TILLER CORPORATION

ENVIRONMENTAL ASSESSMENT WORKSHEET

NEW SCANDIA TOWNSHIP
REVISION OF SAND AND GRAVEL MINING LIMITS

AUGUST, 1999

Revised 2/99

ENVIRONMENTAL ASSESSMENT WORKSHEET

Note to preparers: This form is available at www.mnplan.state.mn.us. *EAW Guidelines* will be available in Spring 1999 at the web site. The Environmental Assessment Worksheet provides information about a project that may have the potential for significant environmental effects. The EAW is prepared by the Responsible Governmental Unit or its agents to determine whether an Environmental Impact Statement should be prepared. The project proposer must supply any reasonably accessible data for — but should not complete — the final worksheet. If a complete answer does not fit in the space allotted, attach additional sheets as necessary. The complete question as well as the answer must be included if the EAW is prepared electronically. **Note to reviewers:** Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. **Project title** Tiller Corporation - New Scandia Township
   Revision of Sand and Gravel Mining Limits

Proposer Tiller Corporation
Contact person Brent Schlueter
Title Facilities Planning & Compliance Coordinator
Address 10633 89th Ave. North P.O. Box 1480

City, state, ZIP Maple Grove, MN 55311-6480
Phone (612) 425-4191
Fax (612) 425-7153
E-mail

RGU Washington County
Contact person Dennis O'Donnell
Title Zoning Administrator
Address 14949 62nd Street N.
P.O. Box 6
City, state, ZIP Stillwater, MN 55082-0006
Phone (651) 430-6875
Fax (651) 420-6888
E-mail

4. **Reason for EAW preparation** (check one)
   EIS scoping Mandatory EAW X Citizen petition RGU discretion
   Proposer volunteered

   If EAW or EIS is mandatory give EQB rule category subpart number 4410.4300 Subp. 12, Item B. **and subpart name** Nonmetallic Mineral Mining: For the extraction or mining of sand, gravel, stone, or other nonmetallic minerals, other than peat that will excavate 40 or more acres of land to a mean depth of ten feet or more during its existence.

5. **Project location**
   County Washington
   City/Township New Scandia Township
   Legal Description SE ¼ of NW ¼ and part of the SW ¼ W. of Lofton Ave. Section 8 and SE ¼ of NE ¼ and SE ¼ and the E ½ of the SW ¼ east of Manning Trail. S. 7, Township 32, Range 20 (Full Legal Description included as Exhibit 1.)

   Attach each of the following to the EAW:
   - County map showing the general location of the project; Exhibit 2
   - U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); Exhibit 3
   - Site plan showing all significant project and natural features. Exhibit 4

6. **Description**
   a. Provide a project summary of 50 words or less to be published in the *EQB Monitor.*

   The project involves revision of mining limits by adding and deleting various

areas to and from an existing aggregate mining operation. Revised limits incorporate property recently purchased by the applicant. The new property contains higher quality aggregate. Areas removed from the existing mining limits contain wetlands and lower quality aggregates.

b. Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of existing structures. Indicate the timing and duration of construction activities.

The proposed project includes the revision of mining limits of an existing mining operation currently permitted by Washington County. The site has been actively mined since at least 1962. An Environmental Assessment Worksheet was prepared for mining of approximately 120 acres in 1987 as part of the initial permitting process. Washington County first issued a five year mining permit for the site in 1989 and reissued the mining permit in 1994. The additional properties and the revised mining limits will be addressed as part of the 1999 permit reissuance.

Current permitted operations at the site include the mining and removal, crushing, screening, washing and stockpiling of aggregate, production of hot mix asphalt, and the recycling and stockpiling of concrete and asphalt products. The main processing activities will remain at their current locations. Excavation, crushing and screening will occur in the new areas. Environmental issues regarding the various processing activities were addressed in the original EAW for the site.

Tiller Corporation recently acquired additional property which will be included within the new mining limits. The additional property brings the site total to approximately 395 acres. Proposed mining limits include a total of 155 acres.

Mining operations are conducted on a seasonal basis, typically from April through mid November. Overburden is removed from new areas to be mined, and is stockpiled and later used for reclamation on site. Aggregate is then excavated using front end loaders to be crushed, screened and stockpiled for the sale and distribution from the site. Used asphalt and concrete are brought to the site for recycling. Add-rock, rock that is not available on-site but needed to meet specifications for production of various products is also brought to the site.

The site is worked in phases. Initially each phase is mined to a minimum elevation of 925. The final phase of mining will include the creation of a lake amenity which will enhance the final development of the site. Material will be removed to a depth of 30-40 feet below the water table over portions of the pit floor. Removal of material below the ground water table will be done using a dragline. The issues related to removal of aggregate below the water table were also addressed in the original EAW.

Reclamation activity proceeds as areas of mining are completed. Perimeter areas are sloped, topsoil is applied and vegetation established.

c. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The purpose of the project is to adjust the mining parameters in such a manner as to utilize the highest quality aggregate reserves available and to leave the lower quality areas which contain wetland areas undisturbed. The project allows the continuation of mining and processing aggregate into a variety of products, including road base materials and hot-mix asphalt, for use in construction activities throughout the northeastern metropolitan area and provides for the recycling and utilization of recycled concrete and asphalt.

d. Are future stages of this development including development on any outlots planned or likely to happen? __Yes x No
If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

e. Is this project a subsequent stage of an earlier project? X Yes __No
If yes, briefly describe the past development, timeline and any past environmental review.

Mining of the original site has occurred since at least 1962. An EAW was prepared for the site in 1987. The EAW included 217 acres of property on which mining was planned for approximately 120 acres. The EAW anticipated mining below the water table and the creation of a fifty-acre lake at the conclusion of mining. The life of the site was estimated to be 35 years.

Washington County first permitted the site in 1989. Prior to that, the County did not require permits for sand and gravel mines. Washington County permits are reissued at five-year intervals and the permit was reissued in 1994. The permit is up for reissuance this year

7. **Project magnitude data**
Total project acreage 395 Acres
Number of residential units: unattached NA **attached** NA **maximum units per building** NA **Commercial, industrial or institutional building area (gross floor space): total square feet** NA

Indicate areas of specific uses (in square feet):

Office 0	**Manufacturing** 0
Retail 0	**Other industrial** 6,751,800 – mining (155 acres)
Warehouse 0	**Institutional** 0
Light industrial 0	**Agricultural** 0
Other commercial (specify) 0	**Other** 10,454,400 – buffer (240 acres)

Building height 90 feet – (asphalt plant stack)
If over 2 stories, compare to heights of nearby buildings Top of stack is at approximately elevation 1030, surrounding residential houses are at approximately 960-1010. The stack height is designed to extend above the surrounding terrain to allow dispersion of the exhaust plume.

8. **Permits and approvals required. List all known local, state and federal permits, approvals and financial assistance for the project. Include modifications of any existing**

permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure.

Unit of government	Type of application	Status*
Washington County	Conditional Use Permit renewal	in process
Washington County	Hazardous Waste Generator	Obtained
New Scandia Township	Mining Permit	Obtained
MN Pollution Control Agency	Air Emission Permit	Obtained
MN Pollution Control Agency	NPDES Storm Water	Obtained
MN Dept. of Natural Resources	Water Appropriations Permit	Obtained

* Washington County Permit to be amended to include additional property. New Scandia Permit issued annually. MPCA NPDES Permit to be amended upon inclusion of additional property

9. **Land use. Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.**

   Current permitted operations include the mining, crushing, screening, and stockpiling of aggregate, the production of hot-mix asphalt, and the recycling of concrete and asphalt products. These activities are permitted uses within the agricultural land use zoning district. Land use of surrounding areas is agricultural and or rural residential in nature.

   Past site use included the operation of a hot-mix asphalt plant which used a wet scrubber to control air emissions. The wet scrubber discharged wastewater into a holding pond. The wastewater contained low concentrations of Polyaromatic hydrocarbons. A ground water investigation and cleanup was performed in cooperation with the Minnesota Pollution Control Agency. The air pollution control device was replaced with a baghouse which does not discharge any wastewater.

10. **Cover types. Estimate the acreage of the site with each of the following cover types before and after development:**

	Before	After		Before	After
Types 1-8 wetlands	**30**	**36**	**Lawn/landscaping**	**8**	**7**
Wooded/forest	**86**	**80**	**Impervious surfaces**		
Brush/Grassland	**63**	**58**	**Other (describe)**		
Cropland	**88**	**59**	**mining limits**	**120**	**155**
TOTAL	**395**	**395**			

If Before and After totals are not equal, explain why:

11. **Fish, wildlife and ecologically sensitive resources**
    a. Identify fish and wildlife resources and habitats on or near the site and describe how they would be affected by the project. Describe any measures to be taken to minimize or avoid impacts.

    The wooded, brush and grassland areas provide a limited habitat for wildlife. Much of this area will remain as undisturbed buffer area. Active mining will alter portions of woods, brush/grassland, and cropland. Revising the mining limits will preserve the wetlands. Mining will result in the temporary reduction of wildlife habitat. Upon reclamation, similar, although not identical, habitat will be restored.

The Washington County Natural Communities and Rare Species Map 1987-1989 identifies an emergent marsh area in the extreme southwestern portion of the site. The emergent marsh lies completely within the buffer area of the site and will not be disturbed due to mining activities.

b. Are any state-listed (endangered, threatened or special concern) species, rare plant communities or other sensitive ecological resources such as native prairie habitat, colonial waterbird nesting colonies or regionally rare plant communities on or near the site? X Yes __No

If yes, describe the resource and how it would be affected by the project. Indicate if a site survey of the resources has been conducted and describe the results. If the DNR Natural Heritage and Nongame Research program has been contacted give the correspondence reference number: ES990720 . Describe measures to minimize or avoid adverse impacts.

The Minnesota Department of Natural Resources was contacted to review the Minnesota Natural Heritage Database to determine if any rare plant or endangered animal species are known to occur within approximately 1 mile from the site. The review determined that the Blanding's Turtle, a state listed threatened species, has been identified within 1 mile of the site. The turtle is found in marsh environments. The female travels to sandy uplands for nesting during the first two weeks in June. Hatchlings make their way from the nest to an aquatic environment between mid August to early October.

The following measures recommended by the DNR will be implemented if the project is approved:

Workers will be notified of the presence of Blanding's Turtle in the area. Turtles that are spotted should be moved to the nearest wetland. Internal haul roads are not curbed. Silt fence installed to protect wetlands adjacent to active mining areas will be removed upon completion of mining activity to facilitate movement to and from nesting areas. Restoration will include the revegetation of mined areas. A vegetated buffer strip will be maintained around wetlands. Existing type 2 and 3 wetlands will not be dredged or deepened.

In addition to the Blanding's turtle, A Halberd-leaved tearthumb was identified in two locations surrounding the site. Both of the locations are over 1 mile from the site. The plant was not found on the site. This plant currently is not listed by the state or federal government, although it may become listed if declines continue. Two natural community types, cattail marsh and shrub swamp, were identified approximately 1 mile from the site.

12. **Physical impacts on water resources. Will the project involve the physical or hydrologic alteration — dredging, filling, stream diversion, outfall structure, diking, and impoundment — of any surface waters such as a lake, pond, wetland, stream or drainage ditch? __ yes X No**

If yes, identify water resource affected and give the DNR Protected Waters Inventory number(s) if the water resources affected are on the PWI: . Describe alternatives considered and proposed mitigation measures to minimize impacts.

Revised mining limits will not have any impact on water resources. Washington County retained Barr Engineering Co. in 1987 to evaluate the impact of mining on local water resources in the area. The report concluded that at the anticipated rate of extraction below the ground water table, a drawdown of 0.2 feet or less at German Lake and of 0.6 feet or less at the nearest residential well could be conservatively predicted. Long term effects of extraction below the water table on water resources were found to be negligible.

The 1987 Barr study also included the effects of a washplant on the site. The conclusion of the report was that as long as chemical agents were not added to the wash process, a washplant will not affect water resources. A portable washplant may be operated periodically at the site. The plant will wash and screen aggregate for use in the hot-mix plant. The washplant to be used at the site is an ElJay 6'X16'screen with twin 36" screw washers with a production capacity of 400 tons per hour.

13. **Water use. Will the project involve installation or abandonment of any water wells, connection to or changes in any public water supply or appropriation of any ground or surface water (including dewatering)? X Yes __No**
If yes, as applicable, give location and purpose of any new wells; public supply affected, changes to be made, and water quantities to be used; the source, duration, quantity and purpose of any appropriations; and unique well numbers and DNR appropriation permit numbers, if known. Identify any existing and new wells on the site map. If there are no wells known on site, explain methodology used to determine.

    There is currently a 16" on-site well used to support the existing operation. The well is the supply for washing activities. The well is 98 feet deep and finished at the approximate elevation of 870. A Department of Natural Resources Water Appropriations permit (No. 86-6193) has been issued for the well allowing for the pumping of up to 600 gallons per minute and 20 million gallons per year. Customer demand will determine the quantity of water used for washing aggregate up to the permitted limits. A well is located just east of the quality control building and supplies water to this building.

    Two residential supply wells are also located on the property that is being added to the site. These wells supply potable water to the residences. One of the wells may need to be abandoned as mining reaches the well location. The other well is outside of the revised mining limits.

14. **Water-related land use management district. Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? __Yes X No**
If yes, identify the district and discuss project compatibility with district land use restrictions.

15. **Water surface use. Will the project change the number or type of watercraft on any water body? __Yes X No**
If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other uses.

16. **Erosion and sedimentation. Give the acreage to be graded or excavated and the cubic yards of soil to be moved:**

acres 155 acres **; cubic yards** 12 M cy**. Describe any steep slopes or highly erodible soils and identify them on the site map. Describe any erosion and sedimentation control measures to be used during and after project construction.**

Erosion and sedimentation effects are not altered as a result of the revision of mining limits. Control measures include establishing vegetation over topsoil on finished elevations after mining operations in the area has ceased. Accordingly this will also help stabilize end-landform slopes formed during reclamation. Vegetation and stabilization of slopes will decrease surface runoff and sedimentation. The property boundary areas have been heavily planted with trees to help contain fugitive dust emissions and protect the soils from eroding during active operations. Runoff is directed onto onsite low areas established throughout the active mining area as mining progresses. This prevents runoff containing a high sediment load from leaving the site during active mining operations. A vegetative buffer strip is preserved around wetland areas which reduces the potential for sedimentation to occur.

17. **Water quality: surface water runoff**
a. Compare the quantity and quality of site runoff before and after the project. Describe permanent controls to manage or treat runoff. Describe any stormwater pollution prevention plans.

Mining has altered storm water runoff patterns, quantity and quality at the site. The nature of the general effects of mining will not be changed as a result of revising the mining limits. Stormwater runoff patterns will continue to be modified as a result of the changing terrain brought about by mining activity. Mining leaves the site with steeper slopes around the perimeter of the mining activity and flatter slopes and water features throughout the central portion of the site. Mining activity will result in the combination of several smaller subwatersheds into a larger subwatershed draining towards the interior of the site.

Mining activity temporarily increases infiltration rates, thereby decreasing the volume of runoff in areas where vegetation has been removed and topsoil has been stripped. This effect is reduced as reclamation proceeds and topsoil and vegetation are replaced.

A pollution prevention plan has been implemented for this site in conjunction with the MPCA NPDES permit. The plan utilizes best management techniques to minimize or prevent discharge of storm water runoff from becoming contaminated or for sediment laden storm water from being discharged off site. The plan will be revised to reflect the revised mining limits and apply best management practices to the revised excavation.

b. Identify routes and receiving water bodies for runoff from the site; include major downstream water bodies as well as the immediate receiving waters. Estimate impact runoff on the quality of receiving waters.

Revising the mining limits will not change runoff from the site. The majority of runoff generated on site is contained within the site itself draining to small wetlands scattered throughout the site. A portion of the site drains to a larger wetland/openwater complex (German Lake) located in part of the extreme Southwest corner of the site. This complex extends well beyond the site to the south. Within

the active area of the mining operation, surface water runoff will infiltrate into the underlying soils and ultimately enter into the ground water system.

18. **Water quality: wastewaters**
a. Describe sources, composition and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.

Sanitary or municipal wastewater will not be generated at the site. Industrial wasetewater will be limited to discharge from a portable washplant which will operate periodically at the site. The discharge from the washplant will not contain chemical additives. Washwater will be discharged to an on-site recycle basin where washwater and fines will be recycled. Washwater will not be discharged from the site.

b. Describe waste treatment methods or pollution prevention efforts and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies, and estimate the discharge impact on the quality of receiving waters. If the project involves on-site sewage systems, discuss the suitability of site conditions for such systems.

Industrial wastewater will not be discharged from the site.

c. If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pretreatment provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying any improvements necessary.

Not applicable

d. **If the project requires disposal of liquid animal manure, describe disposal technique and location and discuss capacity to handle the volume and composition of manure. Identify any improvements necessary. Describe any required setbacks for land disposal systems.**

Not applicable

19. **Geologic hazards and soil conditions**
a. Approximate depth (in feet) to ground water: 9 ft **minimum** 60 ft **average**
to bedrock: 50ft **minimum** 125ft **average**
Describe any of the following geologic site hazards to ground water and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due to any of these hazards.

The site does not contain sinkholes, shallow limestone formations or karst conditions.

Ground water table elevation at the site is at approximately 916 above mean sea level (MLS). The site is located adjacent to some major lakes, Forest Lake to the west, Bone Lake to the northeast, Comfort Lake and Green Lake to the northeast and Big Marine Lake to the south. These lakes have significant effects on the ground water flow regime. Regional studies on ground water flow using water table contour maps and stream and lake elevations show the local area as a ground water recharge area. Surficial aquifer ground water flow is to the northwest. The

underlying bedrock aquifer ground water flow is likely to the east into the St. Croix River.

Two ground water investigations have been performed at this site relating to the existing operation. These studies confirmed the lack of impact from mining activities. Revising mining limits will not change the effects of mining. The first study, performed by Barr Engineering, concluded that mining operations would leave no significant impact on ground water levels in the vicinity surrounding the site or on German Lake. The second study performed by Dr. Hans-Olaf Pfannkuch determined that the direction of ground water flow in the water table aquifer is to the northwest (N 33.7° W), and the ground water flow gradient is an average of 1.02×10^{-3} ft/ft.

The bedrock subcrop beneath the site consists of the lowermost Cambrian St. Lawrence-Franconia Formation in the extreme southwestern portion of the site, the Cambrian Jordan Sandstone over the western and northwestern portion of the site and the Ordovician Prairie du Chien Group which forms the subcrop over the eastern portion of the site. The bedrock is at an average elevation of 850 ft above (MSL).

b. Describe the soils on the site, giving NRCS (SCS) classifications, if known. Discuss soil granularity and potential for groundwater contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.

According to the Soil Survey for Washington County, MN, the site area consists of sandy loams and fine sandy loams with lenses of silt loams and loamy sand mixed in. The most predominant soil at the site is sandy loam. There are large portions of Kingsley and Rosholt, and small sections of Chelek soils. The Kingsley sandy loam is a well-drained soil with moderately slow permeability that formed entirely on glacial till. The Rosholt and Chelek are well drained soils located on the sides of crests and hills on the pitted outwash plains. Formed in a loamy mantle over sandy outwash, these soils have moderately rapid permeability near the surface and rapid permeability in the underlying gravelly sand material.

Because of the poor filtering capability of granular soils, removal of high permeability soils above the ground water will not significantly increase susceptibility to contamination. Measures have been effectively taken to reduce the potential for ground water contamination including secondary containment of fuel and petroleum product storage tanks, utilizing a bag house for control of asphalt plant emissions, containment of hazardous materials used for QA/QC of asphalt production within the control building, prohibiting additives in washplant operations, and conducting limited truck maintenance, oil changes, fueling etc. over impermeable surfaces.

20. **Solid wastes, hazardous wastes, storage tanks**
a. Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.

No solid wastes are generated at the site. Hazardous waste generated at the site

will continue to be limited to parts washer solvents used in the quality control lab. The site operates under a very small quantity generator license issued by Washington County.

b. Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating groundwater. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.

Fuel and asphaltic cement will continue to be stored on the site. These materials are stored in above ground storage tanks. All tanks are surrounded by secondary containment. The hazardous waste generated in the quality control lab is stored inside the lab.

c. Indicate the number, location, size and use of any above or below ground tanks to store petroleum products or other materials, except water. Describe any emergency response containment plans.

There are seven existing above ground storage tanks which will continue to be used on the site. There are three heated insulated vertical tanks that store asphaltic cement (AC). Material in these tanks is not liquid at normal ambient temperatures. The capacities of the AC tanks are 40,000, 40,000, and 20,000 gallons. There is also one 20,000 gallon insulated vertical tank that stores fuel oil or waste oil which is used when natural gas is not available. There are two diesel fuel tanks with capacities of 500 and 1,000 gallons and one 110 gallon gasoline tank. All tanks are located within a concrete secondary containment area.

A Stormwater pollution prevention plan has been prepared for this site as part of the NPDES permit. This plan contains a spill prevention and response section as well as a number of best management techniques. A Minnesota "Spill Bill" Response Contingency Plan has also been prepared for the site. The purpose of this plan is to help company personnel prepare for and respond quickly and safely to spill incidents originating at the hot-mix plant.

21. **Traffic. Parking spaces added** 0
Existing spaces (if project involves expansion)
Estimated total average daily traffic generated: 150 trucks (300 trips) per day during the mining season. **Estimated maximum peak hour traffic generated (if known) and time of occurrence.**

Provide an estimate of the impact on traffic congestion on affected roads and describe any traffic improvements necessary. If the project is within the Twin Cities metropolitan area, discuss its impact on the regional transportation system.

The revised mining limits will not increase traffic.

Average traffic generated during the mining season is 300 trips per day. The estimated maximum traffic generated would be approximately 750 trips per day. There are two site access roads. The main access point is off of Manning Ave. (County Road 15) and is a paved surface all the way into the site and throughout the plant loading area. An access off of Lofton Ave. (County Road 1) is used only on a

very limited basis to provide a more direct route for local jobs. A portion of this secondary access road will be relocated to allow for mining activity over the course of the next five years.

22. **Vehicle-related air emissions. Estimate the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts. Note: If the project involves 500 or more parking spaces, consult *EAW Guidelines* about whether a detailed air quality analysis is needed.**

    The revised mining limits will not affect current levels of vehicle related air emissions.

23. **Stationary source air emissions. Describe the type, sources, quantities and compositions of any emissions from stationary sources of air emissions such as boilers, exhaust stacks or fugitive dust sources. Include any hazardous air pollutants (consult *EAW Guidelines* for a listing) and any greenhouse gases (such as carbon dioxide, methane, nitrous oxide) and ozone-depleting chemicals (chloro-fluorocarbons, hydrofluorocarbons, perfluorocarbons or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.**

    The hot-mix asphalt plant on site produces some air emissions. The plant is a drum mix Boeing 600 equipped with an Aeropulse FS 1265-1062 Baghouse. Stack testing was performed in 1996 for the MPCA air emissions permit. Plant emissions were measured at 0.014 gr/dscf which are significantly below the regulation limit of 0.040 gr/dscf. The plant operates under a Minnesota Pollution Control Agency air emissions permit and is permitted to operate at up to 719 tons per hour. The plant utilizes natural gas as the primary fuel. The current plant has been in operation for the past 11 years at the site. Other asphalt plants have previously operated at the site. The proposed project will not change current plant production or air emissions. The crushing spread operation operates under a separate MPCA air emissions permit.

24. **Odors, noise and dust. Will the project generate odors, noise or dust during construction or during operation? _X_ Yes __No**
    If yes, describe sources, characteristics, duration, quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify locations of nearby sensitive receptors and estimate impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

    All asphalt plants generate some odors. The amount of odor from the plant on this site is dependent upon weather conditions, wind speed and direction. The exhaust stack was raised 45 feet in 1994 in order to facilitate dispersion of emissions and reduce odor at potential receptors.

    Haul trucks and excavation equipment used at the site for mining processes generate dust and noise. The entire entrance road from Manning Avenue to the asphalt plant, including the loading area of the asphalt plant is paved to reduce generation of dust. Processing activities are located in the lower portion of the site to reduce noise and dust levels at the perimeter of the site. There is a water truck at the site which is used to water unpaved portions of the site. Vegetative screening around the perimeter of the site also reduces dust and noise.

25. **Nearby resources. Are any of the following resources on or in proximity to the site?**
Archaeological, historical or architectural resources? __Yes _X_No
Prime or unique farmlands or land within an agricultural preserve? _X_Yes __No
Designated parks, recreation areas or trails? _ Yes _X_ No
Scenic views and vistas? __Yes _X_No
Other unique resources? __Yes _X_No

If yes, describe the resource and identify any project-related impacts on the resource. Describe any measures to minimize or avoid adverse impacts.

A portion of the mining area falls within prime farmlands. Mining limits have been designed to minimize disturbance of prime farmlands, wetlands and wooded areas.

26. **Visual impacts. Will the project create adverse visual impacts during construction or operation? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks? _X_Yes __No**
If yes, explain.

The hot-mix asphalt plant produces a water vapor plume, produced from moisture within the aggregate which is driven off by high temperatures achieved during asphalt production. The visibility of the plume varies somewhat depending upon moisture content of the aggregate and weather conditions.

27. **Compatibility with plans and land use regulations. Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency? _X_Yes __No. If yes, describe the plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain.**

The project is subject to New Scandia Township and Washington County Zoning and Land Use regulations. The comprehensive plans provide for this use at this location. The mine is consistent with current regulations and is operating under mining permits from both the Township and the County.

28. **Impact on infrastructure and public services. Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project? __Yes _X_ No. If yes, describe the new or additional infrastructure or services needed. (Note: any infrastructure that is a connected action with respect to the project must be assessed in the EAW; see *EAW Guidelines* for details.)**

29. **Cumulative impacts. Minnesota Rule part 4410.1700, subpart 7, item B requires that the RGU consider the "cumulative potential effects of related or anticipated future projects" when determining the need for an environmental impact statement. Identify any past, present or reasonably foreseeable future projects that may interact with the project described in this EAW in such a way as to cause cumulative impacts. Describe the nature of the cumulative impacts and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to cumulative impacts *(or discuss each cumulative impact under appropriate item(s) elsewhere on this form).***

As discussed above, this project is a modification of an existing mining operation. Mining limits have been revised in an effort to leave wetland areas intact and to focus mining in areas of higher aggregate quality.

30. **Other potential environmental impacts. If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.**

31. **Summary of issues.** ***Do not complete this section if the EAW is being done for EIS scoping; instead, address relevant issues in the draft Scoping Decision document, which must accompany the EAW.*** **List any impacts and issues identified above that may require further investigation before the project is begun. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.**

#11: State Listed Species: The Blanding's Turtle, a state listed threatened species has been identified within 1 mile of the site. Mitigative measures include following the Minnesota Department of Natural Resources recommendations with respect to turtle management .

#24 Odors, Noise and Dust: The project operates under an Air Emissions Permit and is subject to the Minnesota Pollution Control Agency's noise standards. These issues have been mitigated by compliance with permit conditions and standards and will continue to be mitigated after revising the mining limits.

#25 Portions of the mining area include prime farmlands. Mining the area will remove it from agricultural production.

RGU CERTIFICATION. The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.
I hereby certify that:

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

Signature Date

Title

Environmental Assessment Worksheet was prepared by the staff of the Environmental Quality Board at Minnesota Planning. For additional information, worksheets or for *EAW Guidelines*, contact: Environmental Quality Board, 658 Cedar St., St. Paul, MN 55155, 651-296-8253, or www.mnplan.state.mn.us

LIST OF EXHIBITS

1. Legal Description
2. County Map
3. USGS Quadrangle
4. Site Plan
5. Wetlands
6. Soils
7. Natural Communities and Rare Species
8. Zoning
9. Existing Land Use
10. Bedrock Geology
11. Minnesota Historical Society letter
12. Minnesota Department of Natural Resources letter

Exhibit 1

Legal Description for New Scandia Mining Site

Section 1.

The Southeast ¼ of Section 7, in Township 32 North, of Range 20 West; and that part of the Southwest ¼ of the Southwest ¼ of Section 8, in Township 32 North, of Range 20 West, described as follows:

Commencing at a point in the North line of said Southwest ¼ of the Southwest ¼ of said Section 8, 22 rods East of the Northwest corner thereof, thence West along said North line to the Northwest corner of said Southwest ¼ of the Southwest ¼, thence South along the West line of said Southwest ¼ of Southwest ¼ to the Southwest corner thereof, thence East along the South line of said Southwest ¼ of the Southwest ¼ a distance of 42 rods to a point, thence Northwesterly in a straight line to the point of beginning; and also a strip of land 2 rods wide on the North side of said Southwest ¼ of the Southwest ¼, commencing 22 rods East of the Northwest corner thereof and extending to the Northeast corner thereof.

That part of the South Half of the Northeast Quarter of Section 7, Township 32 North, Range 20 West, Washington County, Minnesota, described as follows:

Commencing at the Northwest corner of said South Half; thence Easterly along the North line of said South Half a distance of 1223.40 feet to the point of beginning; thence Southerly, parallel with the West line of said South Half, a distance of 1319.60 feet to the South line of said South Half; thence Easterly along said South line a distance of 1423.65 feet to the Southeast corner of said South Half; thence Northerly along the East line of said South Half a distance of 1317.76 feet to the Northeast corner of said South Half; thence Westerly along the North line of said South Half a distance of 1422.96 feet to the point of beginning. Subject to 228th Street North along North line.

Section 2.

That part of the Southeast Quarter of the Southwest Quarter and of the South Half of the Northeast Quarter of the Southwest Quarter of Section 7, Township 32, Range 20, Washington County, Minnesota lying easterly of the centerline of County Road 15A as said centerline is described in Book 312 of Deeds on pages 19 and 20.

Subject to County Road 15A.
Subject to easements of record.

Section 3.

The North One-Half of the Southwest Quarter (N ½ of SW ¼) and the Southeast Quarter of the Northwest Quarter (SE ¼ of NW ¼) all in Section 8, Township 32, Range 20.

Except: All that part of the Northeast Quarter of the Southwest Quarter (NE ¼ of SW ¼) of Section 8, Township 32, Range 20, Washington County, Minnesota lying East of the centerline of County State Aid Highway No. 1 (Lofton Avenue).

Section 4.

That part of the Southeast Quarter of the Southwest Quarter (SE ¼ of SW ¼) of Section 8, Township 32, Range 20 lying West of the public highway as the same now runs over and across said tract, except the North 2 rods thereof; and that part of the Southwest Quarter of the Southwest Quarter (SW ¼ of SW ¼) of Section 8, Township 32, Range 20 described as follows, to wit:

Beginning 22 rods East of the Northwest corner of said Southwest Quarter of Southwest Quarter (SW ¼ of SW ¼); thence Southeasterly in a straight line to a point 42 rods East of the Southwest corner of said Southwest Quarter of Southwest Quarter (SW ¼ of SW ¼); thence East to the Southeast corner of said Southwest Quarter of Southwest Quarter (SW ¼ of SW ¼), thence North to the Northeast corner of said Southwest Quarter of Southwest Quarter (SW ¼ of SW ¼), thence West to the point of beginning, except the North 2 rods thereof, said tract.

Except: That part of the North 320.00 feet of the South 620.00 of the Southeast Quarter of the Southwest Quarter of Section 8, Township 32, Range 20, Washington County, Minnesota, lying Westerly of the center line of County State Aid Highway No. 1, as the same is now laid out and traveled, said center line is described as follows:

Beginning at a point on the South line thereof distant 37.30 feet Westerly of the Southeast corner thereof (for the purposes of this description, the South line of said Southeast Quarter of the Southwest Quarter is assumed to bear South 89 degrees 38 minutes 18 seconds West); thence Northerly along a curve concave to the West, having a radius of 2864.81 feet and a central angle of 7 degrees 12 minutes 48 seconds, a distance of 360.67 feet, the chord of said curve bears North 14 degrees 39 minutes 10 seconds West; thence North 18 degrees 15 minutes 34 seconds West, tangent to said curve, a distance of 282.59 feet; thence Northerly along a tangential curve, concave to the East, having a radius of 1980.97 feet and a central angle of 20 degrees 29 minutes 54 seconds, a distance of 708.72 feet to the North line of said Southeast Quarter of the Southwest Quarter, and there terminating.

And lying Easterly of the following described line:

Commencing at the Southwest corner of said Section 8; thence Easterly along the South line of said Section 8, a distance of 1714.61 feet to the point of beginning of the line to be described; thence Northeasterly, deflecting to the left 83 degrees 54 minutes 52 seconds, a distance of 623.51 feet to the North line of the South 620.00 feet of said Southeast Quarter of the Southwest Quarter, and there terminating.

Also except: That part of the Southeast Quarter of the Southwest Quarter of Section 8, Township 32 N, Range 20 W, described as follows: Commencing at the Southwest corner of said Section 8, thence Easterly along the South line of Section 8 a distance of 1714.61 feet which is the point of beginning of this description; thence Northeasterly deflecting to the left 83 degrees 54 minutes 52 seconds a distance of 301.70 feet to the North line of the South 100 feet of the Southeast Quarter of the Southwest Quarter of Section 8; thence Easterly along said North line a distance of 757 feet, more or less, to the center line of County State Aid Highway No. 1; thence Southeasterly along said center line a distance of 305 feet, more or less, to the South line of Section 8, thence Westerly along said South line a distance of 862 feet, more or less, to the point of beginning, according to the United States Government Survey thereof and situate in Washington County, Minnesota.

Site shown on County Map

Source: Washington County Official Highway Map

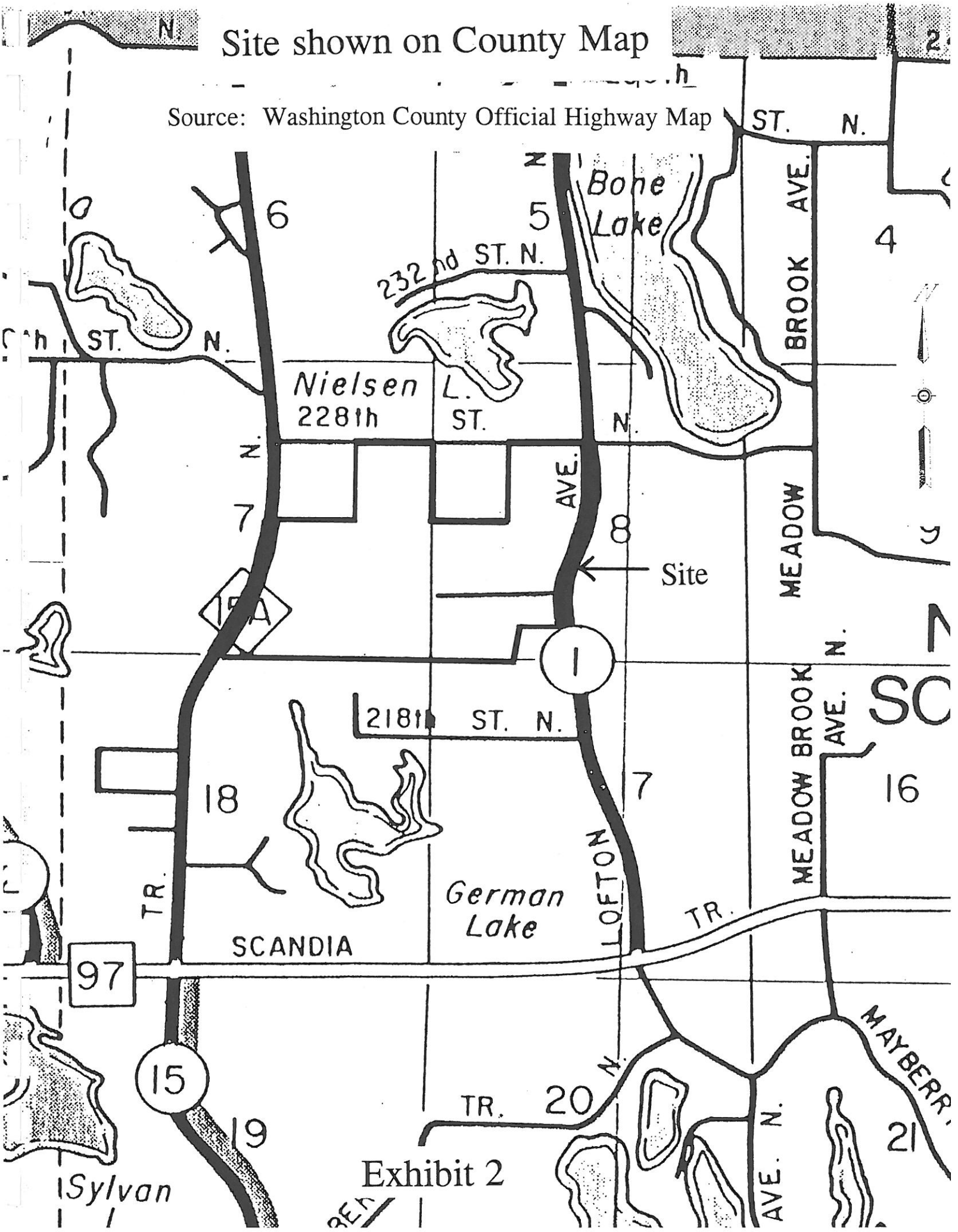


Exhibit 2

Site shown on Quadrangles

Source: Excerpt from USGS 71/2 min.
Forest Lake and Scandia Quadrangles

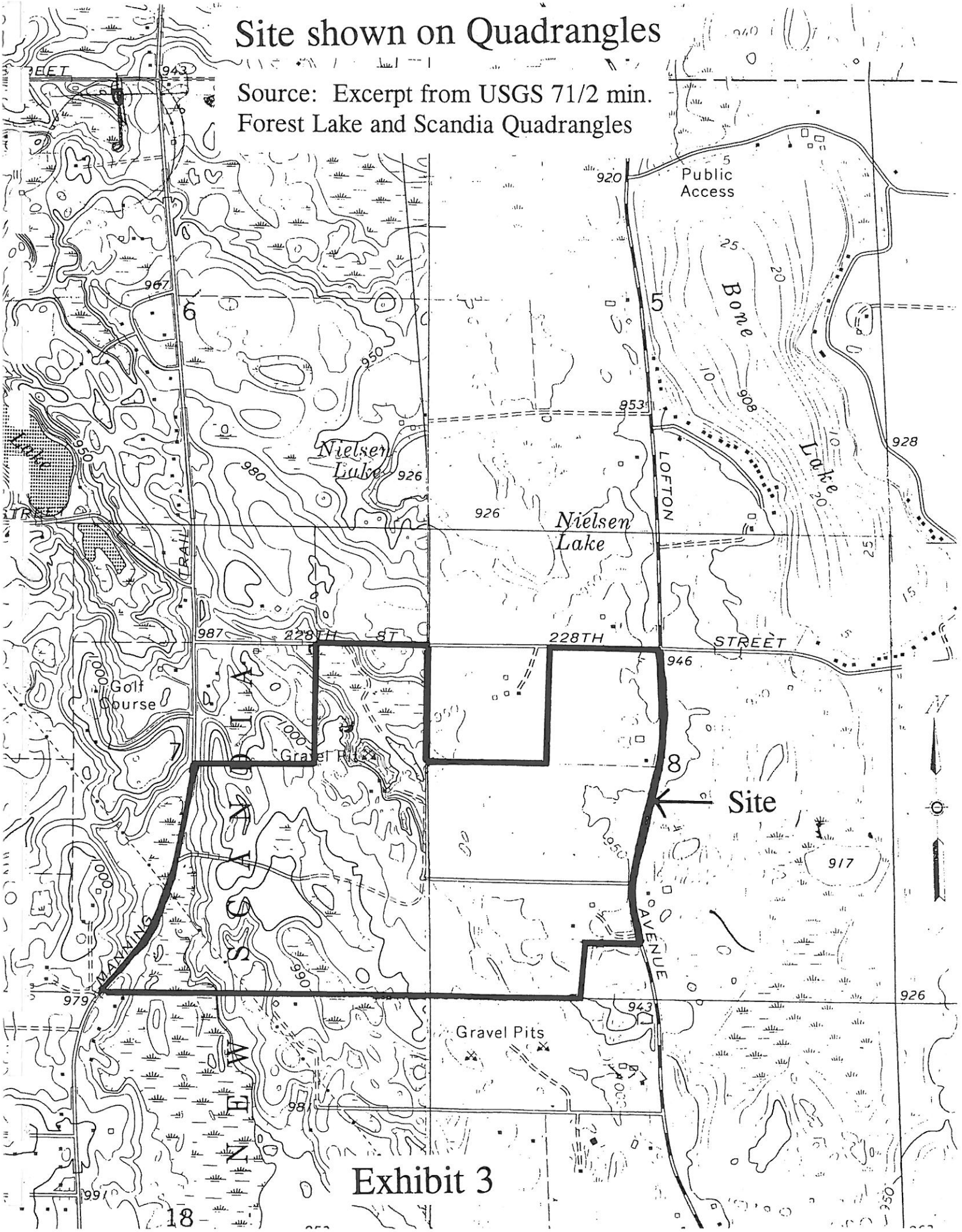
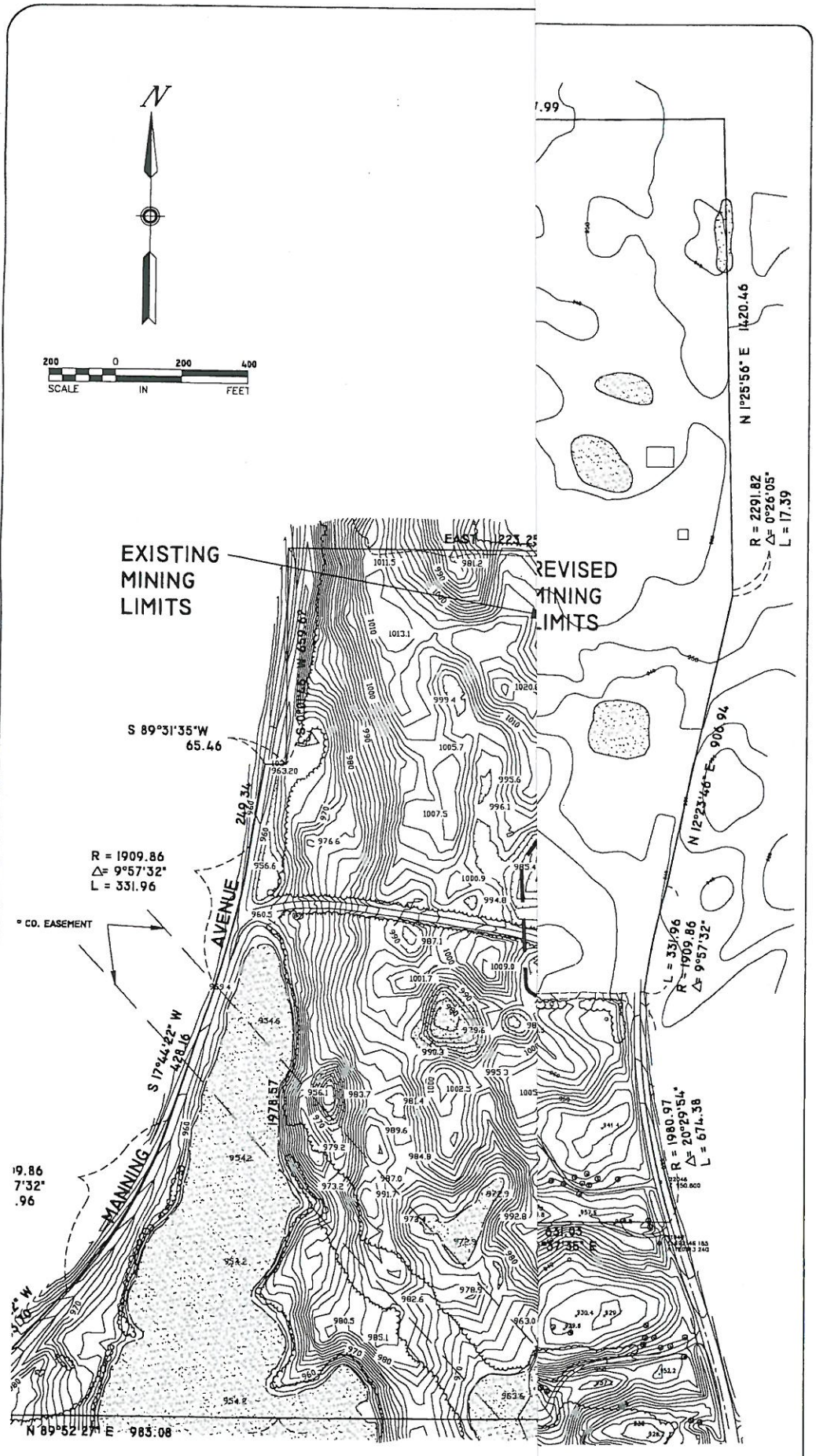


Exhibit 3



SUNDE ENGINEERING INC.

4200 WEST OLD SHAKOPEE ROAD
BLOOMINGTON, MINNESOTA 55437
(612) 881-3344

TILLER CORPORATION

WASHINGTON COUNTY, MN

SITE PLAN

DATE	REVISION

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS 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

DATE: _____ REG. NO.: _____

DRAWN BY:

CHECKED BY:

DATE:

SCALE:

APPROVED BY:

PROJECT NO.:

EXHIBIT 4

PROJECT T:TWP R RGE SEC DRAWN DRAWINGFILE XREFS: XREFS

Wetlands Map

Source: National Wetlands Inventory Map

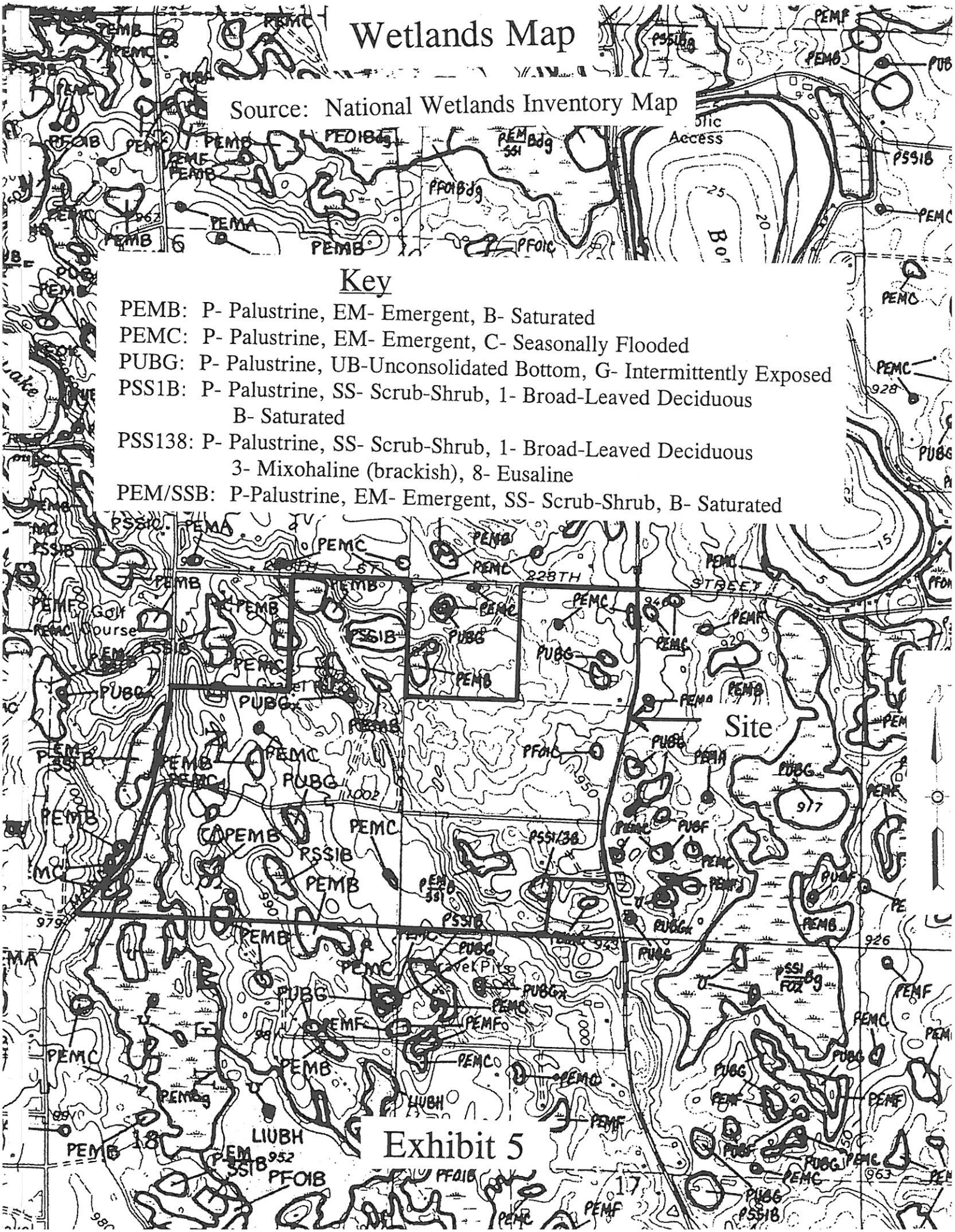


Exhibit 5

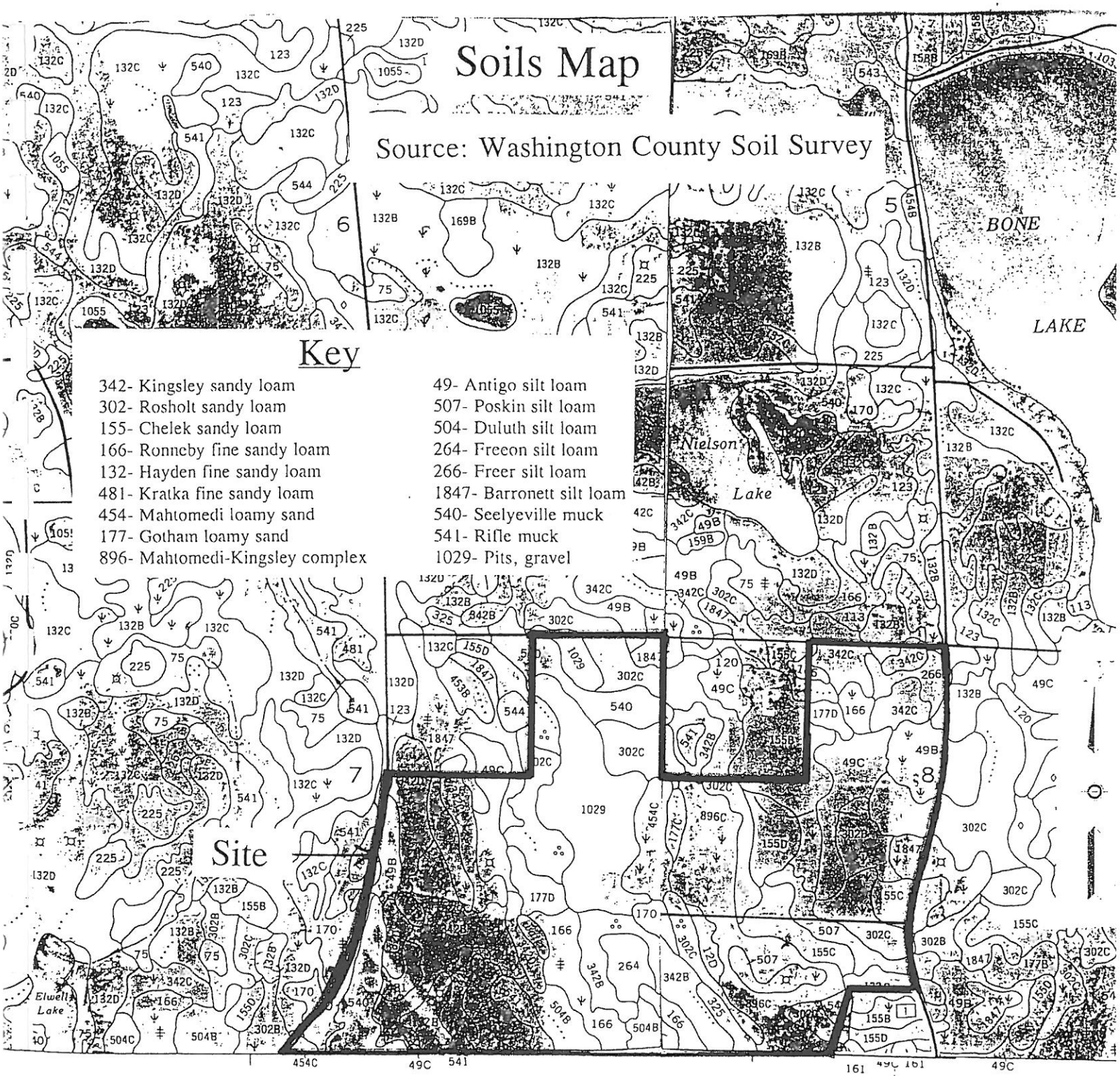

Soils Map
Source: Washington County Soil Survey
Key
342- Kingsley sandy loam
302- Rosholt sandy loam
155- Chelek sandy loam
166- Ronneby fine sandy loam
132- Hayden fine sandy loam
481- Kratka fine sandy loam
454- Mahtomedi loamy sand
177- Gotham loamy sand
896- Mahtomedi-Kingsley complex
49- Antigo silt loam
507- Poskin silt loam
504- Duluth silt loam
264- Freeon silt loam
266- Freer silt loam
1847- Barronett silt loam
540- Seelyeville muck
541- Rifle muck
1029- Pits, gravel
Site
BONE
LAKE
Nielson
Lake
Elwell
Lake

Exhibit 6

Natural Communities and Rare Species

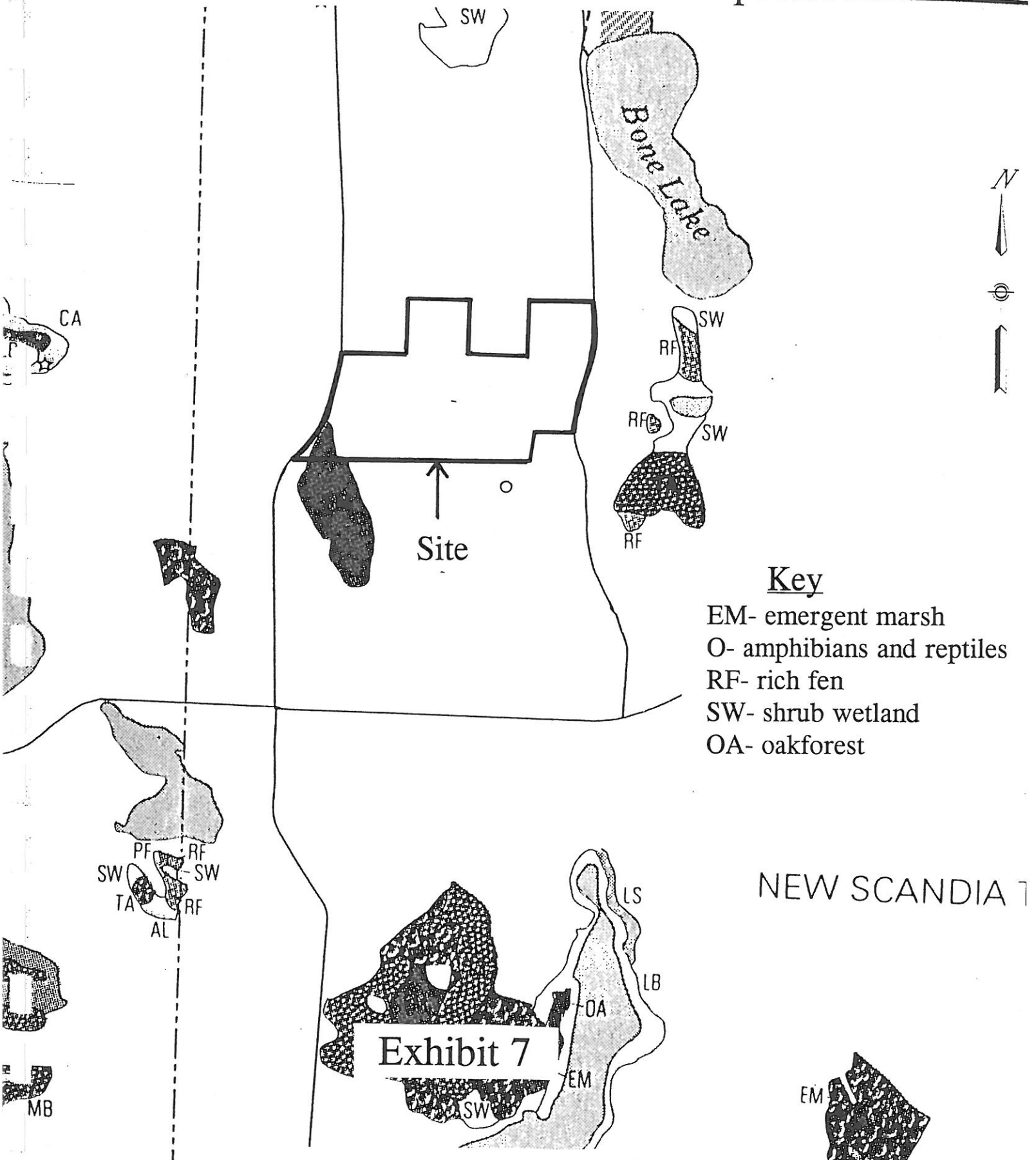


Exhibit 7

Source: Natural Communities and Rare Species Map of Washington County, MN 1987-1989

Zoning

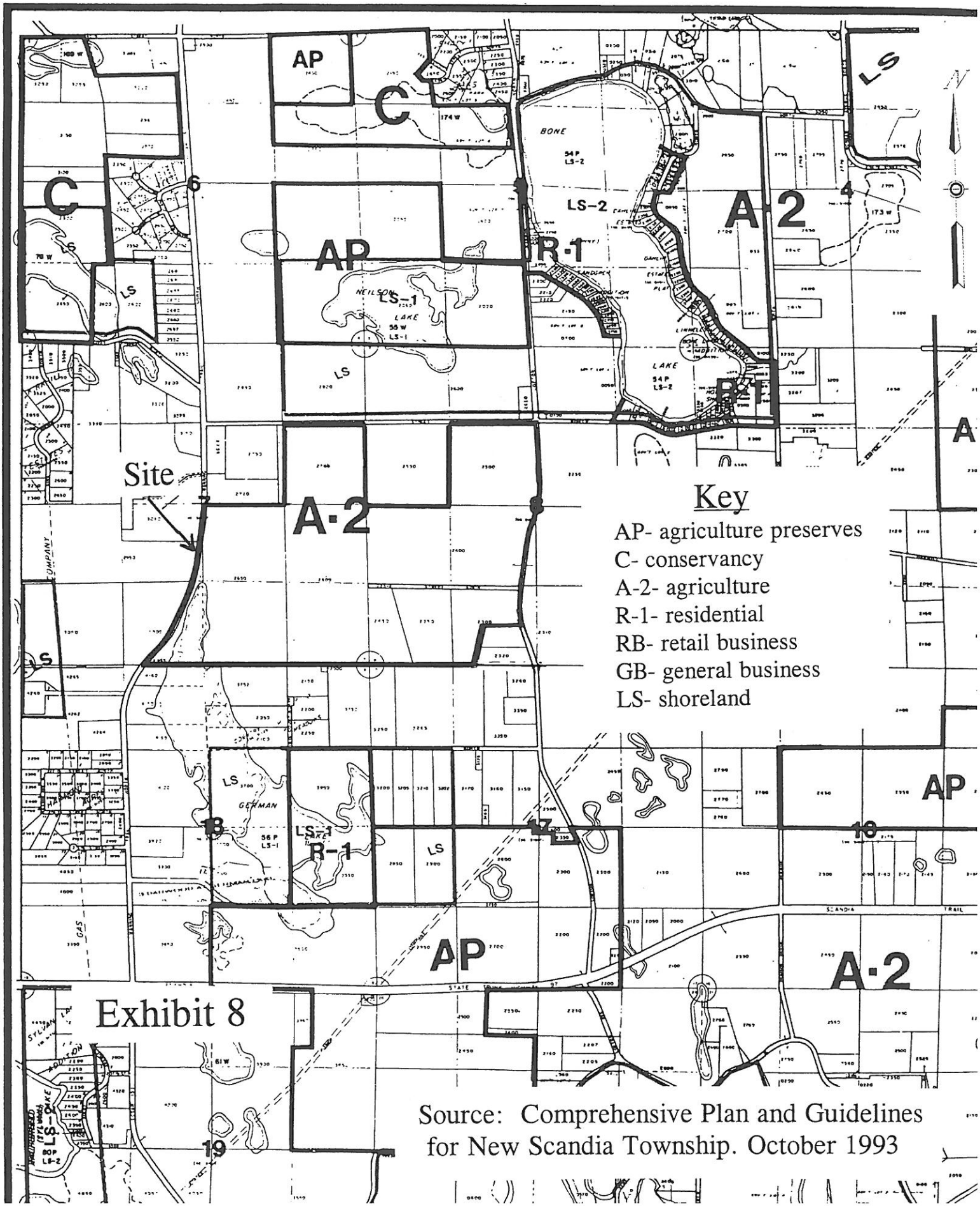
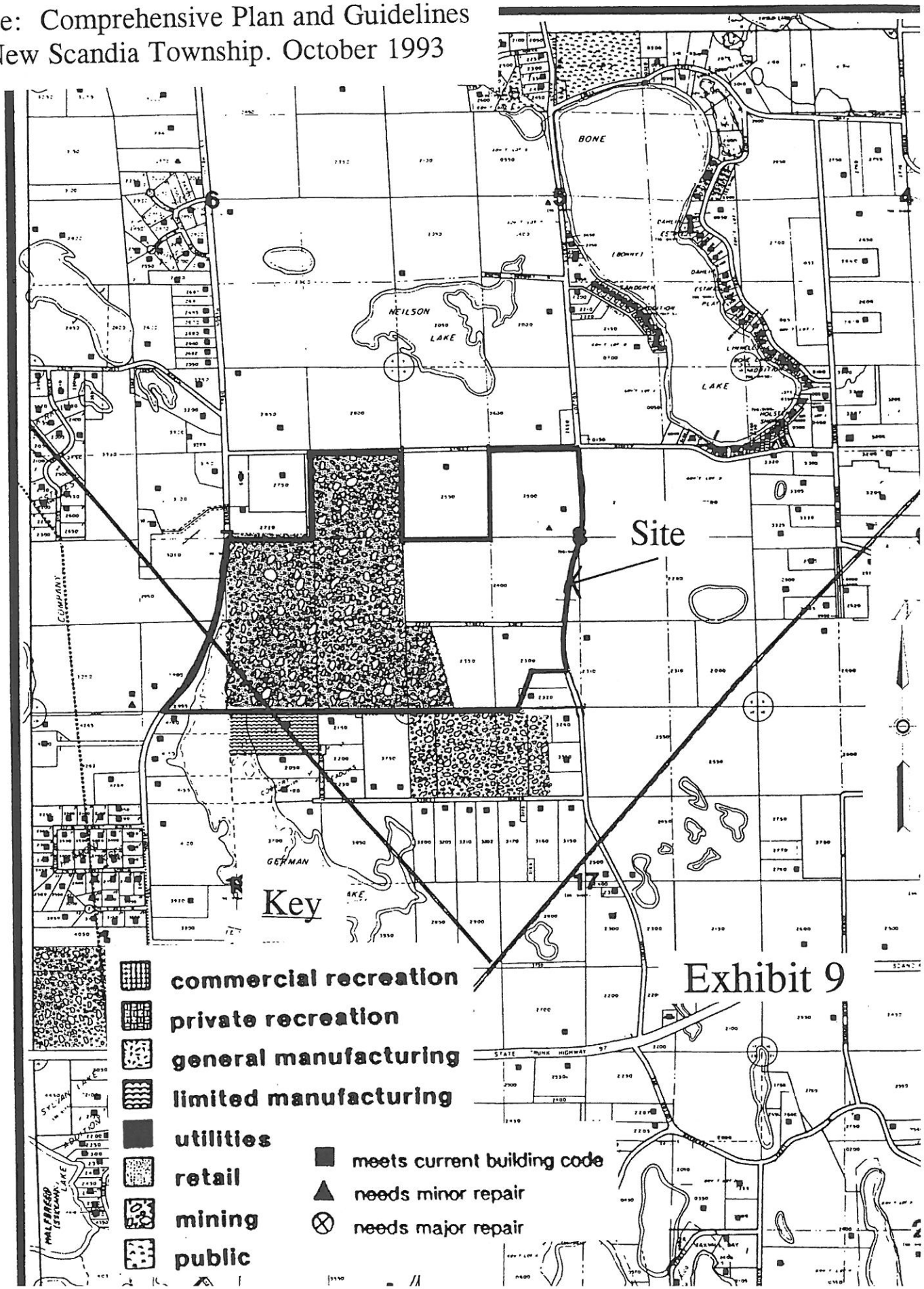


Exhibit 8

Source: Comprehensive Plan and Guidelines for New Scandia Township. October 1993

Existing Land Use

Source: Comprehensive Plan and Guidelines for New Scandia Township. October 1993



Bedrock Geology

Source: Washington County Geologic Atlas

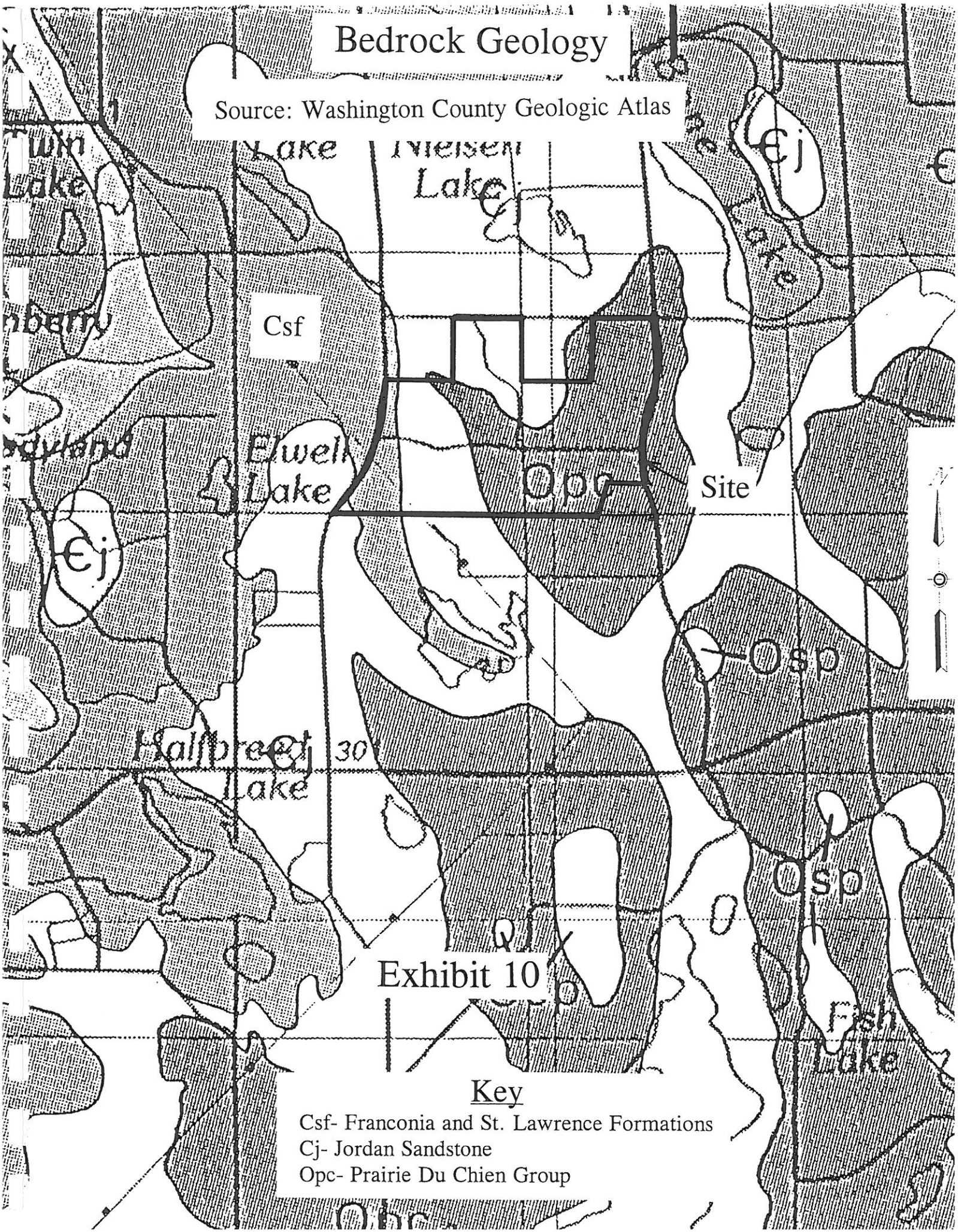


Exhibit 10

Key

Csf- Franconia and St. Lawrence Formations
Cj- Jordan Sandstone
Opc- Prairie Du Chien Group

Exhibit 11

MINNESOTA HISTORICAL SOCIETY

STATE HISTORIC PRESERVATION OFFICE

June 7, 1999

Mr. Scott Meurn
Sunde Engineering Inc.
4200 West Old Shakopee Road, Suite 230
Bloomington, MN 55437-2967

RE: EAW - Existing gravel mining operation in T32 R20 S7/8
New Scandia, Washington County
SHPO Number: 99-2541

Dear Mr. Meurn:

Thank you for consulting with our office during the preparation of an Environmental Assessment Worksheet for the above referenced project.

Based on our review of the project information, we conclude that there are no properties listed on the National or State Registers of Historic Places, and no known or suspected archaeological properties in the area that will be affected by this project.

Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36CFR800, Procedures of the Advisory Council on Historic Preservation for the protection of historic properties. If this project is considered for federal assistance, or requires a federal permit or license, it should be submitted to our office with reference to the assisting federal agency.

Please contact us at (651)296-5462 if you have any questions regarding our comments on this project.

Sincerely,

Dennis A. Gimmestad
Government Programs and Compliance Officer

Exhibit 12

Minnesota Department of Natural Resources
Natural Heritage and Nongame Research Program, Box 25
500 Lafayette Road
St. Paul, Minnesota 55155-40__
Phone: (651) 296-8319 Fax: (651) 296-1811 E-mail: karen.cieminski@dnr.state.mn.us

May 21, 1999

Scott Meurn
Sunde Engineering, Inc.
4200 West Old Shakopee Rd. #230
Bloomington, MN 55437

Re: Request for Natural Heritage information for vicinity of Tiller Sand & Gravel Mining Operation, Washington County; T32N R20W Sec. 7, 8.
NHNRP Contact #: ES990720

Dear Mr. Meurn,

The Minnesota Natural Heritage database has been reviewed to determine if any rare plant or animal species or other significant natural features are known to occur within an approximate one-mile radius of the area indicated on the map enclosed with your information request. Based on this review, there are 7 known occurrences of rare species or natural communities in the area searched (for details, see enclosed database printout and explanation of selected fields).

I recommend the following rare features be addressed in project development, as they may be affected by the project.

- Blanding's turtles

Where available, fact sheets regarding the above-named elements have been enclosed. Please contact me if you require further information.

The Natural Heritage database is maintained by the Natural Heritage and Nongame Research Program, a unit within the Section of Ecological Services, Department of Natural Resources. It is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, natural communities, and other natural features. Its purpose is to foster better understanding and protection of these features.

Because our information is not based on a comprehensive inventory, there may be rare or otherwise significant natural features in the state that are not represented in the database. A county-by-county survey of rare natural features is now underway, and has been completed for Washington County. Our information about natural communities is, therefore, quite thorough for that county. However, because survey work for rare plants and animals is less exhaustive, and because there has not been an on-site survey of all areas of the county, ecologically significant features for which we have no records may exist on the project area.

The enclosed results of the database search are provided in two formats: index and full record. To control the release of locational information which might result in the damage or destruction of a rare element, both printout formats are copyrighted.

The index provides rare feature locations only to the nearest section, and may be reprinted, unaltered, in an Environmental Assessment Worksheet, municipal natural resource plan, or internal report compiled by your company for the project listed above. If you wish to reproduce the index for

any other purpose, please contact me to request written permission. Copyright notice for the index should include the following disclaimer:

> "Copyright (year) State of Minnesota, Department of Natural Resources. This index may be reprinted, unaltered, in Environmental Assessment Worksheets, municipal natural resource plans, and internal reports. For any other use, written permission is required."

The full-record printout includes more detailed locational information, and is for your personal use only. If you wish to reprint the full-record printouts for any purpose, please contact me to request written permission.

Please be aware that review by the Natural Heritage and Nongame Research Program focuses only on rare natural features. It does not constitute review or approval by the Department of Natural Resources as a whole.

An invoice for the work completed is enclosed. You are being billed for map and database search and staff scientist review. Please forward this invoice to your Accounts Payable Department. Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources.

Sincerely,

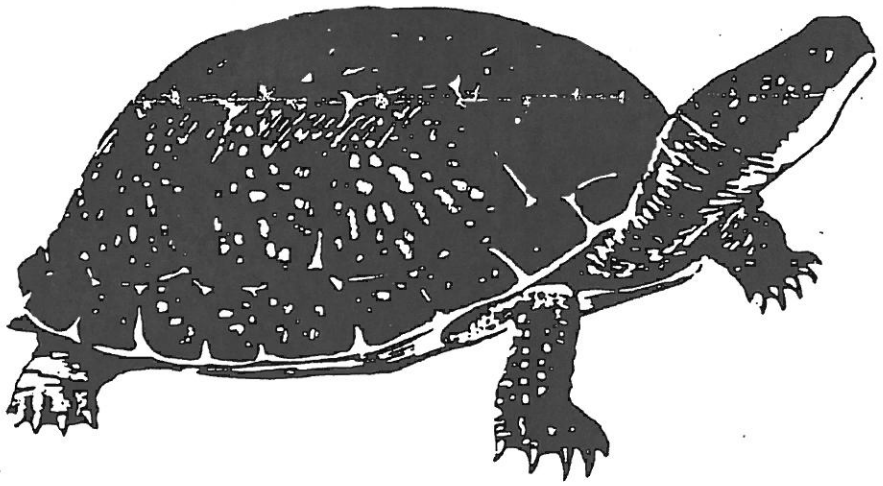
Karen L. Cieminski

Karen L. Cieminski
Data Manager / Ecologist

encl: Database search results
Rare Feature Database Print-Outs: An Explanation of Fields
Fact sheets: Blanding's turtles
Invoice

CONTRACTOR'S VERSION

CAUTION



BLANDING'S TURTLES
MAY BE ENCOUNTERED IN THIS AREA

The unique and rare Blanding's turtle has been found in this area. Blanding's turtles are a State Threatened species and are protected under Minnesota Statute 84.096, Protection of Threatened and Endangered Species. Please be careful of turtles on roads and in construction sites. Turtles should be moved offsite to the nearest wetland. Information and recommendations on Blanding's turtles can be found on the back of this notice. Additional information on turtles can be obtained from the Nongame Wildlife Program, Box 7, DNR Building, 500 Lafayette Rd., St. Paul, MN 55155-4007. (612) 297-4966.

LIFE HISTORY INFORMATION (Adapted from Oldfield and Moriarty 1994 Amphibians and Reptiles Native to Minnesota)

DESCRIPTION:

The Blanding's turtle is a medium to large turtle with a black or dark blue, dome-shaped shell with muted yellow spots and bars. The bottom of the shell is hinged across the front third enabling the turtle to pull the front edge of the lower shell firmly against the top shell to provide additional protection when threatened. The head and appendages are dark brown or blue-gray with small dots of light brown or yellow. A distinctive field mark is the bright yellow chin and neck. The average adult Blanding's turtle ranges from 6 to 9 inches in straight line upper shell length.

HABITAT:

Shallow, slow moving water with mud bottoms and abundant aquatic vegetation are preferred by Blanding's turtles. Extensive marshes bordering rivers provide excellent habitat. In Minnesota, Blanding's turtles are primarily marsh and pond inhabitants and are frequently found in association with snapping and painted turtles. Blanding's turtles protect themselves from freezing temperatures by overwintering in the muddy bottoms of marshes and ponds.

LIFE HISTORY:

Individuals emerge from overwintering and begin basking in early April on warm, sunny days. Nesting occurs during the first two weeks of June in Minnesota. Females are most active in late afternoon and at dusk. After crawling up to 1 mile and laying eggs, females may hide near a bush and return to the marsh the next day, especially in the early morning. The nest is dug by the female in an open sandy area where 6-15 eggs are laid. After a development period of approximately two months, hatchlings leave the nest from mid-August to early-October with an average shell length of 1 1/4 inches. Often, they must make a long overland trek to find water

Blanding's turtles are mild mannered and do not attempt to bite. If molested or threatened they simply pull into their shell and wait for danger to pass. Nests and young of Blanding's turtles fall victim to racoons, skunks, and predatory birds. Adults are particularly vulnerable to being struck by automobiles while crossing roads.

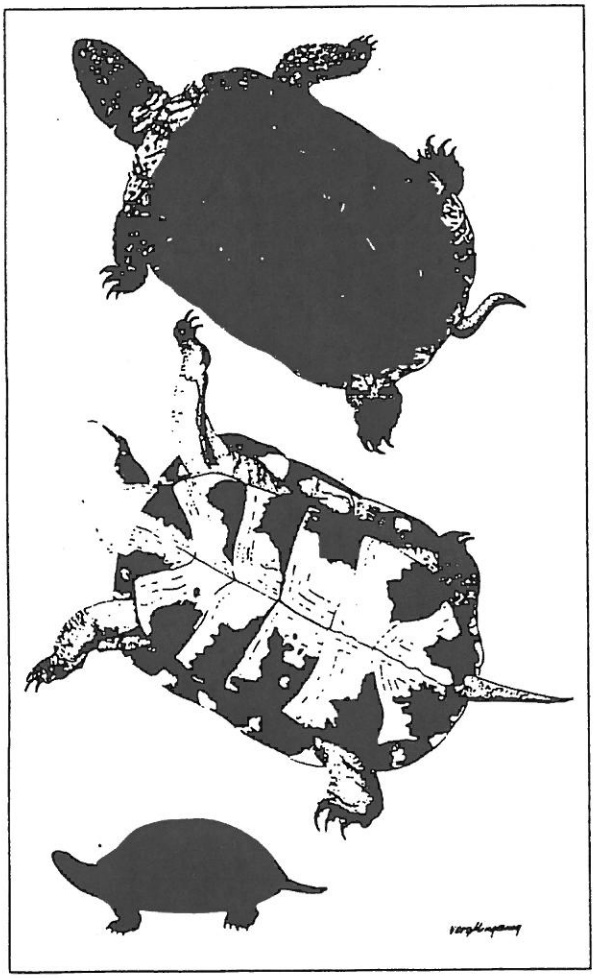
RECOMMENDATIONS:

We offer the following guidelines concerning construction and land use to help minimize impacts on turtles.

- Workers should be informed of the presence of Blanding's Turtles in the area.
- Roads should be kept to minimal standards on widths and lanes.
- Roads should be ditched, not curbed or below grade. If curbs must be used 4" high curbs at a 3:1 slope are preferred. Blanding's Turtles have great difficulty climbing traditional curbs. Curbs and below grade roads trap turtles on the road increasing road kills.
- When working near wetlands silt fencing should be set up to keep turtles out of construction areas, it is critical that silt fences be removed after the area has been revegetated.
- Ditches should not be mowed between June 1st and October 1st.
- Culverts connecting wetland areas should be over-sized and elliptical or box to facilitate turtle movements between wetlands.
- Utility access and maintenance roads should be kept to a minimum.
- Vegetation management under power lines should be done mechanically and between October 1st and June 1st. Chemicals should not be used.
- Below ground utility construction sites should be returned to original grade. Erosion should be prevented from reaching wetlands and lakes.
- Graded areas should be revegetated with native vegetation. Use of fertilizers and pesticides should be avoided.
- All wetlands should be protected from road run-off, lawn and other chemical run-off by a naturally vegetated buffer strip.
- Shallow, vegetated wetlands (Type 2 & 3) should not be dredged or deepened.
- Landscaping should be left as natural as possible.
- Terrain should be left with as much natural contour as possible.
- Road placement should avoid separating wetlands from adjacent uplands and should avoid bisecting wetlands.

BLANDING'S TURTLE

332 *Emydoidea blandingii* (Holbrook)



©1988, State of Minnesota, Vera Ming Wong

OFFICIAL STATUS: Threatened

BASIS FOR STATUS: Although formerly more widespread, the Blanding's turtle is now restricted to a small number of states and provinces in the Upper Midwest, stretching from Nebraska eastward to Michigan, Ontario, and Quebec. A smaller remnant population, spanning portions of a few New England states, as well as a number of scattered populations throughout the Northeast, testify to the turtle's more expanded range in earlier times. Minnesota lies on the northwest periphery of the species' range. An extensive area of sand dunes and marshes along the Mississippi River, south of the town of Kellogg, is recognized as a major concentration area for the turtle and may be one of the largest breeding populations in its entire range. Elsewhere in the state, the Blanding's turtle has a more spotty distribution, following the Mississippi and St. Croix rivers northward into east-central Minnesota and the Minnesota River westward into the south-central portions of the state. Two recent records from Pipestone County also confirm the species' presence in the Missouri River drainage of extreme southwestern Minnesota.

As a marsh inhabitant the recent destruction of wetland habitats by drainage and/or inundation for agricultural purposes, river channelization, and water impoundment has greatly decreased available habitat for the species. Like other turtles, the Blanding's turtle is also vulnerable to collecting as a desirable pet species ($45 for a 15 to 20 centimeter turtle); it is easily collected in areas where it is abundant, especially during the nesting season. The species' life history also makes this turtle particularly susceptible to human disturbances, as evidenced by a long term and intensive study of the population inhabiting the Kellogg Dunes (Pappas, personal communication). Some features contributing to this susceptibility are late maturation, low reproductive potential (one clutch/season), long-lived adults, and high mortality of eggs and juveniles. Population and reproductive dynamics suggest viable populations of Blanding's turtles are dependent on large numbers of animals and adequate areas of undisturbed habitat.

PREFERRED HABITAT: The preferred habitat of the Blanding's turtle includes calm, shallow water, rich, aquatic vegetation and sandy uplands for nesting. Studies by Congdon et al. (1983) in Michigan and by Linck (personal communication) in Massachusetts have shown that nesting females may travel considerable distances (200 to 400 meters) to a nesting area, passing enroute what appears to be suitable nesting habitat immediately adjacent to the marsh in which they reside.

AID TO IDENTIFICATION: Blanding's turtle is medium-sized, averaging 15 to 25 centimeters in length. The species' most diagnostic field characteristics are its smooth, domed upper shell, or carapace, and its bright yellow neck, throat, and chin. The carapace usually appears bluish black, with numerous specks of yellow throughout. The lower shell, or plastron, is bright yellow with black patches on the outside margin. In general, the adult male can be distinguished from the female by its slightly indented plastron and longer tail. The most distinct feature of the plastron is the hinge, which allows the turtle to raise the plastron upward and provide more protection to the soft extremities that it has pulled inside the shell. For this reason the species is often referred to as a "semibox" turtle.

RECOMMENDATIONS: Efforts to identify, protect, and preserve preferred habitats of this species should be continued, particularly where populations are locally abundant. Additional information on the species' local distribution and abundance should also be collected to allow an accurate assessment of its current status and to aid in protection efforts.

SELECTED REFERENCES: Breckenridge 1944; Conant 1975; Congdon et al. 1983; Ewert 1982; Graham and Doyle 1977; McCoy 1973; Vogt 1981.

Blanding's Turtle: adult viewed from above (top) and below (bottom); side view shown in silhouette.

Coffin, B. and L. Pfannmuller, (eds). 1988. *Minnesota's Endangered Flora and Fauna.* ... for the Minnesota Dept. of Natural Resources.

TILLER SAND & GRAVEL; WASHINGTON COUNTY; T32N R20W S. 7-8

Minnesota Natural Heritage Database
Element Occurrence Records

MnDNR, Natural Heritage and Nongame Research Program

17:15 Friday, MAY 14, 1999

TWP	RNG	PRIMARY SECTION	FED STATUS	MN STATUS	S RANK	ELEMENT and OCCURRENCE NUMBER	MANAGED AREA
T032N	R20W	04		THR		EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #701	
T032N	R20W	06		NON		POLYGONUM ARIFOLIUM (HALBERD-LEAVED TEARTHUMB) #12	
T032N	R20W	17		THR		EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #336	
T032N	R20W	18		THR		EMYDOIDEA BLANDINGII (BLANDING'S TURTLE) #808	
T032N	R21W	12			S5	CATTAIL MARSH #14	
T032N	R21W	12		NON		POLYGONUM ARIFOLIUM (HALBERD-LEAVED TEARTHUMB) #11	
T032N	R21W	12			S4	SHRUB SWAMP UNKNOWN/UNRESOLVED SUBTYPE #5	

RECORDS PRINTED = 7

Rare Features Database Print-outs: An Explanation of Fields

The Rare Features database is part of the Natural Heritage Information System,
and is maintained by the Natural Heritage and Nongame Research Program,
a unit within the Section of Ecological Services,
Minnesota Department of Natural Resources (DNR).

Field Name: [Full (non-abreviated) field name, if different]. Further explanation of field.

-C-

CBS Site: [County Biological Survey site number]: In each county, the numbering system begins with 1.

CLASS: A code which classifies features by broad taxonomic group: NC = natural community; SA = special animal; SP = special plant; GP = geologic process; GT = geologic time; OT = other (e.g. colonial waterbird colonies, bat hibernacula).

Cty: [County]. Minnesota counties (ordered alphabetically) are numbered from 1 (Aitkin) to 87 (Yellow Medicine).

CURRENT STATUS: Present protection status, from 0 (owner is not aware of record) to 9 (dedicated as a Scientific and Natural Area).

-D-

DNR Region: 1=NW, 2=NE, 3=E Central, 4=SW, 5=SE, 6= Minneapolis/St. Paul Metro.

DNR Quad: [DNR Quadrangle code]. DNR-assigned code of the U.S. Geologic Survey topographic map on which the rare feature occurs.

-E-

ELEMENT or Element: See "Element Name (Common Name)"

Element Name (Common Name): The name of the rare feature. For plant and animal species records, this field holds the scientific name, followed by the common name in parentheses; for all other elements (such as plant communities, which have no scientific name) it is solely the element name.

EO RANK: [Element Occurrence Rank]. An evaluation of the quality and condition of natural communities from A (highest) to D (lowest).

EO Size: [Element Occurrence Size]. The size in acres (often estimated) of natural communities.

-F-

FED STATUS: [Federal Status]. Status of species under the Federal Endangered Species Law: LE=endangered, LT=threatened, C=species which have been proposed for federal listing.

Federal Status: See "FED STATUS"

Forestry District: The Minnesota DNR's Division of Forestry district number.

-G-

GLOBAL RANK: The abundance of an element globally, from G1 (critically imperiled due to extreme rarity on a world-wide basis) to G5 (demonstrably secure, though perhaps rare in parts of its range). Global ranks are determined by the Conservation Science Division of The Nature Conservancy.

-I-

INTENDED STATUS: Desired protection status. See also "CURRENT STATUS." If a complete list of protection status codes is needed, please contact the Natural Heritage Program.

-L-

LAST OBSERVED or Last Observed Date or Last Observation: Date of the most recent record of the element at the location.

Latitude: The location at which the occurrence is mapped on Natural Heritage Program maps. NOTE: There are various levels of precision in the original information, but this is not reflected in the latitude/longitude data. For some of the data, particularly historical records, it was not possible to determine exactly where the original observation was made (e.g. "Fort Snelling", or "the south shore of Lake Owasso"). Thus the latitude/longitude reflect the mapped location, and not necessarily the observation location.

Legal: Township, range and section numbers.

Long: [Longitude]. See NOTE under "Latitude"

-M-

MANAGED AREA or Managed Area(s): Name of the federally, state, locally, or privately managed park, forest, preserve, etc., containing the occurrence, if any. If this field is blank, the element probably occurs on private land. If "(STATUTORY BOUNDARY)" occurs after the name of a managed area, the location may be a private inholding within the statutory boundary of a state forest or park.

Map Sym: [Map Symbol].

MN STATUS: [Minnesota Status]. Legal status of plant and animal species under the Minnesota endangered species law: END=endangered, THR=threatened, SPC=special concern, NON= no legal status, but rare and may become listed if declines continue. This field is blank for natural communities and colonial waterbird nesting sites, which have no legal status in Minnesota, but are tracked by the database.

-N-

NC Rank: [Natural Community Rank].

-O-

Occ #: [Occurrence Number]. The occurrence number, in combination with the element name, uniquely identifies each record.

OCCURRENCE NUMBER: See "Occ #"

OF OCCURS: The number of records existent in the database for each element within the area searched.

Ownership: Indicates whether the site is publicly or privately owned; for publicly owned land, the agency with management responsibility is listed.

-P-

Precision: Precision of locational information of occurrence: C (confirmed) = known within 1/4 mile radius, U (unconfirmed) = known within 1/2 mile, N (non-specific) = known within 1 mile, G (general) = occurs within the general region, X (unmappable)=location is unmappable on USGS topographic quadrangles (often known only to the nearest county), O (obscure/gone)=element no longer exists at the location.

PS: [Primary Section]. The section containing all or the greatest part of the occurrence.

-Q-

Quad Map: See "DNR Quad"

-R-

Rec #: [Record number].

RNG or Rng: [Range number].

-S-

SECTION or Section: [Section number(s)]. Some records are given only to the nearest section (s), but most are given to the nearest quarter-section or quarter-quarter-section (e.g., SWNW32 denotes the SW1/4 of the NW1/4 of section 32). A "0" is used as a place holder when a half-section is specified (e.g., 0N03 refers to the north 1/2 of section 3). When a occurrence crosses section boundaries, both sections are listed, without punctuation (e.g., the NE1/4 of section 19 and NW1/4 of section 20 is displayed as "NE19NW20").

Site: A name which refers to the geographic area within which the occurrence lies. If no name for the area exists (a locally used name, for example), one is assigned by the County Biological Survey or the Natural Heritage Program.

Source: The collector or observer of the rare feature occurrence.

S RANK: [State Rank]. A rank assigned to the natural community type which reflects the known extent and condition of that community in Minnesota. Ranks range from 1 (in greatest need of conservation action in the state) to 5 (secure under present conditions). A "?" following a rank indicates little information is available to rank the community. Communities for which information is especially scarce are given a "U", for "rank undetermined". The ranks do not represent a legal status. They are used by the Minnesota Department of Natural Resources to set priorities for research, inventory and conservation planning. The state ranks are updated as inventory information becomes available.

State Status: See "MN STATUS"

-T-

TWP or Twp: [Township number].

-V-

Verification: A reflection of the reliability of the information on which the record is based. The highest level of reliability is "verified," which usually indicates a collection was made or, in the case of bird records, nesting was observed. Plant records based on collections made before 1970 are unverified.

Voucher: The museum or herbarium where specimens are maintained, and the accession number assigned by the repository. In the case of bald eagles, this is the breeding area number.

-W-

Wildlife Area: The Minnesota DNR's Section of Wildlife administrative number.

Data Security

Locations of some rare features must be treated as sensitive information because widespread knowledge of these locations could result in harm to the rare features. For example, wildflowers such as orchids and economically valuable plants such as ginseng are vulnerable to exploitation by collectors; other species, such as bald eagles, are sensitive to disturbance by observers. For this reason, we prefer that publications not identify the precise locations of vulnerable species. We suggest describing the location only to the nearest section. If this is not acceptable for your purposes, please call and discuss this issue with the Environmental Review Specialist for the Heritage and Nongame Research Program at 651/296-8319.