Revised Final Related Actions
Environmental Impact Statement (FEIS)
for

Sand & Gravel Mining and Accessory Uses

MITIGATION PLAN

REVISED

Empire Township, Board of Supervisors
Dakota County, Minnesota

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Prepared by:

BOLTON & MENK, INC.
Consulting Engineers & Surveyors

Resource Strategies Corporation

SECTION III
of the FEIS Revised
Mitigation Plan

TABLE OF CONTENTS

INTRODUCTION

This Mitigation Plan is submitted as a part of the environmental review process (EAW/EIS) to provide reviewers, regulators, and prospective users of the site with an understanding of the actions necessary to protect the environment and limit impacts by the proposed project.

The primary mechanisms for mitigation are the effective use of existing codes, rules, and regulations together with the enforcement options that pertain thereto and the use of permit conditions.

Enforcement options include:

- Enforcement of the codes, regulations and permitting conditions by appropriate agencies
- Require submission of performance bonds
- Initiation of civil suits & restraining orders

This recommended Mitigation Plan identifies nine (9) goals and lists several strategies, responsibilities and actions to accomplish the goals.

1. **Goals** - This level defines broad concepts to be achieved.
2. **Strategies** - This level identifies basic philosophies that could help achieve the related goal.
3. **Responsible Parties and Actions** - This level lists responsible parties and key activities that may be employed to achieve the associated goal.

GOAL 1 -- FULFILL AND MAINTAIN THE PUBLIC'S EXPECTATIONS FOR THE CHARACTER OF THE AREA AS DEFINED BY COMPREHENSIVE PLANS, THE ZONING ORDINANCES, ETC.

Strategy 1.1 Modifications to such expectations must be subject to appropriate review and approval by the governing agencies and authorities. These reviews may include public hearings and an opportunity for the public to comment.

A. Responsible Parties: Empire Township, Dakota County, Metropolitan Council, various State and Federal agencies, and special districts.

B. Actions Required: Rigorous enforcement of amendment and variance procedures.

Strategy 1.2 Adoption of Interim Use Permits (IUP) for each mining operation.

A. Responsible Parties: Empire Township, members of the Mining Consortium and any other individual or firm who wishes to enter into mining within the Mining Area.

Strategy 1.3 Execution of performance bonds to provide surety to the Township that all necessary requirements are met. The amount should be as required by the IUP.

A. Responsible Parties: Empire Township, members of the Mining Consortium and any other individual or firm who wishes to enter into mining within the Mining Area.

B. Actions Required: Careful review of the amount of the bonds to assure adequacy.

Strategy 1.4 Enforcement by all governing authorities of their respective rules and regulations

A. Responsible Parties: All appropriate agencies.

B. Actions Required: Rigorous enforcement of the rules, regulations and the requirements included in the IUP and other permits.

GOAL 2 -- PERPETUATE A DESIRABLE HABITAT FOR NATIVE AREAS AND SPECIES FOUND WITHIN THE MINING AREA INCLUDING THE LOGGERHEAD SHRIKE (A STATE THREATENED SPECIES) AND THE MESIC PRAIRIE.

Strategy 2.1 In the short term, develop attractions for the loggerhead shrike in the setback areas and reclaimed areas as they become available.

A. Responsible Parties: DNR, Empire Township, the Mining Consortium and any other individual or firm who wishes to enter into mining within the Mining Area.

B. Actions Required: In consultation with the DNR staff, planting lowland plains or gently sloping hillsides with short grass and habitat. Good habitat includes scattered low shrubs or trees for perching and nesting.

Strategy 2.2 In the long term, reclamation should include similar actions as above.

A. Responsible Parties: DNR, Empire Township and the Mining Consortium.

Strategy 2.3 Establish appropriate setbacks from the railroad, property lines and roadways.

A. Responsible Parties: Dakota County and Empire Township.

Strategy 2.4 Relocate and manage the mesic prairie to areas adjacent to the potential mining setback areas that have a high potential for successful mitigation.

A. Responsible Parties: DNR, Empire Township, interested community groups, and the owner of the Peterson property

B. Actions Required:

1. Survey the remnant areas in the spring and summer to determine more precisely what species are present.
2. Identify an appropriate area; in and adjacent to the (potential mining) setback areas, that has a high potential for successful mitigation. This area can include existing remnants.
3. Determine the group responsible for conducting the work.
4. Execute the appropriate easements to the appropriate agency (DNR).
5. Cut the more woody vegetation in this mitigation area, and apply herbicide to the larger woody vegetation.
6. Conduct a prairie burn in the mitigation area.
7. Monitor the burned area to determine the extent and types of natural re-vegetation that occurs.
8. In the spring and summer of the following year, survey the burned area to determine if any prairie species have thrived.
9. In the fall, collect by hand the seeds of the plants in the unburned remnant areas.
10. In the following spring, reseed the burned setback areas using the seed collected the prior fall. Supplement the seeding with locally collected native seed that matches the species identified, if necessary.

11. Actively manage the areas to assure plant establishment for the next three to four years.

GOAL 3 -- LIMIT IMPACTS OF SURFACE WATER RUNOFF

A. Responsible Parties: Performance: The Mining Consortium and any other individual or firm who wishes to enter into mining within the Mining Area.

Oversight: MPCA, Dakota County SWCD, Empire Township, Vermillion River Joint Powers Organization (JPO)

Strategy 3.1 National Pollutant Discharge Elimination System (NPDES) Permit and Stormwater Pollution Prevention Plan (SWPPP) Requirements

The complete list of required project permits is identified within the Scoping Environmental Worksheet. In addition to the other permits identified, mining and production activities will follow regulations established within Phase 2 of the National Pollutant Discharge Elimination System (NPDES) Permit, administered by the Minnesota Pollution Control Agency (MPCA). The program regulates stormwater discharges from construction sites, industrial facilities, municipalities and other sites. Each mining operator will be required to apply for or amend an NPDES Permit and comply with the permit requirements. The proposed project is regulated under the MPCA Stormwater Program for Construction Activities and Industrial Activities (SIC Code 1442 Construction Sand and Gravel for mining and quarrying of nonmetallic minerals).
Prior to applying for or amending an NPDES permit, each mining operator must complete a Stormwater Pollution Prevention Plan (SWPPP). For all projects greater than 50 acres that discharge to Special Waters, the NPDES permit requires review by the MPCA, in addition to review by local permitting authority, at least 30 days prior to the project start. Generally, the SWPPP should be submitted early in the project planning phase, typically at the 30 percent design level.

Portions of North Creek, the Vermillion River and the unnamed tributaries are designated as trout streams by the DNR and as Special Waters by the MPCA. All mining activities will occur more than 2000 feet from the designated trout streams. DNR Public Water Resource rules (6130.1200 Exclusion Areas for Mining) indicate that additional regulations and BMPs are not required for projects that are more than 300 feet from a designated trout stream. Likewise, MPCA stormwater regulations for discharge to Special Waters do not apply because the distance to these waters is more than 2000 feet.

The SWPPP is a combination of narrative and plans, including appropriate details that describe the proposed construction activity and address the potential for erosion, sediment and pollutant discharge from the site and preventative mitigation measures. The SWPPP must be incorporated in the final project plans and specifications and must address implementation, installation, inspection and maintenance of the control measures. Specifically, the SWPPP includes the following elements (University of Minnesota, 2003-2004):

1. Temporary erosion prevention and sediment control Best Management Practices (BMPs)
2. Permanent erosion prevention and sediment control Best Management Practices (BMPs)
3. Permanent stormwater management system
4. Pollution prevention management measures

Strategy 3.2 Best Management Practices (BMPs)

BMPs for surface water management, erosion and sediment control shall be utilized during mining, production and reclamation activities to protect on-site and adjacent surface waters and wetlands. All NPDES permit regulations shall be followed, however, it is anticipated that the following BMPs will be used throughout the project:

3.2.1 Proactive Planning and Phasing of Mining, Production and Reclamation Operations

Prior to construction, proposed mining, production and reclamation operations should be thoroughly planned and coordinated to minimize unnecessary disturbance of the project area and utilize grading practices that minimize erosion. Existing vegetation shall not be disturbed unnecessarily. Whenever possible, mining excavations should proceed vertically to full depth prior to expanding horizontally. Location of production areas, building facilities, fuel storage areas, groundwater supply wells, stockpile areas, haul roads, sand/gravel washing areas, detention ponds and other on-site facilities shall be determined in conjunction with the phased mining plan to minimize disturbance and potential impacts to on-site and adjacent surface waters.

3.2.2 Maintain Existing Stormwater Drainage Patterns

Whenever possible, the existing stormwater drainage patterns shall be maintained to reduce or eliminate changes in stormwater runoff. Removal of topsoil and overburden soils, placement of soil stockpiles, mining excavation, stockpiles, placement of fill soils, grading and end use reclamation shall be phased accordingly throughout the duration of the project to minimize alteration of the existing drainage patterns during mining, production and following reclamation. Construction of temporary and permanent ditches, swales, berms, culverts, ponds and other engineered controls shall be utilized, as necessary throughout the project, to maintain existing stormwater drainage patterns, flows and runoff volumes. If existing stormwater drainage patterns are not maintained, surface waters and wetlands adjacent to the project will be impacted by a reduction in stormwater flow and runoff volume during mining excavation and grading. Maintaining existing drainage patterns during mining will require modification of an existing township ordinance No. 450 indicating that stormwater from mining areas may not be discharged offsite.

3.2.3 Erosion Control Measures

Temporary and Permanent Vegetation Establishment

Inplace vegetation is the best deterrent to erosion and should be maintained as much as possible and restored as quickly as possible throughout construction. Areas that require disturbance and discharge to surface waters should be restored with temporary or permanent vegetation immediately following active construction. Specific NPDES criteria related to temporary and permanent vegetation includes:

1) During construction, all slopes that have a continuous positive slope within 200 lineal feet of any surface water (including any potential discharges to surface waters, including but not limited to culverts, storm sewer, curb and gutter, ditches, detention ponds, etc.) must receive temporary erosion protection or permanent cover, according to Table 3-1.

Table 3-1. Slope and Duration

Type of Slope	Maximum Time Area Can Remain Unvegetated When It Is Not Actively Being Worked
Steeper than 3:1	7 days
10:1 to 3:1	14 days
Flatter than 10:1	21 days

Source: University of Minnesota, 2003-2004.

2) Any temporary or permanent drainage ditch that drains water from or diverts water around a construction site, must be stabilized within 200 lineal feet of the property edge, or from the point of discharge to any surface water. Stabilization must be completed within 24 hours of connection to a surface water (University of Minnesota, 2003-2004).

3) Final stabilization of all disturbed areas and drainage ditches with a perennial vegetative cover, consisting of a minimum density of 70 percent over the entire pervious area or other equivalent means necessary to prevent soil failure under erosive conditions, must be completed as part of the project (University of Minnesota, 2003-2004).

4) As part of final stabilization, all temporary synthetic erosion prevention and sediment control BMPs (i.e. silt fence) must be removed and sediment must be cleaned out from all conveyances and detention basins (University of Minnesota, 2003-2004).

Other Engineering Controls

Other engineering controls shall be implemented and maintained, as necessary, to minimize erosion. Specific NPDES criteria related to erosion control include:

1) Slope Grading - If possible, slopes greater than 3:1 should be avoided. If slopes steeper than 3:1 are used, unbroken slope lengths greater than 75 feet, should be avoided to maintain sheet flow and minimize rills and/or gullies.

2) Erosion Control Mats, Mulch and Hydraulic Stabilizer - Depending on location, slope length and steepness, erosion control mats, mulch and/or hydraulic soil stabilizer shall be used as necessary to reduce erosion and assist in establishment of temporary or permanent vegetation.

3) Energy Dissipation and Erosion Control at Inlets/Outlets and Other High Flow/High Velocity Areas - Pipe outlets shall be located and aligned to prevent erosion at the outlet. Pipes should be extended to outlet at the toe of slope rather than on the slope. Erosion control shall be provided at all pipe inlets and outlets. Riprap or other approved energy dissipation methods shall be used, as necessary, to protect soils where high flows or velocities may occur. Pipe outlets shall be provided with temporary or permanent energy dissipation (i.e. riprap or other suitable material) within 24 hours of connection to a surface water. Temporary erosion control consisting of ditch checks, seed/erosion control blanket or seed/mulch shall be provided for a minimum of 200 feet from the point of discharge.

3.2.4 Sediment Control Measures

The following controls are proposed to control sediment transport within and from the site:

1) Implementation of Down Gradient Sediment Control Measures – Sediment control measures must be established on all down gradient perimeters before any upgradient land disturbing activities begin. These measures shall remain inplace until final stabilization of all up gradient areas has been established. If the down gradient treatment systems are overloaded, additional up gradient sediment control measures must be installed to eliminate the overloading (University of Minnesota, 2003-2004).

2) Perimeter Surface Water Protection Measures –Measures should be used at surface water perimeters, as necessary, to minimize sediment contamination. These measures may NOT include the use of perimeter hay bale barriers. These measures may include the use of

perimeter sand bag barriers, silt fence or floating silt curtain. Whenever possible, undisturbed vegetation shall be used as a buffer strip with other surface water protection measured placed up gradient of the buffer strip (University of Minnesota, 2003-2004).

3) Temporary Soil Stockpile Measures – Temporary soil stockpiles cannot be placed in or immediately adjacent to surface waters, ditches, storm sewer or culverts. Silt fence or other approved sediment control measures shall be used at the base of the stockpiles to prevent sediment migration.

4) Vehicle Exit Measures - Adequate measures shall be taken to ensure vehicles do not track sediment from the construction site. These measures may include placement of rock construction pads at all site exits, truck washes and street sweeping, as necessary.

5) Inlet Protection Measures - Inlets of all storm sewer conveyances and culverts shall be protected with sand bags, silt fence, sediment traps or other approved measures to eliminate sediment transport to down gradient lands or surface waters. Inlet protection shall remain inplace until final stabilization of all up gradient areas has been completed.

6) Ditch Measures – In addition to erosion control, various ditch measures can be used to reduce sediment transport to down gradient lands or surface waters. Adequate measures shall be taken to ensure sediment does not leave the Mining Area or enter surface waters. These measures include various types of ditch checks (silt fence, biorolls (wattles), rock, etc.) and sediment traps.

7) Temporary Sedimentation Basins – In areas where 10 or more acres of disturbed soil drain to a common location, a temporary sedimentation basin must be provided prior to runoff leaving the construction site or entering surface waters. Additional temporary sedimentation basins are also encouraged adjacent to steep slopes or highly erodible soils. Temporary Sedimentation basins shall be designed and constructed to the following requirements:

   - The basins must provide storage below the outlet pipe for a calculated runoff volume from a 2-year, 24-hour storm over the entire drainage area. In no case shall the basin provide less than 1,800 cubic feet of storage from each acre drained to the basin, as measured below the outlet invert.

   - Where no such runoff calculation has been performed, a temporary sedimentation basin shall provide a minimum of 3,600 cubic feet of storage from each acre drained to the basin, as measured below the outlet invert. The temporary sedimentation basin shall remain inplace until final stabilization of the site has been achieved.

   - Temporary basin outlets must be designed to prevent short-circuiting and the discharge of floating debris. The basin must be designed with the ability to allow complete basin drawdown (e.g. pumps, perforated pipe or other means) for maintenance activities and provide a stabilized emergency overflow to prevent failure of pond integrity. Energy dissipation must be provided for the basin outlet.

   - The temporary basins must be constructed and made operational concurrent with the start of up gradient soil disturbance that contributes runoff to the pond.

   - Where temporary sedimentation basins are not attainable due to site limitations, equivalent sediment controls are required for all down gradient boundaries of the construction area.

Alternative measures may include smaller sedimentation basins, sediment traps, ditch checks, silt fence, vegetative buffer strips, or any appropriate combination of measures.

- Sediment from conveyances and temporary sedimentation basins that are to be used as permanent water quality management basins, must be sufficiently cleaned out to return the basin to its design capacity. Sediment must be stabilized to prevent it from being washed back into the basin, conveyances, ditches or swales discharging off-site or to surface waters.

3.2.5 Permanent Stormwater Management System

When project development replaces vegetation and/or other pervious surfaces with one or more acres of cumulative impervious surface, permanent water quality treatment is required for the new impervious area created by the project. Prior to runoff leaving the construction site or entering surface waters, a volume equal to ½-inch over the impervious area created by the project must be treated. Treatment may occur via any of the following methods:

1) Wet Sedimentation Basin - The basin must have a minimum permanent volume of 1,800 cubic feet of storage for each acre that drains to the basin, as measured below the outlet invert. The basin's permanent volume must have a minimum depth of 3-feet and a maximum depth of 10-feet and must be configured such that the scour or resuspension of solids is minimized.

   - Basin outlets shall be designed such that the water quality volume is discharged at no more than 5.66 cfs per acre of pond surface area.

   - Basin outlets must be designed to prevent short-circuiting and the discharge of floating debris and must have energy dissipation.

   - The basin must provide a stabilized emergency overflow to accommodate storm events in excess of the basin's hydraulic design.

   - Adequate maintenance access must be provided (typically 8-feet wide) along with a maintenance plan identifying responsibility for future maintenance.

2) Infiltration/Filtration – Infiltration/filtration options include but are not limited to: infiltration basins, infiltration trenches, rainwater gardens, sand filters, organic filters, bioretention areas, enhanced swales, dry storage ponds with underdrain discharge, off-line retention areas and natural depressions. Infiltration must be used only if appropriate to the site and land uses. Settleable solids, floating materials, oil and grease should be removed from the runoff to the maximum extent practicable before runoff enters the infiltration/filtration system. Filtration systems must have a reasonable chance of achieving approximately 80 percent removal of total suspended solids. Evaluation of the impacts of the infiltration system on existing hydrologic features (e.g. wetlands) must be determined with an effort to maintain pre-existing conditions. Other criteria include the following:

   - Infiltration systems should not be excavated to final grade until the contributing drainage area has been constructed and fully stabilized.

   - During construction of an infiltration system, rigorous sediment and erosion controls (e.g. diversion berms) should be used to keep runoff and sediment away from the infiltration area. In an effort to avoid soil compaction, the area must be staked off and marked to keep heavy equipment away.

- Pretreatment devices such as a vegetated filter strip, small sedimentation basin or grit chamber must be used to settle particulates before the stormwater discharges into the infiltration or filtration system.

- The water quality volume shall discharge through the soil or filter media in 48 hours or less. Additional flow that cannot be infiltrated or filtered in 48 hours should be routed to bypass the system through a stabilized discharge point. A method to visually verify system operation must be provided.

- Appropriate on-site testing shall be conducted to ensure a minimum of 3-feet of separation between the seasonally saturated soils or bedrock and the bottom of the proposed infiltration system. Calculations and computer model results that demonstrate the design adequacy must be included as part of the SWPPP.

- Adequate maintenance access must be provided (typically 8-feet wide) along with a maintenance plan identifying responsibility for future maintenance.

- Use of designed infiltration systems from industrial areas with exposed contaminated materials or from vehicle fueling and maintenance areas is prohibited.

3) Regional Ponds – Regional ponds may be used provided they are constructed ponds, not natural wetlands or water bodies and are designed, per design requirements, to accommodate water from all impervious surfaces that reach the pond. Basin outlets shall be designed such that the water quality volume is discharged at no more than 5.66 cubic feet per second (cfs) per acre of pond surface area. The owner must obtain written documentation from the applicable local governmental unit (LGU) or private entity that owns and maintains the regional pond.

4) Combination of Practices – A combination of permanent practices, which meet the design requirements (wet sedimentation basins, infiltration/filtration and regional ponds) may be used. The water quality treatment volume shall be accounted for from each treatment system. If any combination of these practices is used, the SWPPP must contain documentation (e.g. LGU or private entity's authorization, infiltration computer model results or calculations, etc.) identifying the volume that each practice addresses.

5) Alternative Method – When an alternative, innovative treatment system is proposed and demonstrated by calculation, design or other independent methods to achieve approximately 80 percent removal of total suspended solids on an annual average basis, the Commissioner will approve the method if the application process is completed and the following information is submitted:

   - All calculations, drainage areas, plans and specifications for the proposed alternative method and a graphic representation of the area to be served by the method. These items must be included in the SWPPP and submitted to the MPCA at least 90 days prior to the proposed starting date of the construction activity.

   - A 2-year monitoring plan to sample runoff from the proposed method. The plan must include a discussion of the methods used to collect samples, sample location (upstream and downstream of the proposed method), sample frequency (minimum of six runoff events), identify lab used to analyze samples and QA/QC methods to be used. The plan must include a schedule for submitting annual monitoring data.

- A mitigation plan that addresses how the water quality volume will be treated in the event that monitoring data shows the proposed alternative treatment method does not function as designed.

- The alternative method must achieve approximately 80 percent removal of total suspended solids on an average annual basis for the conditions expected at the site. The design must also consider public safety, health and water quality concerns. Proprietary information on effectiveness will not be considered for alternative treatment method review and approval. No construction activity on the project is covered until the applicant receives an alternative treatment approval letter from the MPCA.

6) Mining Practices – Dewatering - Some mine operators have expressed interest in using localized dewatering to expedite the extraction of the aggregate materials. As stated in the EAW, "*by practice, the Township has not permitted de-watering during the mining process but it has permitted the extraction of material below the water table with draglines and backhoes. …. The potential impacts of excavation below the water table will be investigated in the EIS."*

   - Section 4.4 of the Groundwater Impact Study explained that, "*dewatering could be allowed in the northern portion of the Mining Area with minimal impacts on surface water features*." Dewatering in areas other than the northern of the Mining Area Mining Area will only be permitted after further study and monitoring to ensure minimal impacts. This concern was particularly directed at both the southeast (east of Biscayne) and the southwest (near North Creek) portions of the Mining Area.

7) Dewatering and Basin Draining – All dewatering or basin discharge water that may have turbid or sediment laden water, must be discharged to a temporary or permanent sedimentation basin prior to draining off-site or entering a surface water. If the water cannot be discharged to a sedimentation basin prior to entering a surface water, it must be treated with other appropriate BMPs, such that the discharge does not adversely affect the receiving waters or downstream landowners. Adequate sedimentation control measures are required for discharge water that contains suspended solids. The discharge points must be adequately protected from erosion and scour by accepted energy dissipation measures (riprap, sand bags, etc.). All water from dewatering or basin draining activities must be discharged in a manner that does not cause nuisance conditions, erosion in receiving channels or on down grade properties, or inundation of wetlands causing significant adverse impacts to the wetland.

8) Pollution Prevention Measures – The following pollution prevention management measures shall be implemented on the site:

   - All solid waste shall be managed appropriately on-site and disposed off-site per MPCA disposal requirements.

   - All hazardous materials shall be properly stored and include secondary containment to prevent spills, leaks and other discharges. Restricted access to hazardous material storage areas must be provided to prevent vandalism. Storage and disposal of hazardous waste must be in compliance with MPCA regulations.

   - External washing of trucks and other construction vehicles shall be limited to a defined area of the site. All runoff must be contained and waste shall be properly disposed. No engine degreasing is allowed on-site.

9) Inspections and Maintenance – The Mining Area must receive routine inspection to ensure that erosion/sediment control and pollution prevention measures are functioning properly and determine if additional measures are necessary. The following inspection and maintenance procedures shall be implemented:

- The owner or operator (whoever is identified in the SWPPP), must routinely inspect the construction site at least once every seven days during active construction and within 24 hours after a rainfall event greater than 0.5 inches in 24 hours.
- All inspections and maintenance must be recorded in writing and retained with the SWPPP. Records of each inspection and maintenance activity shall include the following:

  - Date and time of inspection
  - Name of person conducting inspection
  - Findings of inspection, including recommendations for corrective actions
  - Corrective actions taken (include dates, times and party completing maintenance activities)
  - Date and amount of rainfall events greater than 0.5 inches in 24 hours
  - Documentation of changes made to the SWPPP

- Inspections within areas where final stabilization has been completed may be reduced to once per month.

- When work is suspended due to frozen ground conditions, inspection must take place as soon as runoff occurs at the site or prior to resuming construction, whichever comes first.
- All erosion and sediment control BMPs and temporary and permanent water quality management BMPs must be inspected to ensure integrity and effectiveness. All nonfunctional BMPs must be repaired, replaced or supplemented with functional BMPs. The Permittee is responsible for operation and maintenance of all BMPs for the duration of site construction work, until final stabilization has been achieved and accepted by the agencies. The following specific inspection and maintenance requirements shall be followed:

  - All silt fence must be repaired, replaced or supplemented when it becomes nonfunctional or the sediment reaches 1/3 of the fence height. Repairs must be made within 24 hours of discovery or as soon as field conditions allow access.

  - Temporary and permanent sedimentation basins must be drained and the sediment removed when the sediment depth reaches ½ the storage volume. Drainage and removal must be completed within 72 hours of discovery or as soon as field conditions allow access.

  - Surface waters, including ditches and conveyance systems, must be inspected for evidence of sediment deposition by erosion. All deposited sediment shall be removed from surface waters, including ditches, swales, catchbasins, storm sewer, culverts and other drainage systems. All areas of erosion and sediment deposition that result in exposed soil shall be restabilized. The removal and stabilization must take place within seven days of discovery unless precluded by legal, regulatory or physical access constraints. All reasonable efforts shall be made to achieve access, however, if access is

precluded, removal and stabilization must take place within seven calendar days of obtaining access. The Permittee is responsible for contacting all local, regional, state and federal authorities and obtaining all required permits, prior to conducting any work.

- Construction site vehicle exit locations must be inspected for evidence of off-site sediment tracking onto paved surfaces. Tracked sediment must be removed from all off-site paved surfaces, within 24 hours of discovery.

- Any off-site accumulations of sediment must be removed in a manner and frequency sufficient to minimize off-site safety or water quality impacts (i.e. sediment within streets could enter into storm sewer system and/or pose safety hazard to street users).

- All infiltration areas must be inspected to ensure that no sediment from construction activities is reaching the infiltration area and the area is protected from compaction by construction equipment.

GOAL 4 -- PRESERVE AND PROTECT THE GROUNDWATER AQUIFERS

Strategy 4.1 Permitting - Mine operators shall obtain all applicable permits concerning the design, drilling, installation, use and abandonment of groundwater production and dewatering wells per MDNR, MDH and Dakota County Ordinance Number 114.

A. Responsible Parties: Performance: The Mining Consortium and any other individual or firm who wishes to enter into mining within the Mining Area.

Oversight: MPCA, MDNR, MDH, Dakota County, Empire Township

B. Actions Required:

1. Unsaturated Zone - Mine operators shall comply with Empire Township Ordinance Number 450 and 450a, "An Ordinance Establishing Regulations and Standards for Mineral Extraction" or the amended version thereof.
2. The current 2020 comprehensive plan identifies this area as Agriculture. During the 35-year mining period, the Township may periodically update the future land use plan. Any non-agriculture land uses identified within the Mining Area will require careful analysis because of the shallow depth to the water table. The Township will be required to perform new environmental review of non-agriculture developments according to Minnesota Environmental Rules. It is recommended that the Township consider an Alternative Urban Areawide Review for future non-agriculture land uses of larger mined tracks as the mining activities begin to cease operations. The End Use Plan should ensure the preservation of surface water drainage as identified in **Figure 12.** The ultimate end use drainage features shall be preserved in the post mining land plan by enforcement of the then current planning and zoning ordinances and building codes. Any future land uses must carefully take into consideration that in many cases groundwater will be less than 10 feet below the surface making the site vulnerable to contamination. Future end uses shall include consideration of the importance of the Rosemount Wellhead Protection Program and the Vermillion River Watershed.
3. Environmental Monitoring and Contingency Plan - The Township will work with the Dakota SWCD, the JPO and the individual mine operators to develop an overall comprehensive mine monitoring plan that will be implemented by the Township (miners) as part of the permit conditions. At a minimum it is anticipated that the monitoring plan shall include the monitoring of all surface water bodies including stormwater retention ponds, wash ponds and make-up water sumps and the installation and monitoring of both up-gradient and down-gradient monitoring wells capable of evaluating changes in groundwater elevation, temperature and dissolved solids.
4. Improve the current understanding of Layer 2 and Layer 3 - install several nested pairs of groundwater monitoring wells at the site. The wells could also serve as an early warning system or sentry network for changes at the site. These wells would also be included in the long-term monitoring program described above.
5. Stormwater treatment – employ Best Management Practices (BMPs) as described in the Surface Water Impact Study.
6. End use ponds - mine operators can significantly mitigate or eliminate groundwater elevation increases, thermal impacts and total dissolved solids increases attributed to the reclamation end use plan by changing the configuration of the proposed end use ponds from retention ponds to diversion swales.

7. Vegetative cover - mine operators can minimize thermal inputs to the groundwater by installing and maintaining trees and tall bushes near end use ponds.

8. Security - Mine operators shall ensure, per Empire Township Ordinance 405, that areas where aggregate has been mined are adequately secured until reclamation is complete. This will protect groundwater resources from potential releases of chemicals that could infiltrate and contaminate the resources. This is particularly important in areas that are included in the Rosemount Wellhead Protection Program.

GOAL 5 -- PRESERVE AND PROTECT THE QUALITY, QUANTITY AND RATE OF STORMWATER REACHING DOWNSTREAM WATER BODIES INCLUDING WETLANDS, THE VERMILLION RIVER, BUTLER POND, NORTH CREEK, ETC.

Strategy 5.1 Permitting - Mine operators shall obtain all applicable permits concerning the design, installation and use of surface water management systems.

A. Responsible Parties: Performance: The Mining Consortium and any other individual or firm who wishes to enter into mining within the Mining Area.

Oversight: COE, MPCA, MDNR, Dakota County, Dakota County SWCD, Empire Township, Vermillion River Joint Powers Organization (JPO)

B. Actions Required:

1. In accord with the State and Federal wetland regulations, each mine operator will need to provide a detailed wetland delineation and mitigation plan for the direct wetland impacts. All wetlands within the Mining Boundary will be affected through excavation, with the exception of wetlands 15-NW-01, 15-SW-01 and 16-SW-01 in the southeast corner of the site. These wetlands are near the groundwater elevation and have minimal aggregate deposits and have been identified by the Mining Consortium as areas within the Study Area that will not be disturbed by mining activities.
2. Current Minnesota Wetland Conservation Act regulations require that mitigation be provided for "excavation in the permanently and semi-permanently flooded areas of type 3, 4, or 5 wetlands, and *in all wetland types if excavation* includes filling or draining or *results in conversation to nonwetland*". Since the proposed excavation activities will result in the conversion of wetlands to non-wetlands, all wetland fill or excavation must be mitigated.
3. State regulations require that mitigation be completed at a 2:1 ratio. Given that 18.0 acres of wetland will be directly impacted, the mitigation requirement is 36.0 acres. This can be completed through creation and/or restoration of 18.0 acres of wetland plus creation, preservation or restoration of 18.0 acres of stormwater ponds and upland buffers.
4. The current end use plan includes nearly 240 acres of ponding. Some of these areas could be designated and constructed to meet the wetland mitigation requirements for on-site wetland losses. Additional mitigation, in the form of wetland restoration and upland buffer establishment, could be provided at select areas within the Mining Area. Each mining operator will be responsible for mitigating wetland impacts that occur on their site prior to the associated impact.
5. The Groundwater Impact Study in section 4.3.2 revealed potential temperature increases ranging between 0.07 and 1.13 ºC to the local surface water and wetland features. Although this is well below the range of seasonal fluctuations and within the range of variability related to sampling error and the report concludes, "impacts related to temperature and TDS to these surface water features are deemed to be negligible", the sensitivity of the Vermillion River as a designated trout stream requires that the Mitigation Plan include:

   (a) Monitoring of groundwater and surface water temperatures

(b) Monitor the stream channel in close proximity to the mining area for degradation from sedimentation that might impact the trout habitat.

(c) Annually, hold a meeting of all mine operators to review their mining plan for the next 12 months and adjust potential mitigation measures that will be used to eliminate impacts, if detected.

(d) Mitigation measures that will be used to protect the stream channel and habitat, or restore it if degradation occurs.

(e) An area wide monitoring plan will prescribe the specifics of this monitoring. The Township's consultant will recommend any mitigation that may be necessary.

GOAL 6 -- PROVIDE MITIGATION FOR INDIRECT WETLAND AND WATERCOURSE IMPACTS

Strategy 6.1 Monitoring of the surface waters and the groundwater in the Mining Area and the immediate surrounding area will be required as part of the comprehensive monitoring plan. The general hypothesis is that if no significant impacts on turbidity, sediment, phosphorous, nitrogen, temperature, volume, velocity, etc. are detected leaving the Mining Area, or immediately adjacent thereto, changes in the environment beyond those limits are probably the result of some other activity in the tributary area.

A. Responsible Parties: Performance: The Mining Consortium and any other individual or firm who wishes to enter into mining within the Mining Area.

Oversight: COE, MPCA, MDNR, Dakota County, Dakota County SWCD, Empire Township, Vermillion River Joint Powers Organization

B. Actions Required:

1. Monitor the surface water systems for changes

A. The surface water analysis provides an evaluation of the potential impacts between the existing conditions and end use conditions. As indicated in the surface water impact evaluation, wetlands and watercourses with potential indirect impacts are expected to maintain their existing functions and values during the mining operation and post reclamation.

B. On a broad scale, the most substantial indirect impact is the increase in the size of the watershed area draining to Butler Pond. This change is associated with an increase in flow volume to the receiving waters and wetlands. Although this change is anticipated to have a minor impact, there is opportunity to reduce the flows to Butler Pond by creating additional stormwater ponds in the upstream watershed. Construction of stormwater ponding within the Mining Area will reduce the sediment and nutrient loads to surface waters and wetlands.

C. Mitigation for indirect impacts is identified in Section 5.2 of the Surface Water Impact Study. No additional mitigation measures for indirect surface water impacts are necessary.

2. Monitor the groundwater system for changes

A. The groundwater analysis provides a worst-case evaluation of potential impacts. As indicated in the evaluation, none of the wetlands or watercourses are expected to have decreased function and value as a result of the mining operation. Groundwater impacts are primarily associated with the construction of stormwater ponds that provide infiltration. These ponds provide a long-term source of total dissolved solids and increased temperatures. They also are largely responsible for the potential raising of the groundwater table through focused recharge.

B. Stormwater swales are proposed to prevent mixing of groundwater and stormwater, improve water quality, and to reduce runoff volumes and flow rates. The need for surface water controls must be balanced with the need to minimize groundwater impacts. Based on this need for balance, the following mitigation is proposed:

C. The precise location of all ponds will be subject to adjustment based on the findings of the ongoing monitoring program, the progress of mining and the specific soils encountered The sites will be chosen where the future monitoring suggests such ponds would be most effective. Permanent stormwater ponds will be constructed, as shown in the surface water study, around end use groundwater Ponds 1, 2 and 10. In addition, a stormwater pond will be constructed at Pond 8. The stormwater pond will provide storage for runoff from the 2-year, 24-hour precipitation event. This pond will reduce the runoff rate, as compared to pre-construction conditions. This pond location is proposed because it provides the best opportunity to improve the quality of water from a large watershed while minimizing potential groundwater impacts. It minimizes groundwater impacts to the Vermillion River and its tributaries, since the groundwater at this location moves to the north toward the Mississippi River. It is further recommended that the end use groundwater pond at this location be removed to provide adequate space for the stormwater pond and to minimize the potential for groundwater/surface water mixing. All other groundwater pond locations will be surrounded by a shallow swale to maintain stormwater flows and prevent surface water from directly entering the groundwater system. The implementation of these mitigation measures will result in the following::

(a) Reduce rate and volume of stormwater draining to the Vermillion River Wetlands to more closely mimic existing conditions

(b) Improve the quality of water entering the Vermillion River Wetlands

(c) Reduce the simulated TDS, temperature and surface elevation effects on groundwater associated with Ponds 3, 4, 5, 6, 7, 9, and 10.

3. Environmental Monitoring and Contingency Plan

A. In addition to the environmental monitoring and contingency plan outlined in the groundwater impact study, the following is recommended:

- Continue monitoring operations in North Creek and south of Butler Pond (Tributary 1). As necessary, develop monitoring plan that evaluates multiple parameters such as flow, turbidity, sediment, phosphorous, nitrogen and temperature on a more frequent schedule (weekly to monthly). Biological monitoring, such as Stream Watch, should also be considered if appropriate habitat conditions exist.

- Conduct biological monitoring of wetlands at select sites within the Butler Pond wetlands. Utilize MPCA Vegetative and Invertebrate protocol, or other suitable methodology.

GOAL 7 -- PROVIDE ENVIRONMENTAL MONITORING AND A CONTINGENCY PLAN TO SECURE GROUNDWATER PROTECTION

Strategy 7.1 Permitting - Mine permits will include monitoring requirements.

Strategy 7.2 Best Management Practices

A. Responsible Parties: MDNR, MPCA, MET Council, Dakota County, Empire Township, Dakota County SWCD, the Mining Consortium and any other individual or firm who wishes to enter into mining within the Mining Area.

B. Actions Required:

Sand and gravel operators utilize substantial quantities of groundwater in the processing of aggregate, production of concrete and asphalt products and for dust suppression. Use of groundwater resources by mine operators must be balanced with existing and future uses of the groundwater resource including base flow to the Vermilion River watershed, agriculture irrigation and potable well usage. Sand and gravel mining frequently occurs in areas where the targeted sand and gravel deposits provide a shallow, productive aquifer. In many cases, mining may remove overburden and near surface layers of soils and aggregate deposits that would otherwise act as a level of protection to the underlying groundwater. In addition, many sites from which aggregate is extracted are later used as landfills, industrial plants sites or for unrestricted residential development. Changes can occur in groundwater chemistry, water elevation, flow direction, gradient and groundwater temperature ultimately upsetting the delicate balance in both the local and regional environmental setting. Services provided by groundwater can thus be adversely impacted by sand and gravel mining and the final end use conditions after mine reclamation. In order to minimize potential impacts and ensure that mining and ancillary processes can proceed under desirable cost-benefit conditions, the following Mitigation Options are suggested as components of the mining operations plan and end use plan.

7.1 Permitting

7.1.1. Groundwater Appropriation

Mining operators shall obtain all applicable permits concerning the design, drilling, installation, use and abandonment of groundwater production and dewatering wells per Dakota County Ordinance Number 114. Production wells, dewatering wells and sumps shall comply with all Dakota County Rules and Regulations and Minnesota Department of Health Rules and regulations. Mine Operators shall obtain Minnesota Department of Natural Resources Groundwater Appropriation Permits for all production wells. Production and recirculation ponds shall comply with all appropriate and or applicable requirements including Dakota County Ordinance Number 50 concerning Shoreline and Floodplain Management.

7.1.2. Unsaturated Zone

Mine operators shall comply with Empire Township Ordinance Number 450 and 450a, “An Ordinance Establishing Regulations and Standards for Mineral Extraction” or the amended versions thereof. The mining permits and the reclamation plans will specifically address and control the amount of acreage that can be exposed to extraction and the amount of total acreage that can be utilized by an operator at any one time. This portion of the ordinance is an important component of the protection of groundwater because it limits the amount of exposed surface area where the underlying saturated zone containing groundwater is at greatest vulnerability. The

ordinance further requires operators return overburden and topsoil in adequate quantities to protect the underlying groundwater as a part of the site reclamation.

7.1.3. End Use Planning

The current 2020 comprehensive plan identifies the proposed Mining Area as Agriculture. During the mining period the Township will periodically update the future land use plan. Non-agriculture land uses will require careful analysis because of the shallow depth to the water table. The Township will be required to perform new environmental review of certain proposed developments according to Minnesota Environmental Rules. It is recommended that the Township consider an Alternative Urban Areawide Review for future non-agriculture land uses of larger mined tracks as the mining activities begin to cease operations. The End Use Plan should ensure the preservation of surface water drainage as identified in Figure 12, "Sand and Gravel Mining and Accessory Uses" or as the abovementioned plan may be modified. Any future land uses must carefully consider that in many cases groundwater will be less than 10 feet below the surface making the site vulnerable to contamination. Future end uses shall include consideration of the importance of the Rosemount Wellhead Protection Program and the Vermillion River Watershed.

7.1.4. Environmental Monitoring and Contingency Plan

The Township will work with the Dakota SWCD and JPO to develop an overall comprehensive mine monitoring plan that will be implemented by the Township (miners) as part of the permit conditions. The plan must address the actual mining schedule from each mine operator. At a minimum it is anticipated that the monitoring plan shall include the monitoring of all surface water bodies including stormwater retention ponds, wash ponds and make-up water sumps. At a minimum, the plan shall include the installation and monitoring of both up-gradient and down-gradient monitoring wells capable of evaluating changes in groundwater elevation, temperature and dissolved solids. The operating plan shall be approvable by all local government authorities including Empire Township, the Rosemount Wellhead and Source Water Protection Plan Administrator, Dakota County Environmental Management and the Vermillion River Watershed Joint Powers Organization (JPO). The plan shall list contingencies that the mine operator will implement based on observed groundwater impacts.

The mine operators shall fund a separate long-term monitoring program that includes long-term monitoring and reporting of:

- The existing Empire groundwater monitoring wells
- Butler Pond
- The North Creek tributary to the Vermillion River
- Adjacent wetlands.

Information shall be used by the operators to validate the numerical model simulations and ensure that unanticipated changes in site conditions are promptly addressed. The Environmental Monitoring and Contingency Plan is intended to address the inherent uncertainties associated with trying to simulate future conditions using a numerical groundwater model.

7.1.5. Improve Current Understanding of Layer 2 and Layer 3

The understanding of current site conditions for the underlying deeper aquifers could be improved by installing several nested pairs of groundwater monitoring wells at the site. The wells could be used to verify current assumptions concerning hydraulic conductivity, gradient and water quality in the Prairie du Chien and the Jordan aquifers. The additional wells would certainly add an additional level of confidence in the current understanding of the localized groundwater flow system. The wells could also serve as an early warning system or sentry network for changes at the

site. These wells would be included in the long-term monitoring program for the Empire Aggregate Mine Sites described above.

7.1.6. Stormwater Treatment

This topic is covered in the Surface Water Impact Study. In addition to the traditional best management plans (BMPs) for addressing suspended solids entrained in stormwater it is suggested that the mine operators investigate the use BMPs that can address dissolved solids in process water and stormwater. Dissolved solids are typically generated by the dissolution of stored aggregate by rain events or in the aggregate washing process. Stormwater rich in dissolved minerals (hardness) can adversely impact services provided by surficial groundwater. Based on the model simulations it is not anticipated that dissolved solids will present a problem but the operators should have a contingent remedy available in case modeling simulations under predict future conditions.

7.1.7. End Use Stormwater Ponds

The mine operators can significantly mitigate or eliminate groundwater elevation increases, thermal impacts and total dissolved solids increases attributed to the reclamation end use plan by changing the configuration of the proposed end use stormwater ponds to diversion swales. The diversion swales will divert stormwater and minimize infiltration as opposed to enhance infiltration of high TDS laden stormwater. Lower infiltration rates will minimize groundwater elevation increases, mitigate thermal impacts and eliminate any increases in TDS. This is a simple and cost effective mitigation effort that should be included in the Reclamation End Use Plan.

7.1.8. Vegetative Cover

The mine operators can minimize thermal inputs to the groundwater by installing and maintaining trees and tall bushes near end use ponds. This is a traditional method for managing summertime increases in pond water by implementing a shade management plan.

7.1.9. Security

Mine operators shall ensure, per Empire Township Ordinance 405, that areas where aggregate has been mined are adequately secured until reclamation is complete. This is particularly important in areas that are included in the Rosemount Wellhead Protection Program. The End Use Plan shall include provisions for protecting groundwater resources from potential releases of chemicals by direct infiltration or contamination of the end use ponds followed by infiltration into the groundwater resource.

7.2 Monitoring

7.2.1. Organization

Empire Township recognizes the intense interest and authority that the Vermillion Rivers Joint Powers Organization (JPO) has over the Mining Area and the establishment of a monitoring program that is capable of assuring the health of downstream wetlands, rivers as well as the regional groundwater. Therefore, the Township will coordinate with JPO and the Dakota County Soil & Water Conservation District in the design of an ongoing monitoring program to be implemented by the mine operators as a permit conditions.

GOAL 8 -- LIMIT THE IMPACTS TO TRAFFIC IN THE VICINITY OF THE MINING AREA

Strategy 8.1 Construct such roadway improvements as may be necessary to directly support the mining activity.

A. Responsible Parties: The Mining Consortium, Empire Township, Dakota County, and Mn/DOT

B. Actions Required:

1. The timing and precise nature of the improvements will be determined by the rate of permitting and mine operator movement into the Mining Area. The following may be necessary to directly support the mining operations.
   (a) Reconstruction of 170th Street, between the railroad tracks and Biscayne Avenue
   (b) Install signals on TH 3 at 170th (CR 58).
   (c) Reconstruction of Biscayne Avenue, between 160th Street and 180th Street
   (d) It might also be necessary to improve Biscayne from CR 46 to CR 42 to support the 9/10 ton loads that are eventually destined to the northeast.

Strategy 8.2 Verify that residential development does not advance faster than mitigation measures are implemented.

A. Responsible Parties: Empire Township, Dakota County, MET Council, Mn/DOT, the cities of Farmington, Lakeville, Apple Valley, Rosemount and the various developers in the region.

The exercise of responsibility in some cases may be to restrict or limit development until the appropriate mitigative measures are complete.

B. Actions Required:

1. Monitor the cumulative development of the residential projects in Empire Township and the neighboring communities. The comprehensive and regional nature of this EIS Traffic Impact Study (TIS) revealed several categories of improvements that will be necessary to serve the transportation needs of the region.
2. **The attached spreadsheet illustrates the improvements identified in the TIS and the parties associated with each needed improvement.**
3. The categories of improvement include:

   (a) Improvements Required by Planned Residential Development Studies - The improvement measures refer to those items identified as part of the previous EAW and AUAR traffic studies completed for the Cobblestone Lake, Brandtjen and Genstar developments[1] to mitigate their individual impacts. **Figure 6-1 of the TIS** detail the improvements required by Year 2015 as a result of the planned residential development studies.

   (b) Improvements Not Previously Identified - In addition to the measures listed in Section 6.4.1 of the TIS, several additional improvement measures will be

required to accommodate traffic generated from the background growth and the four planned land developments (Brandtjen, Cobblestone Lake, Genstar and Heritage). **Figure 6-2 of the TIS** illustrates the additional improvements required to accommodate the planned residential developments.

(a) **Potential Regional Improvements -** Several larger scale infrastructure needs that may be required to better facilitate the forecast background volumes in the long term. Even with the improvements identified in previous environmental reviews, near capacity operations are expected by Year 2025.

4. These various projects have also been separated into a series of Mitigation Options in the Traffic Impact Study.

(a) Mitigation Option 1 - For purposes of this analysis, the background improvements described in Sections 5.1, 5.2.1 and 5.2.2 of the TIS were assumed to be in place to determine the specific improvements needed for mitigation of the Mining Area impacts. Mitigation Option 1 is defined by the identification of mitigation measures required to address impacts as a result of the proposed Mining Area project (mining phasing, plant location and access points as defined and detailed in the TIS.

(1) Mitigation Option 1 - Year 2015 Build - Based on the traffic analysis results and expected deficiencies presented in Chapter 4.0 of the TIS, several localized traffic impacts are expected under the forecast 2015 Build scenario. The Mitigation Option 1 scenario evaluation included the 2015 Build forecast traffic volumes, all geometric improvements identified previously in Sections 5.1 and 5.2.1, and optimized signal operations. Under Mitigation Option 1, the mitigation measures are required to maintain acceptable AM and PM peak hour traffic operations in Year 2015.

(2) Mitigation Option 1 - Year 2025 Build - Based on the traffic analysis results and expected deficiencies presented in Chapter 4.0 of the TIS, several additional localized traffic impacts are expected under the forecast 2025 Build scenario. The Mitigation Option 1 scenario evaluation included: the 2025 Build forecast traffic volumes, all geometric improvements identified previously in Sections 5.1, Section 5.2.1, Section 5.2.2, Section 5.3.1 and optimized signal operations. Under Mitigation Option 1, the additional mitigation measures are required to maintain acceptable AM and PM peak hour traffic operations at the key intersections in Year 2025.

(b) Mitigation Option 2 - Mitigation Option 2 was developed to specifically reduce the number of trucks entering/exiting via the TH 3/170th Street intersection in an effort to improve the intersection LOS. To accomplish this, the proposed shared Aggregate Industries and McNamara access points were relocated to Biscayne Avenue. The relocated access points would be located on Biscayne Avenue, midway between 160th Street and 170th Street. As a result of this access point change, Aggregate Industries and McNamara mining traffic would be expected to use the 160th Street/Biscayne Avenue intersection rather than TH 3/170th Street, as it becomes a more direct and quicker route to their plants.

(1) Mitigation Option 2 - Year 2025 Build - Figures 5-13 and **5-14** in the TIS illustrate the redistributed AM and PM peak hour forecast Year 2025 Build intersection turning movement volumes, respectively, for Mitigation Option 2. The Mitigation Option 2 scenario evaluation

included the re-distributed 2025 Build forecast traffic volumes, all geometric improvements identified previously in Sections 5.1, Section 5.2.1, Section 5.2.2 and optimized signal operations. Under Mitigation Option 2, the mitigation measures are required to maintain acceptable AM and PM peak hour traffic operations in Year 2025.

(c) Other Potential Mitigation - In addition to the traffic operation impacts and the respective mitigation measures necessary to mitigate mining traffic (Mitigation Option 1 or Mitigation Option 2), the mining companies may be responsible for the reconstruction of two segments of roadway immediately identified with mining.

Strategy 8.3 Secure funding that is adequate to construct the needed improvements.

A. Responsible Parties: Empire Township, Dakota County, MET Council, Mn/DOT, the cities of Farmington, Lakeville, Apple Valley, Rosemount and the various developers in the region.

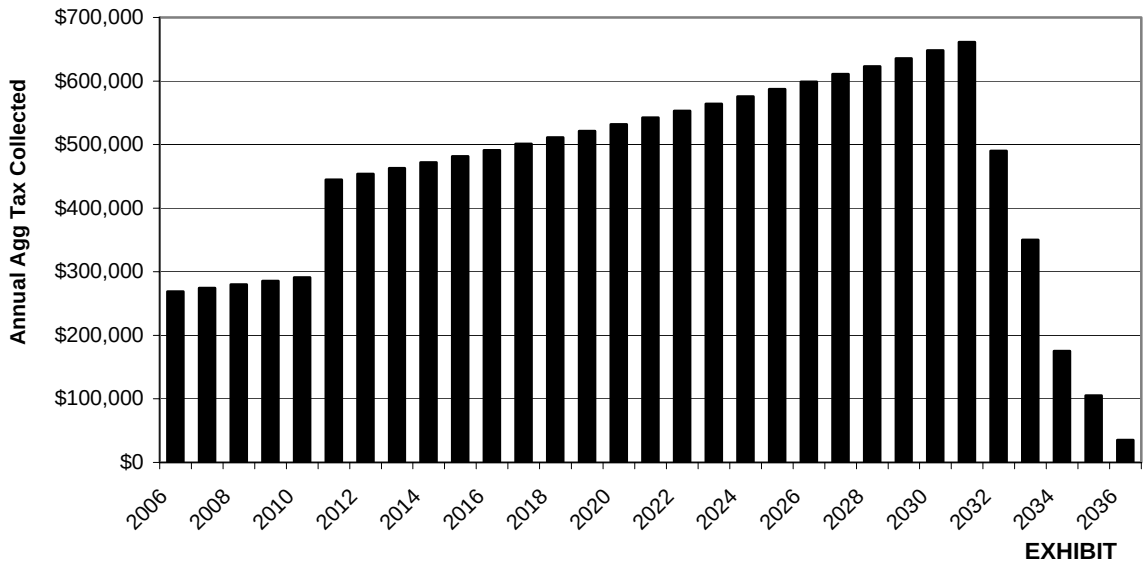
The total of the traffic improvements identified in this study exceed those that would be caused by mining activity alone.

The mitigation needed to support the improvements is not currently committed to by any agency. However, the aggregate tax will remain an ongoing source of revenue as shown on the following graph. The public agencies do not have these improvements in their programs. This report has quantified known regional traffic growth through 2025 and has listed the necessary road improvements to support that growth. The vision of Dakota County, as shown in their Transportation Plan, is shown as the needed road system in this part of the region. The public agencies are encouraged to implement this vision and to continue to support changes in the funding available to the region. The mining development will make the mitigation improvements needed to support the mining activity and appropriately contribute to regional mitigative efforts; however, it is not in a position to make all improvements necessary to support the overall regional growth pattern.

B. Actions Required:

1. Conduct regional meetings with all responsible parties to develop a fair and equitable funding mechanism.
2. Implement all necessary legislation by all parties.
3. Construct the needed improvements to meet the timing from Strategy 8.2.

Aggregate Tax Forecast
"Full Mining Scenario"
Full Mining of the Area Designated in the Study



EXHIBIT

The above projection is based on the production estimates from the Scoping EAW with the total of over $14,000,000 over the life of the project.

GOAL 9 -- LIMIT THE INDIVIDUAL AND CUMULATIVE AIR QUALITY IMPACTS OF TRAFFIC GENERATED BY THE PROJECT AND THE ACTIVITIES OF INDIVIDUAL OPERATORS.

Strategy 9.1 Permitting - Mine operators shall obtain all applicable state and federal permits.

Strategy 9.2 Best Management Practices.

A. Responsible Parties: MPCA, Dakota County, Empire Township, the Mining Consortium and any other individual or firm who wishes to enter into mining within the Mining Area.

B. Actions Required:

Aggregate Processing Emissions

Mitigation of dust emissions from aggregate processing and handling operations includes two basic options (1) reducing the number of processing and/or handling operations, and (2) dust control.

With regards to the number of operations, the numbers used in this analysis are a worst case estimate. They assume a maximum production and a maximum number of pieces of equipment and further assume that 100% of the material passes through every operation. The calculations also assume that each operator, even the smallest, will use the same number of processes as the largest operator (refer to 3.1.1 IN THE Air Quality Impact Study). In practice, each operation will be different and will employ the most efficient design (the smallest number of operations) for its specific needs. And the number of emission sources for Aggregate Industries, Fischer and Cemstone will be further reduced by the use of wash plants. It is likely that the actual number of operations (drop points or emissions sources) will be closer to half of the total number used in this analysis.

With respect to dust control, there are a number of dust control techniques that will be applied within each of the on-site mining facilities, including general operational techniques and specific applications:

1. Use of conveyers to transport aggregate between mine facilities (mine face, sorting, concrete plant, asphalt plant) to the extent practical to limit the number in internal truck trips
2. Maintain a perimeter berm to limit direct wind access or sight of the operations from adjacent roads or residences
3. Seed graded areas to provide cover during interim operations and/or to stabilize overburden soils
4. Use of water during sorting process
5. Setbacks from the down wind receptors will also permit the particulates to settle out before crossing the property lines.

All of the above dust control techniques will reduce the particulate matter from the proposed mining operations. The reductions due to the implementation of such techniques have not been quantified.

Internal Haul Road Emissions

As shown in Table 4.2 in the Air Quality Impact Study (AQIS), the haul roads contribute to a majority of the total current and proposed Year 2015 and 2025 Mining Area emissions. This is typical of such operations. With respect to internal haul roads, there are again two basic mitigation options (1) shorten the length of the haul roads or (2) apply dust control. Again, each operator at the time of establishing operations over the life of the site will establish a haul road distance. Those will be based on site-specific circumstances not available at the time of this writing. Internal haul road distances may be shorter than the ½ mile round trip distance used here. Any reduction in haul road distances will significantly reduce haul road emissions.

Therefore, two control options, 50 and 75 percent, were provided to demonstrate the difference in overall emissions totals and available control options. The following section outlines methods to obtain the 50 and 75 percent control efficiencies for the proposed mining operations.

Typical unpaved haul road controls include:

1. Wet suppression
2. Chemical Stabilization
3. Reduction of silt content by gravel surface application.

It is assumed that the operations in the proposed Mining Area will apply wet suppression (water application) to the unpaved haul roads. Water application keeps the road surface wet to control emissions. The control efficiency of unpaved road watering depends on: 1) the amount of water applied per unit area of road surface, 2) the time between reapplications, 3) traffic volume during that period, and 4) prevailing meteorological conditions during the period.

The following discussion outlines two methods to determine the required amount of water to achieve the 50 and 75 percent control efficiencies on the haul roads. The two methods are provided as information on how application rates are determined. Either method will provide the required control. Note that either method can consider the impact of natural rainfall on watering requirements, as natural rainfalls can be taken into account in watering requirements.

Unpaved Haul Road Control Efficiency Determination Methods

Control Method 1. An empirical model for the performance of water as a control technique has been developed. This model is taken from pages 141 through 144 of the Air Pollution Engineering Manual (Reference 2). The model is represented using the following equation.

$$C = 100 - (0.8pdt/i)$$

Where:

C	=	average control efficiency (%)
p	=	potential average hourly daytime evaporation rate (mm/h)
d	=	average hourly daytime traffic rate (h^{-1})
t	=	time since last application (hours)
i	=	application intensity (L/m^2)

Figure 13.2.2-2 in AP-42 Section 13.2.2 provides the mean annual average pan evaporation rate. The potential hourly evaporation rate (in mm per hour) was calculated by multiplying the annual rate by 0.0049.

The control efficiency calculated by the equation above is dependent on the application intensity and time since last application. This method was used to determine the necessary application intensity and application frequency for each proposed haul road.

The following example is for the Aggregate Industries internal haul road at the proposed Mining Area. The haul road is 1320 feet in length and 32.8 feet wide. Table 9-1 indicates that if a 2 hour watering frequency is used, 416 gallons of water are needed over the extent of the haul road to ensure 50 percent control; whereas if a 12 hour watering frequency is used 2,495 gallons of water are needed to ensure 50 percent control. Either combination of frequency and amount of water will achieve the required control efficiency.

Table 9-1. Typical Quantities and Watering Frequencies Example

C	p	d	WATER (GAL)	Area (M^2)	i	t (hours)
50%	0.196	62.3	416	4022.3	0.39	2
			1248		1.17	6
			2495		2.35	12
			4991		4.69	24

Control Method 2. A second control method analyzes the ratio of moisture content of the haul road under both controlled and uncontrolled conditions (References 3 and 4). This method outlines the controlled surface moisture content EKS would need to achieve to maintain appropriate control levels.

$$C = 75 (M-1), \text{ for } 1 \leq M \leq 2$$
$$C = 62 + 6.7M, \text{ for } 2 \leq M \leq 5$$

Where:

C = Instantaneous control efficiency (%)
M = ratio of controlled to uncontrolled surface moisture contents

In order to obtain the necessary control measures, the haul road surface material to be controlled should first be sampled to determine the initial percent moisture content of the road. This value will be used to determine "M" in the equation above. Then, water the haul road utilizing a known application intensity (volume per area) and record the time of application. After waiting a predetermined time period, re-sample the haul road surface material to determine the residual percent moisture content. To determine "M," divide the residual percent moisture content by the initial percent moisture content. "M" will then be inserted into the equation to determine the control efficiency. The amount of time between samples will be the same as the time necessary between water applications.

Asphalt Processing Emissions

The asphalt production will be fired using natural gas versus typical operators that use #6 waste oil. The natural gas firing will create significantly lower combustion emissions from the plants. In addition, fabric filters will be used to control PM and PM_{10} emissions from the asphalt operations. No specific additional mitigation measures are required. The previous haul road discussion (5.2) applies to product shipped out from these operations as well.

Ready-Mix Processing Emissions

The ready-mix operations will have dry bag houses to control for both PM and PM_{10} particulate emissions. No specific additional mitigation measures are required. The previous haul road discussion applies to product shipped out from these operations as well.

Appendix

Traffic Involvement Analysis