projects outside Scandia shall utilize TH 97, TH 95, CR 15 (Manning Ave), CR 91 (Lofton Ave) and the existing haul route between Lofton Avenue and the Scandia Mine. Tiller shall notify the City in advance of any hauling that will occur on local streets to serve local projects, and shall receive confirmation that the City received notice prior to the start of hauling on local streets. Trucks shall not back onto roadways.**

Hauling has been limited to the existing haul route traveling over TH 95 onto westbound TH 97, then north on Lofton Avenue and into the Scandia Mine.

Hauling utilized Oakhill Road on one occasion, to deliver aggregate to Lilleskogen Park from December 2 to December 3, 2013. The City was notified in advance of this hauling activity.

38. **Subject to approval from Mn/DOT, the applicant shall install truck warning signs that comply with the Minnesota Manual on Uniform Traffic Control Devices (MMUTCD) on State Scenic Byway TH 95 to advise drivers of trucks crossing TH 97 in and out of the Zavoral Site; on TH 97 at County Road 91 to advise drivers of trucks turning onto TH 97; and on County 91 at 223rd Street.**

An application to install truck warning signs on County Road 91 near the entrance to the Scandia Mine was submitted to Washington County Public Works Department. The request was denied noting adequate site distances near the entrance to the Scandia Mine on Lofton Ave. A copy of the denial letter was submitted to the City.

An application to install truck warning signs at the requested locations has been submitted to Mn/DOT but Tiller has not yet received a permit decision from Mn/DOT.

39. **The applicant shall provide parking for all employees and visitors within the site. Circulation and parking shall minimize internal and external traffic conflicts.**

Adequate parking is available and will be maintained on-site. The location of parking is subject to change due to the dynamic nature of the mine site. Circulation and parking minimizes internal and external traffic conflicts.

40. **If the applicant has knowledge that a crash or traffic violation occurs involving a truck hauling for Tiller, Tiller shall contact the City to report the incident immediately. The applicant shall report actions it will take to respond to the incident.**

To the best of our knowledge there have not been any crash or traffic violations that have occurred involving a truck hauling for Tiller since the Project has started.

41. **The applicant shall construct the fence included in the Project plans prior to beginning mining operations, and shall maintain the fence until reclamation is complete.**

A portion of the Site along State Highway 95 is fenced with a four foot high chain link fence. The fence is currently used in conjunction with an in place screening berm and established vegetation to provide access control and screening from State Highway 95. There is a locking metal gate at the entrance to the Site.

The majority of the fence was already in-place prior to the start of the Project. Maintenance on the fence occurred near the end of November to reestablish the fencing after the access area had achieved final grades, as well as to attend to two areas requiring repair.

42. **The hours of operation and hauling shall be conducted only between 7 a.m. and 7 p.m., Monday through Thursday and between 7 a.m. and 2 p.m. on Friday, excluding Federal holidays, during daylight hours, or one hour before sunrise and one hour after sunset during seasons when daylight is not available between 7 a.m. and 7 p.m., unless the City authorizes other hours or days of operation.**

The Site operates in accordance with the hours of operation as defined in the City's Mining Ordinance. During the operating season of 2013, we did not seek authorization for extended hours or days of operation.

43. **The applicant shall coordinate any proposed berm removals associated with Project completion with the City.**

Tiller will coordinate any proposed berm removals after Project completion with the City.

44. **The applicant shall implement the Dust Control Plan (dated 10/8/12 and updated within 60 days of approval of the CUP), including all activities proposed during stripping, grading and active mining operations.**

Tiller implemented the approved dust control plan with the commencement of construction activities at the site. The Dust Control Plan revised April 18, 2013 is on file with the City. Please see section II. A.5. for more information on the Dust Control Plan.

45. **The applicant shall utilize non-chloride agriculturally derived organic polymers or naturally- occurring polymers on internal haul roads to control dust in accordance with the Dust Control Plan. The applicant shall review the coverage of the material on a regular basis, and reapply the polymers if they are no longer effective.**

Dust control on internal unpaved haul roads was achieved with the use of water during the 2013 operating season in accordance with the Dust Control Plan. The use of water was adequate for dust control, therefore the use of non-chloride agriculturally derived organic polymers was not necessary during the 2013 operating season.

46. **The City or its consultants shall perform periodic on-site review and monitoring of dust control activities to assure compliance with this permit. The monitoring locations, protocols and methodology shall be specified in the AOP.**

The City has determined the City's consultant will conduct on-site review and monitoring of dust control activities for the Project. Tiller has cooperated with the City and/or its consultant to ensure access to the Site as needed to comply with this condition.

47. **The Dust Control Plan and air monitoring procedures shall be reviewed and updated as necessary on at least an annual basis with the AOP application.**

A Dust Control Plan, revised April 18, 2013, has been prepared for the Site and is on file with the City. Tiller has reviewed the plan and the air monitoring procedures in conjunction with this AOP and found them to be adequate.

48. **The applicant shall implement the berms and screens proposed in the site plan.**

The proposed screening berm on the site plan submitted with the CUP was constructed during the 2013 operating season. See section II.A.4 for more information about screening berms.

49. **Trucks shall not idle on the site and approach area for more than 30 minutes.**

Trucks are not allowed to idle on the Site or at the approach area for more than 30 minutes.

50. **The project shall comply with the City's adopted noise standards. The City or its consultant shall complete noise monitoring at the Project site. The monitoring**

locations, protocols and methodology shall be specified in the AOP.

Site activities are conducted so as to be in compliance with all Federal, State and City noise standards. The City or its consultants will conduct noise monitoring for the Project. Tiller has cooperated with the City and/or its consultant to ensure compliance with this condition.

51. **If the noise levels at the Project exceed State Standards the applicant will identify and take corrective actions to bring the noise levels into compliance. The City may order additional testing to confirm that the Project is in compliance.**

The City has not indicated to Tiller that they have identified any concerns about compliance with Federal, State and City noise standards.

52. **The applicant shall require that all Tiller-owned equipment on the site use broadband alarms and haul trucks shall utilize a circular traffic pattern or other traffic pattern to the extent feasible that minimizes the need for haul trucks to back up on the site.**

All Tiller-owned equipment on-site is equipped with broadband alarms.

53. **The applicant shall ensure that on-site Tiller-owned equipment is properly muffled and shall inspect mufflers on the on-site equipment on at least a weekly basis and document inspections.**

Tiller-owned equipment is properly muffled. The equipment is inspected regularly and at least weekly during active operations to document the condition of the equipment on-site. Appropriate maintenance is conducted as needed.

54. **The applicant shall ensure that the mining plan will minimize any time when the noise from the on-site equipment and haul trucks are operating without noise mitigation from berms and/or the mine face.**

The Site is operated with appropriate noise mitigation from berms and the mine face.

55. **The applicant shall complete any clearing of vegetation (trees and brush) from previously-unmined areas from September through April to minimize noise impacts.**

The clearing of vegetation started in mid-September and was completed near the end of November during the 2013 operating season.

56. **The applicant shall recycle debris created by clearing, grubbing and excavation, or dispose of stumps, trees and debris in another manner approved by the City.**

See Section II.A.8 for information about Site clearing.

57. **The applicant shall maintain the mine site and equipment in an orderly condition, and shall control weeds in planted and reclaimed areas. The applicant shall**

preserve, maintain and supplement existing trees, berms and topsoil along existing public rights-of-way as proposed in the Site Plan and Reclamation Plan.

Tiller maintains mine site equipment in an orderly condition. The Phase 1 reclaimed area was dormant seeded in the late fall of 2013 so weed control in planted and reclaimed areas was not applicable in 2013.

58. **The applicant shall provide and maintain portable sanitary facilities to serve the site and shall meet all applicable standards and regulations for wastewater disposal.**

Portable sanitary facilities are provided in the operating areas as required by the Mine Safety and Health Administration.

59. **The applicant shall dispose of any waste generated from the mining operation, including waste from vehicles or equipment maintenance, in accordance with Federal, State and City requirements.**

Waste generated from the operation is disposed of in a 4-cubic yard covered waste bin and maintained in accordance with Federal, State and City requirements.

60. **Within 60 days of the approval of the CUP, the applicant shall prepare and provide to the City an updated reclamation plan (revising the Reclamation Plan dated October 9, 2012), which includes performance standards identified in the conditions that follow for approval by the City. Reclamation on the site shall be implemented in accordance with the updated and approved reclamation plan. Such updated reclamation plan shall be subject to review by and approval of the City.**

An updated Reclamation Plan, revised April 18, 2013, has been prepared for the Site and was provided to the City within 60 days of CUP approval. Site reclamation was completed in Phase 1 Reclamation in accordance with the approved Reclamation Plan.

61. **Reclamation shall proceed concurrently and proportionally to mining operations. Progress on reclamation shall be demonstrated in each AOP application.**

Reclamation is proceeding concurrently and in proportion to mining operations conducted in accordance with the approved Reclamation Plan. Progress on reclamation for the 2013 operating season is included in Attachment 4, *Annual Reclamation Report*.

62. **The applicant shall use clean, non-contaminated fill material and topsoil for all reclamation. The applicant shall use sandy subsoil available at the site with added organic soil amendments for reclamation topsoil. The applicant shall successfully establish permanent native vegetation in reclaimed areas as per the schedule, extents and methods as provided in the Zavoral Reclamation Plan and Zavoral Reclamation Plan Topsoil and Prairie Establishment Memorandum (October 3, 2011) by CCES.**

Clean, non-contaminated fill material and topsoil was used for all reclamation conducted in 2013. Reclamation activities were conducted in accordance with the approved Reclamation Plan, which includes the Zavoral Reclamation Plan Topsoil and Prairie Establishment Memorandum.

63. **Reclamation success shall be defined as follows:**
- **90% areal coverage of vegetation for each reclaimed area, within 3 years post seed installation;**
 - **Non-native and invasive plant species (as defined and listed by the Minnesota DNR) and potentially-aggressive native plant species (Rhus spp. And Juniperus virginiana) shall account for no more than 20% cover of the reclaimed area at the end of the 5th growing season, post seed installation.**
 - **The reclaimed areas shall contain at least 50% of the species for both grasses and forbs contained in the specified seed mixes at the end of the 5th growing season, post seed installation;**

Reclamation activities commenced during the 2013 operating season with the reclamation of the Phase 1 Reclamation area. Performance monitoring, in accordance with this condition, will begin during the 2014 operating season and will be documented accordingly.

64. **Vegetation establishment and monitoring shall continue for a period of 5 years after completion of the Zavoral Mine Project, in its entirety.**

Not applicable during 2013.

65. **The City shall monitor the transplanting of trees to ensure a survival rate of at least 80% for all transplanted trees. The Applicant shall provide the City with the quantity, location, species and proposed maintenance plan for all trees transplanted as part of the reclamation. Survival rates of less than 80% will require replacement of the dead trees by the applicant. Replacement tree species will be selected in consultation with the City and its consultant and approved by the City.**

During the 2013 operating season, 25 trees were transplanted at the Site during vegetation removal at the start of the Project. Attachment 5, *Tree Transplanting Results* includes a summary of the tree transplanting activity.

The reclamation and maintenance plan for this project encourages adaptive management techniques be employed when problems are encountered with implementation of the plan. Initially the plan called for transplanting trees to provide a transitional ecotone along the woodland/forest to the planted prairie. As it became apparent that tree transplanting would not be a viable option in the Phase 1 Reclamation area, the project ecologists identified an adaptive management solution.

Within Phase 1 Reclamation exists a narrow, linear 0.8 acre area along the eastern border that was originally scheduled to be cleared of existing vegetation and

planted as native prairie. This area is essentially the same size as the original transition area and is located within the National Park Service's Scenic Easement Area. It was determined this area could be effectively managed as a north to south transition area along the existing woodland/forest on a portion of the project's east side. This would replace the original east to west transition area along a portion of the project's north side which is in the City's River District Zoning but out of the Scenic Easement Area. Within the 0.8 acre portion of Phase 1 Reclamation several hundred small to medium sized (8-20' tall) trees occupy the area at moderate to high densities.

As part of an adaptive management strategy, all of the existing vegetation in this 0.8 acre area was left undisturbed and will be managed using maintenance techniques identified in the Reclamation Plan which include but are not limited to spot herbicide application to manage invasive plant species and the installation of additional native grass seeding as necessary to provide a transition from planted prairie areas to the existing woodland/forest edge. Maintenance techniques will be implemented in 2014 through 2016.

The City has determined that the City or its consultant will monitor the reclamation activities of the Project.

66. **The applicant shall submit annual reclamation monitoring reports to the City, with the AOP application, that describe the reclamation activities that occurred in the specified year, and the status of all reclaimed areas. The applicant shall provide detailed information such as percent coverage of vegetation, species composition, etc., pertaining to compliance with the performance standards, as provided above. If the City determines that a reclaimed area has not met the vegetative performance standards listed above, the city shall order corrective action(s) including, but not limited to, reseeding, over-seeding, spot seeding, or other actions so that the reclamation meets the criteria for success. The specific corrective actions may be dependent on site conditions. The city will determine the appropriate actions in consultation with its consultants, the applicant, and other experts, as necessary. The applicant shall include the required corrective actions in the reclamation monitoring report and AOP application.**

Attachment 4, *Annual Reclamation Report* has been prepared for the Site for activities conducted in 2013. Reclamation activities commenced with the reclamation of Phase 1 Reclamation area. Performance monitoring of the reclaimed area will begin during the 2014 growing season.

67. **The City or its consultants shall complete monitoring of reclamation activities on the site on behalf of the City. Monitoring locations, protocols and methodologies shall be specified in the AOP.**

The City has determined the City's consultant will monitor the reclamation activities of the Project. Tiller has cooperated with the City and/or its consultant to ensure access to the Site as needed to comply with this condition.

68. **Final reclamation shall include removal of any equipment and backfilling and seeding the operations area.**

Not applicable in 2013.

69. **Approval of the reclamation plan shall not constitute an approval by the City of Scandia of an ultimate use for the site. Ultimate use shall be determined based on the Scandia Comprehensive Plan and ordinances in effect at the time the mining is complete and applications for development of the site may be submitted.**

No response needed.

70. **The applicant shall not disturb existing woodlands and screening outside the mine area limits.**

Tiller has not disturbed any of the existing woodlands or screening outside the mine area limits.

As part of the site preparation, vegetation removal was required within a small area from the road right-of-way to the Project Limit in order to construct the access realignment and right-turn lane for the Site. This vegetation removal from road right-of-way was approved by Mn/DOT.

71. **The applicant shall establish a maximum stockpile height of 880 feet above mean sea level. Stockpiles located in the Phase 1 mining area of the Site shall be maintained at a lower height as needed so that the stockpiles are not visible from the key viewpoints identified in the EIS.**

There is one small, approximately 950 ton stockpile of engineered topsoil to be used in reclamation that is currently stored just south of the Phase 1 Reclamation area, in Phase 3 Mining. This stockpile does not exceed 880 feet above mean sea level and is not visible from key viewpoints located on State Hwy 95 and State Hwy 97.

72. **All lighting on the site shall be hooded or controlled and meet the requirements of the City's Development code. Lighting shall be limited to the hours of mine operation. Lighting shall be arranged to deflect light away from any adjoining residential property or from public streets.**

No lighting plants were utilized at the Site during the 2013 operating season.

73. **The applicant shall obtain the required sign permits for all signs proposed at the site.**

The installation of truck warning signs per condition #34 is contingent upon approval from the appropriate road authority. Washington County Public Works Department denied the application for a right-of-way permit requesting a truck hauling sign on County Road 91 (Lofton Ave.) near 223rd Street, noting adequate

site distances near the entrance to the Scandia Mine on Lofton Ave. An application has been submitted to the Mn/DOT, but Mn/DOT has not yet ruled on it.

74. **The applicant shall pay all costs associated with site monitoring activities identified in this permit and the AOP including, but not limited to monitoring of traffic, air quality, noise, ground water and surface water, and the reclamation plan, and the costs of equipment, installation, site visits, data collection, data analysis, reporting, maintaining compliance and all other costs associated with all of the monitoring activities identified in these conditions.**

Financial agreements have been established for the Project and are on file with the City and are reviewed annually with the AOP. The escrow account is replenished as necessary to cover costs incurred by the City.

75. **The applicant shall cooperate with the City and provide access to the site as needed to conduct the monitoring activities required by this permit.**

Tiller has cooperated with the City and/or its consultant to ensure access to the Site as needed to comply with this condition.

76. **The applicant shall provide a final, corrected copy of the Groundwater Monitoring Plan, Reclamation Plan and Dust Control Plan to the City within 60 days of approval of the CUP. All such updated plans shall be subject to review by and approval of the City. The Applicant shall implement the updated and approved plans.**

Final corrected copies of the GWPP, Reclamation Plan and Dust Control Plan were provided to the City within 60 days of CUP approval.

77. **The applicant and owner shall enter into a Conditional Use Permit Compliance and Reclamation Agreement ("Development Agreement") with the City within fifteen (15) days of approval of the CUP. The Agreement shall specify that the project will be implemented to comply with Alternative #3 in the EIS. The Agreement shall specify that all Project activities, except reclamation, shall be completed within 3.3 years beginning 30 days after all permits required prior to the start of mining operations are obtained. Reclamation activities and reclamation monitoring shall continue for five years after completion of the mining activities, as specified in this permit.**

A Development Agreement has been entered into between Tiller and The City. The Development Agreement satisfies this condition and is on file with the City.

78. **If negative impacts or issues due to mining activities are identified by the City or its consultants during any of the monitoring described in the CUP or AOP, the City may request additional monitoring, may require the Applicant to cease mining operations, or may consult with other agencies to take appropriate actions.**

No negative impacts or issues due to mining activities were identified by the City or its consultants in 2013.

79. **The Agreement shall include a financial guarantee acceptable to the City to assure compliance with the reclamation plan, and provide for an escrow that the City will use to pay for City staff and consultant costs related to monitoring and reporting activities.**

Financial agreements have been established for the Project and are on file with the City. The financial guarantee is reviewed annually with the AOP. The escrow account is replenished as necessary to cover costs incurred by the City.

80. **The applicant must apply for and obtain an Annual Operating Permit from the City.**

The Site operates in accordance with the AOP issued in 2013. The Site will continue to make application for each subsequent AOP for the duration of the Project.

81. **The applicant shall, on or before the earlier of (1) commencement of any Project activities on the Project Site or (2) April 15, 2013, provide to the City an Irrevocable Letter of Credit, Performance Bond or other security satisfactory to the City in the amount of \$550,000 and the LOC required by the Development Agreement to guarantee the completion of the reclamation plan and the performance of its obligations set forth by this permit. The City may require the amount of this security to be adjusted in future years based on inflationary increases in construction and monitoring costs, or upon re-evaluation of the needs for reclamation, as a condition of approval of an Annual Operating Permit. Future reductions in this security shall be made as provided by the ordinance. The City may allow reductions in portions of the Letter of Credit or other security for completed and approved reclamation on a five-year basis.**

A Performance Bond issued by Liberty Mutual in the amount of \$550,000 and a Letter of Credit to guarantee the expected reclamation have been issued and are on file with the City. The Letter of Credit is reviewed annually with the AOP.

82. **The applicant shall pay all fees and escrows related to this application.**

Tiller has cooperated with the City and/or its consultant to ensure the fees are issued in accordance with this condition. An escrow is on file with the City.

83. **The Applicant shall at all times comply with the terms and conditions of this Conditional Use Permit, the Annual Operating Permit and the Development Agreement.**

Tiller will comply with the terms and conditions of the CUP, AOP and the Development Agreement that have been issued for the Project.

C. Annual Activity

1. Amount of material removed from the site: Approximately 83,500 tons of material was removed in 2013.

2. Amount of add-rock brought onto the site: 0 tons.
3. Amount of recycled asphalt brought to the site: 0 tons.
4. Amount of recycled concrete brought to the site: 0 tons.
5. Other: Approximately 750 cubic yards of millings were brought on-site for the construction of the main haul road and fueling pad and approximately 1,600 cubic yards of blending material was hauled on-site to engineer topsoil for final reclamation grading.
6. Area reclaimed and type of reclamation: Reclamation activities for Phase 1 Reclamation were completed in 2013 and are detailed in Attachment 4, *Annual Reclamation Report* and shown on the *Site Plan 2014 Activity*. Ongoing reclamation activities are anticipated to progress as mining advances through Phase 1 Mining and into Phase 2 Mining. Quarterly reclamation progress reports will be submitted to the City during the growing season.
7. Average number of trips hauling material to and from the site per day for the season: The average number of trucks travelling to and from the site per day in 2013 during the haul event was 402 trips per day.

D. Description of operating conditions planned for the coming year:

1. During the 2014 mining season, the site will continue with construction of the main access road into the Site which includes bringing the side slopes of the road to final grades and extending the road further into the site as mining is completed in this area and the final grades of the access road can be achieved.

Mining commenced in the Phase 1 Mining area in November 2013 and will continue to advance through this phase. Depending on the materials encountered within Phase 1 Mining, mining may advance into Phase 2 Mining within the 2014 operating season.

The mining operation includes the removal of overburden and the excavation of sand and gravel. The marketable sand and gravel is loaded into haul trucks and transported to the Scandia Mine as Class C add-rock or may be transported directly to local projects.

As mining advances throughout the Site, overburden materials is separated from the marketable aggregate and placed in reclamation areas to be used to achieve final reclamation grades. The progression of reclamation activities will follow the advancement of mining throughout the Site.

2. Site Plan: A *Site Plan 2014 Activity* is attached which illustrates the areas planned to be mined in 2014.
3. Aerial Photo: An aerial photo is attached which illustrates the areas planned to be mined in 2014.

4. Reclamation: Reclamation activities performed during the 2013 operating season consisted of the reclamation of the Phase 1 Reclamation area in accordance with the approved Reclamation Plan for the Site. A more detailed summary of the reclamation activities that occurred in 2013 are included as Attachment 4, *Annual Reclamation Report*.

Reclamation activities planned for 2014 will be in the Phase 2 Reclamation area. Reclamation activities will be conducted in accordance with the approved Reclamation Plan.

5. Operating Conditions for 2014: Active mining will occur within the Phase 1 Mining area and potentially into Phase 2 Mining depending on the materials encountered, as indicated on the *Site Plan 2014 Activity*.

E. Inspection:

The City conducts an annual inspection of the Site. The last inspection occurred on October 24, 2013.

III. CERTIFICATION

I certify that the plans, specifications or reports for the above described facility were prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.



Kirsten Pauly

Date: January 24, 2014 Reg. No. 21842

Attachment 1: Groundwater Sampling Results

MW-1	9/10/2013	units
Diesel Range Organics	ND	mg/l
Benzene	ND	ug/L
Ethylbenzene	ND	ug/L
Toluene	ND	ug/L
Xylene	ND	ug/L

In accordance with the GWPP, a background or baseline groundwater sample was taken from the on-site monitoring well (MW-1) by Tiller's groundwater sampling consultant on September 10, 2013 before the commencement of Site activity. A water level reading was also taken and recorded at this time. The baseline sample was analyzed for Diesel Range Organics (DRO), Gasoline Range Organics (GRO) and benzene.

Attachment 2: Zavoral Well Water Use

Date	Amount Pumped (gallons)
October 16, 2013	8,0000
November 1, 2013	8,0000
Total for 2013	16,0000

Attachment 3: Stick Nest Survey Results

2013 Raptor Stick Nest Survey Zavoral Mine, Scandia, Minnesota Critical Connections Ecological Services, Inc. January 21, 2014

At the request of Tiller Corporation (Tiller), Critical Connections Ecological Services, Inc. (CCES) conducted a raptor stick nest survey prior to the commencement of land clearing within the 64 acre Zavoral Mining and Reclamation Project (Project) area. The raptor stick nest survey was conducted on September 9th, 2013 within wooded parts of the mining limit area. This area included an 8 acre second growth deciduous forest and 31 acres of open woodland dominated by young eastern white pine (*Pinus strobus*) and eastern cottonwood (*Populus deltoides*). The survey resulted in no raptor stick nests being detected within any area scheduled to be cleared of vegetation within the approved mining areas.

The purpose of the survey was to detect whether or not any active raptor nesting sites were located within areas scheduled to be cleared of vegetation for mining activities. In particular raptor stick nests that were surveyed for include: red-shouldered hawk (*Buteo lineatus*) and bald eagle (*Haliaeetus leucocephalus*), but included stick nests for all potential Minnesota native raptor species. CCES ecologists conducted an extensive survey within the 8 acre deciduous forest part of the Project area where potential nesting habitat occurs. Woodland areas of young white pine and cottonwood were also surveyed for nests. However, such areas were less intensively surveyed due to the lack of potential nesting habitat of targeted raptor species and increased visibility due to relatively sparse tree cover. Habitat for nesting raptors like red-shouldered hawks and bald eagles include mature deciduous forest more consistent with what occurred within the southern portion of the Zavoral mining limit.

No nesting sites of red-shouldered hawks, bald eagles or any other native raptor species were positively detected by CCES ecologists during the September 9th, 2013 survey of the Zavoral Project areas proposed for vegetation clearing. Furthermore, no visual evidence of the presence of resident red-shouldered hawks or bald eagles was observed during the September 9th, 2013 survey. The results of the 2013 survey for active raptor nesting sites are consistent with the results (i.e. negative detections) of the stick nest survey completed at the Zavoral property by CCES in 2009. While red-shouldered hawks and bald eagles are documented raptor species of the greater St. Croix River Valley's deciduous forest, mixed coniferous forest, and floodplain forest habitats, no active nesting sites for these species or other protected raptor species have been detected within the Project area or the immediate adjacent forest habitats of the Zavoral Project.

Attachment 4: Annual Reclamation Report

Annual Reclamation Report, 2013

Status of Reclaimed Areas: Beginning in the fall of 2013, reclamation activities started within Phase 1 Reclamation of the Zavoral Mining and Reclamation Project (Project) (**Figure 1**). The Project consists of the mining and reclamation of a 64-acre site (Zavoral Site or Site). Phase 1 Reclamation is located within the northeast quadrant of the Zavoral Site within the St. Croix River District and USA Scenic Easement Areas. This portion of the Site was scheduled to be reclaimed concurrently with commencement of mining activities at the Site.

Phase 1 Reclamation is 4 acres in size with 3.2 acres being seeded with native dry prairie and mesic prairie seed mixes and 0.8 acres of native woody vegetation that was left undisturbed (**Figure 2**). All reclamation activities completed in 2013 followed the specifications that were detailed in the final Reclamation Plan for the Zavoral Site dated May 3rd, 2011 (revised April 18th, 2013) and the Zavoral Reclamation Plan Topsoil and Prairie Establishment Memorandum, dated October 3rd, 2011.

Initial reclamation activities within Phase 1 Reclamation involved the removal of existing stockpiles and some minor grading taking place prior to engineered topsoil placement and seeding. The Phase 1 Reclamation planting plan included the seeding and establishment of native dry prairie and mesic prairie seed mixes and the transplanting of native white pine that were growing within other areas of the Zavoral site.

The reclamation and maintenance plan for this project mentions that adaptive management techniques would be employed when problems were encountered with implementation of the plan. Initially the plan called for transplanting trees to provide a transitional ecotone along the woodland/forest to the planted prairie. As it became apparent that tree transplanting would not be a viable option in the Phase 1 Reclamation area, the project ecologists identified an adaptive management solution.

Within Phase 1 Reclamation exists a narrow, linear 0.8 acre area along the eastern border that was originally scheduled to be cleared of existing vegetation and planted as native prairie. This area is essentially the same size as the original transition area and is located within the National Park Service's Scenic Easement Area. It was determined this area could be effectively managed as a north to south transition area along the existing woodland/forest on a portion of the Project's east side. This would replace the original east to west transition area along a portion of the Project's north side which is in the City's River District Zoning but out of the Scenic Easement Area.

Within the 0.8 acre portion of Phase 1 Reclamation several hundred small to medium sized (8-20' tall) trees occupy the area at moderate to high densities. Tree species that were observed within this 0.8 acre area include: White Pine (*Pinus strobus*), Cottonwood (*Populus deltoides*), Quaking Aspen (*Populus tremuloides*), Paper Birch (*Betula papyrifera*), Red Oak (*Quercus rubra*), White Oak (*Quercus alba*), Box Elder (*Acer negundo*), American Elm (*Ulmus americana*), and Black Cherry (*Prunus serotina*). Also identified in this area are sparse invasive woody shrubs (*Rhamnus cathartica*, *Zanthoxylum americanum*) and weedy herbaceous species (*Centaurea maculosa*, *Melilotus* spp.)

As part of an adaptive management strategy, all of the existing vegetation in this 0.8 acre area was left undisturbed and will be managed using maintenance techniques identified in the Reclamation Plan which include but are not limited to spot herbicide application to manage invasive plant species and the installation of additional native grass seeding as necessary to provide a transition from planted prairie areas to the existing woodland/forest edge. Maintenance techniques will be implemented in 2014 through 2016.

Topsoil Placement: Following the removal of several small existing stockpiles within Phase 1 Reclamation, engineered topsoil was generated. Engineered topsoil that was created for placement within Phase 1 Reclamation was blended on-site and final graded during October of 2013. As specified in the conditional use permit (CUP), engineered topsoil was placed and graded to a minimum depth of four inches with an average of six inches across Phase 1 Reclamation area.

Topsoil that was used for the reclamation area was blended on-site by Plaisted Companies, Inc. using a portable two-bin blender equipped with an on-board screen-deck to remove over-sized particles and a mechanical paddle-wheel to insure a uniformly blended mix. Weed-free coarse sedge peat and MnDOT Type 2 compost was blended with on-site sand resources in order to create the specified engineered topsoil for Phase 1 Reclamation. This method of creating topsoil capitalized on the relatively sterile and noxious weed-free soil parent material conditions found within the on-site sand.

Potential engineered soil mixes were tested for fertility, macro-nutrient content, and composition by A&L Eastern Laboratories, by Normal W. Hummel, Jr., PhD, under the direction of Plaisted Companies, Inc., and Critical Connections Ecological Services, Inc. (CCES). The project team selected an engineered soil mixture that met the performance standards specified in the CUP and the City's mining reclamation ordinance. These detailed test results of the final approved engineered soil mix can be found in Appendix A of this annual reclamation monitoring report.

To generate the volume of topsoil needed for Phase 1 Reclamation, a mix of approximately 60% on-site sands, 20% coarse peat and 20% MnDOT Type 2 certified weed free compost was used. In total 4,000 cubic yards of engineered topsoil was placed within Phase 1 Reclamation which consisted of 2,400 cubic yards of on-site sands, 800 cubic yards of coarse peat, and 800 cubic yards of MnDOT Type 2 compost. By utilizing 20% coarse peat with 20% compost, the blended topsoil yielded a 4.0% organic matter content. The MnDOT specification for Topsoil Borrow and Select Topsoil Borrow is 3% - 20% organic matter. The City of Scandia mining ordinance (no. 103) requires an organic soil be used as topsoil for the reclamation of mined areas. MnDOT Type 2 Compost is a humus rich material that is derived from the decomposition of leaves and yard wastes. No animal or poultry manure was utilized in the type of compost used on-site at Zavoral.

Seeding/Mulching: Seeding and mulching was completed for the 3.2 acre part of Phase 1 Reclamation on December 27th, 2013 by Minnesota Native Landscapes (MNL). Native mesic and dry prairie seed mixes with cover crop that was specified for the Zavoral reclamation plan was installed by broadcast methods with straw mulch being placed following the installation of all seed. Due to the timing of

access to Phase 1 Reclamation during the fall of 2013, the seeding contractor's only option to install the seed mixes involved utilizing a broadcast method rather than seed drilling method. Approximately 50% of the native seed that was installed within Phase 1 Reclamation was produced from local ecotype prairie species of the St. Croix River Valley, which was supplied by Dr. Shawn Schottler and the St. Croix Watershed Research Station. The remaining native seed was supplied by Prairie Moon Nurseries, and originated from other sources within Minnesota.

Tree Transplanting 2013: Starting in October of 2013, CCES oversaw the transplanting of existing, on-site White Pine (*Pinus strobus*) trees into Phase 1 Reclamation. All tree transplanting was completed by Reliable Tree Service, Inc. with the use of two different sized tree spades, a 65" and 80" spade. Tree transplanting was completed by the end of October with a total of 25 white pine trees moved. All transplanted white pine trees were mulched with wood chips generated during the removal of vegetation in the mining area and watered following planting, to maintain good moisture levels in the needles and to minimize winter desiccation (browning of the needles). Watering of all transplanted white pine trees continued up until the ground froze for the season in November. Watering will continue throughout the 2014 growing season as needed. Additional details on the tree transplanting that was completed during 2013 can be found in the Zavoral Tree Transplanting Results (2013).

Year One Maintenance of Phase 1 Reclamation (2014): Tiller has contracted with MNL to provide all maintenance services for Phase 1 Reclamation for the next three years (2014-2016) following installation. Site vegetation management within Phase 1 Reclamation during 2014 will involve mowing and spot herbicide treatment of weed species that may establish. CCES will be working closely with MNL to monitor the seeded reclamation area(s) during the 2014 season in order to determine optimum timing and extent of both mowing and spot spraying treatments.

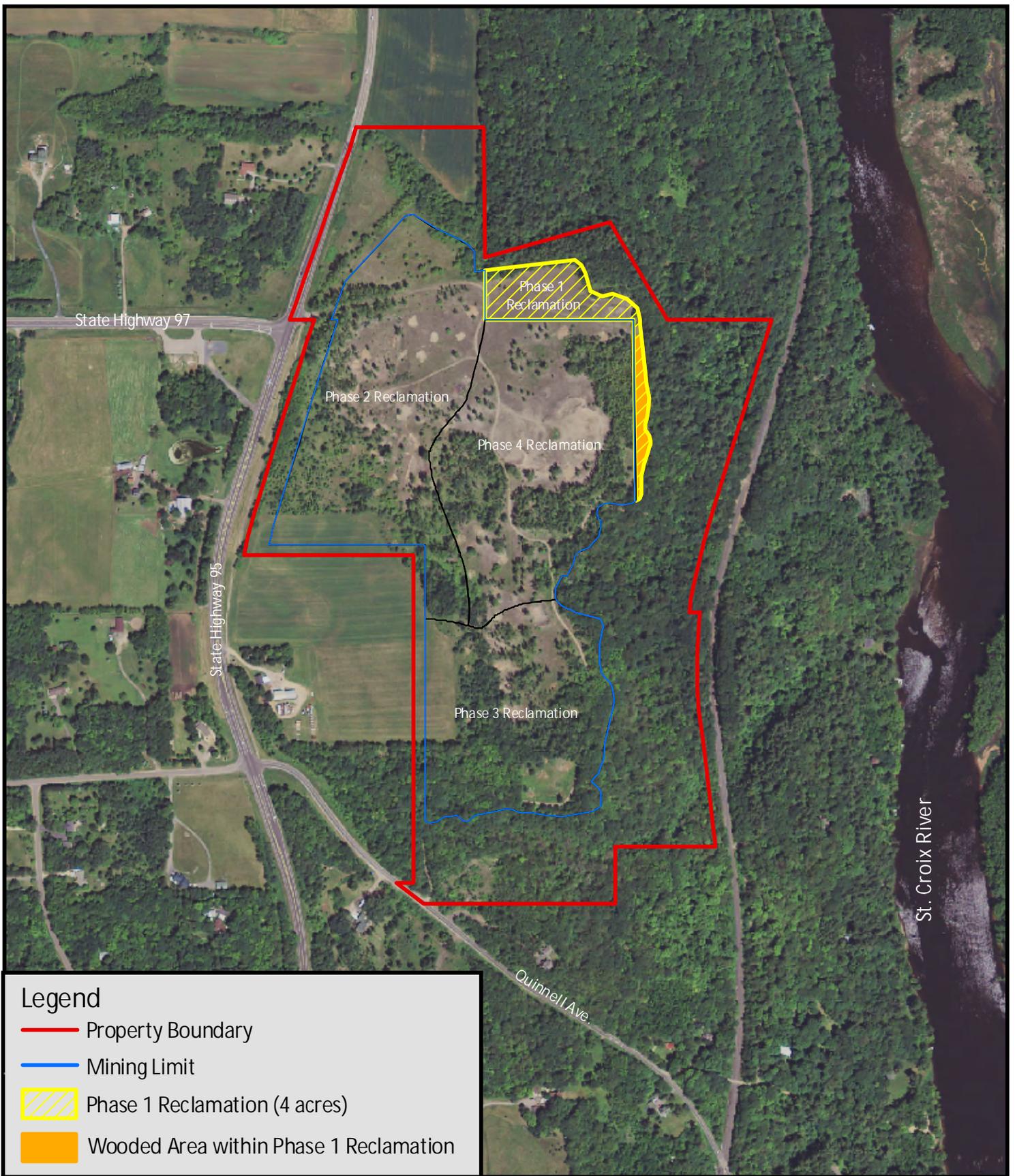
Weed management for Phase 1 Reclamation will involve mowing the newly planted areas two to three times a year or as necessary following planting. This management technique helps minimize annual weed seed production which in turn will reduce the amount of herbicide needed to effectively control problematic weed species. Native perennial plants that germinate, emerge, and establish during 2014 will be relatively small in size and will not be damaged by the mowing. The initial mowing of all areas that were seeded in 2013 should be conducted in June followed by a second mowing in August. Mowed areas will be mowed to a height of approximately 5-6 inches to reduce flowering and seeding of annual weeds while avoiding damage to establishing native perennial species.

In addition to mowing the newly planted reclamation area, spot herbicide treatments may be utilized to control areas with any germinating aggressive, non-native weeds that may become established during 2014. All herbicide applications will be conducted by MNL who have qualified and licensed professional herbicide applicators on staff. Spot spraying of problematic weed species may include treatment to Canada Thistle (*Cirsium arvense*), Spotted Knapweed (*Centaurea maculata*), White and Yellow Sweet Clover (*Melilotus alba*, *M. officinalis*), and any other non-native problem plants that currently exist

elsewhere on the site. In total, two complete spot herbicide applications will be conducted by MNL during the 2014 growing season. Additional herbicide applications will be scheduled as needed.

Trees transplanted during 2013 will continue to be watered as needed throughout the 2014 growing season to help promote the success of the transplant.

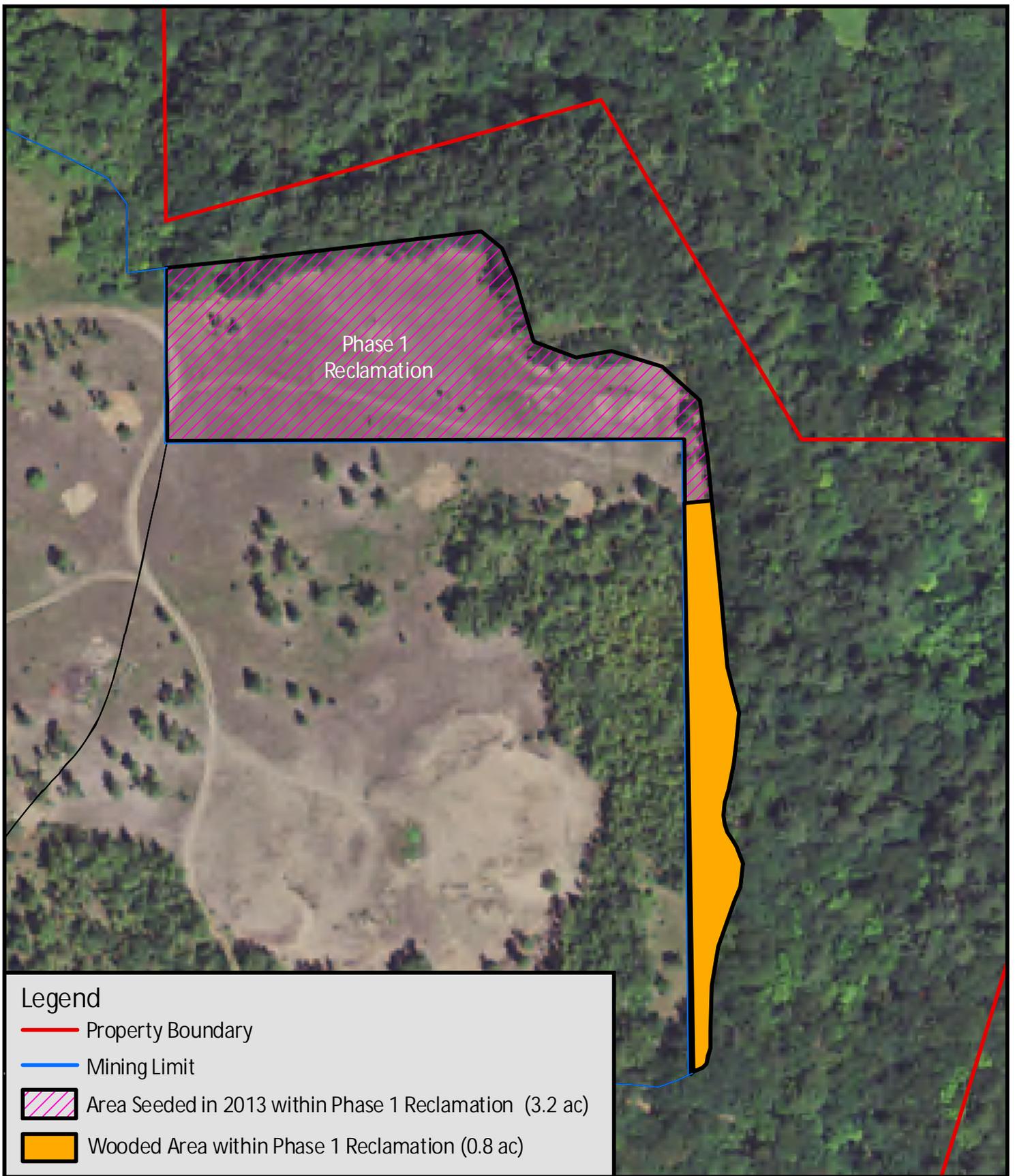
Monitoring in 2014: During the 2014 growing season, CCES will monitor the progress of the native prairie seeding installed within Phase 1 Reclamation as well as the success of the trees transplanted along the north perimeter of the Site. Reclamation activity progress reports will be submitted to the City of Scandia on a quarterly basis during the upcoming growing season and will document progress on reclamation activity and corrective actions, if any, that need to be taken in 2014 for the newly planted native prairie or for the woodland management area.



Aerial Photo Source: 2010 USDA NAIP Color Aerial Photograph

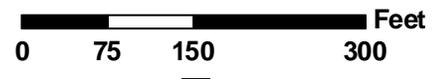
Zavoral Property Phase 1 Reclamation





Aerial Photo Source: 2010 USDA NAIP Color Aerial Photograph

Zavoral Property Phase 1 Reclamation Seeding Map





www.aleastern.com

A&L Eastern Laboratories

7621 Whitepine Road Richmond, Virginia 23237 (804) 743-9401 Fax (804) 271-6446

9/27/2013

SOIL ANALYSIS

Client : HUMMEL & CO INC NORM HUMMEL 35 KING ST TRUMANSBURG NY 14886	Grower : PLAISTED LAB#33366-2D PO:	Report No: 13-269-0621 Cust No: 40751 Date Printed: 09/27/2013 Date Received : 09/26/2013 Date Analysis : 09/27/2013 Page : 1 of 2
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Lab Number : 06007

Field Id :

Sample Id : 60-20-20

Test	Results	SOIL TEST RATINGS					Calculated Cation Exchange Capacity
		Very Low	Low	Medium	Optimum	Very High	
Soil pH	6.8						17.9 meq/100g
Buffer pH	6.88						
Phosphorus (P)	125 ppm						Calculated Cation Saturation
Potassium (K)	387 ppm						
Calcium (Ca)	2640 ppm						%K 5.5
Magnesium (Mg)	371 ppm						%Ca 73.7
Sulfur (S)	15 ppm						%Mg 17.3
Boron (B)	2.1 ppm						%H 2.9
Copper (Cu)	1.3 ppm						Hmeq 0.5
Iron (Fe)	156 ppm						%Na 0.7
Manganese (Mn)	55 ppm						
Zinc (Zn)	5.6 ppm						
Sodium (Na)	30 ppm						
Soluble Salts							
Organic Matter	4.0 % ENR 85						K : Mg Ratio
Nitrate Nitrogen							0.32
							Ca : Mg Ratio
							4.26

SOIL FERTILITY GUIDELINES

Crop : Lawn

Rec Units: LB/1000 SF

(lbs)	LIME	(tons)	N	P ₂ O ₅	K ₂ O	Mg	S	B	Cu	Mn	Zn	Fe
0			3.5	0	0	0	0.46	0	0	0	0	0
Crop :												Rec Units:

Comment :

Pauric McGroary



www.aleastern.com

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9/27/2013

SOIL ANALYSIS

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Lab Number : 06007

Field Id :

Sample Id : 60-20-20

SUGGESTED FERTILIZATION PROGRAM

First Application		Second Application		Third Application		Fourth Application	
#/1000 Sq. Ft.	Fertilizer	#/1000 Sq. Ft.	Fertilizer	#/1000 Sq. Ft.	Fertilizer	#/1000 Sq. Ft.	Fertilizer
6	21-0-0	6	21-0-0	6	21-0-0		

Comments:

Lawn

The amount of fertilizer recommended in the first page is the total amount needed for the entire growing season. Split into 3-4 applications to keep the lawn green and prevent fertilizer loss. Custom blend is best to meet exactly the requirement, if this is impossible, the above specific fertilizer application is a general guideline, if the specified grades can not be found, replace with fertilizer having similar N:P:K ratio. The best time to apply fertilizer for cool season grass (bluegrass, fescue, ryegrass) is in the Fall when grass is growing. For Mid-Atlantic region the time is from late August to November. For Northeast region the time is from mid August to October. Fall application should start as soon as the day time high temperature is below 80-85F, apply with the interval of one month. If you start application late in the Fall and do not finish all three applications, repeat the same applications in the Fall of next year. Spring application is recommended when exceptional fertilizer loss due to heavy Spring rain leaching and the grasses look pale green. Spring application can start as soon as the grass starts to grow in April. In the case of exceptional warm Spring, the application can be made earlier.

For more in depth explanation, go to our website www.aleastern.com and select the "Lawn and Garden" tab at the top of home page. At the bottom of the "Lawn and Garden" page, you find information explaining a soil test report and fertilizer recommendations. <http://aleastern.com/forms/LawnGardenSoilTestExplained.pdf>

Attachment 5: Tree Transplanting Results

Zavoral Tree Transplanting Results (2013)

Starting in October of 2013, Critical Connections Ecological Services (CCES) oversaw the transplanting of existing, on-site White Pine (*Pinus strobus*) trees into Phase 1 Reclamation of the Zavoral Mining and Reclamation Project (Project). The Project consists of the mining and reclamation of a 64-acre site (Zavoral Site or Site).

All tree transplanting was completed by Reliable Tree Service, Inc. (Reliable) with the use of two different sized tree spades, a 65" and 80" spade. Tree transplanting was completed by the end of October with a total of 25 white pine trees transplanted (**Figure 1**). All transplanted white pine trees were mulched with wood chips generated during removal of vegetation from the mining area and watered following planting, to maintain good moisture levels in the needles and to minimize winter desiccation (browning of the needles). Watering of all transplanted white pine trees continued up until the ground froze for the season in November.

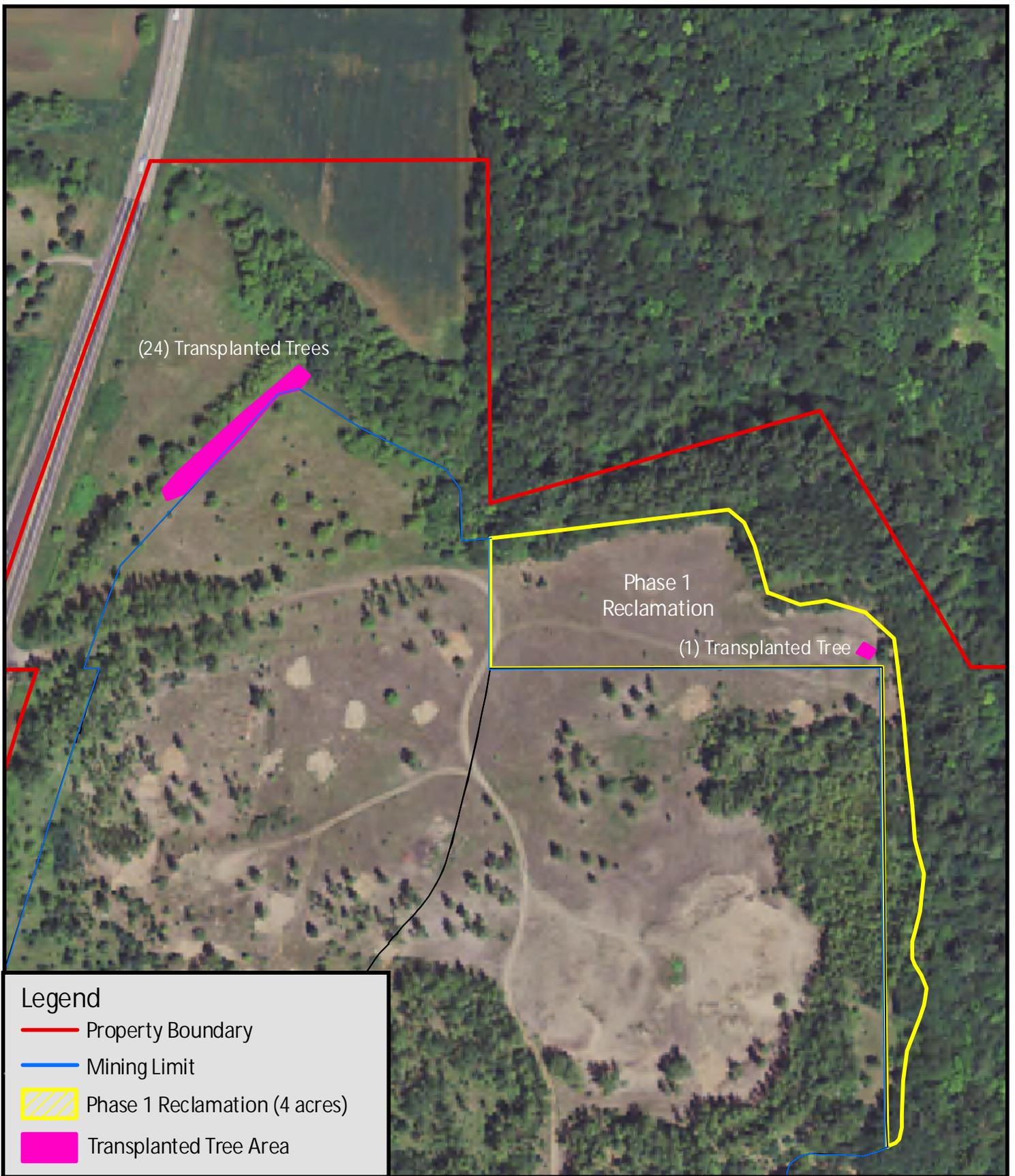
Based on the reclamation plan for the Zavoral Site, it was specified that a minimum of 100 white pine trees were to be planted within Phase 1 Reclamation. The trees to be moved were volunteer white pine trees growing throughout the Site. Prior to moving the on-site white pine trees into Phase 1 Reclamation, 125 white pine trees were marked with pink flagging tape. All of the marked white pine trees that were specified to be moved had an average height of 10-12 feet, were in excellent health and were located on level terrain.

When transplanting of the on-site white pine trees began, it became evident early on that there was significant difficulty advancing the tree spade into the soils where the white pine trees were located as well as the locations of the proposed receiving holes. Soils that were encountered initially within Phase 1 Reclamation were extremely rocky/stony soils as were the nearby soils where the white pine trees had been flagged for transplanting. These rocky/stony soils prohibited typical transplanting by the two different tree spades that were used. Several unsuccessful attempts were made before the first white pine tree was even transplanted. Many white pines were not able to be transplanted due to the tree spade hitting rocks and not being able to dig a complete root ball around each tree. Once any one of the four blades from the tree spade encountered a large rock it could no longer dig a complete root ball without soil falling away, making the root ball unusable. A relatively complete root ball is necessary for the health and success of a transplanted tree.

Following the first tree that was transplanted into Phase 1 Reclamation, all other attempts at digging a receiving hole in Phase 1 Reclamation failed due to encountering rocky/stony soils. At least a dozen attempts were made to dig receiving holes all along the northern edge of Phase 1 Reclamation for the white pine trees scheduled to be moved. All of these attempts failed to produce a satisfactory receiving hole because the tree spade blades were unable to even penetrate the ground more than two feet from the surface. It was determined at that time that no more attempts would be made within Phase 1 Reclamation for tree transplanting.

Since tree transplanting could no longer take place anywhere within Phase 1 Reclamation an alternative receiving area outside of the mining limit (**see Figure 1**) was located and determined to be a good

alternative. In an effort to continue transplanting on-site white pine trees into an area that was not proposed to be mined, Reliable was able to successfully move 24 additional trees into the new receiving area. The area where the 24 white pine trees were moved is located at the northern end of the Zavoral property on the south side of a row of box elder (*Acer negundo*) trees. These white pine trees should improve the visual screening of the mine from traffic traveling south on TH 95.

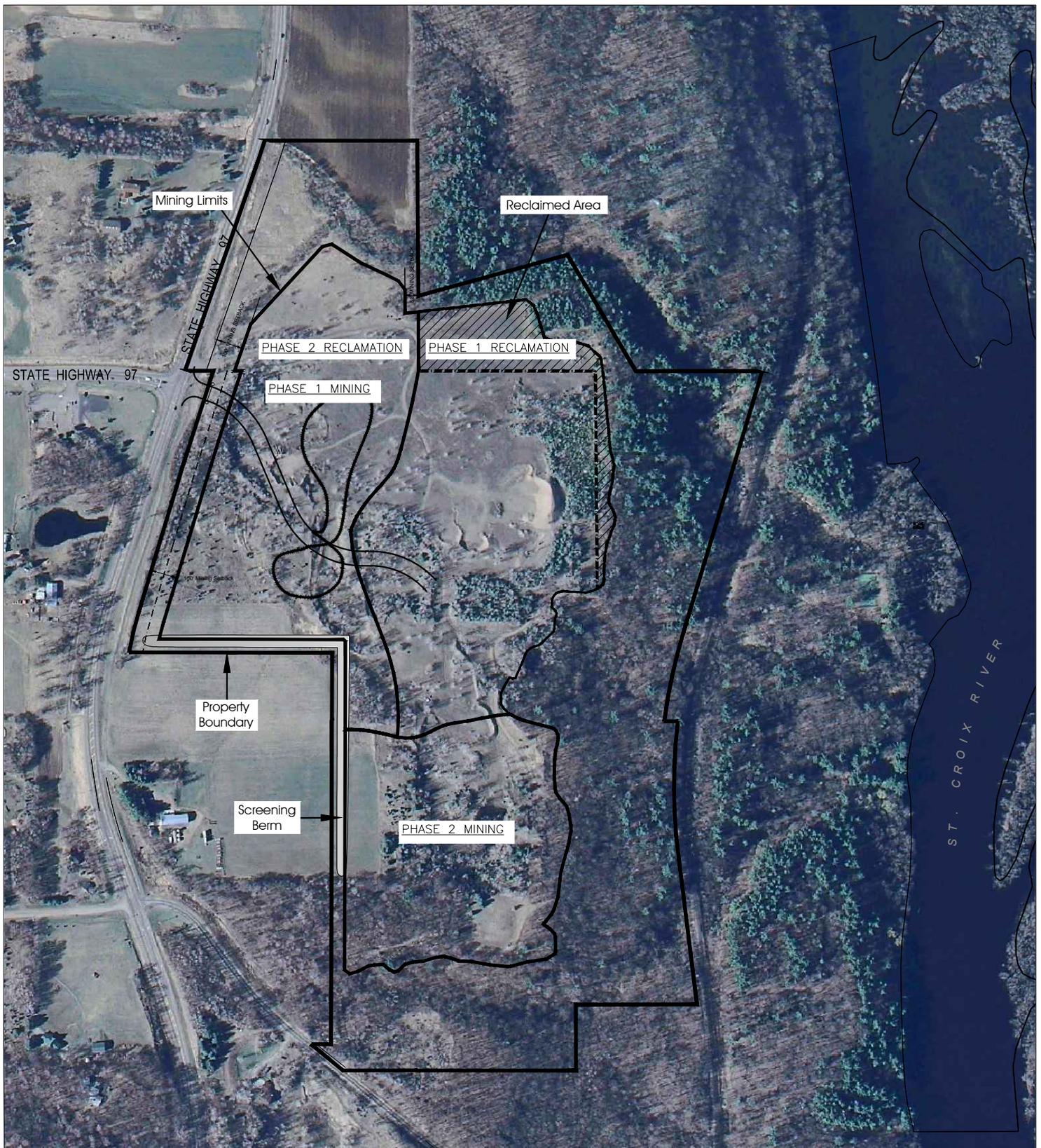


Aerial Photo Source: 2010 USDA NAIP Color Aerial Photograph

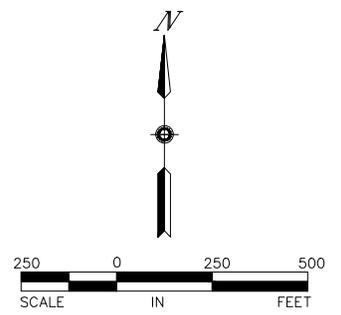
Zavoral Property
Transplanted Tree Area



Figure 1



Aerial Photo
2014 Activity
Annual Operating Permit





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 BLOOMINGTON, MINNESOTA 55437
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 (952) 881-1913 FAX
 www.sundecivil.com

TILLER CORPORATION

ZAVORAL MINING AND RECLAMATION PROJECT

SCANDIA, MINNESOTA

DATE	REVISION
08/27/2012	proposed berm setback/access road
10/8/2012	construct new access and turn lane
1/21/2014	2014 AOP

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Kristen Pauly
 Kristen Pauly
 DATE: 1/21/2014 REG. NO.: 21842

INFORMATION:

PROJECT NO.:	02-626
DRAWN BY:	
CHECKED BY:	KP
APPROVED BY:	KP
SCALE:	Graphic
DATE:	10-08-2012
DESCRIPTION:	

SITE PLAN 2014 ACTIVITY

SHEET NO.

AOP

PHASE 1 RECLAMATION

- RECLAIMED THE ST. CROIX RIVER DISTRICT AND USA SCENIC EASEMENT AREAS DURING 2013 OPERATING SEASON.
- REMOVED EXISTING STOCKPILES
- THE GRADING, TOPSOIL PLACEMENT AND SEEDING WAS CONDUCTED IN ACCORDANCE WITH THE APPROVED RECLAMATION PLAN.
- RECLAMATION WORK MAY EXTEND BEYOND THE RIVER DISTRICT/SCENIC EASEMENT AREA AND INTO THE MINING AREA TO ALLOW SUFFICIENT ROOM FOR RECLAMATION ACTIVITY.
- A PORTION OF PHASE 1 RECLAMATION WAS LEFT UNDISTURBED AS A WOODLAND ADAPTIVE MANAGEMENT AREA.
- 3.93 ACRES

PHASE 3 MINING

Utility corridor to be established into Phase 3 Mining to accommodate relocation of utility poles

PHASE 2 MINING

- DEPENDING ON MATERIALS ENCOUNTERED IN PHASE 1 MINING, MINING MAY ADVANCE INTO PHASE 2 MINING.
- MINIMUM EXCAVATION ELEVATION = 840 ft ABOVE MEAN SEA LEVEL.
- 16.26 ACRES

PHASE 2 RECLAMATION

- DEPENDING UPON THE ADVANCEMENT OF MINING FROM PHASE 1 MINING INTO PHASE 2 MINING, RECLAMATION MAY CONTINUE ON PHASE 2.
- THE GRADING, TOPSOIL PLACEMENT AND SEEDING WILL BE CONDUCTED IN ACCORDANCE WITH THE APPROVED RECLAMATION PLAN.
- RECLAMATION WORK MAY EXTEND BEYOND PHASE 2 RECLAMATION TO ALLOW SUFFICIENT ROOM FOR RECLAMATION ACTIVITY.

PHASE 1 MINING

- CONTINUE PHASE 1 MINING
- MINIMUM EXCAVATION ELEVATION = 840 ft ABOVE MEAN SEA LEVEL.
- 22.29 ACRES
- PROGRESS ON RECLAMATION WILL OCCUR IN PHASE 1 MINING AS MINING ADVANCES



NOTES:

THIS PLAN DEPICTS ACTIVITIES ANTICIPATED FOR THE 2014 MINING SEASON.

TOPOGRAPHIC AND PARCEL INFORMATION FROM WASHINGTON COUNTY LAND SURVEY DIVISION. DATE OF AERIAL PHOTOGRAPHY: APRIL 2000. PARCEL DATA IS CURRENT TO MAY 31, 2008.

MINING SETBACKS: 50' FROM ADJOINING PROPERTY LINES; 100' FROM ANY PUBLIC RIGHT-OF-WAY.



RESTORATION ONLY



POWER POLE



WOODLAND ADAPTIVE MANAGEMENT AREA

