87-0070D

CROSS RANGE EXPRESSWAY
TH 169 GRAND RAPIDS TO PENGILLY

DRAFT
ENVIRONMENTAL IMPACT STATEMENT
FOR
S.P. 3116-88 & 94
Minnesota Project F 076-1 ( )
Four Lane Divided Highway Construction

District 1- Duluth

December, 1986

FHWA-MN-EIS 87-01 D
Region 5

U.S. Trunk Highway 169
From U.S. Trunk Highway 2 in Grand Rapids
To Minnesota Trunk Highway 65 in Pengilly
Itasca County

Minnesota Project F 076-1 ( )
Minnesota State Project 3116-88 and 94

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Submitted In Accordance with:
42 USC 4332 (2)(c)
49 USC 303 (f)
Minnesota Statute, Chapter 116D

Submitted by:
U.S. Department of Transportation
Federal Highway Administration
Minnesota Department of Transportation

Cooperating Agencies:
U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers
MN Department of Natural Resources
MN Pollution Control Agency

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For Mn/DOT E.E. Ofstead
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12-19-86
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ABSTRACT: This environmental impact statement describes and evaluates the alternatives associated with improving an eighteen-mile segment of TH 169 in Itasca County from a two-lane roadway to a four-lane divided expressway.

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1.0 SUMMARY

1.1 PROJECT DESCRIPTION

The Federal Highway Administration (FHWA) and the Minnesota Department of Transportation (Mn/DOT) propose the improvement of Trunk Highway (TH) 169 from a basic two-lane highway to a four-lane divided expressway. The limits of the proposed project extend from the junction of TH 2 in Grand Rapids to the junction of TH 65 in Pengilly, a distance of approximately eighteen miles (Figure 1).

The completion of this project would result in the completion of the Cross Range Expressway between Grand Rapids and Virginia, and would result in a continuous 60 mile four-lane divided, limited access roadway connecting the principal cities along the Iron Range.

1.2 ACTIONS PROPOSED BY OTHER GOVERNMENT AGENCIES IN THE PROJECT CORRIDOR

There are no actions proposed by other government agencies within any of the Alternative Corridors.

1.3 MAJOR ALTERNATIVES CONSIDERED

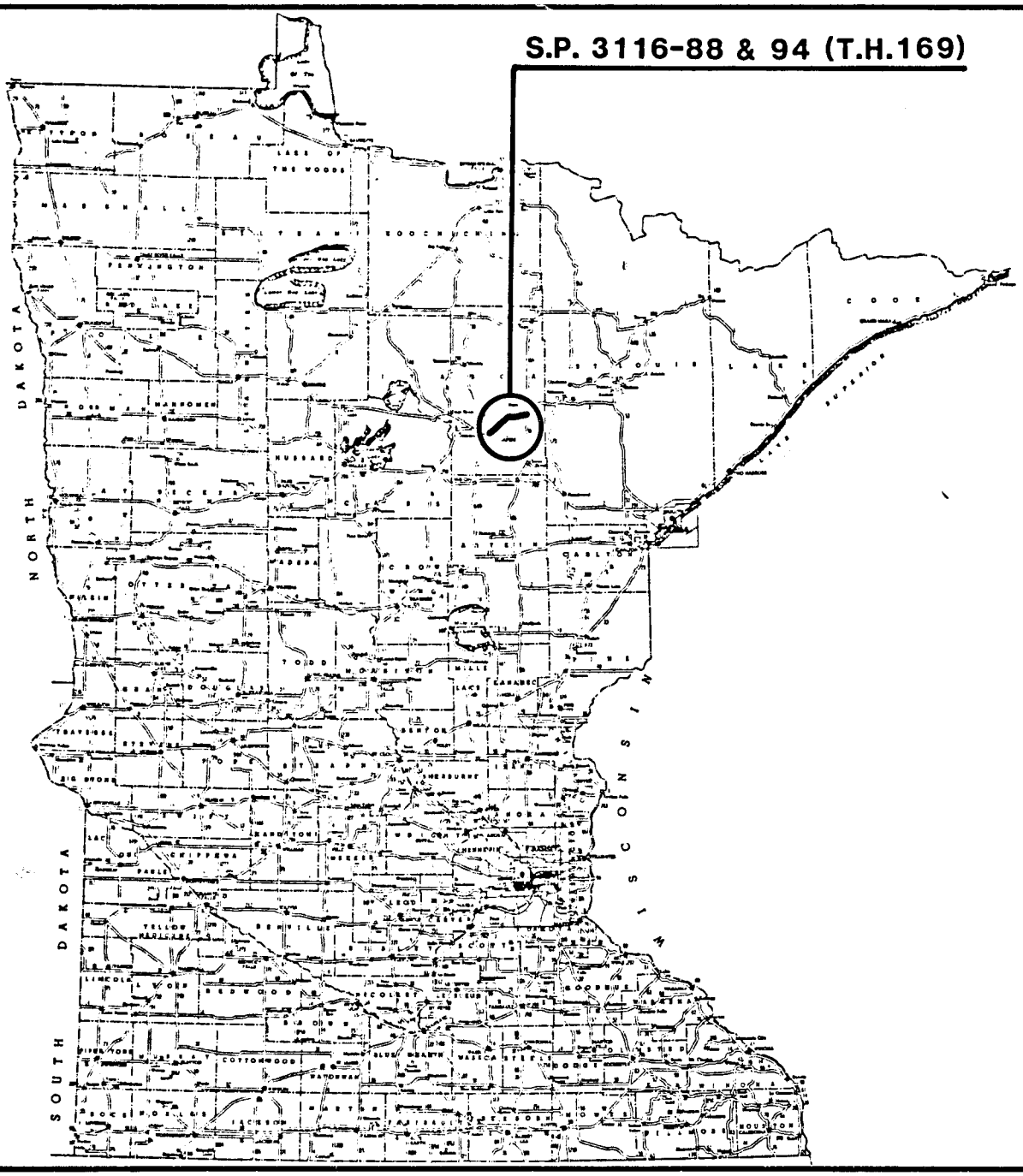
The following major alternatives were considered:

1.3.1 No-Action.

Under the No-Action Alternative, TH 169 would be maintained in its present geometric design, but minor construction which could be accomplished within the current right-of-way could be considered.

1.3.2. Construction Alternatives.

The construction alternatives involve the redesign and rebuilding of the eighteen-mile length of TH 169 from Grand Rapids to Pengilly, transforming the facility from basically a two-lane highway to a four-lane divided expressway. The Alternative Corridors selected for study were documented in the Final Study Outline and Scoping Decision Document (Mn/DOT, 1985), and are illustrated in Figure 2. The construction activities associated with the project will



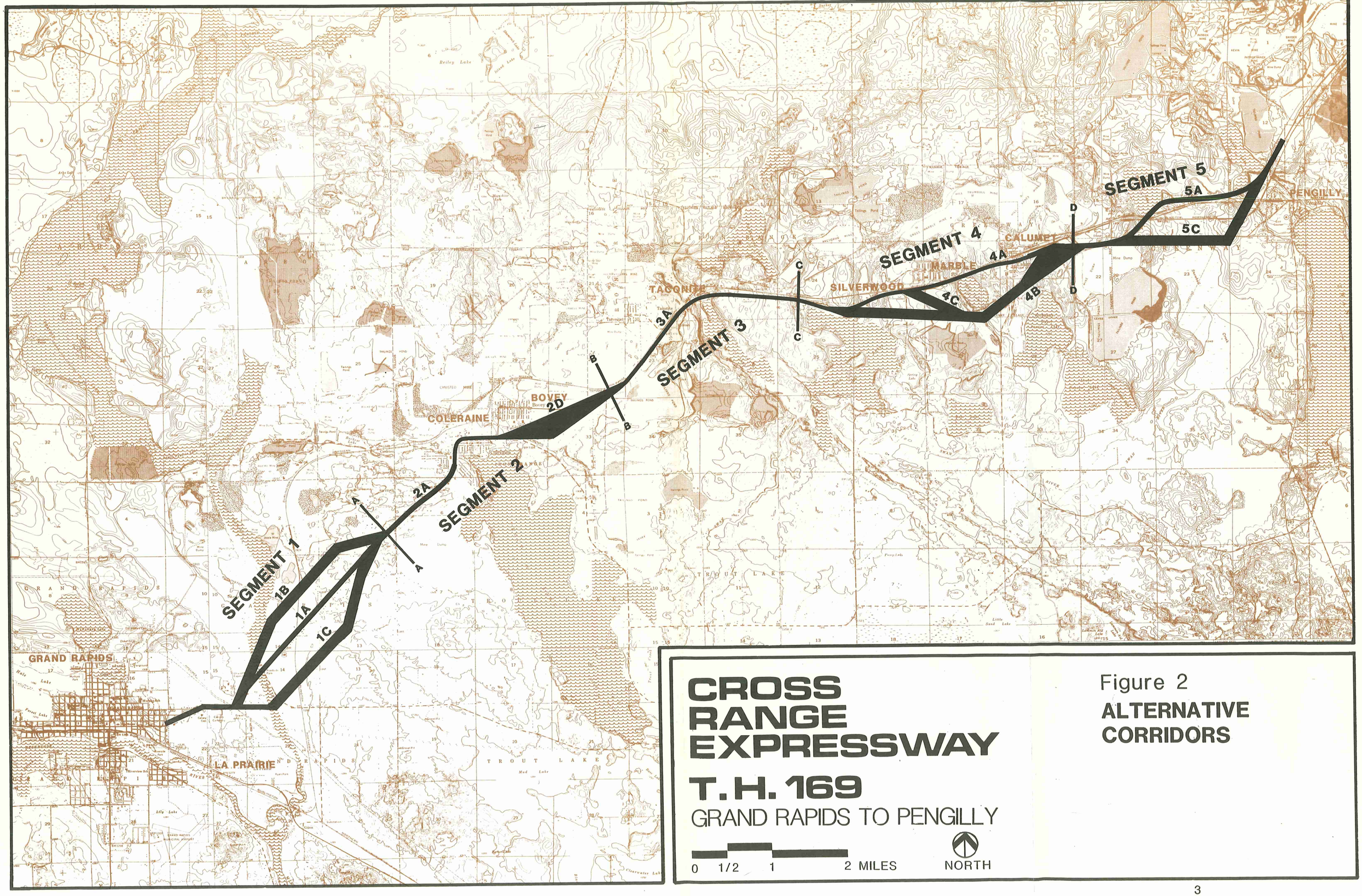
CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

Figure 1

SITE LOCATION MAP



CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

0 1/2 1 2 MILES

NORTH

Figure 2

ALTERNATIVE CORRIDORS

consist of grading, surfacing, the replacement of highway and railroad bridges, and the reconstruction of several major intersections. Other considerations in the design process include drainage, existing utilities, bicycle and pedestrian facilities and application of traffic control devices. It has been determined that additional right-of-way will have to be acquired to accommodate the improved roadway regardless of the alternative alignment decision.

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS

To aid in the comparison of project alternatives, a summary of environmental consequences associated with each segment is documented in Table 1 and briefly described in the following paragraphs. A more detailed discussion of environmental consequences is included in Section 5, which should be consulted for a full explanation of those and other impacts.

1.4.1 Significant Adverse Impacts

Five types of significant adverse environmental impacts were identified.

1) Relocation - Between fourteen and 47 residences and up to five businesses would have to be relocated, depending on the combination of alternatives chosen. These homeowners and business people would receive relocation payments and assistance from Mn/DOT but could encounter considerable disruption in the process.

2) Floodplain Encroachment - Alternative 1B would result in the loss of about 140 acre-feet of storage in the Prairie River floodplain. This loss would possibly be mitigated by providing an additional 140 acre-feet of flood storage elsewhere in the floodplain.

3) Traffic Noise - None of the construction alternatives would result in a violation of the Federal Noise Standards. However, construction along any of the new alignments would result in violation of the State Nighttime Noise Standards at up to 41 residences which are not currently experiencing nighttime noise problems. Noise abatement measures were considered but positive measures such as the construction of noise walls or the acquisition of property for buffer zones is not proposed. A request for a variance from the State Noise Standards will be submitted to the Minnesota Pollution Control Agency.

4) Park Land Impact - Alternative 4B would not require the acquisition of land from the swimming beach at the northeast corner of Twin Lake. However, construction of

TABLE 1
SUMMARY OF ENVIRONMENTAL CONSEQUENCES

	SEGMENT ONE			SEGMENT TWO		SEGMENT THREE
	1A	1B	1C	2A	2D	3A
POPULATION Persons Relocated:	52	22	60	3	0	8
HOUSING Units Removed:	20	8	23	1	0	3
PUBLIC SERVICES AND FACILITIES	No adverse effect.			No adverse effect.		No adverse effect.
ECONOMIC AND FISCAL CONDITION Business Relocated:	1	2	1	0	0	0
Other Effects:	Beneficial short- and long-term effects to local and regional economies.			Same as Segment One.		Same as Segment One.
HISTORIC AND ARCHAEOLOGIC RESOURCES	No adverse effects.			No adverse effects.		No adverse effects.
COMMUNITY DEVELOPMENT	Generally beneficial. Some relocation impacts.			Beneficial.		Beneficial.
BICYCLISTS Road Rating:	Fair	Fair	Fair	Fair	Fair	Good
WETLANDS Acres and (Habitat Units) Impacted:	1.7 (112)	16.0 (1,104)	15.8 (1,134)	0 (0)	3.5 (285)	20.0 (1,612)
FLOODPLAINS Encroachments:	Prairie River Insignificant	Prairie River Significant	Priarie River Insignificant	None	None	None
VEGETATION	No significant effects.			No significant effects.		No significant effects.
FISHERIES	Prairie River Impacts.			Not Applicable.		Negligible Impacts.
WILDLIFE	Few secondary impacts.	Secondary and minor impacts.	Secondary and minor impacts.	Negligible impacts.	Few	Minor impacts.
PARKS AND WAYSIDES	Would remove roadside rest area.	Would remove roadside rest area.	No effect.	No effect.	No effect.	No effect.
VISUAL SCORE	30.2	38.3	40.3	34.5	34.5	37.8

TABLE 1 (Continued)
SUMMARY OF ENVIRONMENTAL CONSEQUENCES

	SEGMENT FOUR			SEGMENT FIVE		NO ACTION
	4A	4B	4C	5A	5C	
POPULATION Persons Relocated:	34	19	0	19	8	0
HOUSING Units Removed:	13	7	0	7	3	0
PUBLIC SERVICES AND FACILITIES		No adverse effect.		No adverse effect.		Some access difficulties.
ECONOMIC AND FISCAL CONDITION Business Relocated:	3	1	0	0	0	0
Other Effects:	Same as Segment One. Relocation effects can be mitigated.	May harm local economies of Marble and Calumet by diverting traffic away from town.		Same as Segment One.		No short-term construction benefits. May harm long-term growth of local economies.
HISTORIC AND ARCHAEOLOGIC RESOURCES		No adverse effects.		No adverse effects.		No adverse effects.
COMMUNITY DEVELOPMENT	Beneficial but some relocation required.	May harm local economy.	May harm local economy.	Beneficial but some relocation required.		May retard community growth over long term.
BICYCLISTS Road Rating:	Good	Good	Good	Good	Good	Fair-Unsatisfactory
WETLANDS Acres and (Habitat Units) Impacted:	7.6 (610)	29.4 (2,136)	19.9 (1,506)	13.3 (950)	4.5 (336)	0 (0)
FLOODPLAINS Encroachments:	None	None	None	None	None	None
VEGETATION		No significant effects.		No significant effects.		No effects.
FISHERIES		Negligible impacts.		Potential impacts.		No impacts.
WILDLIFE	Major impacts.	Minor impacts.	Minor impacts.	Minor impacts.	Minor impacts.	No impacts.
PARKS AND WAYSIDES	No effect.	Air, noise, and visual impacts on beach site.	No effect.	No effect.	No effect.	No effect.

TABLE 1 (Continued)
SUMMARY OF ENVIRONMENTAL CONSEQUENCES

	SEGMENT ONE			SEGMENT TWO		SEGMENT THREE
	1A	1B	1C	2A	2D	3A
AIR QUALITY Violations:	None	None	None	None	None	None
TRANSPORTATION Level of Service:	B	B	B	A	A	A
NOISE Residences Impacted						
- Federal Standard:	0	0	0	0	0	0
- State Daytime Standard:	36	19	18	22	0	1
- State Nighttime Standard:	117	78	46	51	9	11
RIGHT-OF-WAY ACQUISITIONS (Acres)	165	180	165	20	65	150
AGRICULTURE Acres of Actively Farmed Land Removed:	165	177	165	0	0	0
Prime & Statewide Land Removed (Acres):	108	118	100	19	64	78
CONSTRUCTION	Non Significant air, noise, water, and traffic impacts.			Same as 1A.		Same as 1A.
ESTIMATED COST	$12,840,000	$12,800,000	$12,870,000	$510,000	$2,500,000	$6,550,000

TABLE 1 (Continued)
SUMMARY OF ENVIRONMENTAL CONSEQUENCES

	SEGMENT FOUR			SEGMENT FIVE		NO ACTION
	4A	4B	4C	5A	5C	
VISUAL SCORE	36.1	36.1	32.1	30.6	33.0	Same as 1, 2, 4, 5-A. No additional river impacts.
AIR QUALITY Violations:	None	None	None	None	None	None
TRANSPORTATION Level of Service:	A	A	A	A	A	E - In Grand Rapids D - Grand Rapids/Coleraine C - Coleraine to Pengilly
NOISE Residences Impacted						
- Federal Standard:	0	0	0	0	0	
- State Daytime Standard:	8	0	3	0	0	
- State Nighttime Standard:	33	3	27	10	1	
RIGHT-OF-WAY ACQUISITION (Acres)	65	165	145	80	140	
AGRICULTURE Acres of Actively Farmed Land Removed:	0	164	0	0	137	0
Prime & Statewide Land Removed (Acres):	68	55	36	30	58	0
CONSTRUCTION		Same as 1A.		Same as 1A.		None
ESTIMATED COST	$7,790,000	$8,070,000	$7,510,000	$9,810,000	$7,570,000	N.A.

the roadway near the park would result in slightly lower air quality, noticeable increases in traffic noise and major visual impacts to the recreation area. There are no entirely effective measures to mitigate these potential impacts.

5) Wetlands and Wildlife - Major wildlife impacts are associated with Alternative Alignment 4A, more specifically the possible encroachment into the north end of Mud Lake. This action would likely result in adverse impacts to double-crested cormorants and great-blue herons.

   A structured crossing of this area is presently being considered as a design alternative because of the physical constraints at the site and a technical and economic feasibility study is being prepared. If the structured crossing alternative is selected, the impacts associated with the wetland crossing would be minimized.

1.4.2 Non-significant Adverse Impacts

Seven types of non-significant adverse impacts were identified.

1) Wetlands - Between 23 and 36 minor wetlands could be impacted depending on the combination of alternatives chosen. Specific mitigations for these impacts will be determined at a later date in accordance with established habitat evaluation procedures. However, the mitigations will likely consist of replacement of the wetlands lost to road construction and/or habitat improvements at other wetlands.

2) Wildlife - The increased width of roadway associated with widening from a two-lane to a four-lane divided expressway will create an additional barrier for small mammals, reptiles, and amphibians.

   In addition, increased siltation into waterbodies adjacent to the expressway could result in a reduction of fish numbers thereby creating an indirect impact to the area's populations of bald eagles and ospreys that prey on these fish stocks in the project lakes.

   Alternatives 4B and 4C could potentially affect the success of the sharptail grouse reintroduction project proposed by the Mn/DNR. The translocation site is south of the project area, however it is close enough so that project-related alterations and disturbances could result in indirect impacts.

All alignments in segments 4 and 5 will produce some minor ring-necked duck nesting habitat loss, primarily in the vicinity of Mud Lake and Oxide Lake.

3) Vegetation - The proposed project would result in the loss of vegetative cover, less so under the A Alternatives than the others. In any case, this impact is not expected to be significant because of the relatively small amount of vegetation removed and the absence of any outstanding examples of vegetation that would be affected.

4) Economic - Alternatives 4B and 4C could harm the economies of Calumet and Marble by diverting traffic away from local businesses and/or compelling the relocation of businesses dependent on highway traffic. In addition, the No-Action Alternative would retard the long-term growth of the economy of the Study Area by impeding traffic flow and discouraging the expansion of existing businesses or the location of new businesses along this portion of TH 169.

5) Visual - The new bridges across the Prairie River associated with Alternatives 1B or 1C could create a visual impact for river users and some residents.

6) Farm Land - Farming is not a significant activity in the Study Area mainly because of the very short growing season. However, there would be a loss of up to 37 acres of actively farmed land and up to 386 acres of prime and statewide-significant farmland, depending on the combination of alternatives chosen. In addition, up to seven parcels of farmed land which are forty or more acres in size could be severed. Operations at the University of Minnesota North Central Experiment Station would also be impacted with the loss of a number of experimental plots west of the Prairie River, and if Alternative 1B is chosen, the loss of approximately fifteen acres of tilled land east of the Prairie River.

7) Construction - The construction of the roadway would result in temporary and non-significant air, noise, water, and traffic impacts. These impacts would likely be greatest with the alternatives involving construction along the existing roadway.

1.4.3 Beneficial Impacts

Six types of beneficial impacts were identified.

1) Transportation - A major beneficial impact associated with the Action Alternatives would be the improvement of

traffic flow and safety. Year 2005 traffic would operate at Level of Service A or B compared to Level of Service C, D, or E for the No-Action Alternative. In addition, the construction of a four-lane expressway should result in a reduction in the number of traffic accidents in the Study Area.

2) Economic - Short and long-term economic impacts would accrue to the Study Area and Itasca County as a result of construction of the roadway and the improved access to business and industrial sites. Community development would be assisted by long-term economic gains.

3) Wetlands - The proposed drainage system for the project includes the creation of up to twenty new ponding areas and wetlands. These new wet areas will minimize the impacts associated with increases in highway related runoff, provide replacement of wet areas lost in other parts of the project, and provide new wildlife habitat.

4) Bicycle - The construction of a four-lane expressway with ten-foot paved shoulders and a separation between opposing lanes of traffic would improve the bicycle rating from Unsatisfactory with the No-Action Alternative to Good under the Action Alternatives.

5) Joint Development - The Action Alternatives would present opportunities for the development of roadside parks and rest areas in conjunction with the Minnesota Department of Natural Resources. Potential locations include the Prairie River, Trout Lake, Twin Lake, Snowball Lake, and Oxhide Lake.

6) Energy - There would likely be a relatively small savings in motor fuels under the Action Alternative as a result of smoother traffic operations.

1.4.4 Environmentally Neutral Issues

The following areas were analyzed, and it was determined that the proposed project would not result in any impact, either adverse or beneficial.

- o Air Quality
- o Fisheries
- o Rare, Threatened and Endangered Species
- o Section 4(f) and Section 106 Lands

1.5 AREAS OF CONTROVERSY

The following issues have been the subject of public controversy during the scoping, design, and impact identification

process that has taken place thus far on this proposed project.

1. In Segment One (Grand Rapids to Coleraine), should the selected alignment follow the present roadway or one of the other Alignment Alternatives? If the present alignment is chosen, a number of homes and businesses would have to be acquired for right-of-way. If an alternative route is chosen, the effects of the roadway would be introduced into areas that are relatively undisturbed, and some land parcels would be severed.

2. In Segment Four, should the selected alignment follow the present roadway through Calumet and Marble or go to the south of Mud Lake and miss those communities altogether? If the present alignment is chosen, homes, businesses, and other private real estate would have to be acquired for extra right-of-way. If the road goes to the south, there is concern that the local economies may be adversely affected. A southern alignment may also adversely affect a public swimming beach at Twin Lakes.

3. In Segment Five (Calumet to Pengilly), should the selected alignment stay along the present roadway and cause the acquisition of private property or should it take the alternative alignment (which also requires acquisition and relocation) and introduce the highway into a relatively undisturbed area?

1.6 PROJECT SCHEDULE AND COSTS

The total estimated cost of the project is between $38 and $40 million and construction is anticipated to begin in 1989. Because of the scope of the project and funding availability, actual construction is expected to take place in a series of logical stages with lettings spread over a period of several years.

There is currently $5 million in the Department's 1989 work program and an additional $7 million in fiscal year 1991 for TH 169 improvements. Based on this concept of staged construction and continued funding for TH 169, it is expected that the Cross Range Expressway will be completed in the 1997-2000 time frame.

1.7 OTHER REQUIRED GOVERNMENTAL ACTIONS

In accordance with Federal guidelines, the following governmental agencies were asked to cooperate in the preparation of this document.

- o U.S. Army Corps of Engineers
- o U.S. Fish and Wildlife Service

- o Minnesota Department of Natural Resources
- o Minnesota Pollution Control Agency

The U.S. Army Corps of Engineers will be asked to review and approve any changes to floodplains, including those associated with non-riparian wetlands as well as the Prairie River. An application for a Section 404 permit will be submitted to the Corps of Engineers, requesting authorization to perform work in or affecting public waters.

The U.S. Fish and Wildlife Service will be asked to review the proposed project and assist in the determination of wetland impacts and appropriate mitigations.

The Minnesota Department of Natural Resources (DNR) will be asked to review the proposed project and assist in the determination of wetland impacts and appropriate mitigations. In addition, an application will be submitted for a permit to work in public waters.

The Minnesota Pollution Control Agency (PCA) will be asked to review the proposed project for compliance with State and Federal guidelines for air quality, traffic noise, construction noise, and water quality.

2.0 PURPOSE OF AND NEED FOR ACTION

2.1 INTRODUCTION

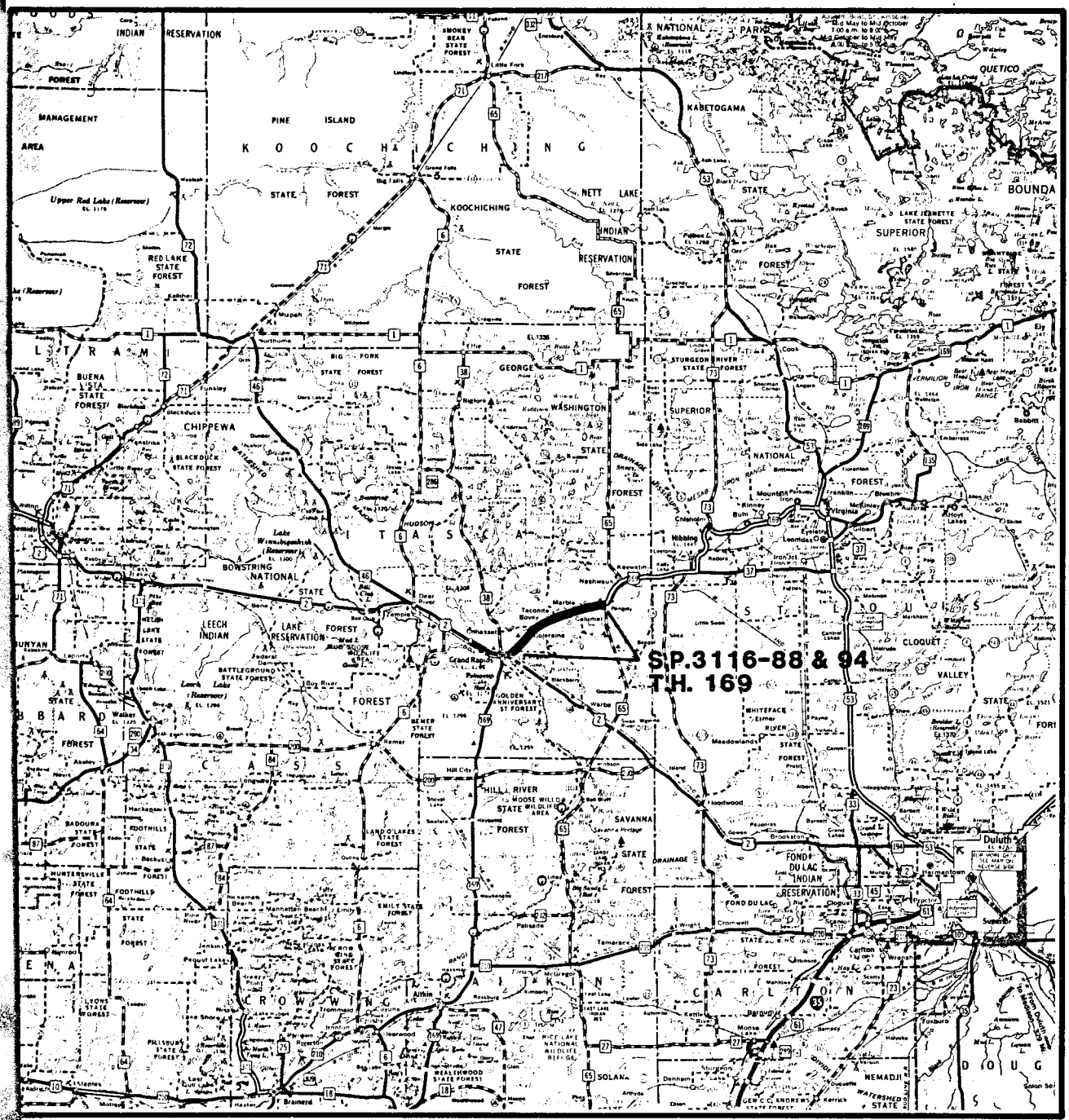
2.1.1 Project Location and Description

The proposed project involves the improvement of Trunk Highway (TH) 169 from the junction with TH 2 in Grand Rapids to the junction with TH 65 near Pengilly (Figure 3). The eighteen-mile segment of roadway is planned to be upgraded from a primarily two-lane highway to a four-lane expressway.

2.1.2 Project Objectives

The objectives of the proposed highway construction project are as follows:

- To complete the Cross-Range Expressway which has been built from Virginia to Pengilly, Minnesota.
- To provide a consistent four-lane divided roadway design along TH 169 from Virginia to Grand Rapids, Minnesota.
- To provide a high quality of traffic operations and a high level of motorist comfort and convenience along the entire length of the project.
- To replace deficient bridges, underpasses, and railroad crossings.
- To improve mobility across the Iron Range.
- To stimulate and support business expansion and long term economic growth in the Region by investing in transportation facility improvements.
- To provide a ten-ton route on a year-around basis for logging and other heavy trucks.
- To improve user safety.



CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

Figure 3

REGIONAL LOCATION MAP

0 5 10 20 MILES

NORTH

2.1.3 Previous Roadway Investments and Commitments

Trunk Highway 169 is a principal arterial roadway and is the only major roadway connecting the Iron Range communities. As a result, the highway acts both as a commuter route to the major employment centers along the Iron Range as well as a route for all other daily personal and business trips. In addition, the roadway serves recreational traffic during the summer months, as indicated by summer traffic volumes which are fifty percent over those of the winter months.

This eighteen-mile section of TH 169 was originally graded in 1921, and a concrete surface was added in 1922. Since then a variety of improvement projects have been completed including realigning the original roadway in the vicinity of several sharp curves; adding curb and gutter in the urban areas; widening the road bed and surface; adding right turn lanes at the major county road intersections and driveways to major traffic generators; and constructing some short sections of four-lane roadway in Grand Rapids and Coleraine. The portions of the roadway in Grand Rapids, La Prairie, Bovey and Calumet are on the original alignment and road bed. The remaining portions of the roadway have been either partially or totally realigned.

The Minnesota Department of Transportation has made previous commitments to area residents and has already made a considerable effort to provide an expressway all the way across the Iron Range. The eighteen-mile segment from Grand Rapids to Pengilly is the only unbuilt portion in this system.

2.2 ROLE IN THE REGIONAL TRANSPORTATION SYSTEM

2.2.1 Relevant Plans and Policies

A recommendation to provide a four-lane divided Cross Range Expressway between Virginia and Grand Rapids was first documented in Mn/DOT's Interim Service Level Classification Study of 1966. In addition, the Mn/DOT Plan of 1978 further recommended that the two-lane portion of TH 169 between Grand Rapids and Pengilly be improved to a design consistent with the remainder of the Cross Range Expressway. Based upon that study and recommendation, $5,000,000 was programmed in the Mn/DOT 1984-1989 Highway Improvement Work Program for bridge replacement along this segment of TH 169. The recommendation to upgrade TH 169 is also reflected in the current Mn/DOT Twenty-Year Plan (October, 1984), which calls for construction of a four-lane expressway between Grand Rapids and Pengilly by the year 2000. This action from the Twenty-Year Plan is based on "reasonable expectations of funding."

Major improvements to TH 169 are also recommended by the Arrowhead Regional Development Commission (ARDC). The ARDC's "twenty year highway investment strategy" indicates that four-lane construction between Grand Rapids and Pengilly should be completed by the year 2000.

Finally, State efforts to improve the economic climate along the Iron Range would be fostered by improvements to TH 169. A report prepared by the 1984-1985 Executive Branch Policy Development Program discussed the state transportation system and identified "the factors in the system which present a limit or barrier to effective economic growth." A major cause of difficulties to the companies which took part in the study was found to be weight restrictions on the state's roads. TH 169 was shown in that study as a main supply route for the forest products industry and was identified as a route constraint because of springtime weight restrictions. It should be noted that these spring weight restrictions were recently lifted, however, the load carrying capability of the roadway has not been increased. As a result the existing roadway is now subject to heavier wheel loads during the most critical time of the year without a corresponding increase in structural capacity.

2.3 EXISTING AND FORECAST CONDITIONS

Four aspects of the subject section of TH 169 deserve consideration in determining the purpose of and need for action. They are: (1) physical design, (2) level of service, (3) safety, and (4) design consistency.

2.3.1 Physical Design

TH 169 is a two-lane, 24-foot wide, bituminous surfaced roadway in the rural areas between communities. Two twelve-foot traffic lanes are provided along with eight-foot bituminous shoulders and rural-type drainage in ditches and culverts.

In the communities of Grand Rapids, Coleraine, Bovey and Calumet the road surface has been widened and an urban drainage system, with concrete curb and gutter, provided. However, a consistent urban road design has not been provided. The actual design is as follows:

- Grand Rapids - A fifty-foot, four-lane undivided roadway is provided.
- Coleraine - A four-lane divided roadway is provided, the actual width varies.
- Bovey and Calumet - A 46-foot, two-lane roadway plus parking is provided.

Typical existing roadway designs are shown in Figure 4 and the major roadway characteristics are summarized in Table 2.

An analysis of these major roadway characteristics plus a field review of the roadway indicates the following deficiencies:

1) Four bridges with less than adequate horizontal clearance.

2) Three bridges with less than adequate vertical clearance.

3) Several locations with less than adequate stopping sight distance.

4) A significant portion (approximately 32 percent) of the two-lane roadway with less than adequate passing sight distance.

5) Several locations with less than adequate intersection sight distance.

6) Several locations with less that adequate clear roadside border areas.

7) A considerable portion of the roadway without control of access from abutting properties.

2.3.2 Level of Service

During the planning phase for major highway improvement projects, analyses of the traffic carrying capabilities of existing and proposed facilities are typically conducted. The purpose of these studies is to determine the quality of traffic flow under both existing and forecast design year traffic volumes (Figure 5), in order to ensure that the proposed roadway will adequately serve traffic volumes throughout its expected design life.

The method of analysis used by most transportation professionals is called a Capacity Analysis, and is based on recommended procedures contained in the Highway Capacity Manual[1/], a document prepared by the Transportation Research Board. A Capacity Analysis provides a method of objectively measuring the quality of traffic flow along a segment of

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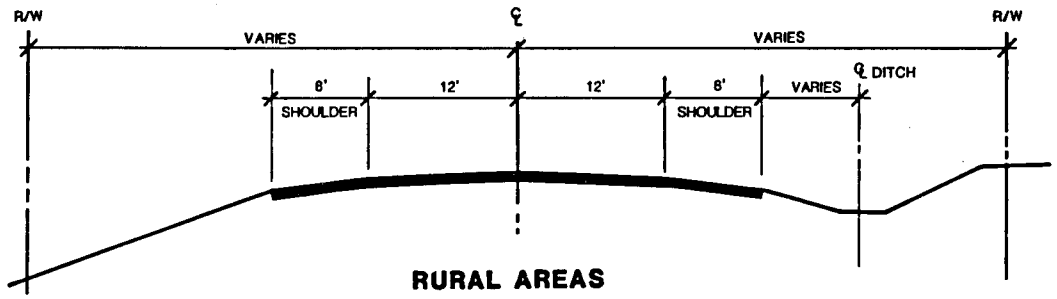
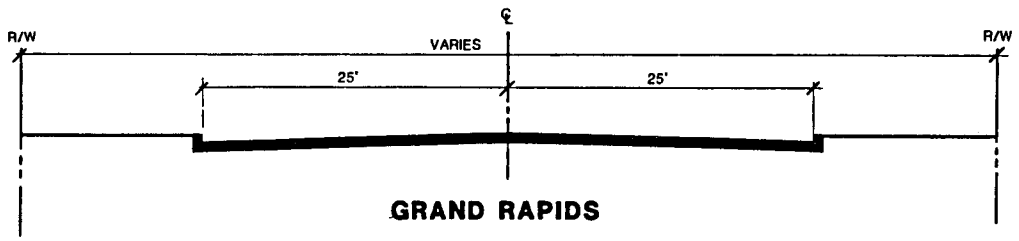
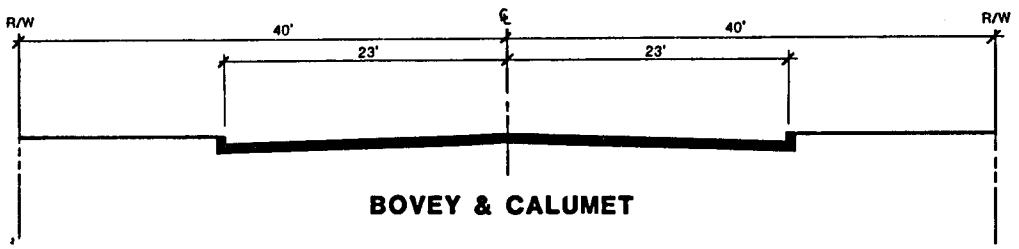
1/ Highway Capacity Manual, Special Report 209, Transportation Research Board, National Research Council, Washington, D.C., 1985.



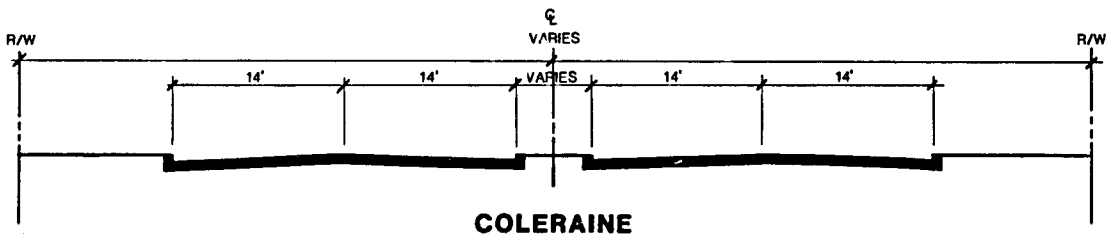
RURAL AREAS



GRAND RAPIDS



BOVEY & CALUMET



COLERAINE

CROSS RANGE EXPRESSWAY

T.H. 169

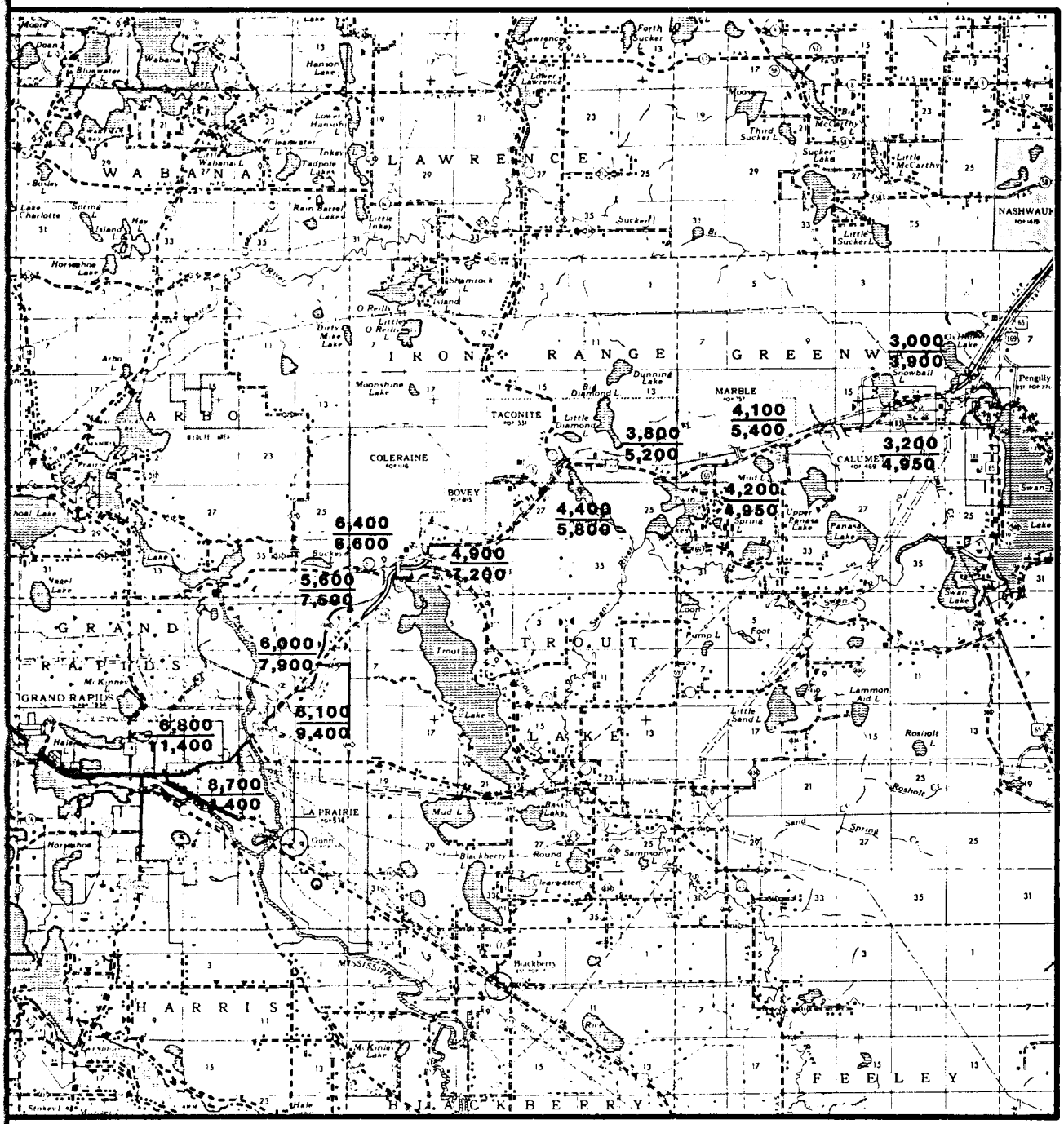
GRAND RAPIDS TO PENGILLY

Figure 4

TYPICAL EXISTING ROAD DESIGNS

TABLE 2
EXISTING ROADWAY CHARACTERISTICS

SEGMENT	LENGTH	DRIVING LANES	SHOULDERS	SPEED LIMIT	ALIGNMENT	RIGHT-OF-WAY	BRIDGES	NO PASSING ZONES
In Grand Rapids	0.3 Mi.	4 lanes at 12 ft.	None	30 MPH	Tangent	80-150 ft.	None	N.A.
Grand Rapids to Coleraine	4.8 Mi.	2 lanes at 12 ft.	8 feet	55 MPH	6 curves 2°30' Max.	150-425 ft.	2	25%
In Coleraine	1.2 Mi.	4 lanes at 12 ft.	None	40 MPH	2 curves 9° Max.	85-385 ft.	2	N.A.
In Bovey	0.9 Mi.	2 lanes at 12 ft.	11 feet	30 MPH	2 curves 140° Max.	66-80 ft.	None	N.A.
Bovey to Calumet	6.7 Mi.	2 lanes at 12 ft.	8 feet	55 MPH	12 curves 3° Max.	108-315 ft.	1	28%
In Calumet	0.4 Mi.	2 lanes at 12 ft.	11 feet	30 MPH	2 curves 4° Max.	100-150 ft.	1	N.A.
Calumet to Pengilly	3.5 Mi.	2 lanes at 12 feet	8 feet	55 MPH	5 curves 2°30' Max.	125-300 ft.	4	55%



CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

Figure 5

AVERAGE DAILY TRAFFIC VOLUMES, 1982 & 2005

000 1982 ADT

XXX FORECAST 2005 ADT

0 5 10 20 MILES

NORTH

roadway. Six levels of traffic flow are typically considered and are usually given letter designations from A to F, with Level of Service A representing the best operating conditions and F the worst.

Qualitatively speaking, the various levels of traffic flow along a roadway segment can be described as follows:

Level of Service A - Light traffic, free flow, extremely high level of motorist comfort and convenience.

Level of Service B - Moderate traffic, stable flow, high level of motorist comfort and convenience.

Level of Service C - Moderately heavy traffic, stable flow, general level of motorist comfort and convenience declines noticeably at this level.

Level of Service D - Heavy traffic, stable flow, generally poor level of motorist comfort and convenience.

Level of Service E - Very heavy traffic, unstable flow, operating conditions near the capacity, extremely poor levels of motorist comfort and convenience.

Level of Service F - Forced or breakdown flow, with operations characterized by extremely unstable stop and go waves.

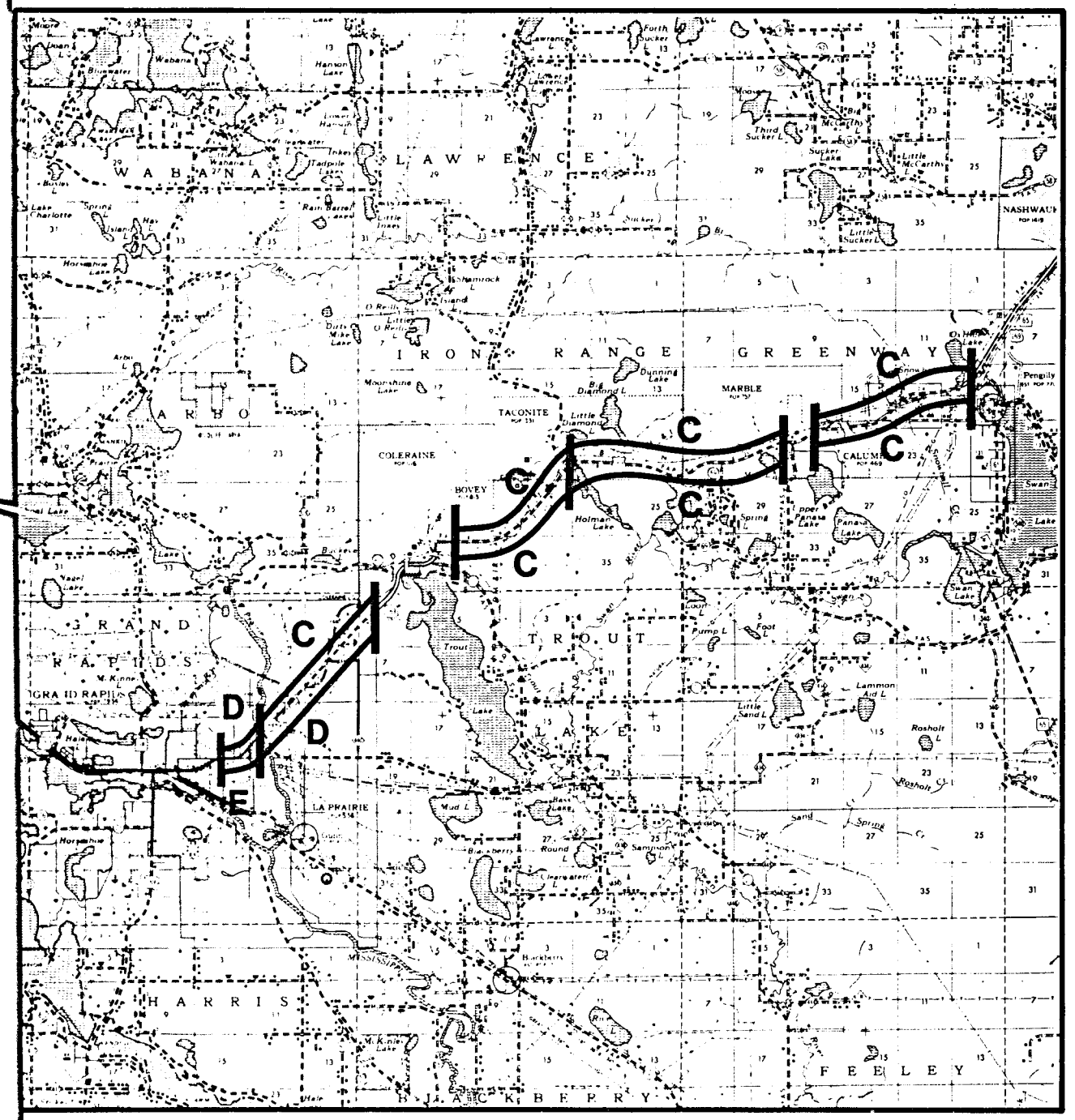
It should be noted that in most areas Level of Service B is recommended for rural highway design. In addition, it is the Department of Transportation's policy to provide a Level of Service B operation on multi-lane rural roadways, such as the Cross Range Expressway.

The two-lane sections of existing TH 169 were analyzed and the Level of Service (which is basically a function of passing opportunities and the number of trucks and recreational vehicles in the traffic stream) was determined for both existing and forecast traffic volumes. The results of this analysis are documented in Table 3 and Figure 6 and indicate the following:

- The existing two-lane section between Grand Rapids and the Prairie River presently operates at Level of Service D.
- All other two-lane sections presently operate at Level of Service C.

TABLE 3
TWO-LANE ROADWAY LEVEL OF SERVICE

LOCATION/SEGMENT	GRADE	HEAVY COMMERCIAL TRAFFIC	NO PASSING	DESIGN HOUR VOLUME 1982/2005	LEVEL OF SERVICE 1982/2005
Grand Rapids - Prairie River	Rolling	4.3%	27%	1,000/1,480	D/E
Grand Rapids - Coleraine	Rolling	4.7%	24%	790/1,125	C/D
Bovey - Holman Lake	Rolling	5.1%	20%	600/790	C/C
Holman Lake - Calumet	Rolling	5.0%	34%	520/690	C/C
Calumet - Pengilly	Rolling	5.6%	55%	400/510	C/C



CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

Figure 6

LEVEL OF SERVICE 2 LANE RURAL SECTIONS

C 1982 EXISTING CONDITIONS

D 2005 FORECAST VOLUMES

0 5 10 20 MILES

NORTH

- o If TH 169 is not upgraded and traffic volumes increase as expected, the quality of traffic flow on the segment between Grand Rapids and Coleraine will drop to Level of Service E west of the Prairie River and Level of Service D east of Prairie River.

- o With forecast traffic volumes the quality of traffic flow on all segments east of Bovey is expected to remain the same as with the present conditions.

A capacity analysis of the proposed expressway design was then completed. This analysis indicates that the proposed four-lane, divided roadway will provide a Level of Service B or better throughout the entire project area. This high level of traffic operations is consistent with the Level of Service (A or B) presently provided on the remainder of the Cross Range Expressway.

2.3.3 Safety

Analysis of the documented accident statistics for this segment of TH 169 and appropriate District 1 and statewide average accident rates indicates the following (Table 4):

- o No segment of existing TH 169 has a significant accident problem. The actual accident rates are less than the statewide averages for comparable roadways.

- o If an expressway were constructed between Grand Rapids and Pengilly, the number of accidents occurring in the corridor would be expected to decrease because the statewide average accident rate for rural expressways is less than the accident rate on most segments of existing TH 169.

Further analysis of the accident data supports the contention that the project will result in an overall reduction of accidents even though no segment of existing TH 169 has a significant accident problem. A review of the accident listing for the entire segment indicated that the four most common types of accidents now occurring, run off the road - 26 percent, rear end - nineteen percent, left turn - nine percent, and head on - six percent, are all susceptible to correction by providing typical design features associated with new expressways.

The new roadway will provide a clear border area adjacent to the traffic lanes. This will minimize the possibility of vehicles leaving the roadway sustaining any damage and maximize the chances of those errant vehicles recovering and returning safely to the roadway. While a clear border area

TABLE 4
ACCIDENT STATISTICS

Location	Road Design	No. of Accidents 1981	1982	1983	Segment Length	ADT	Acc.* Rate
Grand Rapids	Four-lane urban	8	4	7	0.34	8,700	5.9
La Prairie	Two-lane urban	4	3	5	0.27	7,200	5.6
La Prairie to Coleraine	Two-lane rural	12	11	17	4.44	6,300	1.3
Coleraine	Four-lane divided	6	6	2	1.37	5,200	1.8
Bovey	Two-lane urban	5	1	0	1.01	5,500	1.0
Bovey to Marble	Two-lane rural	6	7	4	4.71	4,200	0.8
Marble	Two-lane rural	2	2	5	1.71	4,100	1.2
Calumet	Two-lane urban	0	3	2	0.56	4,100	2.0
Calumet to Pengilly	Two-lane rural	8	4	5	3.65	3,100	1.4
TOTAL:	Four-lane urban	8	4	7	0.34	8,700	5.9
	Four-lane divided	6	6	2	1.37	5,200	1.8
	Two-lane urban	9	7	7	1.84	5,300	2.2
	Two-lane rural	28	24	31	14.54	4,500	1.2
	Total	51	41	47	18.10		

* Accidents Per Million Vehicle-Miles.

Typical statewide average accident rates by roadway design type:

- o Four-lane urban - 10 accidents per million vehicle miles.
- o Four-lane divided - 3 accidents per million vehicle miles.
- o Two-lane urban - 4.5 accidents per million vehicle miles.
- o Two-lane rural - 1.5 accidents per million vehicle miles.
- o Rural Expressway - 1.1 accidents per million vehicle miles.

will probably not reduce the number of vehicles which run off the road, it should reduce the number and severity of those incidents which actually result in reported accidents.

The proposed expressway design will limit the number of access points and median cross-overs. In addition, turning lanes will be provided at all cross-overs, public road intersections and major driveways. These features should result in a reduction in the number of rear end and left-turn accidents.

The proposed expressway design will also provide either a recovery area or a barrier between opposing lanes of traffic. This feature should result in either a significant reduction or the elimination of the head-on type of accident, the type of accident which has resulted in two fatalities during the period 1981 through 1983.

2.3.4 Design Consistency

The role of expectation and perception in driving performance cannot be overemphasized. A major task of highway designers and engineers is to use all devices and techniques available to shape and manipulate driver expectation so that drivers will encounter as few surprises as possible.

The two most important ways of accomplishing this task are listed below:

1) Avoid unusual or nonstandard designs and consistently apply design elements throughout a highway segment.

2) Care should be taken to maintain consistency from one highway segment to another.

For this project the first task will be accomplished by providing design features in conformance with Mn/DOT's guidelines for multi-lane rural expressways. The second task will be accomplished by providing a four-lane expressway design for the eighteen-mile segment currently under consideration which is consistent with the forty-mile segment previously constructed between Pengilly and Virginia.

2.4 USER BENEFITS

Benefits to the users of TH 169 from a four-lane expressway design include the following:

- o Increased motorist comfort and convenience.
- o Reduced travel times.
- o Improved traffic safety.

- o Increased tourist enjoyment as a result of the increased ease of driving.
- o Improved interaction among residents as a result of greater mobility.

TH 169 is essential for transporting residents of this portion of the Iron Range to work, school, public services, health care, and social or recreational activities. The importance of TH 169 is increased because the network of supporting county, township, and local roads normally found in rural areas is missing largely as a result of mining activities. Therefore, improvements to TH 169 would have a considerable effect on the lives of residents from Grand Rapids to Pengilly.

3.0 ALTERNATIVES

3.1 DESCRIPTION OF ALTERNATIVES CONSIDERED

Two categories of alternatives were considered in the TH 169 project: (1) No-Action, and (2) Construction Alternatives. Each of these categories is described below.

3.1.1 No-Action Alternative

Under the No-Action Alternative, TH 169 would remain a basic two-lane rural road on the present alignment; however, minor improvements within the current right-of-way could be considered. Examples of such construction could include truck climbing/passing lanes, turning lanes, safety improvements, traffic control devices, and resurfacing. All existing public and private access points would remain.

3.1.2 Construction Alternatives

The construction alternatives originally consisted of two possible roadway designs and eleven alternative corridors. The two roadway designs consisted of an upgraded two-lane facility and a four-lane divided expressway. The upgraded two-lane design alternative was rejected during the Scoping process for the following reasons:

- The existing two-lane roadway does not now provide an acceptable level of traffic operations along major portions of the facility because of passing restrictions and the high percentage of slow moving commercial and recreational vehicles. (See Table 3.)

- An upgraded two-lane roadway would probably not provide an acceptable level of traffic operations in the future because of expected increases in traffic volumes and the high percentage of slow moving commercial and recreational vehicles. (See Table 3.)

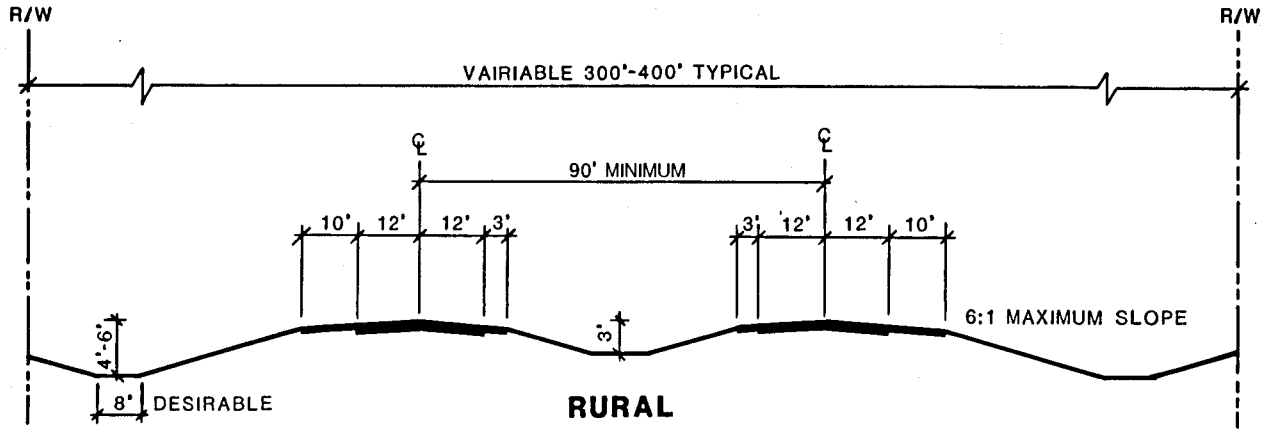
- A two-lane facility would not provide a roadway design consistent with the remainder of the Cross Range Expressway and an upgraded two-lane facility would not be in accordance with recommendations in current Statewide and Regional Transportation Plans.

Therefore, all construction alternatives now under consideration consist of providing a four-lane divided expressway with design features in accordance with the Tier I Standards for Multi-Lane Highways, documented in Section 2.6 of Mn/DOT's Road Design Manual. These design features would be provided wherever, the social, economic, and environmental impacts associated with this type of roadway design were considered acceptable. Typical cross sections are shown in Figure 7 and the major design features are outlined below:

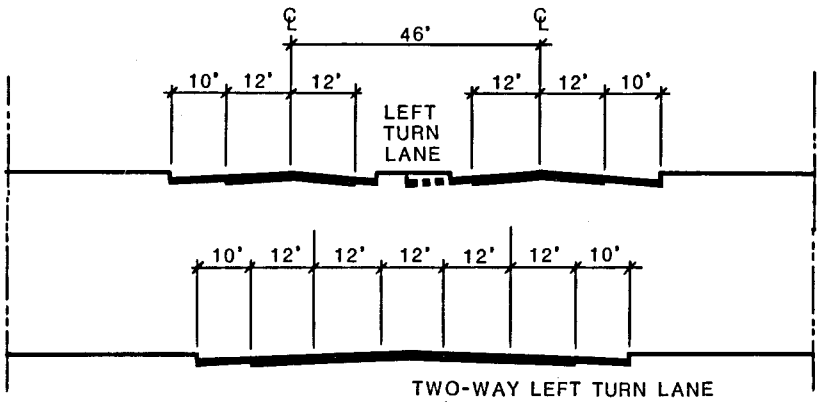
- o Design Speed: Desirable - 70 MPH
  Minimum - 60 MPH
- o Lane Widths: 12 Feet
- o Shoulders: Outside - 11.5 feet, 10 feet paved
  Inside - 4.5 feet, 3 feet paved
- o Median: Rural - Depressed median with 90 feet between centerlines of opposing roadways.
  Urban - Raised concrete median, 6-foot minimum width.
- o Horizontal Alignment: Maximum degree of curvature - 1°30'
- o Vertical Alignment: Maximum grade - 3%
- o Springtime Design Load: 10 tons/axle
- o Slopes: Maximum slope - 6:1
- o Turn Lanes: Left-turn lanes - provided at all median openings.
  Right-turn lanes - provided at all public road intersections and private driveways to major traffic generators.

A total of eleven alternative corridors were considered including the construction of a new two-lane facility adjacent to the existing two-lane roadway plus the construction of a new four-lane facility on the following new alignments:

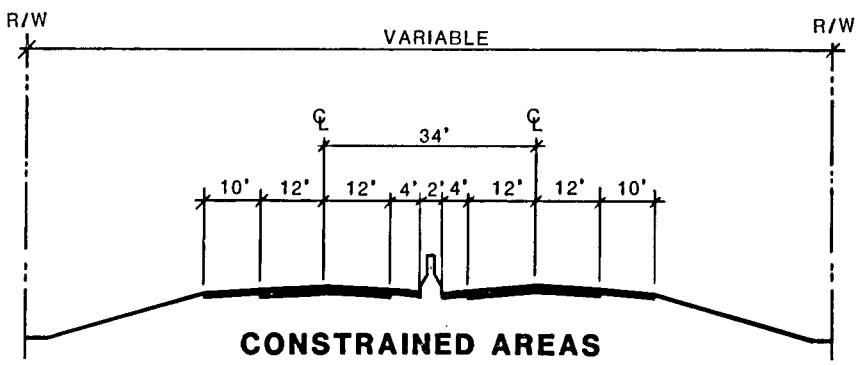
- o Between Grand Rapids and Coleraine
- o Around Bovey
- o Around Marble and Calumet
- o Between Calumet and Pengilly



RURAL



URBAN



CONSTRAINED AREAS

CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

Figure 7

TYPICAL 4-LANE CROSS SECTIONS

NOTE: Dimensions refer to paved portions of the roadway.

Within each Alternative Roadway Corridor, a preliminary centerline alignment has been developed for purposes of this Environmental Impact Statement. These preliminary alignments are illustrated in Figures 8A - 8H and are described in the following paragraphs.

Segment 1 - Grand Rapids to Coleraine

Alternative 1A follows the existing alignment of TH 169 from Grand Rapids to just west of Coleraine but widens the roadway to the north of the current alignment, thus resulting in the relocation of some existing housing and businesses. Construction would include upgrading the urban section through Grand Rapids and La Prairie, widening the bridge over the Prairie River, improving the intersection at County Road 440 and providing a new railroad bridge over the highway.

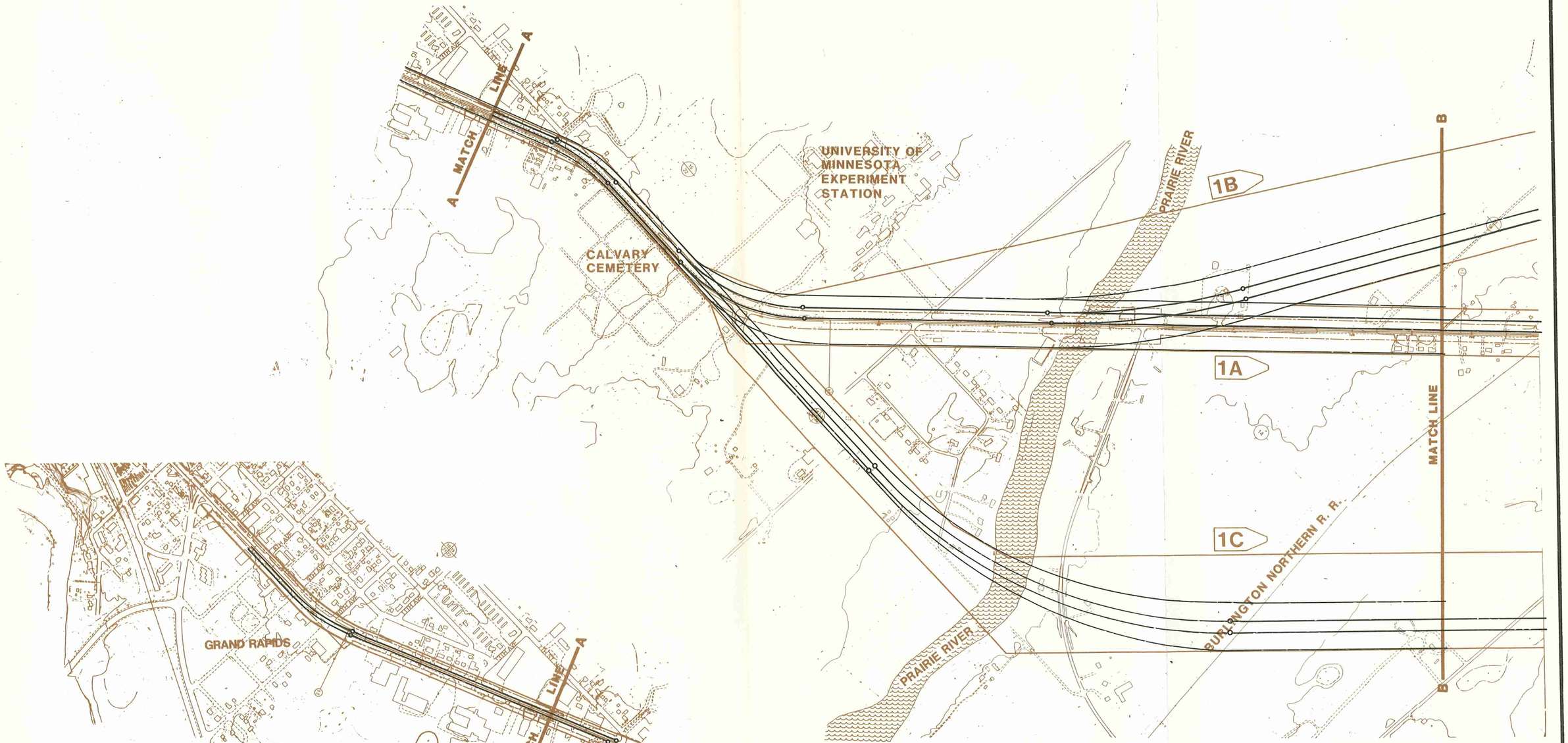
Alternative 1B follows the existing alignment through Grand Rapids and La Prairie. Just west of the Prairie River the corridor shifts approximately one-quarter mile to the north for about 2-1/2 miles, and then rejoins the existing alignment to the east. This corridor was developed in an effort to reduce impacts to existing land uses by locating the roadway in a more sparsely developed area. This alternative would involve upgrading the urban section of highway in Grand Rapids and La Prairie, and constructing a new bridge over the Prairie River, four new bridges over the Burlington Northern Railroad tracks and a new County Road 440 intersection.

Alternative 1C follows the existing alignment through Grand Rapids and La Prairie. West of the Prairie River the corridor continues easterly to a point approximately one-half mile south of the existing alignment. Turning northeasterly it rejoins the existing alignment about two miles east of the Prairie River. This alternative was also developed in order to reduce impacts on the homes along the present TH 169. Construction would again involve upgrading the urban section of highway in Grand Rapids and La Prairie, a new Prairie River bridge, two new bridges over the railroad and a new County Road 440 intersection.

All of the corridors in Segment 1 would be built to the full rural expressway cross-section wherever possible. This would include much of the alignment outside of Grand Rapids and La Prairie. Within Grand Rapids and La Prairie, an urban design is being considered.

Segment 2 - Coleraine through Bovey

Alternative 2A follows the existing alignment of TH 169 into and through Coleraine. The portion of this alternative in



CROSS RANGE EXPRESSWAY

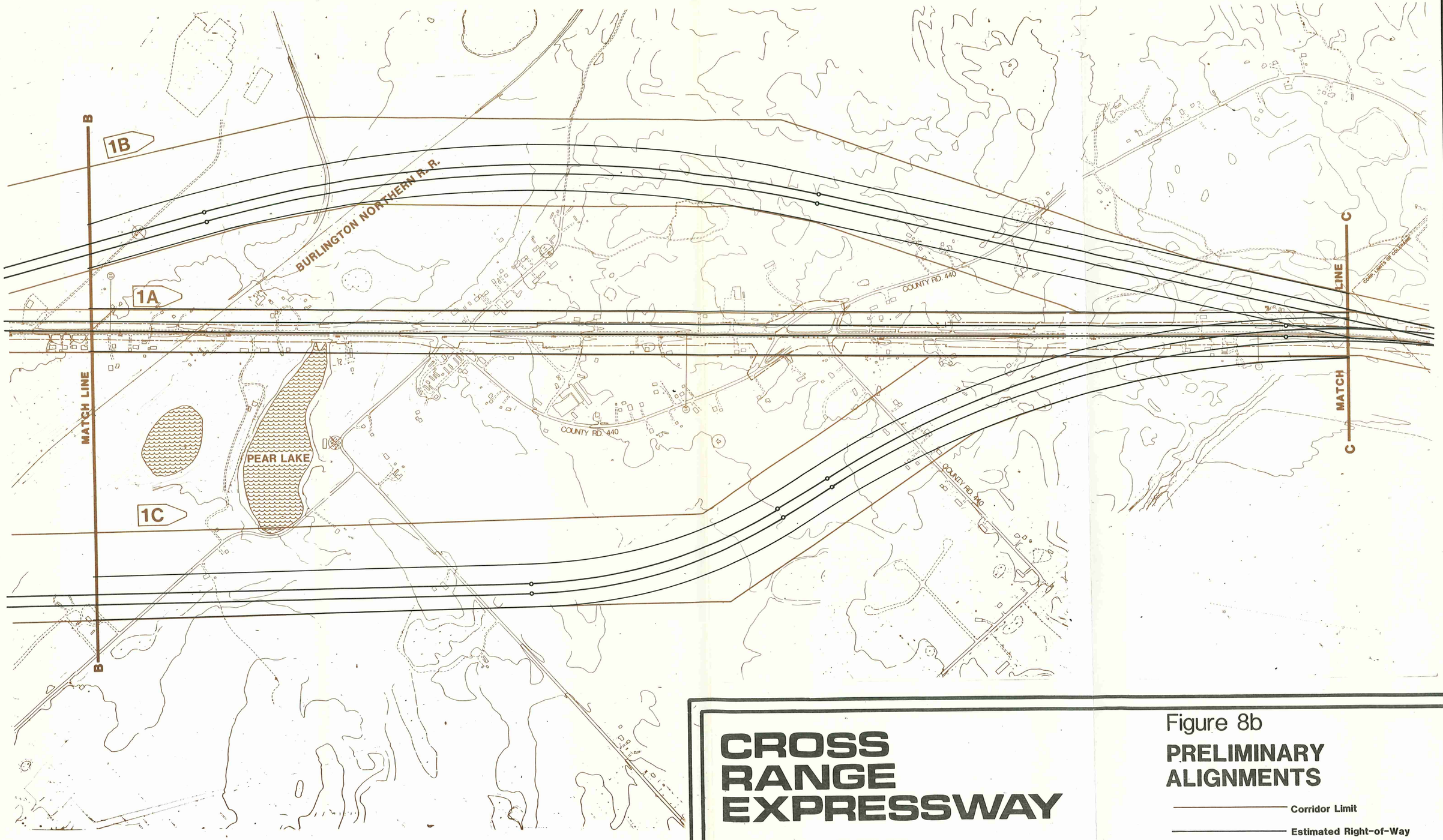
T.H. 169

GRAND RAPIDS TO PENGILLY

Figure 8a

PRELIMINARY ALIGNMENTS

- Corridor Limit
- Estimated Right-of-Way
- Proposed Highway Centerlines
- Estimated Right-of-Way
- Corridor Limit
- 3A — Alternative Alignment Designation



CROSS RANGE EXPRESSWAY

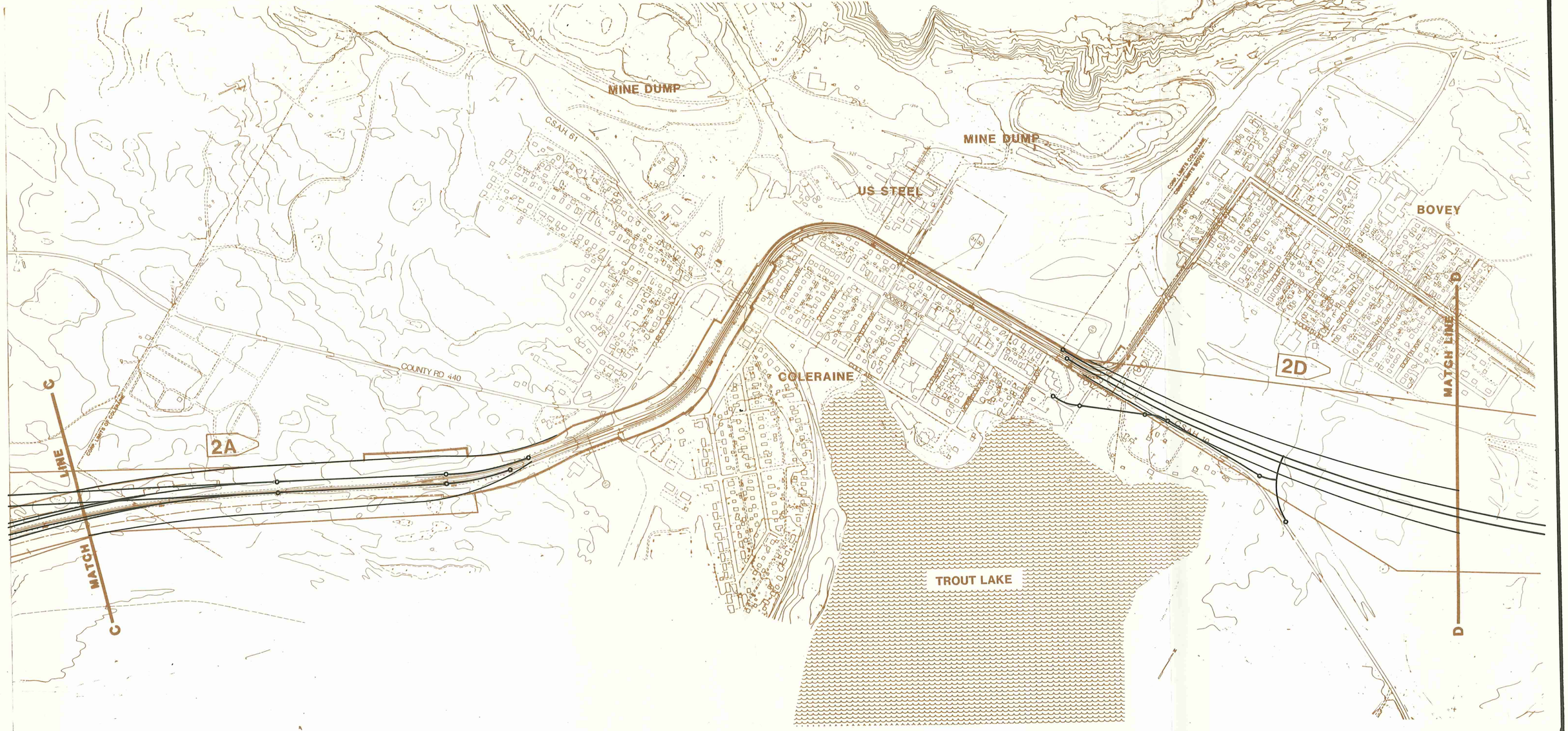
T.H. 169

GRAND RAPIDS TO PENGILLY

Figure 8b

PRELIMINARY ALIGNMENTS

- Corridor Limit
- Estimated Right-of-Way
- Proposed Highway Centerlines
- Estimated Right-of-Way
- Corridor Limit
- 3A — Alternative Alignment Designation



CROSS RANGE EXPRESSWAY

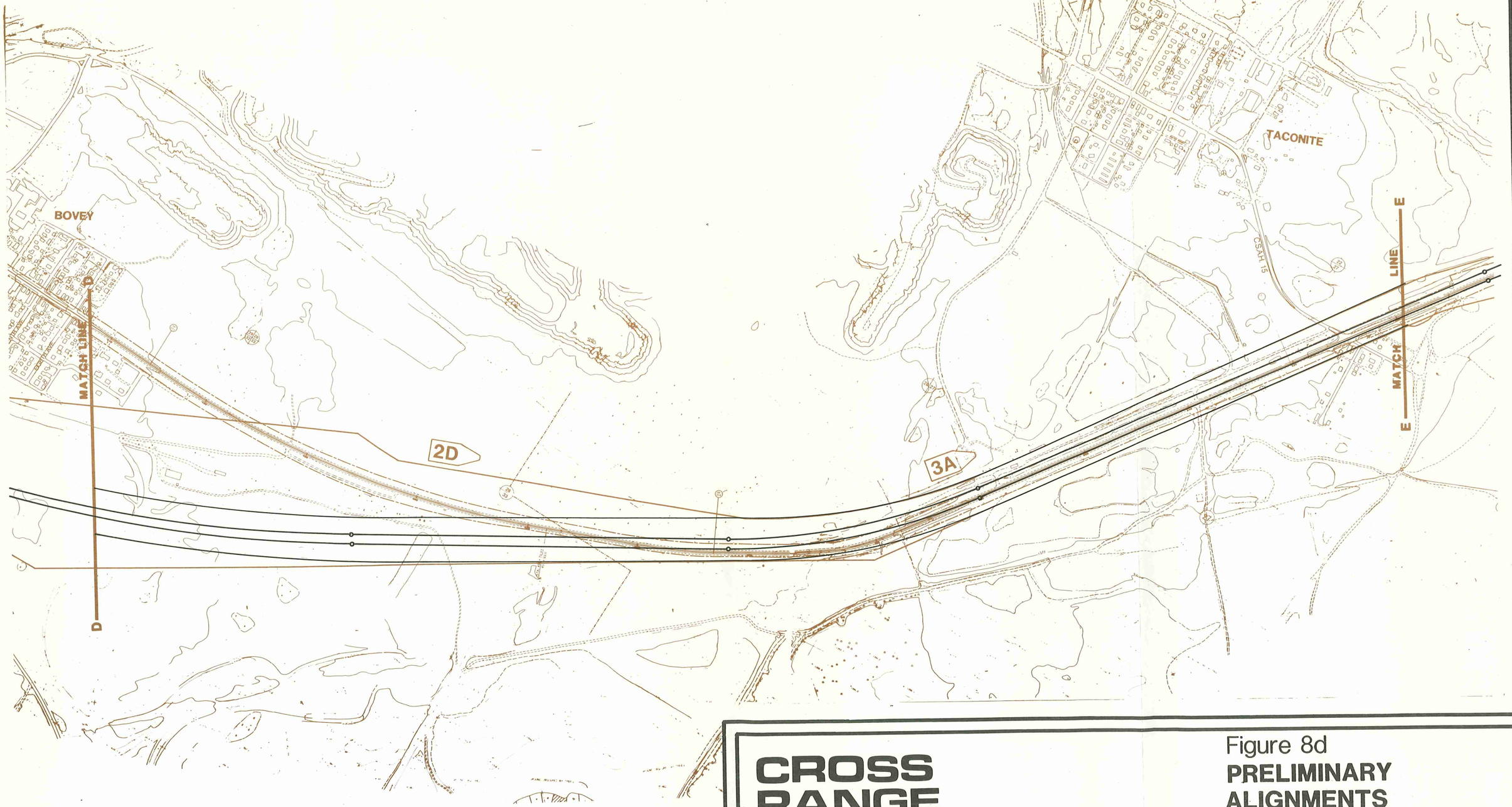
T.H. 169

GRAND RAPIDS TO PENGILLY

Figure 8c

PRELIMINARY ALIGNMENTS

- Corridor Limit
- Estimated Right-of-Way
- Proposed Highway Centerlines
- Estimated Right-of-Way
- Corridor Limit
- 3A — Alternative Alignment Designation



CROSS RANGE EXPRESSWAY

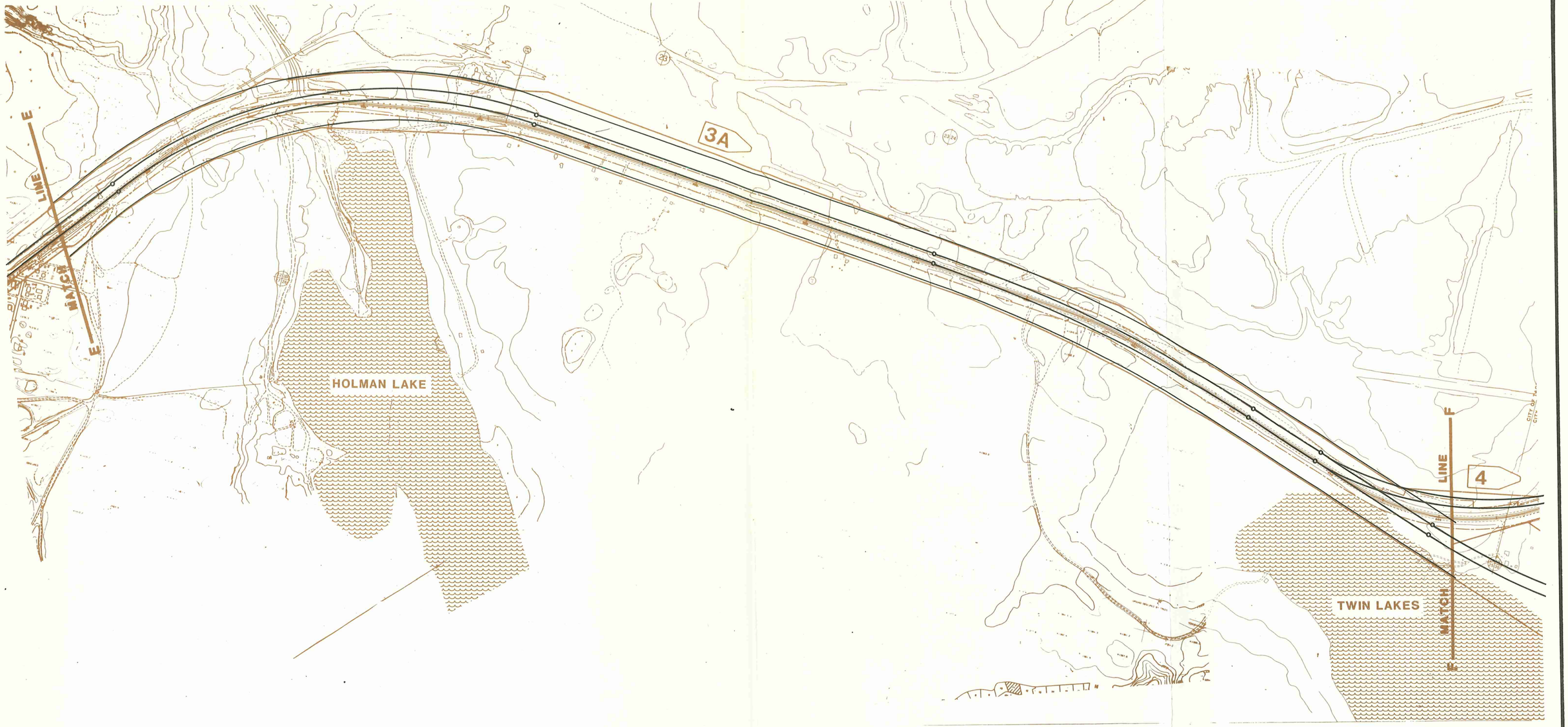
T.H. 169

GRAND RAPIDS TO PENGILLY

Figure 8d

PRELIMINARY ALIGNMENTS

- Corridor Limit
- Estimated Right-of-Way
- Proposed Highway Centerlines
- Estimated Right-of-Way
- Corridor Limit
- 3A — Alternative Alignment Designation



CROSS RANGE EXPRESSWAY

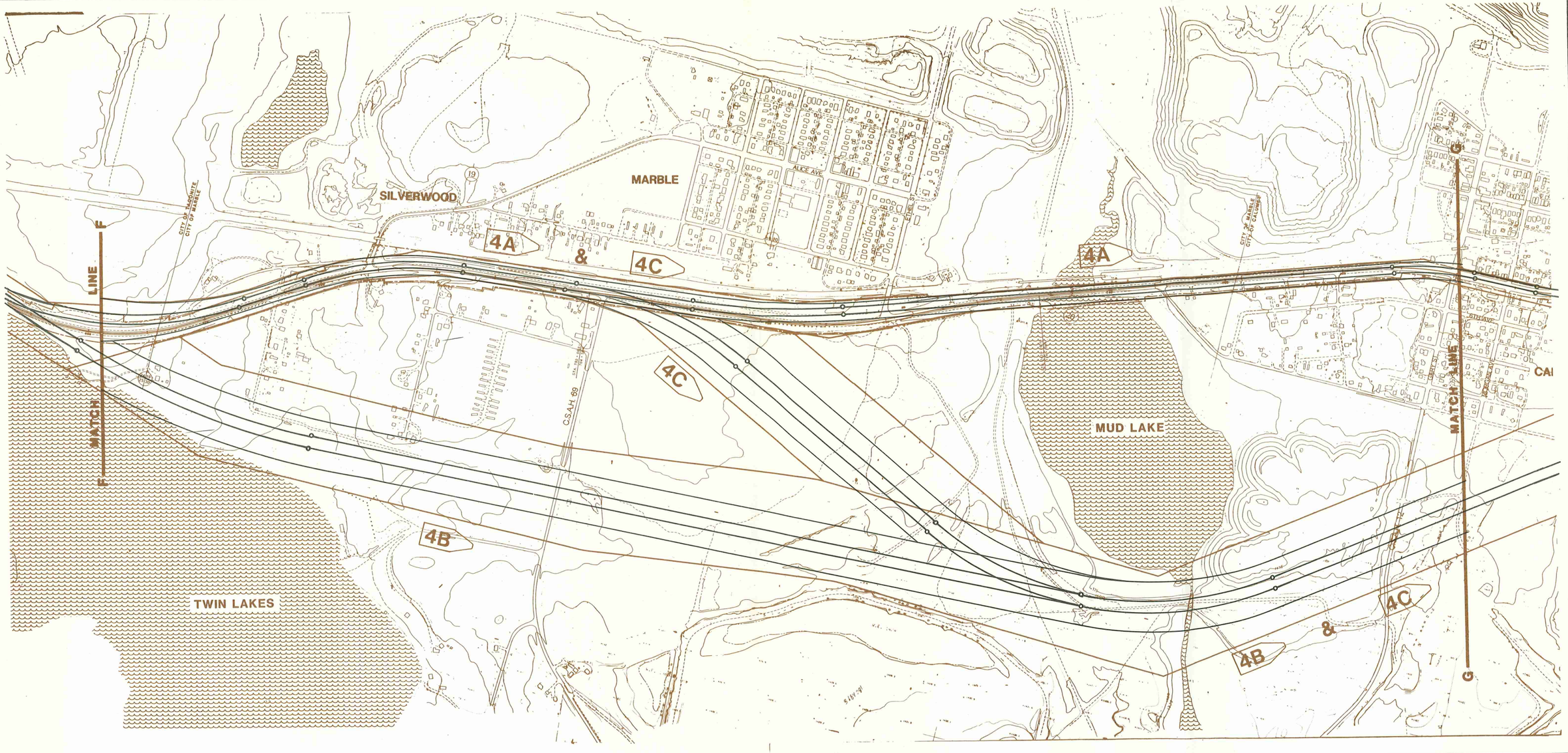
T.H. 169

GRAND RAPIDS TO PENGILLY

Figure 8e

PRELIMINARY ALIGNMENTS

- Corridor Limit
- Estimated Right-of-Way
- Proposed Highway Centerlines
- Estimated Right-of-Way
- Corridor Limit
- 3A — Alternative Alignment Designation



CROSS RANGE EXPRESSWAY

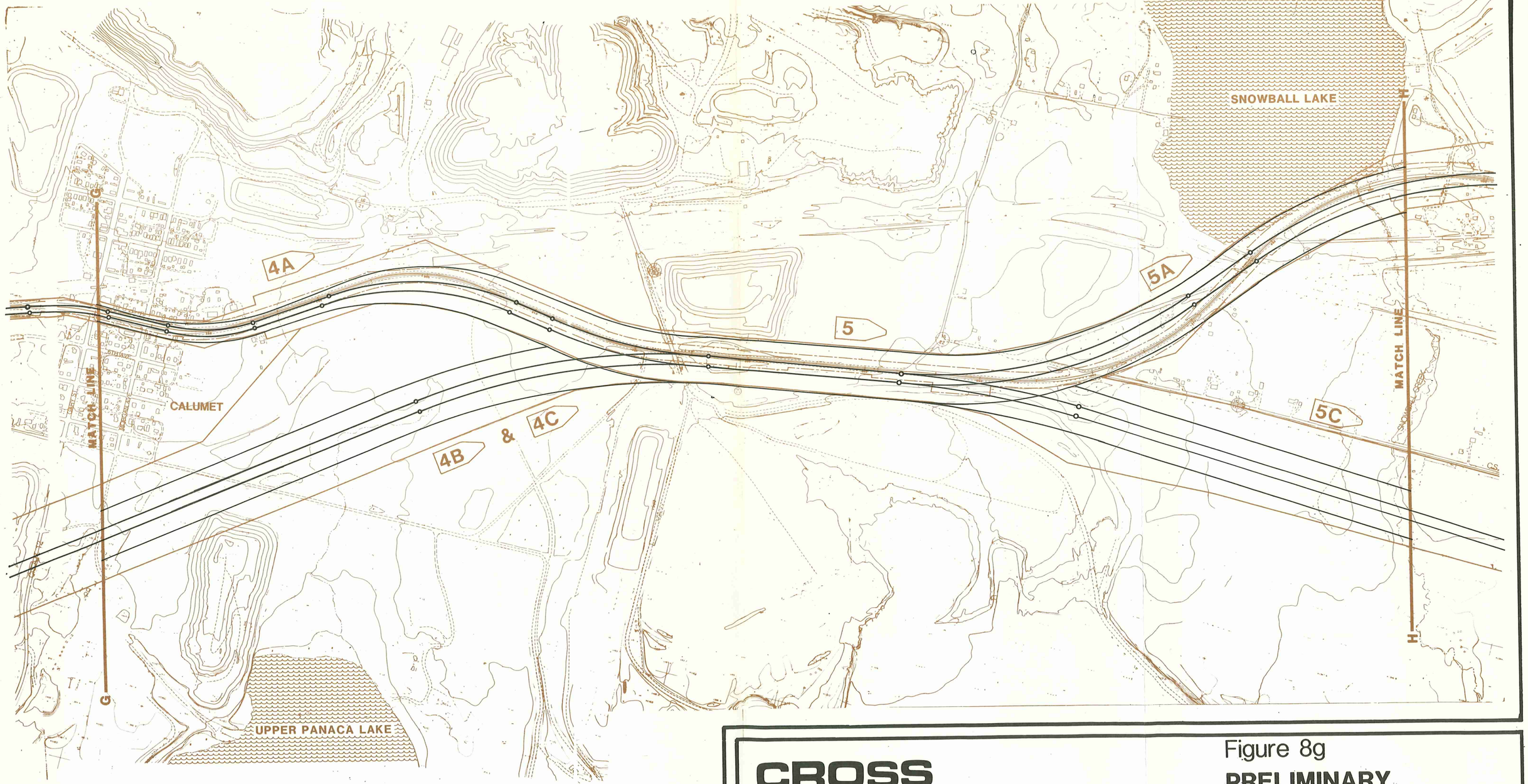
T.H. 169

GRAND RAPIDS TO PENGILLY

Figure 8f

PRELIMINARY ALIGNMENTS

- Corridor Limit
- Estimated Right-of-Way
- Proposed Highway Centerlines
- Estimated Right-of-Way
- Corridor Limit
- 3A — Alternative Alignment Designation



CROSS RANGE EXPRESSWAY

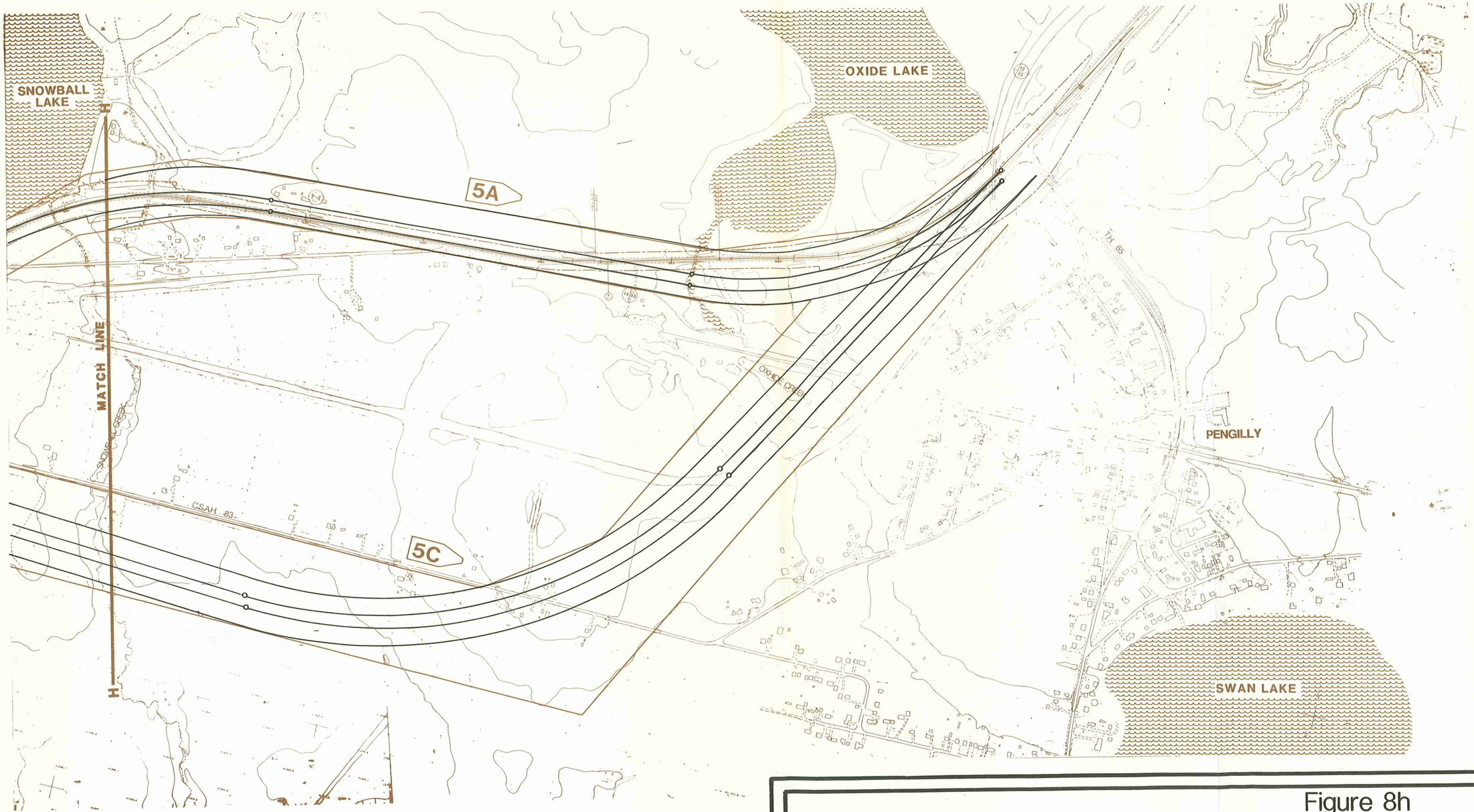
T.H. 169

GRAND RAPIDS TO PENGILLY

Figure 8g

PRELIMINARY ALIGNMENTS

- Corridor Limit
- Estimated Right-of-Way
- Proposed Highway Centerlines
- Estimated Right-of-Way
- Corridor Limit
- 3A — Alternative Alignment Designation



CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

Figure 8h

PRELIMINARY ALIGNMENTS

- Corridor Limit
- Estimated Right-of-Way
- Proposed Highway Centerlines
- Estimated Right-of-Way
- Corridor Limit
- 3A — Alternative Alignment Designation

Coleraine was previously reconstructed to a four-lane divided roadway. Therefore, significant changes to this segment are not being considered.

Alternative 2D, also called the Bovey by-pass, follows CSAH 10 from the junction with TH 169 about one-quarter mile east then turns northeasterly to rejoin the existing alignment of TH 169. Extensive development adjacent to existing TH 169 and a ninety degree turn in the downtown area of Bovey preclude widening the roadway without significant impacts. Therefore, this alternative was located in a mostly undeveloped area in order to reduce the impact on existing land uses and to provide an opportunity to greatly improve the geometric design of the roadway. The rural expressway cross section is proposed for the segments outside the built-up areas in Coleraine and Bovey. A four-lane divided urban design is being considered in the restricted areas in town.

Segment 3 - Bovey to Marble

Alternative 3A follows the existing TH 169 alignment. No location alternatives were considered in this segment because there are no major restrictions or geometric deficiencies along the existing roadway. In addition, residential and mining development to the north and Holman Lake to the south preclude road construction in these areas. The rural expressway cross-section is being considered for this area along with reconstruction of the major intersections with CSAH 15 and CSAH 7.

Segment 4 - Marble through Calumet

Alternative 4A follows the existing TH 169 alignment. Any roadway developed in this corridor would be restricted by existing land uses in Calumet and Marble and in the very narrow area between the north end of Mud Lake and an existing railroad trestle.

Alternative 4B by-passes Marble and Calumet to the south of Mud Lake. The corridor heads easterly at the north end of Twin Lakes and rejoins the existing alignment east of Calumet. This alternative was developed in order to minimize the impacts on existing land uses by locating the roadway in a more sparsely developed area. However, because of the proximity of a portion of the alignment to Twin Lake, adverse effects to the lake, several residences, and a city park could result.

Alternative 4C also by-passes Marble and Calumet south of Mud Lake. This is a shorter by-pass, diverging from the existing alignment between CSAH 69 and Mud Lake. This alternative was designed in order to minimize the impact on

the existing homes and businesses along TH 169 and to avoid the lake shore and park land located at the north end of Twin Lakes.

All of the alignment alternatives in Segment 4 have some restriction to the cross section near Mud Lake, Twin Lakes, or both. This could result in the use of a narrower cross-section and access restrictions. In addition, an urban design would likely be used in the portion of Alignment 4A in Marble and Calumet.

Segment 5 - Calumet to Pengilly

Alternative 5A would follow the existing alignment of TH 169 with the exception that portions of the alignment would be shifted slightly to minimize the impact on residences and the shorelines of Snowball and Oxhide Lakes. This alternative would involve constructing a new intersection with CSAH 83, widening the Oxhide Creek crossing and Snowball Creek crossing, and constructing a new railroad bridge.

Alternative 5C was developed because of the desire to continue to have a corridor located away from the shorelines of Snowball and Oxhide Lake and also to minimize the land acquisition and property severance impacts on the residents living along the north side of CSAH 83. As a result, Alternative Alignment 5C was located approximately 500 feet south of CSAH 83. This location would not result in any shoreline impacts, would still provide an opportunity to improve the geometrics in this segment, and would minimize right-of-way and relocation costs since there are no homes presently located south of CSAH 83.

3.2 SCREENING OF ALTERNATIVES

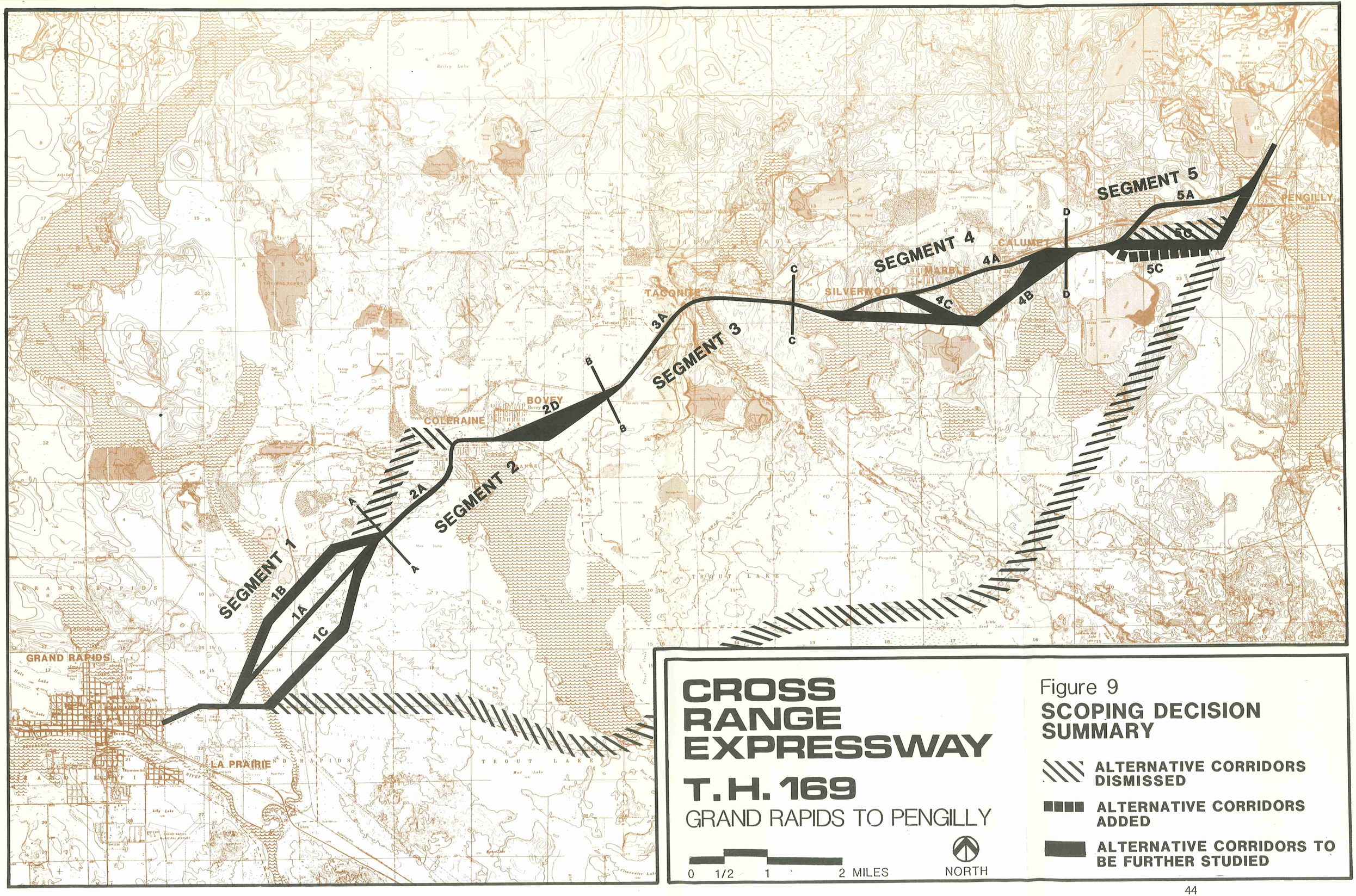
The process for identifying, evaluating, and selecting route alternatives for the extension of the TH 169 Cross Range Expressway consisted of the following major items:

- o A series of informational meetings were held during the summer of 1984 with representatives of the affected communities and major employers in the area.
- o A Draft Study Outline and Scoping Report was prepared and circulated for comments in October, 1984.
- o A Scoping Meeting, attended by approximately 250 people, was held in November, 1984.

As a result of comments received at the scoping meeting and during the following public comment period, it was decided to follow the course of action described below:

- o Dismiss the two-lane upgrade design alternative.
- o Dismiss the following Alternative Corridors (Figure 9):
  - Alternative 2C, the northwest bypass of Coleraine.
  - Alternative 5B, the new alignment north of CSAH 83.
  - Alternative 6, the south bypass.
- o Add the following Alternative Corridors (Figure 9.):
  - Alternative 5C, a new alignment south of CSAH 83.
- o Carry into the environmental impact phase of the project the Alternative Corridors listed in the previous section.

Further discussion of the reasons for dismissing the two-lane design alternative, Alternative Corridors 2C, 5B, and 6 and for adding Alternative 5 can be found in the Final Study Outline and Scoping Decision Document (Mn/DOT; March, 1985).



CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

0 1/2 1 2 MILES

NORTH

Figure 9

SCOPING DECISION SUMMARY

- ALTERNATIVE CORRIDORS DISMISSED
- ALTERNATIVE CORRIDORS ADDED
- ALTERNATIVE CORRIDORS TO BE FURTHER STUDIED

4.0 AFFECTED ENVIRONMENT

4.1 SOCIAL AND ECONOMIC CONDITIONS

4.1.1 Population

Past Growth

The study area for this project includes the communities of Grand Rapids and La Prairie on the western end of the route, Coleraine, Bovey, and Taconite in the center of the route, and Marble, Calumet, and Pengilly (unincorporated) on the eastern end. These communities are situated in Arbo, Grand Rapids, Iron Range, Trout Lake, and Greenway Townships as illustrated in Figure 10, and were settled in the late 1800's and early 1900's in response to the lumbering and iron mining industries.

The population of each of these communities, with the exception of Grand Rapids, has peaked and is now in a period of decline because population gain and loss have been closely tied to the fortunes of the mining industry. Grand Rapids and La Prairie have a more diverse economic base and have not suffered the recent downturn that the other cities have. The percentage of the Itasca County population which these cities represent has also declined. Table 5 indicates the population change for these communities since 1900, their combined percentage of the Itasca County population, and their peak population levels.

Forecast Growth

It is anticipated that population trends currently exhibited within Itasca County will continue, given no significant change in the mix of mining, forest products and tourism industries or in community response to current population changes. Therefore, the County population is forecast by the Office of the State Demographer to grow from its present level of 45,730 to 52,987 by the year 2000 and 56,121 by the year 2010.

No specific population forecast is available for the Study Area communities. However, all of the communities with the exception of Grand Rapids and La Prairie are expected to lose population. This will result from the expected

ARBO TOWNSHIP

IRON RANGE TOWNSHIP

GREENWAY TOWNSHIP

PENGILLY

MARBLE

TACONITE

CALUMET

BOVEY

COLERAINE

GRAND RAPIDS TOWNSHIP

TROUT LAKE TOWNSHIP

UNORGANIZED

GRAND RAPIDS

LA PRAIRE

CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

0 1/2 1 2 MILES

NORTH

Figure 10

STUDY AREA COMMUNITIES

TABLE 5
HISTORICAL POPULATION PATTERNS OF INCORPORATED COMMUNITIES IN THE STUDY AREA

INCORPORATED COMMUNITIES	1900	1910	1920	1930	1940	1950	1960	1970	1980	1983 (est)	1983 POP./ PEAK YEAR POPULATION
Bovey	**	1,377*	1,324	1,248	1,355	1,350	1,086	858	813	851	62%
Calumet	**	235	445	805	946*	854	799	460	469	446	47%
Coleraine	**	1,613*	1,300	1,243	1,325	1,321	1,346	1,086	1,116	1,149	71%
Grand Rapids	1,428	2,230	2,914	3,206	4,875	6,019	7,265	7,247	7,934	8,221*	100%
La Prairie	88	48	63	43	69	88	243	413	536*	503	94%
Marble	**	887*	742	738	792	867	879	682	757	773	87%
Taconite	**	549	621*	485	375	322	376	352	331	329	53%
Percentage of County Population	13	55	31	29	30	32	32	32	28	27	
Townships											
Grand Rapids	NA	NA	NA	NA	NA	NA	2,680	2,663	3,179	3,031	
Greenway	NA	NA	NA	NA	NA	NA	1,114	1,065	1,156	1,141	
Iron Range	NA	NA	NA	NA	NA	NA	297	285	294	300	
Lone Pine	NA	NA	NA	NA	NA	NA	635	468	592	562	
Itasca County	11,675	12,615	23,876	27,224	32,996	33,321	38,006	35,530	43,069	45,047	

NA = Not Available.
* Peak Population
** Unincorporated
Source: U.S. Census of Population

continued slump in the iron mining industry with no significant replacement industry as well as from the fact that approximately one-fifth of the population of most of these communities is older than sixty years of age.

Occupation and Industry

In 1980, over fifty percent of employed Itasca County males were in occupations classified as precision production, craft, repair operators, fabricators, or laborers, reflecting the dependence of the county work force on such industries as mining, construction and manufacturing. However, since 1979 this relationship has changed to one of less reliance on mining. This shift is discussed in more detail in Section 4.1.4, Economic and Fiscal Conditions.

Special Social Groups

Special groups which were identified in the Study Area include elderly, minorities, low-income households, disabled and other non-drivers.

The elderly constitute 17.6 percent of the Itasca County population, which is slightly higher than the percentage of elderly in the entire Minnesota rural population. Of the study area communities La Prairie had the fewest elderly, eleven percent, while the other towns all had between 21 and 27 percent of their population in the over 65 age group.

American Indians, primarily of the Minnesota Chippewa tribe, constitute the largest minority group in the study area with approximately 0.6 percent of the population. This compares with 1.1 percent Native Americans in the balance of the county and 0.9 percent for the entire state. It should be noted that no tribal land has been identified in the study area. All other racial minorities totaled only 0.4 percent of the Itasca County population. Of this total, only 31 indiviuals live in the study area communities with the majority (75 percent) in Grand Rapids.

The percentage of the study area population with incomes (1979 data) below the defined poverty level was less than that for the remainder of Itasca County or for the rest of rural Minnesota. However, this data does not reflect the recent economic problems experienced by the mining industry and as a result the number of low-income households in the study area has likely increased.

The last special group for which lata was collected consisted of individuals with disabilities which prevented them from operating an automobile. In 1980 there were 181 disabled persons in the Study Area and more than 75 percent of these people lived in Grand Rapids.

Community Cohesion

A high degree of community cohesion and community identity exist among the various Study Area cities. Certain quantitative measures as well as the perception of residents and officials support this assertion.

Community cohesion is a concern when assessing the social impact of a highway project because changes in transportation can affect the ability of people to participate in social groups, clubs, shopping, entertainment, and employment. Satisfying personal interactions build community spirit and a sense of belonging, which are important social phenomena.

Community cohesion has been fostered in the Study Area through common ancestery, employers, and religions, longevity in the area, physical isolation, and a sense of having survived economic hardships together. One measurement of community cohesion is the percentage of households who have lived in the same house for five years or more. In Itasca County in 1980, this measure of residential stability was 54 percent, while Bovey, Coleraine, Marble, Taconite, and even fast-growing La Prairie were higher, with values ranging from 56 to 79 percent. Only Grand Rapids and Calumet were lower. For rural Minnesota as a whole, this figure averaged 62 percent.

4.1.2 Housing

In 1980, there were 4,903 housing units in the TH 169 communities, most of which were occupied on a year-round basis. Vacancy rates ranged from sixteen percent in Calument to four percent in Taconite. The percentage of units occupied by owners was quite high, ranging from 66 percent in Grand Rapids to 100 percent in Taconite. Detached housing composed 67 percent of the total stock, attached housing 28 percent, and mobile homes five percent. Most vacancies were among the attached housing. Three-quarters of all housing was built prior to 1950.

Senior citizens housing is available in Bovey, Calumet, and Taconite. A recent survey indicates that approximately sixty percent of these units are vacant.

The median value of housing in the Study Area communities ranged from $18,800 in Taconite to $43,180 in La Prairie. The median value for Itasca County housing was $36,200 in 1980.

In the early 1980's, the general economic downturn combined with specific losses in mining activity have served to keep housing starts low, particularly in the communities along TH 169 east of Grand Rapids. Some new housing, mostly in the form of Housing and Redevelopment Authority and other subsidized projects, has added senior citizen and low-income housing in several communities. Other new housing has primarily been mobile homes.

While neither the number of vacant housing units nor the number of homes for sale is apparently large, conversations with community leaders have indicated that many homes would be placed on the market if hope of a sale could be anticipated.

4.1.3 Public Services and Facilities

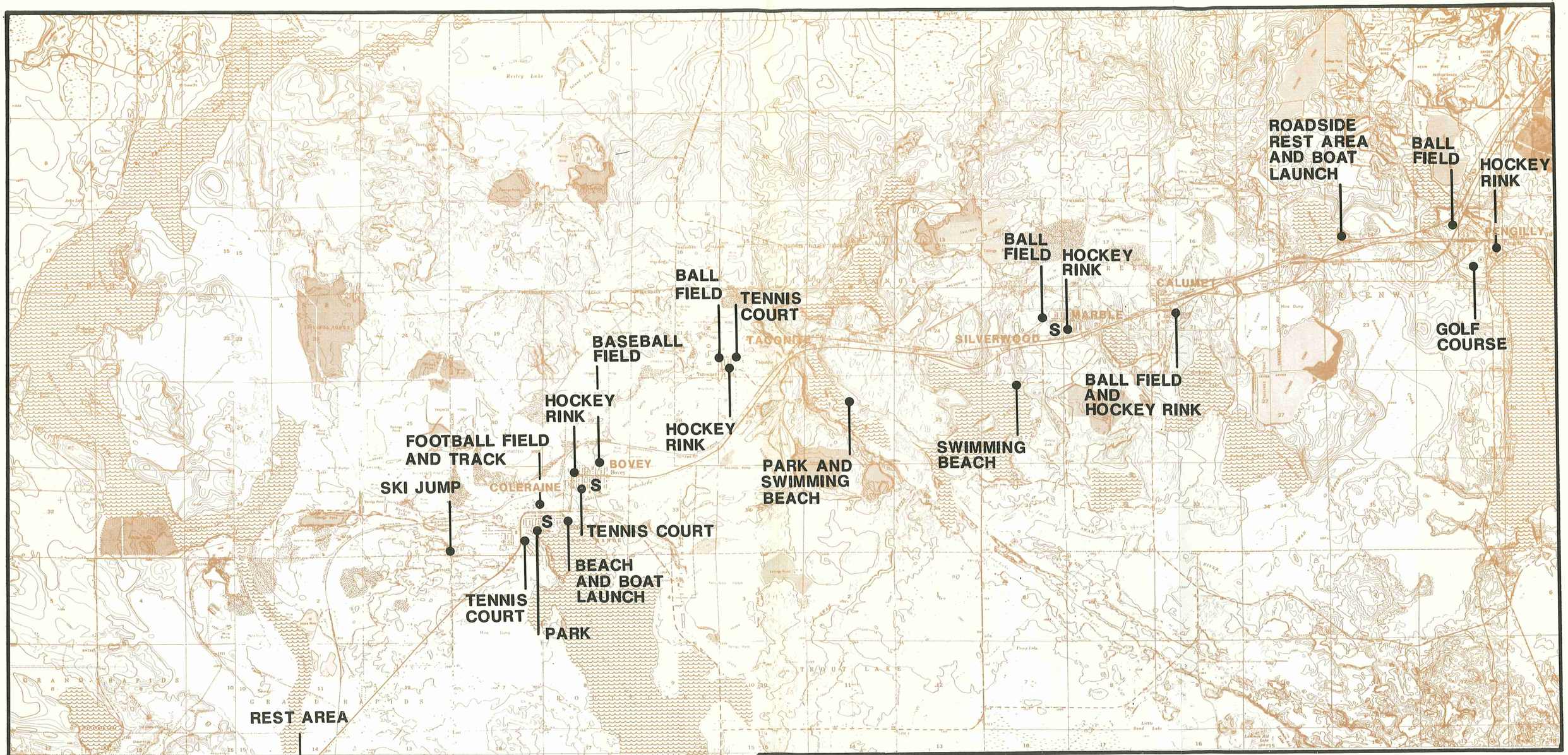
A variety of public services are provided to residents in the study area (Figure 11), and schools, health care, emergency, social and recreational services are those most dependent on travel along TH 169. The private automobile, supplemented by school bus and public transit service, is vital for transporting study area residents to neighboring communities to participate in or to receive these services. TH 169 provides the major link in this transportation network because it connects the communities of eastern Itasca County to each other and to the service centers in Grand Rapids and Hibbing. Because of the previously extensive mining activity in the area, the network of smaller roads normally found in rural areas is largely missing, making dependence upon TH 169 more complete.

Schools

Coleraine School District (#316) has elementary schools in Marble, Bovey, and Coleraine, a middle school in Bovey, and a high school in Coleraine. Over 1,600 students are eligible for transportation by school bus. The busing program for these students consists of 26 bus routes throughout the district, each of which utilizes some portion of TH 169.

Health Care

Medical services are available to Study Area Communities in Grand Rapids on the west and Nashwauk and Hibbing on the east. All ambulance services use TH 169, and representatives of the Itasca County Sheriff's office, plus the private ambulance services, have indicated that the delivery of



CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

0 1/2 1 2 MILES

NORTH

Figure 11

PUBLIC SERVICES & FACILITIES

H - HOSPITAL
A - AMBULANCE SERVICE
S - SCHOOL

emergency services has been hampered by heavy traffic, slow-moving vehicles, and stopped school buses in the two-lane sections.

Fire Protection

Each community provides its own fire protection with volunteer departments. Protection is also provided to nearby township areas by these crews. All fire trucks use TH 169 to get to these outlying areas.

Social Services

Only a small number of governmental social services are provided in the Study Area, and these are concentrated at the Itasca County Office of Social Services, located in Grand Rapids. Anyone using these services must travel on TH 169, except in the instance of the Meals on Wheels program, which is based in each community.

Recreational Facilities

There are many recreational activities available in the Study Area, most of them outdoors such as fishing, hunting, boating, swimming, hiking, cross-country skiing, snowmobiling, hockey, and field sports among others. Throughout the Study Area there are also a number of snowmobile trails and cross-country skiing trails.

The parks along the Alternative Alignments are briefly described below, and the location of each is documented in Figure 11.

1. City of La Prairie. At the La Prairie municipal complex, there are tennis courts, a ball field, and playground equipment. The nearby Itasca County Community College has ball fields and tennis courts. None of these facilities is within an Alternative Corridor.

2. City of Coleraine. Located in Coleraine are an indoor ice arena and outdoor multi-purpose field (owned by the Greenway Joint Recreational Association), a beach at Trout Lake (jointly maintained with the City of Bovey), a ski-jump, Longyear Park, which includes a pavillion, boat launch ramps, tennis courts, a ball field, and playground equipment, and two other tennis courts just east of TH 169 on the western side of town. None of these facilities is within an Alternative Corridor.

3. City of Bovey. Bovey has two tennis courts, a baseball field, a playground complex, and a hockey rink. None is within an Alternative Corridor.

4. City of Taconite. Dunstan Park is the site of a baseball-softball field. The City also has a hockey rink, two tennis courts, and a playground area. None is within an Alternative Corridor.

5. Iron Range Township. Within Iron Range Township, a recreational area operated by Iron Range Township and the City of Taconite consists of a beach and a daycamp picnic area. This is located near the Scenic Highway (Highway 7) just east of Taconite. Iron Range Township also maintains a hockey rink adjacent to their fire hall ard a public beach on Reiley Lake. These facilities are located north of the community of Taconite along Highway 7.

6. Greenway Township. Greenway Township maintains a swimming beach south of the town of Marble on Twin Lakes and another in Pengilly on Swan Lake. The beach on Twin Lakes is immediately adjacent to the Alignment Alternative 4B.

7. City of Marble. The Knight-Anderson Memorial Field is operated and maintained by the City of Marble. There is a complete ballfield equipped with covered stands. Also in Marble are two tennis courts, a softball field near the school, a hockey rink, a playground and a band shell next to the village hall. All of these facilities are outside of the Alternative Corridors.

8. City of Calumet. Within the City of Calumet are softball fields, an outdoor hockey rink, a playground, and a ballpark located next to TH 169. The 4A Corridor is quite narrow in this location and does not include the ballfield.

9. City of Pengilly. Greenway Township maintains a ballfield, a swimming beach, a hockey rink behind the old Pengilly school and a public boat launching site on Swan Lake. The golf course located in Pengilly is privately owned and outside of the 5C Corridor.

4.1.4 Economic and Fiscal Conditions

Economic conditions in the seven-county Arrowhead Region, Itasca County, and the TH 169 communities have declined in recent years. This decline is due primarily to the severe economic turndown in the mining sector of the economy, which has long been the driving economic force in this part of Minnesota. No major reversal of the problems affecting the mining industry are anticipated in the foreseeable future. Efforts are underway to promote non-mining employment, but these sectors of the local and regional economies have been

stable at best. TH 169 plays a fairly major role in economic activity since it is one of the few continuous routes in the vicinity. It is the only traffic linkage for the communities it serves. It provides truck access to the Iron Range and to the resource-based industries in Grand Rapids, and it allows long-distance commuting for workers as employment locations shift.

Regional Economy

Employment in the counties which make up the Arrowhead Region (Itasca, Aitkin, Carlton, Cook, Koochiching, Lake and St. Louis) peaked in 1979 and has declined ever since. Employment in mining has been reduced by more than half since that time, although non-mining industrial employment has been less severely affected. Wages in the mining industry, which have traditionally been above average, have declined, and other wages in the region have been only steady since 1979, a period of high inflation. This is an indication that the buying power of the economy has been severely constrained. This effect is also registered in annual sales figures. Sales volumes for most industries in the region have barely kept pace with inflation, and the construction and finance sectors are down sharply in recent years. However, manufacturing and retail trade (boosted by tourism) have increased sales.

Itasca County Economy

Mining activity has declined in Itasca County to less than half of its 1979 peak, an even greater decline than experienced by the region as a whole. As mines and taconite plants have closed, union mine workers have begun to commute greater distances to active operations. The strength of other sectors of the County economy have remained relatively constant, increasing their cumulative role in the County and diminishing that of mining. Manufacturing is becoming especially dominant in Itasca County, accounting for nearly half of the total sales, compared with 30 percent in St. Louis County and 23 percent statewide. Firms in Grand Rapids accounted for 80 percent of the total 1983 industrial sales in Itasca County, making it the economic center of the county.

The pulpwood industry is a very important part of the economy in Itasca County. The Blandin Corporation is one of the major employers (approximately 1,400 persons) and currently operates two forest product companies in Grand Rapids, Blandin Paper Company and Blandin Wood Products Company. These companies receive approximately 45,000 pulp wagon loads of wood annually which results in 3,000 to 3,600 truck trips per month on the two-lane portion of TH 169 east

of Grand Rapids. The number of trucks on this section of TH 169 is greater than at anytime in the past as a result of the recent abandonment of a railroad line that parallels TH 169.

Tourism and outdoor recreational activities also are well-established in Itasca County and contribute three to six percent of the total annual sales.

Local Economies

Grand Rapids is the major shopping and service destination in Itasca County. Grand Rapids is the seat of County Government and also accounts for approximately 71 percent of the County's retail sales and 68 percent of food sales. The main thrust of economic activity in the rest of the Study Area communities is the provision of local shopping and services. There are very limited opportunities for employment within each of these communities and the major form of economic activity is retail sales.

Consumers in the communities along TH 169 east of Grand Rapids are located between regional service centers in Grand Rapids and Hibbing. Itasca County residents are required to travel to Grand Rapids for all interaction with the county government. However, for shopping and business services, Hibbing may have the competitive advantage, particularly for those residents living east of Bovey. Discussions with community officials indicate that the level of driving comfort and convenience provided by the existing four-lane roadway east of Pengilly results in approximately fifty percent of these types of trips being oriented to Hibbing even though the actual distance is greater than the distance to Grand Rapids.

Tax Base

The trend in taxable valuations for most communities along TH 169 has been downward since 1950 because of the decline in the assessed values of the mineral deposits located within their corporate boundaries.

Employment and Income

Unemployment among residents of the Study Area communities has risen dramatically in recent years, from 8.1 percent in 1970 to a high of 18.1 percent in 1982. The 1984 rate was down to 12.6 percent. Rates of unemployment vary from one community to another, from five percent in Coleraine to 32 percent in Marble. Generally, unemployment is lowest in the western end of the Study Area, higher in the eastern end.

However, total employment in Itasca County is also up considerably, from 11,628 in 1970 to 15,223 in 1984. Therefore, jobs are being created, primarily in Grand Rapids and La Prairie and other locations away from the Study Area, but the labor force is also growing commensurately.

Tables 6 and 7 indicate changes in labor force, employment, and unemployment in Itasca County and the Study Area Cities.

TABLE 6
LABOR FORCE, EMPLOYMENT, AND UNEMPLOYMENT, ITASCA COUNTY, 1970-1984

Year	Labor Force	Employment	Unemployment	
			Number	Rate
1970	12,668	11,628	1,030	8.1%
1975	15,136	13,792	1,344	8.9%
1980	17,483	14,998	2,485	14.2%
1982	17,152	14,047	3,105	18.1%
1984	17,415	15,223	2.192	12.6%

Source: Minnesota Department of Economic Security; U.S. Census of Population, 1980.

One additional item regarding employment should be noted. There are a total of about 6,900 jobs in Grand Rapids and only 47 percent of these are held by residents of that city. The remaining 53 percent of the jobs in Grand Rapids are filled by persons who live elsewhere and commute to and from work, and TH 169 is one of the major commuter routes.

Communities in the Study Area have median family and household incomes that compare favorably with those measures for rural Minnesota as a whole and with Itasca County in general. Similarly, the percentage of persons in the Study Area communities with incomes below the defined poverty level was in no case higher than that of rural Minnesota and in only one case higher than that of Itasca County. Poverty among persons aged 65 or older was also no more common in the Study Area than in rural Minnesota or Itasca County. (Incomes in Itasca County have traditionally trailed much of the rest of the state and since 1979 have fallen further behind.) Table 8 lists these income statistics.

TABLE 7
LABOR FORCE AND EMPLOYMENT, STUDY AREA COMMUNITIES, 1980

	LABOR FORCE	EMPLOYED	UNEMPLOYMENT NUMBER	UNEMPLOYMENT RATE	LABOR FORCE PARTICIPATION
Bovey	335	293	42	12.5%	65%
Calumet	153	104	49	32.0%	57%
Coleraine	508	481	27	5.3%	75%
Grand Rapids	3,606	3,241	365	10.1%	75%
La Prairie	255	223	32	12.5%	75%
Marble	275	207	68	24.7%	63%
Taconite	130	104	26	20.0%	62%

Source: Minnesota Department of Economic Security; U.S. Census of Population, 1980.

TABLE 8
INCOME STATISTICS FOR STUDY AREA RESIDENTS, 1979

INCORPORATED CITIES	MEDIAN INCOME		% OF PERSONS BELOW POVERTY LEVEL	
	FAMILY	HOUSEHOLD	ALL PERSONS	>AGE 64
Bovey	$18,491	$12,941	12.7%	16.9%
Calumet	15,625	13,500	8.5	9.3
Coleraine	22,024	19,735	3.5	11.7
Grand Rapids	20,780	16,226	9.2	12.2
La Prairie	20,812	19,844	4.6	0.0
Marble	16,771	13,854	10.4	9.1
Taconite	19,250	15,750	2.9	12.5
Itasca Co.	18,661	16,157	10.6	14.7
(Rural)	18,228	16,138	10.9	14.6
Minnesota	21,185	17,761	9.5	14.8
(Rural)	17,516	15,398	12.7	19.0
(Places, 2,500-10,000)	19,988	16,147	9.1	18.5

Source: U.S. Census of Population, 1980

4.1.5 Historic and Archaeological Resources

The east central portion of Itasca County, including the project area between Grand Rapids and Pengilly, is an area with a rich history which was influenced by the fur trapping, logging, and mining eras. As a result, a thorough historic and archaeological resource review of the Alternative Corridors was conducted by a professional archaeologist, and the results of this effort are documented in the Historic/Archaeological Technical Report (Mn/DOT, 1985).

This resource review began with an investigation of the following sources of historic information:

- Diaries of early explorers in the region and other documents at the Minnesota Historical Society's archives, reference library, and audio-visual library.
- Consultation with representatives of the Minnesota Historical Society including the Environmental Review Staff and the Trunk Highway Archaeologist.
- Itasca County Historical Society Archives.
- Andreas Atlas Minnesota Historic Properties Registry.
- National Register of Historic Places.
- Original land survey maps of the area.
- Minnesota Historical Society (MHS) - State Historic Preservation Officer (SHPO) site files.

In addition, a visual field inspection of the project area was also conducted not only to confirm previously reported historic sites, but also to determine the cultural resource potential of the study area.

As a result of this data collection process, a total of forty-five historical sites were found in the communities along the segment of TH 169 now under consideration. These sites are described in Table 9 according to the City or Township in which they are located. It should be noted that there are currently no known historic sites in the basically undeveloped areas between the communities along TH 169. In addition, the proposed project starts at the eastern edge of Grand Rapids, away from all known historic sites in that city.

TABLE 9
HISTORIC/ARCHAEOLOGICAL SITE INVENTORY

	Historic Property/ District	Historic Properties and Districts		
		National Register of Historic Places		State Historic Sites Registry
		Listed	Eligible	
	Grand Rapids - none			
	Coleraine			
1	Carnegie Library	x		x
2	Church of the Good Shepard	x		x
3	Coleraine Methodist Episcopal Church, NW Corner Gayley Avenue and Cole Avenue	x		x
4	Western Mesabe Iron Range Village Halls			x
5	Oliver Iron Mining Company Buildings - General Office, Cole Avenue	x		x
6	Coleraine Water Tower West Side of Town			x
7	Boarding House - Dudley Avenue			x
8	House - Hartley Avenue			x
9	Oliver Iron Company house - Hartley Avenue			x
10	Doctor's Residence, NW Corner Cole Avenue and Morrison Avenue			x
11	Oliver Mining Company - General Superintendent's House, Cole Avenue 11A, 11B, 11C	x		x
12	Park - Elizabeth Avenue			x

TABLE 9 (continued)

	Historic Property/ District	Historic Properties and Districts		
		National Register of Historic Places		State Historic Sites Registry
		Listed	Eligible	
13	Company Housing District 102 - 112 Roosevelt Avenue			x
14	Greenway High School - Roosevelt Avenue			x
15	Church - Kerr Avenue			x
16	Feldman Block - NW Corner Roosevelt Avenue and Kerr Avenue			x
17	First National Bank Bldg. NE Corner Roosevelt Avenue and Gayley Avenue			x
18	Canisteo District Laboratory, North of Business District			x
19	Canisteo District Shops, North of Town			x
	Bovey			
20	Bovey Water Tower			x
21	Bovey Village Hall, SE Corner Second Street and Fourth Avenue			x
22	Presbyterian Church, NW Corner Second Street and Fifth Avenue			x
23	Hotel Fitger, NE Corner of Second Street and Fifth Avenue			x
24	Commercial Building, South Side Second Street between Second and Third Avenue			x

TABLE 9 (continued)

	Historic Property/ District	Historic Properties and Districts: National Register of Historic Places Listed	National Register of Historic Places Eligible	State Historic Sites Registry
25	Pick and Mathers Mining Company Superintendent's Residence, NE Corner Second Street and Fifth Avenue			x
26	Pick and Mathers Mining Company Houses, Fifth Avenue			x
27	Great Northern Railway Depot, Trackside Location East of Town			x
	Taconite			
27	Bank Building, Broadway			x
28	Taconite Water Tower			x
29	Taconite Village Hall, NE Corner Broadway and Leroy			x
	Marble			
30	United Methodist Church, SW Corner of Ethel and Alice			x
31	Marble Hospital, Ethel Street			x
32	Oliver Mining Company Boardinghouse, Jessie Street	x		x
33	Henry Bolthouse house,			x

TABLE 9 (continued)

	Historic Property/ District	Historic Properties and Districts: National Register of Historic Places Listed	National Register of Historic Places Eligible	State Historic Sites Registry
34	Worker's House, Jessie Street			x
35	Marble Water Tower			x
36	Commercial Building, Alice Avenue			x
37	First National Bank of Marble, NE Corner Alice and Kate			x
38	Railroad Bridge, East of Marble BN #16.6			x
	Calumet			
39	Calumet State Bank, SW Corner Third Avenue and Gary Street			x
40	Calumet Village Hall, NE Corner of Gary Street and Third Avenue			x
41	Calumet Variety Store, Gary Street			x
42	Calumet - Marble Depot			x
43	Calumet Water Tower			
44	Calumet Community Church, Sixth Avenue			x
	Greenway			
45	Railroad Bridge, U.S. Highway 169			x

4.2 PHYSICAL ENVIRONMENT

The following sections (4.2.1 through 4.2.9) document the existing physical environment and the data which was collected for evaluation and analysis. The discussion regarding the actual analysis and a description of expected impacts and mitigation measures can be found in Section 5.2, starting on page 108.

4.2.1 Wetlands

There are both an abundance and a variety of wetlands within Itasca County and within the probable limits of this project. These wetlands, especially those types with open water, are recognized as important habitat for wildlife and waterfowl. In additon, wetlands are protected by both State (Minnesota State Protected Waters Regulation - 6115.1000 to 6115.1150) and Federal (Executive Order 11990 - Wetlands Protection and the Army Corps of Engineers Section 404 Permit Process) regulations. As a result, the data necessary to analyze potential wetland impacts was collected. This information consisted of the following:

- o The number of wetlands within each of the alterntive corridors.
- o The number of acres within the proposed right-of-way and in the total wetlands basin.
- o The type of wetland.

Two methods were used to locate and identify wetlands within the Study Area. Aerial photography was used for those wetlands within or adjacent to the project corridors and National Wetland Survey Maps, provided by the U.S. Fish and Wildlife Service, were used for those wetlands outside the limits of the aerial photography. These aerial photographs and maps were also used to determine the size of each wetland and the relationship to other wetlands.

All wetlands were classified in accordance with the guidelines and classification systems documented in the Classification of Wetlands and Deep Water Habitats of the United States and in Cicurlar 39, published by the U.S. Fish and Wildlife Service. A basic description of the various wetland types is outlined in Table 10.

The results of the data collection effort are documented in Table 11 and summarized below.

- o A total of 47 wetlands were identified as being located within the proposed right-of-way.

TABLE 10
WETLAND TYPES

Type 1 Wetland - The soil is covered with water, or is waterlogged, during variable seasonal periods but usually is well drained during much of the growing season. Plant species potentially present are smart weeds, wild millet, fall panicum, tealgrass, ragweed, and cockleburs.

Type 1L Wetland - These are floodplain hardwoods which are inundated during periods of highwater. Wetlands of this type offer considerably greater wildlife habitat than do other Type 1 wetlands. These wetlands are often interlaced with permanent backwater channels.

Type 2 Wetlands - Inland fresh meadows. The soil is usually without standing water during most of the growing season but is waterlogged within at least a few inches of its surface. Vegetation includes grasses, sedges, rushes, and various broad-leafed plants. Representative plants include carex, rushes, red top, reed grasses, mannagrasses, prairie cord grass, and mints. These meadows may border shallow marshes on the landward side. These are utilized by waterfowl primarily for supplemental feeding areas.

Type 3 Wetlands - Inland shallow fresh marshes. The soil is usually waterlogged during the growing season; often it is covered with as much as six inches or more of water. Vegetation includes grasses, bulrushes, spike rushes, and various other marsh plants such as cattails, arrowheads, pickerel weed, and smartweeds. Common representatives include reed, white top, rice cutgrass, carex, and giant bur reed. These marshes may border deeper marshes on the landward side. Marshes of this type are used extensively as nesting and feeding habitat. In combination with deep fresh marshes, they constitute the principal production areas for waterfowl.

Type 4 Wetlands - Inland deep fresh marshes. The soil is covered with six inches to three feet or more of water during the growing season. Vegetation includes cattails, reeds, bulrushes, spikerushes, and wild rice. In open areas, pondweeds, naiads, coontail, water milfoils, waterweeds, duck weeds, water lilies, or spatter docks may occur. Deep fresh marshes constitute the best breeding habitat in the country, and they are also important feeding places.

Type 5 Wetlands - Inland fresh open water. Water is usually less than ten feet deep and is fringed by a border of emergent vegetation. Vegetation (mainly at water depths of less than six feet) includes pond weeds, naiads, wild celery, coontail, water milfoils, muskgrasses, water lilies, and spatterdocks. These are used extensively as brood habitat areas when, in midsummer and late summer, the less permanent marshes begin to dry out.

Type 6 Wetlands - Shrub-Swamps. The soil is usually water logged during the growing season and is often covered with as much as six inches of water. Vegetation includes alders, willows, dogwoods, and swamp-privet. Shrub swamps occur mostly along sluggish streams and occasionally on floodplains. They are used to a limited extent for nesting and feeding.

Type 7 Wetlands - Wooded swamps. The soil is waterlogged at least to within a few inches of its surface during the growing season, and is often covered with as much as one foot of water. Wooded swamps occur mostly along sluggish streams on floodplains, on flat uplands, and in very shallow lake basins. Trees include tamarack, arbor vitae, black spruce, balsam, red maple, and black ash. Wooded swamps often occur in association with shrub swamps, and waterfowl often use the two types interchangeably.

Type 8 Wetlands - Bogs. The soil is usually waterlogged and supports a spongy covering of mosses. Bogs occur mostly in shallow lake basins, on flat uplands, and along sluggish streams. Vegetation is woody or herbaceous, or both. Typical plants are heath shrubs, sphagnum moss, and sedges. Typical vegetation includes leather-leaf, laborador-tea, cranberries, carex, and cottongrass. Bogs have the lowest waterfowl rating.

TABLE 11
WETLAND DATA SUMMARY

WETLAND NUMBER	WETLAND TYPE	ACRES IN RIGHT-OF-WAY	TOTAL ACRES IN BASIN
1*	Prairie River	2.4 (1A & 1B) 0.6 (1C)	252.0
2a	1L	8.1	86.0
2b	6	4.5	9.6
3	1L	3.8	55.5
4	7	4.1	15.0
5	2	1.7	29.5
6	5	2.2	2.6
7	6	0.8	1.1
8	3, 6, 7	2.2	56.5
9	7	1.2	3.0
10	7	4.3	56.5
11	3,	0.5	1.6
12	6	0.5	0.6
13	3, 6	0.3	0.3
14	3	2.2	10.0
15	3, 6	1.9	26.5
16	3, 5	9.0	37.5
17a	3	2.8	37.0
17b	3	0.6	0.8
18	3	0.1	21.5
19	5	1.4	275.0
20	2	1.3	1.3
21	3	0.3	0.3
22	7	0.3	0.3
23	5	2.3	500.0
24	2	0.4	0.4
25	1L	10.5	500.0
26	3	0.1	2.5
27	6	3.6	9.5
28	3	4.3	10.6
29	4	0.8	78.8
30	1L	0.4	78.0
31	5	1.3	3.0
32	5	1.0	1.1
33	6 7	1.5 (4A) 7.6 (4B & 4C)	50.0
34	3	4.9	4.9
35	6	3.5	3.5
36	1L	0.9	1.0
37	6	1.2	1.2
38	3	0.2	0.6
39	6	0.3	2.0
40	6	2.1	13.5
41	6	1.0	1.0
42	7	1.9	210.0
43	7	2.0	2.0
44	5	0.1	145.0
45	2, 6	3.4 (5A) 1.2 (5C)	33.0

*Note: Prairie River channel is not defined as a wetland in accordance with guidelines contained in Executive Order 11990.

- o Twenty-one of the 47 wetlands are classified as either type 3, 4, or 5 (the most important wildlife habitat).

- o The wetland basins vary in size from less than an acre to 500 acres; however, most are less than ten acres in size.

The approximate location of each of the wetlands is shown in Figures 12A through 12H. More detailed information about the location and classification of the wetlands is contained in the Wetland Technical Report (Mn/DOT, 1985).

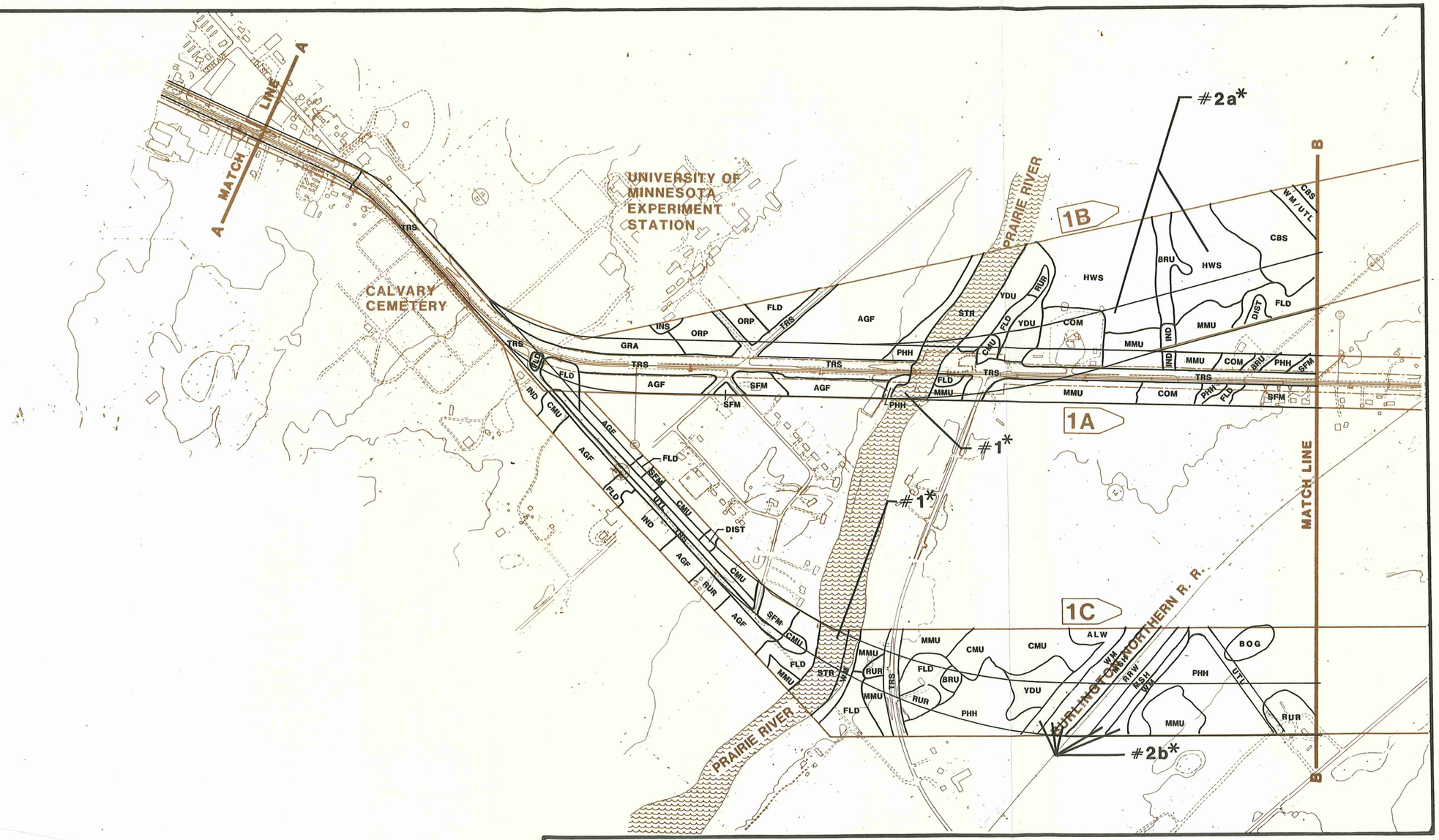
The State of Minnesota also regulates changes in course, current, and cross-section in certain wetlands, streams and lakes through a State Protected Waters program. Information regarding the protected waters in Itasca County was obtained from the Minnesota Department of Natural Resources (Mn/DNR). This information indicates that 210 wetlands and 797 lake basins were designated as State Protected Waters in Itasca County. Of this total, only seven protected waters are located within or adjacent to the limits of the proposed project. These protected waters (and the DNR identification number) are listed below and shown in Figure 13.

1) Prairie River (1074P)
2) Unnamed creek flowing between the Prairie River and Pear Lake (371W)
3) Holman Lake (227P)
4) Twin Lake (190P)
5) Mud Lake (110W)
6) Snowball Lake and Creek (108P)
7) Oxhide Lake and Creek (106P)

4.2.2 Water Resources

The discussion of water resources has been divided into four major categories: surface water hydrology and hydraulics, flood plains, water quality, and ground water. A detailed description of each of these subjects is presented in the TH 169 Water Resources Technical Report (Mn/DOT, 1985).

The TH 169 study area lies within three major drainage basins. In the area between Grand Rapids and Coleraine, surface water flows to either the Mississippi River or the Prairie River and the remainder of the study area drains to the Swan River. In addition, eleven sub-basins were identified. The relationship between these basins is documented in Table 12.



GENERAL VEGETATION TYPES

Grassland

FLD - Old Field

Brushland

BRU - Open Brush
YDU - Young Deciduous Upland
YCU - Young Coniferous Upland
ALW - Wetland Shrub

Woodland

PHH - Mature Deciduous Upland
NOH - Old Growth Deciduous Upland
MMU - Mature Deciduous - Coniferous Upland
CMU - Mature Coniferous Upland
CBS - Closed Canopy Lowland Conifer
HWS - Broadleaf Deciduous Lowland

Wetlands

MSH - Persistent Emergent
SMD - Sedge Meadow
WM - Wet Meadow
BOG - Sphagnum Bog

Open Water

OW - Open Water
STR - Streams and Rivers

Special Habitats

URB - Urban
UTL - Utility
TRS - Transportation
RRW - Railroad Right-of-way
INS - Institution
IND - Industrial Site
COM - Commercial
RUR - Rural Residential
SFM - Single Family Residential

Seasonally Altered

WDP - Wooded Pasture
OPT - Open Pasture
ORP - Orchards or Plantations
AGM - Agricultural Meadow
AGF - Agricultural Field
GRA - Cultured Grassland

Other

LOG - Recently Logged
DIST - Disturbed

***Note:** Wetland Identification Numbers. See Table 10 for Wetland Classification.

CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

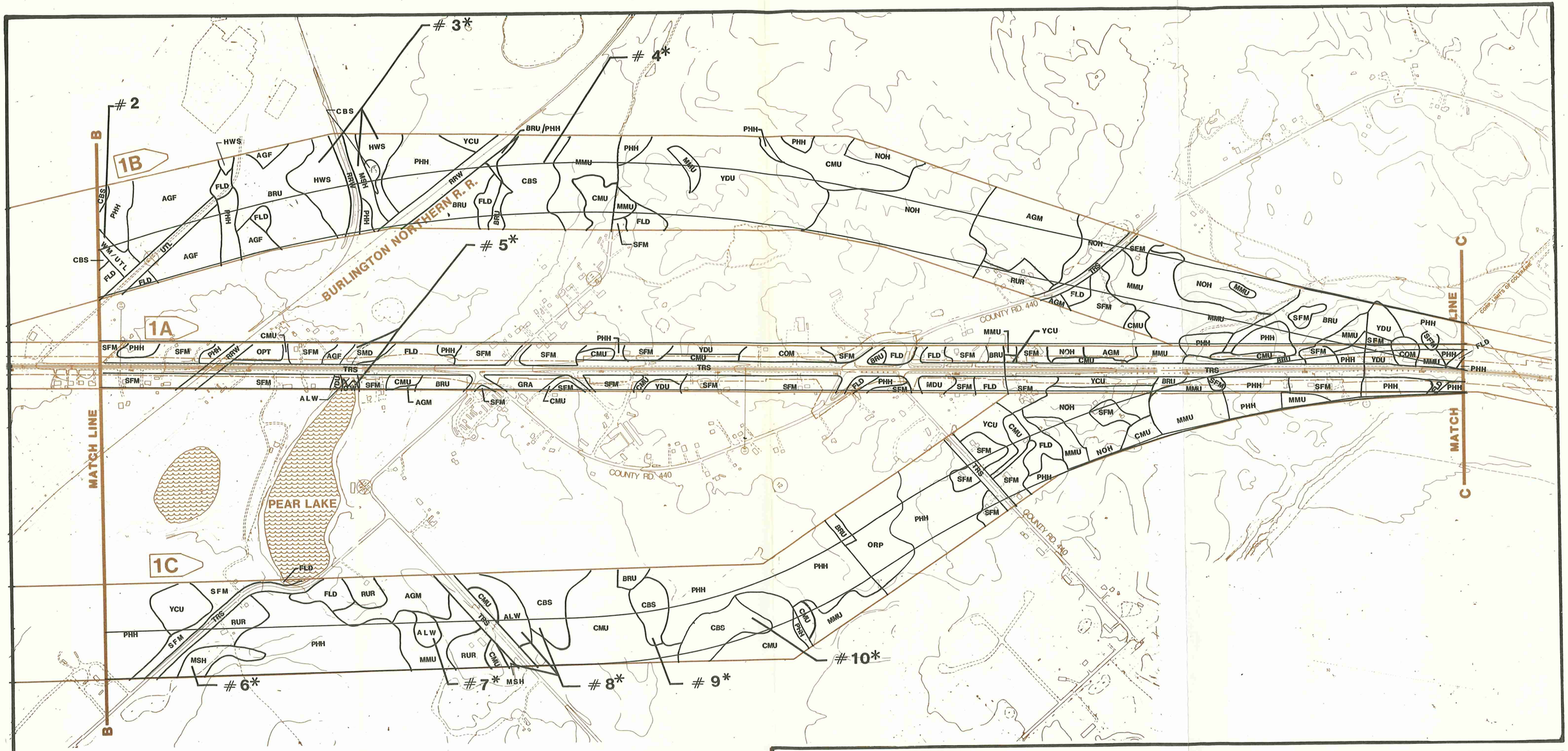
0 400 800 1600 FEET

NORTH

Figure 12a

WETLANDS/ VEGETATION

3A Alternative Alignment Designation



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DIST - Disturbed

***Note:** Wetland Identification Numbers. See Table 10 for Wetland Classification.

CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

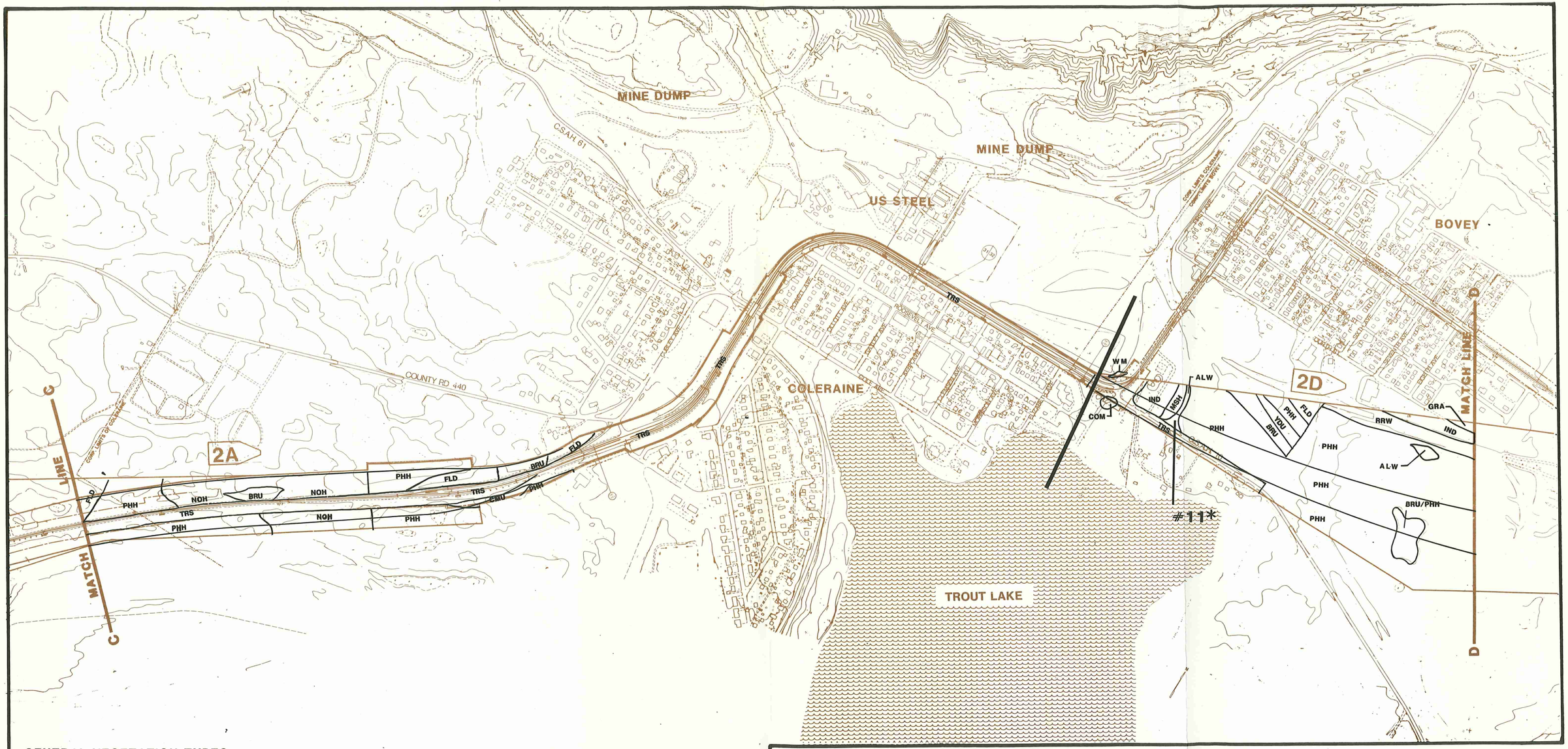
0 400 800 1600 FEET

NORTH

Figure 12b

WETLANDS VEGETATION/

3A **Alternative Alignment Designation**



GENERAL VEGETATION TYPES

Grassland
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Brushland
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- **YCU** - Young Coniferous Upland
- **ALW** - Wetland Shrub

Woodland
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Wetlands
- **MSH** - Persistent Emergent
- **SMD** - Sedge Meadow
- **WM** - Wet Meadow
- **BOG** - Sphagnum Bog

Open Water
- **OW** - Open Water
- **STR** - Streams and Rivers

Special Habitats
- **URB** - Urban
- **UTL** - Utility
- **TRS** - Transportation
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- **INS** - Institution
- **IND** - Industrial Site
- **COM** - Commercial
- **RUR** - Rural Residential
- **SFM** - Single Family Residential

Seasonally Altered
- **WDP** - Wooded Pasture
- **OPT** - Open Pasture
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- **AGF** - Agricultural Field
- **GRA** - Cultured Grassland

Other
- **LOG** - Recently Logged
- **DIST** - Disturbed

***Note:** Wetland Identification Numbers. See Table 10 for Wetland Classification.

CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

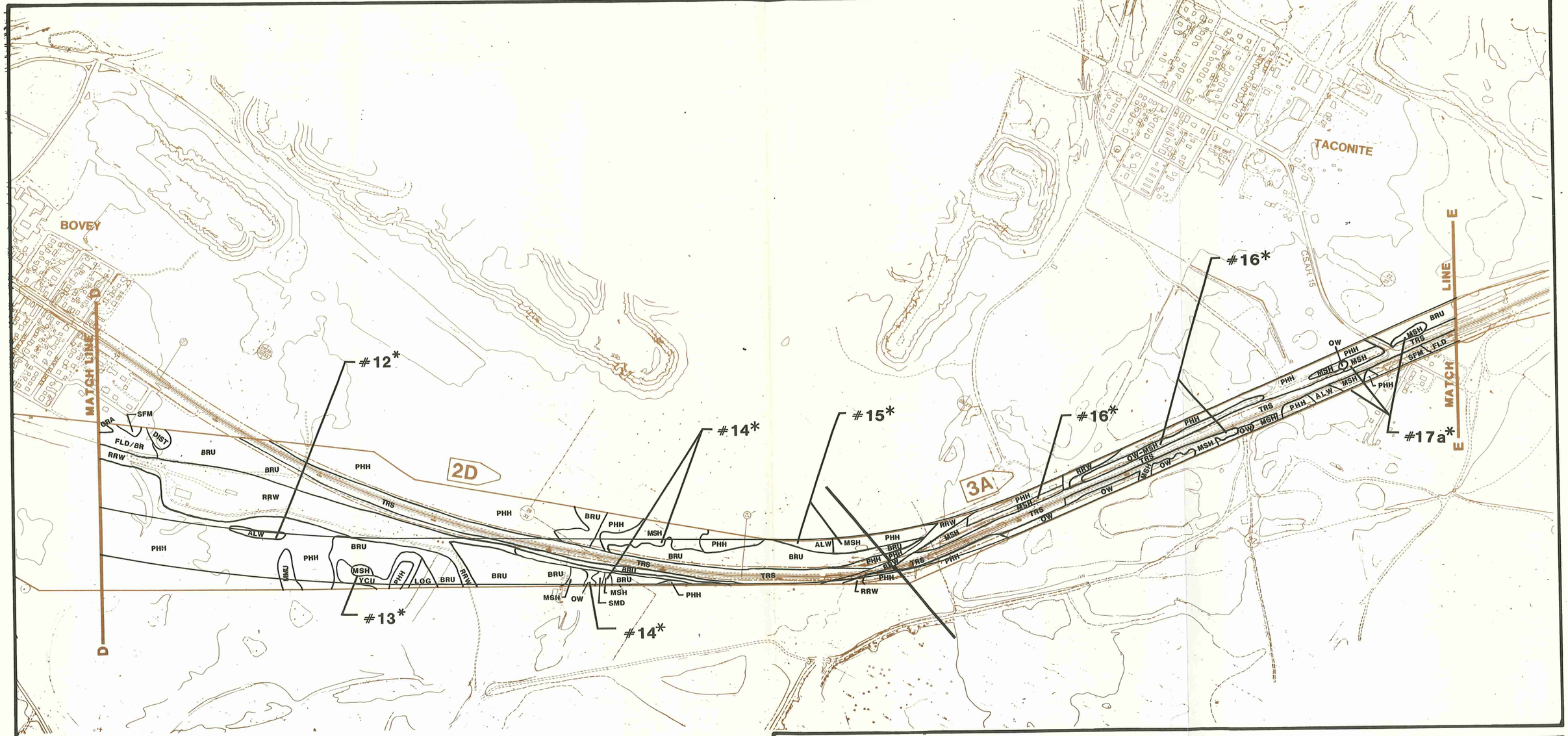
0 400 800 1600 FEET

NORTH

Figure 12c

WETLANDS/ VEGETATION

3A **Alternative Alignment Designation**



GENERAL VEGETATION TYPES

Grassland
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Brushland
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- **YCU** - Young Coniferous Upland
- **ALW** - Wetland Shrub

Woodland
- **PHH** - Mature Deciduous Upland
- **NOH** - Old Growth Deciduous Upland
- **MMU** - Mature Deciduous - Coniferous Upland
- **CMU** - Mature Coniferous Upland
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- **HWS** - Broadleaf Deciduous Lowland

Wetlands
- **MSH** - Persistent Emergent
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Open Water
- **OW** - Open Water
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Special Habitats
- **URB** - Urban
- **UTL** - Utility
- **TRS** - Transportation
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Seasonally Altered
- **WDP** - Wooded Pasture
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- **AGF** - Agricultural Field
- **GRA** - Cultured Grassland

Other
- **LOG** - Recently Logged
- **DIST** - Disturbed

***Note:** Wetland Identification Numbers. See Table 10 for Wetland Classification.

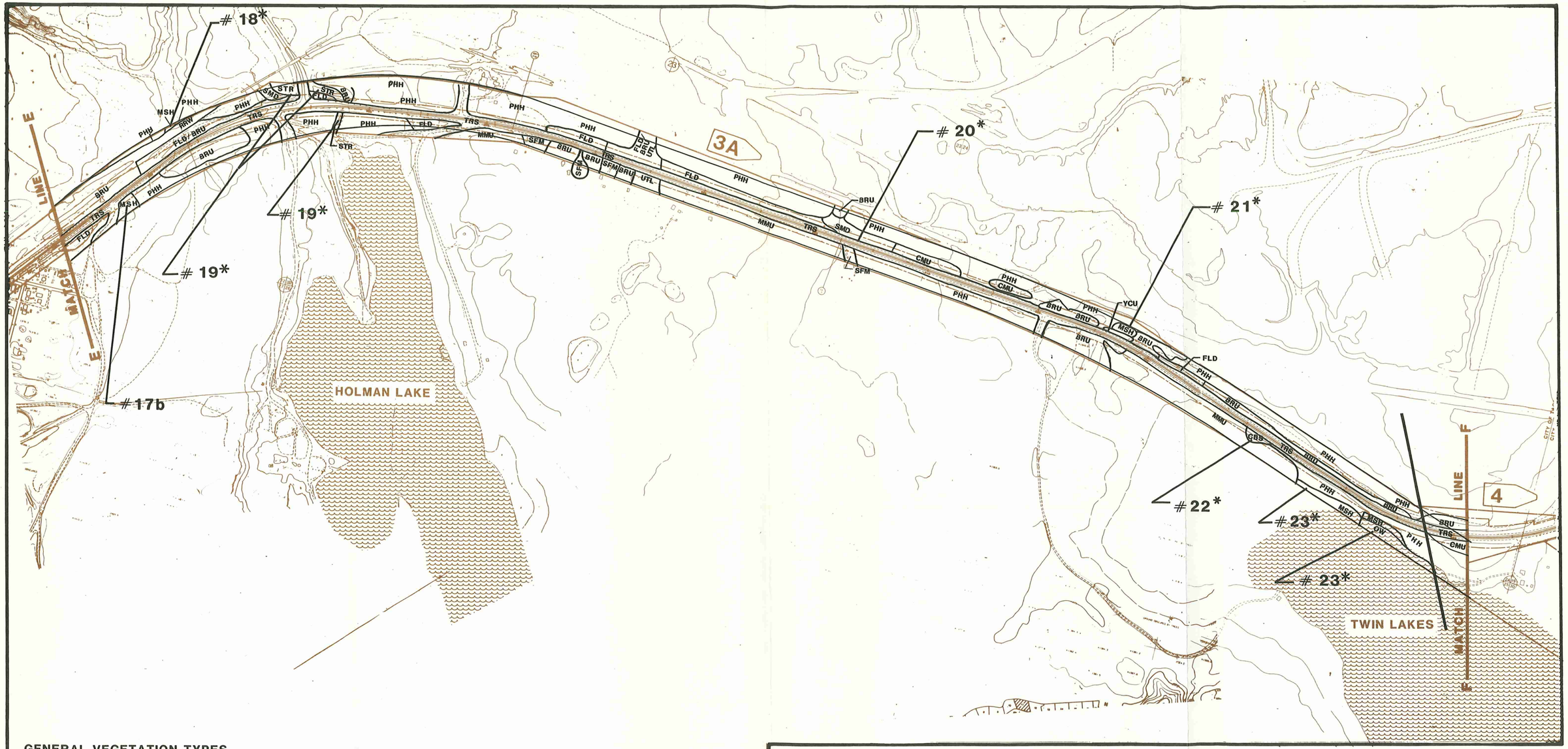
CROSS RANGE EXPRESSWAY
T.H. 169
GRAND RAPIDS TO PENGILLY

0 400 800 1600 FEET

NORTH

Figure 12d
WETLANDS/ VEGETATION

3A **Alternative Alignment Designation**



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Other

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***Note:** Wetland Identification Numbers. See Table 10 for Wetland Classification.

CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

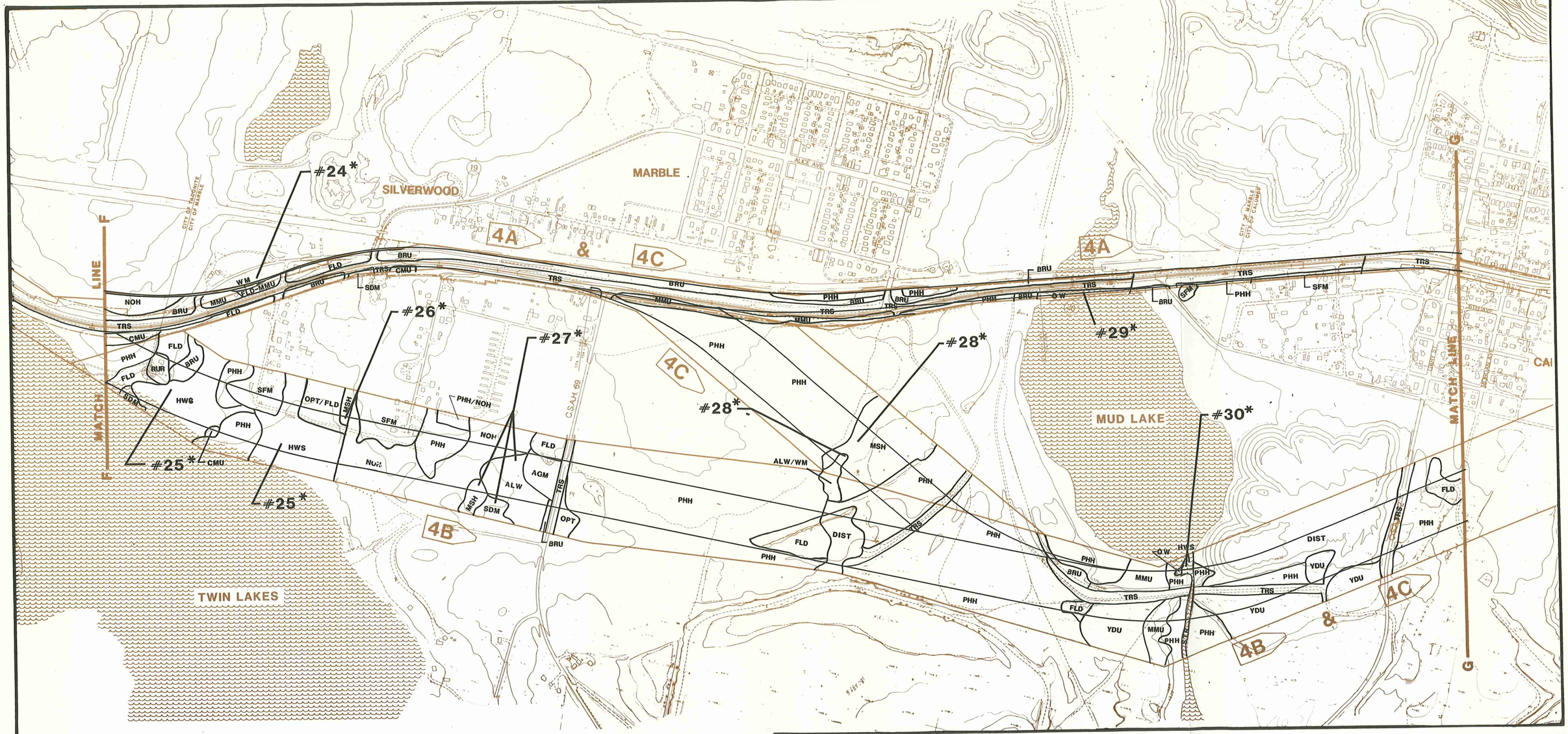
0 400 800 1600 FEET

NORTH

Figure 12e

WETLANDS/ VEGETATION

3A Alternative Alignment Designation



GENERAL VEGETATION TYPES

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BRU - Open Brush
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Open Water

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Special Habitats

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UTL - Utility
TRS - Transportation
RRW - Railroad Right-of-way
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IND - Industrial Site
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Seasonally Altered

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AGF - Agricultural Field
GRA - Cultured Grassland

Other

LOG - Recently Logged
DIST - Disturbed

***Note:** Wetland Identification Numbers. See Table 10 for Wetland Classification.

CROSS RANGE EXPRESSWAY

T.H. 169

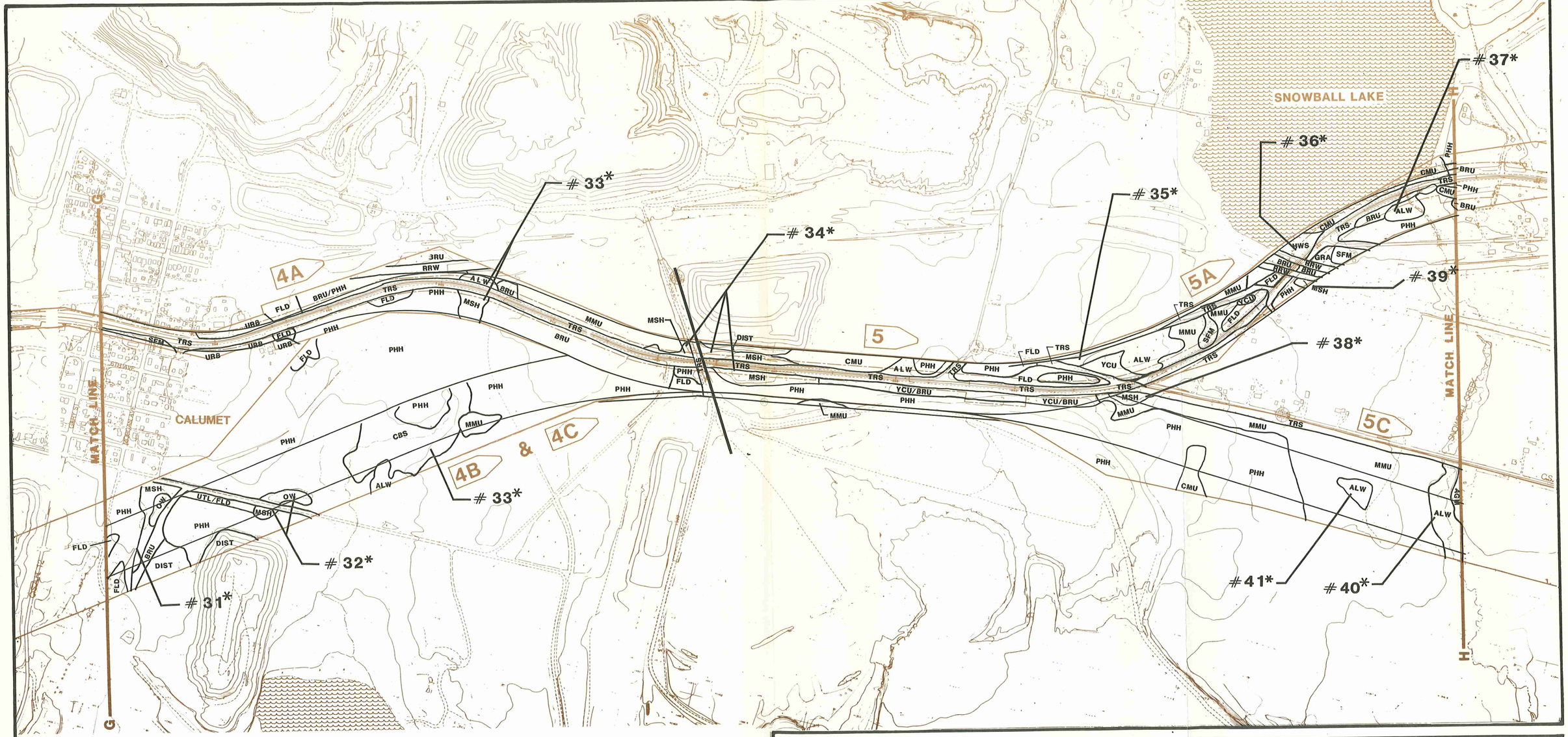
GRAND RAPIDS TO PENGILLY

0 400 800 1600 FEET

NORTH

Figure 12f
WETLANDS/ VEGETATION

3A **Alternative Alignment Designation**



GENERAL VEGETATION TYPES

Grassland

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Brushland

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CBS - Closed Canopy Lowland Conifer
HWS - Broadleaf Deciduous Lowland

Wetlands

MSH - Persistent Emergent
SMD - Sedge Meadow
WM - Wet Meadow
BOG - Sphagnum Bog

Open Water

OW - Open Water
STR - Streams and Rivers

Special Habitats

URB - Urban
UTL - Utility
TRS - Transportation
RRW - Railroad Right-of-way
INS - Institution
IND - Industrial Site
COM - Commercial
RUR - Rural Residential
SFM - Single Family Residential

Seasonally Altered

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OPT - Open Pasture
ORP - Orchards or Plantations
AGM - Agricultural Meadow
AGF - Agricultural Field
GRA - Cultured Grassland

Other

LOG - Recently Logged
DIST - Disturbed

***Note:** Wetland Identification Numbers. See Table 10 for Wetland Classification.

CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

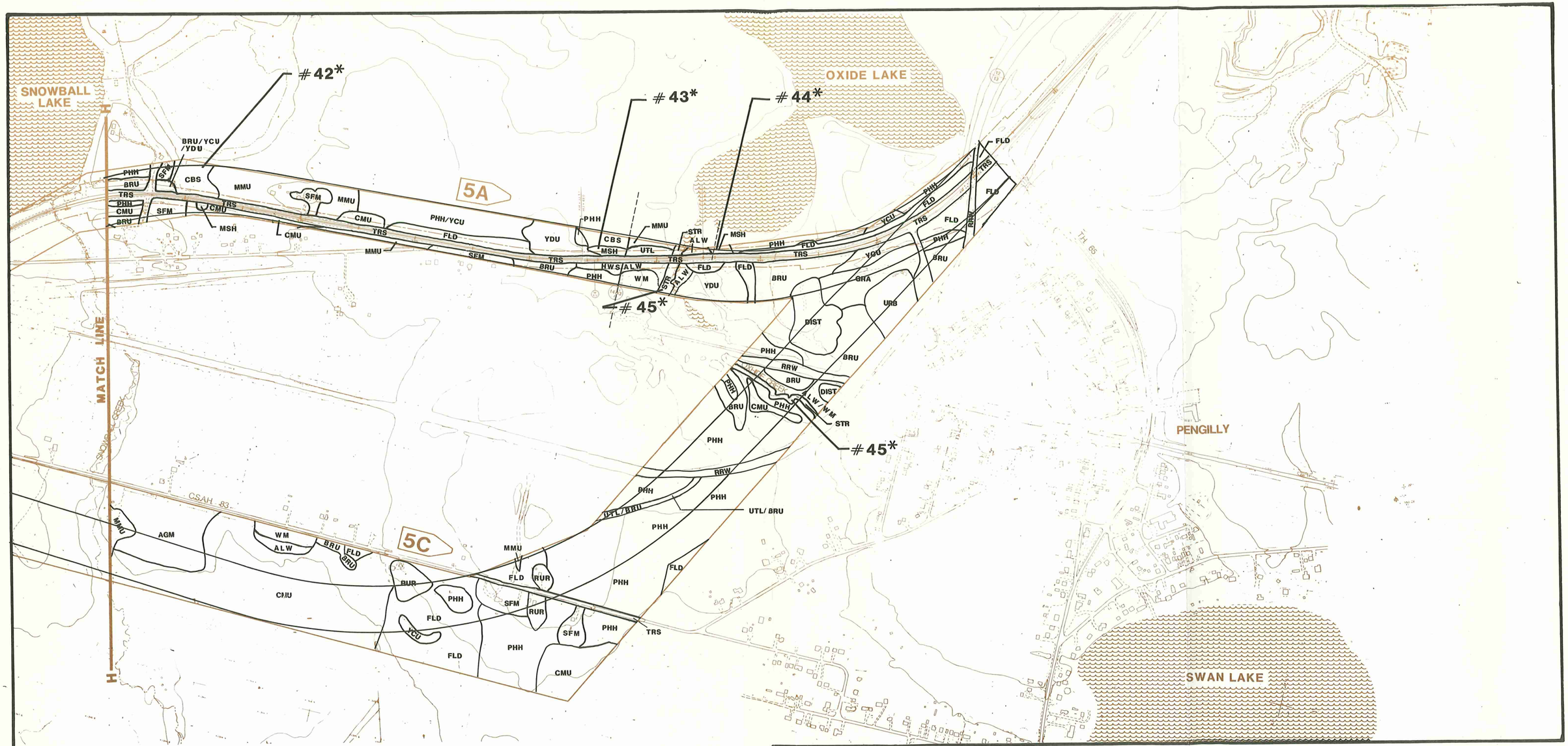
0 400 800 1600 FEET

NORTH

Figure 12g

WETLANDS/ VEGETATION

3A **Alternative Alignment Designation**



GENERAL VEGETATION TYPES

Grassland

FLD - Old Field

Brushland

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YCU - Young Coniferous Upland
ALW - Wetland Shrub

Woodland

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HWS - Broadleaf Deciduous Lowland

Wetlands

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Open Water

OW - Open Water
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Special Habitats

URB - Urban
UTL - Utility
TRS - Transportation
RRW - Railroad Right-of-way
INS - Institution
IND - Industrial Site
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Seasonally Altered

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ORP - Orchards or Plantations
AGM - Agricultural Meadow
AGF - Agricultural Field
GRA - Cultured Grassland

Other

LOG - Recently Logged
DIST - Disturbed

***Note:** Wetland Identification Numbers. See Table 10 for Wetland Classification.

CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

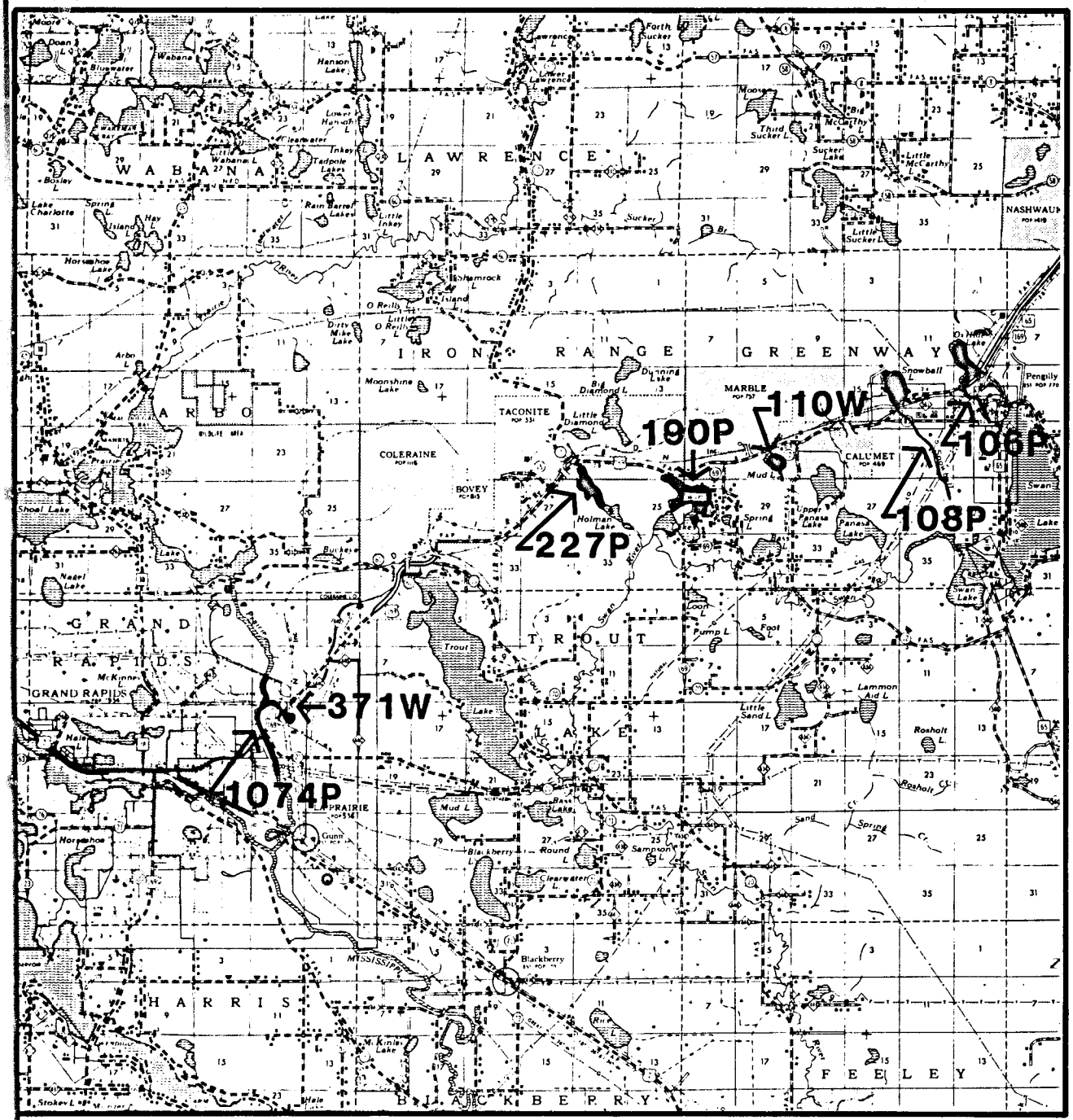
0 400 800 1600 FEET

NORTH

Figure 12h

WETLANDS/ VEGETATION

3A **Alternative Alignment Designation**



CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

Figure 13

MINNESOTA DNR STATE PROTECTED WATERS

P = PROTECTED WATER
W = WETLAND
371W = DNR IDENTIFICATION NUMBER

0 5 10 20 MILES

NORTH

TABLE 12
DRAINAGE BASINS

DRAINAGE BASIN	SUB-BASIN
Mississippi River	Direct
Prairie River	Direct
	Pear Lake
Swan River	Trout Lake
	Holman Lake
	Big Diamond Lake
	Twin Lake
	Mud Lake
	Upper Panaca Lake
	Snowball Lake
	Oxhide Lake

The existing environment in the study area makes description and analysis of drainage patterns difficult because the surface water system in a large portion of the area is very complex. For example, between Coleraine and Pengilly there are an abundance of streams, wetlands and lakes, some of which are natural and the remainder are a result of mining activity, but all are interconnected hydraulically.

The topography of the study area varies from gently undulating in the west to large, rolling hills in the east and east-central portions, and the drainage characteristics of the surface soils in the area vary from low to high amounts of runoff (Figure 14).

The designated floodplains within the study area were identified from the Flood Insurance Studies prepared for Grand Rapids and Itasca County by the U.S. Department of Housing and Urban Development. These studies indicate that the floodplain associated with the Prairie River is the only designated floodplain likely to be affected by the proposed project. The limits of this floodplain are shown in Figure 15. Other undesignated floodplains were also identified around the larger lakes in the study area. These lakes and the estimated 100-year flood elevation are documented in Table 13.

CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

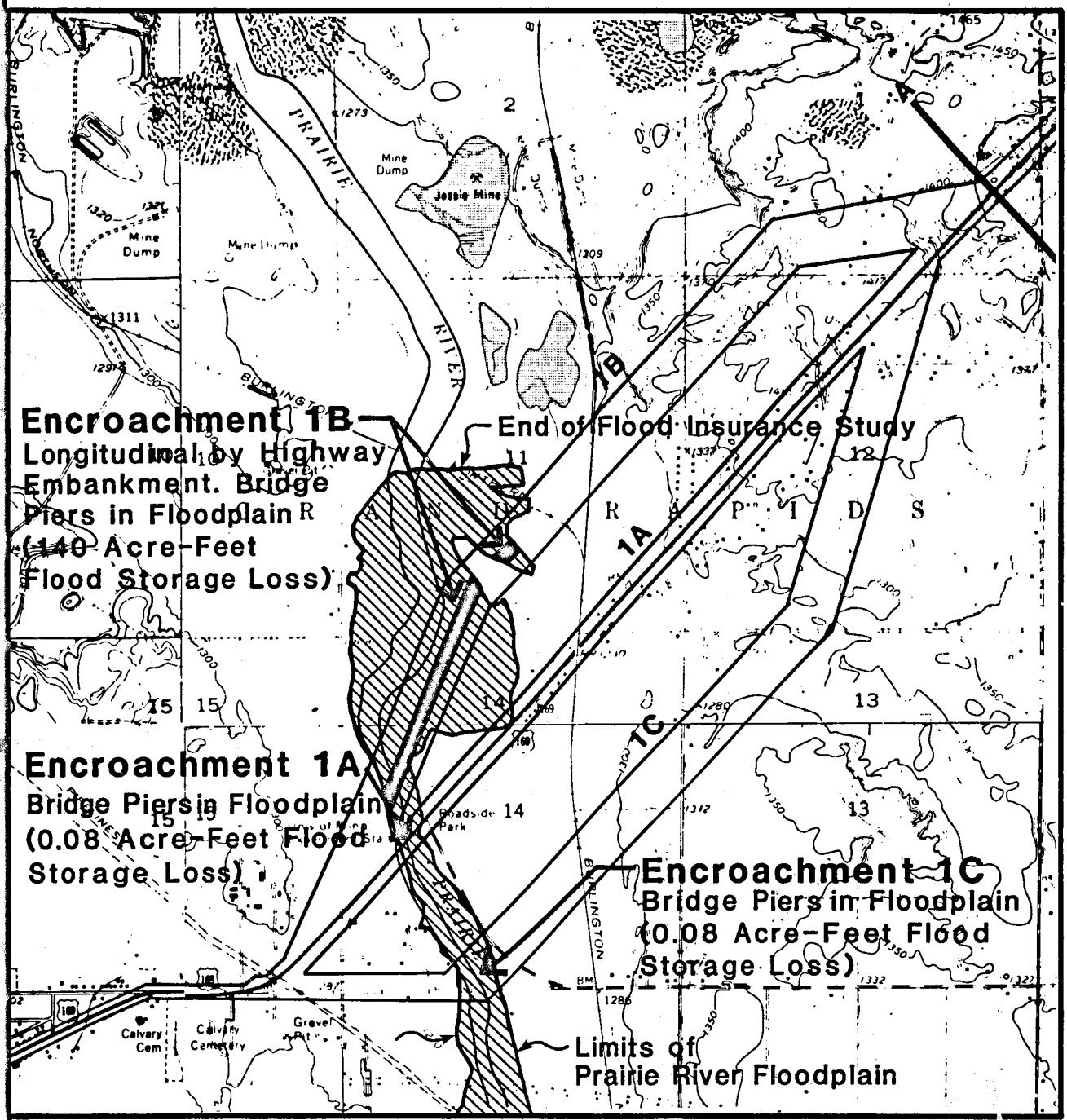
0 1/2 1 2 MILES

NORTH

Figure 14

SOILS DRAINAGE SUITABILITY

- A — LOW RUNOFF
- B — MODERATELY LOW RUNOFF
- C — MODERATELY HIGH RUNOFF
- D — HIGH RUNOFF
- W — WATER



CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

Figure 15

PRAIRIE RIVER FLOODPLAIN MAP

0 1000 2000 4000 FT.

NORTH

TABLE 13
ESTIMATED 100-YEAR FLOOD ELEVATIONS

LAKE	AVERAGE WATER LEVEL	RECORDED HIGH WATER	100-YEAR* ELEVATIONS
Big Diamond	1337.5	1340.73	1341.25
Holman	1313.5	1314.92	1315.20
Mud	1348.3	1350.61	1350.95
Oxhide	1347.0	1348.60	1349.35
Snowball	1354.7	1355.78	1356.25
Swan	1335.8	1337.00	1337.50
Trout	1287.5	1288.68	1289.20
Twin	1311.5	1313.95	1314.60
Upper Panaca	1343.5	1344.65	1345.40

* Estimated elevations based on probability analysis.

The information required for the water quality analysis consisted of background data for the major receiving waters and deposition rates for deicing salt and other roadway related pollutants. Existing surface water quality data was obtained from the Minnesota Department of Natural Resources and the Minnesota Pollution Control Agency, and this information is summarized in Table 14. The deposition rate for deicing salt is based on information provided by the Minnesota Department of Transportation's Area Maintenance Engineer. This information indicates the following:

- o The basic salt/sand mix consists of seven percent salt.
- o The average salt/sand mix used in the study area consists of 24 percent salt.
- o The application rate used in the study area is 26 tons per lane mile annually.

TABLE 14
EXISTING SURFACE WATER QUALITY DATA

BODY OF WATER	CHLORIDE CONCENTRATIONS (MG/L) MAX.	MIN.	AVE.	TURBIDITY (FTU) MAX.	MIN.	AVE.
Mississippi River	9.4	1.9	5.6	16.0	2.2	5.9
Swan Lake	8.5	5.0	6.6	4.4	1.1	2.6
Trout Lake	8.2	6.0	7.1	6.0	0.8	2.4

The deposition rates for the other roadway related pollutants (petroleum products, rubber, heavy metal, etc.) was based on studies conducted by the U.S. Environmental Protection Agency.

The basic information regarding groundwater in the study area indicates that shallow groundwater movement is generally toward the lakes and streams. In addition, regionwide groundwater movement of deeper water areas is toward the Mississippi River. Information regarding the depth and associated geological formation of major deep water aquifers is documented in Table 15. The groundwater information indicates that the major aquifers in the area are deep enough so that they are not likely to be impacted by any construction activities or by post-construction increases in runoff and the associated infiltration of highway related contaminants.

TABLE 15
GROUNDWATER INFORMATION

LOCATION	DEPTH	GEOLOGICAL FORMATION
Grand Rapids	80-179 Feet	Glacial Sand and Gravel
	129-507 Feet	Precambrian Iron
Bovey	39- 91 Feet	Glacial Sand and Gravel
Taconite	110-280 Feet	Precambrian Iron
Marble	129-507 Feet	Precambrian Iron
Calumet	119-300 Feet	Precambrian Slate
	300-500 Feet	Precambrian Iron

Source: Minnesota Department of Health; Water Well Drilling Logs for Itasca County, Mn. Hydrologic Investigations Atlas HA-278; U.S. Department of the Interior, United States Geological Survey.

4.2.3 Vegetation

This section summarizes the findings of the TH 169 Vegetation Technical Report (Mn/DOT, 1985), which contained a detailed description of the vegetation of the TH 169 Study Area and the Alternative Alignments. That study utilized field-checked aerial photography and assistance from personnel of the Minnesota Department of Natural Resources and the

U.S. Fish and Wildlife Agency to determine patterns of vegetative cover. Field investigation showed that the vegetative cover types found in the Alternative Alignments are fairly common throughout northern Minnesota. All areas showed evidence of disturbance at some point within approximately the past 100 years, although most disturbances appeared to be much more recent in origin.

The study area was once covered by a magnificent coniferous forest which was dominated by the white pine. Logging began around 1837 and eventually removed most of the virgin timber of this region. The introduction and expansion of the mining industry and the spread of urban activities also affected the original vegetation and the subsequent reintroduction of species. The Study Area was especially affected because it is immediately adjacent to or within the Mesabi Iron Range and has been a principal transportation artery for many decades. All locations of naturally-occurring vegetation now show varying signs of disturbance, and there are no instances of significant or outstanding vegetative cover remaining along the Alternative Alignments.

There were seven vegetative and land use cover types identified within the Study Area. These include grassland, wetlands, brushland, woodland, special habitats, seasonally-altered habitats, and disturbed habitat (Figures 12A - 12H). The Vegetation Technical Report has more detailed maps of these cover types in relation to the Alternative Alignments.

The most commonly encountered forest type was pioneer hardwood (primarily aspen and birch), ranging in size from one to twelve inches in diameter. The average age for most of these trees is thirty years. A second major forest type found was northern hardwood, including such trees as oak, elm, and maple which emerge after the pioneer hardwoods pass maturity and die off. The third major type of woodland found was the mixed mature upland, consisting of balsam fir, spruce, red or white pine, oak, aspen, ash, and birch.

There were no prairie areas found in the Study Area. Grasslands and brushlands were identified based upon the percent of woody plants present.

Seven types of wetland vegetative cover were also identified: wetland scrub, closed-canopy coniferous bog, broadleafed deciduous lowland, marsh, sedge meadow, wet meadow, and sphagnum bog.

4.2.4 Fisheries

There are several bodies of water within the Study Area which provide habitat for fish production and opportunities

for angling, including Snowball, Oxhide, Mud, and Holman Lakes, Snowball Creek, and the Prairie River. Information regarding fish species present in these bodies of water was obtained from survey reports provided by the Mn/DNR Area Fisheries Office and this information is summarized in Table 16.

4.2.5 Wildlife

There is a great diversity of animal species found in the Study Area because of the wide range of habitat available. These species include but are not limited to white-tailed deer, beaver, moose, bobcats, muskrats, bears, otters, fishers, martens, racoons, foxes, timber wolves, grouse, bald eagles, cormorants, loons, great blue herons, and a variety of ducks and geese. The wetlands and lakes are an especially important habitat resource of the Study Area. As the habitat of the area has changed because of logging, mining, and urban development, some species such as moose, caribou, and lynx have declined in number while others such as bobcat, beaver, and white-tailed deer have flourished.

The wildlife analysis focused on the following specific groups:

- o Rare, threatened and endangered species.
- o Species of special interest identified by the Mn/DNR Area Wildlife Manager.

Detailed discussions regarding each of these groups are contained in the Vegetation/Wildlife/Fisheries Technical Report for TH 169 (Mn/DOT, 1985) and basic background information is summarized below and in Figure 16.

Rare, Threatened and Endangered Species

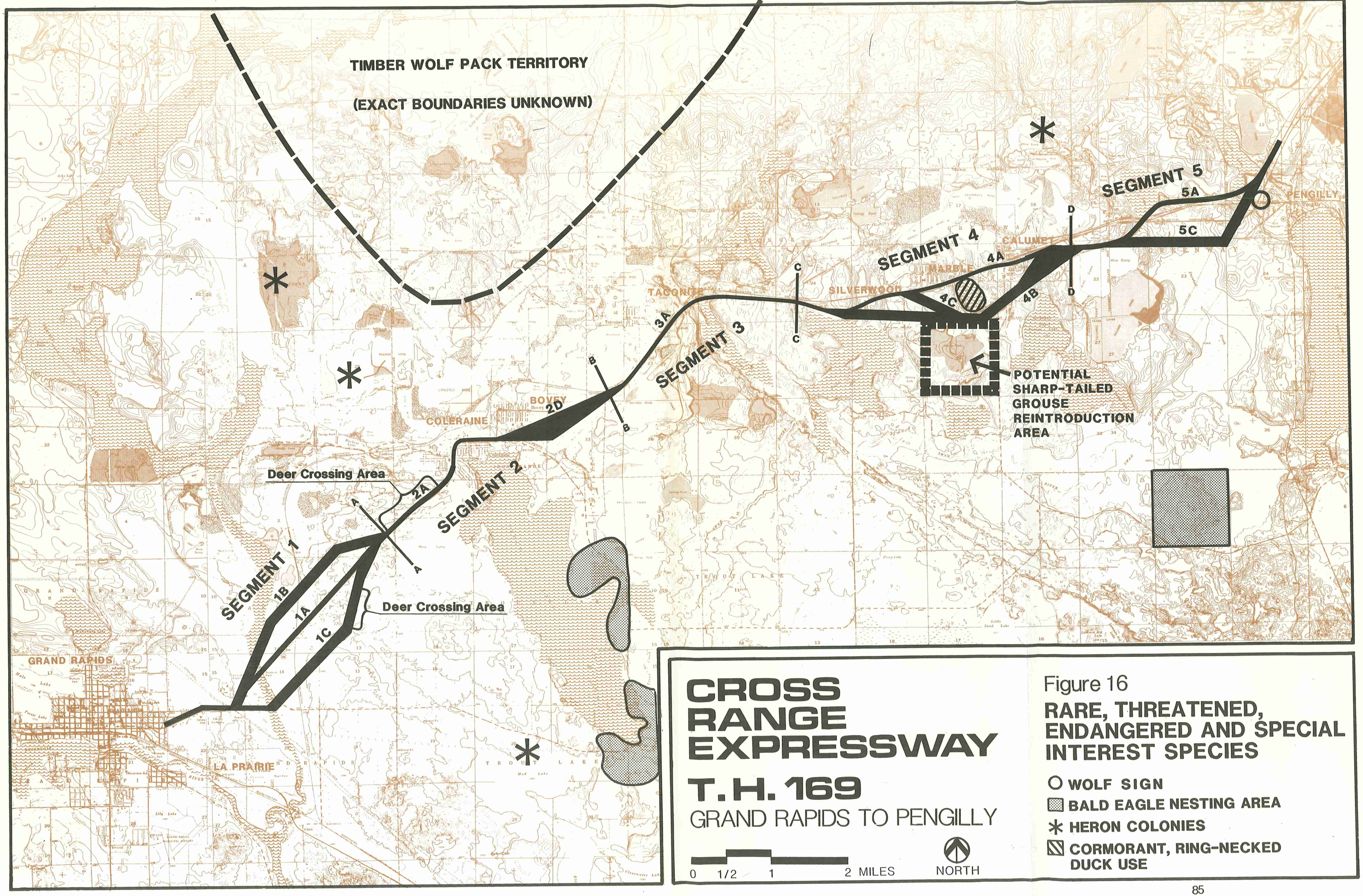
Bald Eagle - The bald eagle is currently listed as endangered on the Federal list of rare, threatened and endangered species and as threatened on the list prepared by the State of Minnesota. There are currently no reported nesting sites within the study area, however, eagles are known to nest near the study area and probably feed within the study area. Therefore, a field investigation was conducted in order to determine if there are any suitable nesting sites within the study area which could be impacted by any of the proposed alternative alignments. The investigation looked for the appropriate type and size of trees near bodies of water. The field investigation found no suitable nesting sites in the study area.

Eastern Timber Wolf - The eastern timber wolf is currently listed as a threatened species on both the Federal and State lists of rare, threatened, an endangered species. A pack of

TABLE 16
FISH SPECIES PRESENT IN STUDY AREA MAJOR WATER BODIES

	PRAIRIE RIVER	HOLMAN LAKE	MUD LAKE	SNOWBALL LAKE	SNOWBALL CREEK	OXHIDE LAKE
Northern Pike	P	P	O	A	P	O
Largemouth Bass	P	P	N	O	N	A
Bluegill	N	P	N	A	N	A
White Sucker	P	N	N	P	P	P
White Crappie	N	N	N	N	N	N
Black Crappie	N	N	N	A	N	P
Black Bullhead	P	N	P	O	N	P
Yellow Bullhead	P	N	P	O	N	P
Redhorse	P	N	N	N	N	N
Pumpkinseed	N	P	N	A	N	P
Walleye	P	N	N	O	N	O
Yellow Perch	P	N	N	A	N	A
Bowfin	P	N	N	O	N	P
Rock Bass	P	N	N	P	N	P
Brown Bullhead	P	N	P	O	N	N
Smallmouth Bass	P	N	N	N	N	N

A = Abundant
P = Present
O = Occasionally Present
N = Not Recorded



CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

0 1/2 1 2 MILES

NORTH

Figure 16

RARE, THREATENED, ENDANGERED AND SPECIAL INTEREST SPECIES

- WOLF SIGN
- BALD EAGLE NESTING AREA
- HERON COLONIES
- CORMORANT, RING-NECKED DUCK USE

wolves is known to inhabit an area north of Bovey and Coleraine. However, radio-tracking studies indicate that the range of this pack is well north of the study area. Wolf sign containing deer hair was found southwest of Pengilly during a field survey conducted during May, 1986. This sign may only indicate the presence of a lone wolf, however, it is likely that a small wolf pack exists within the study area.

Species of Special Interest/Concern

Ring-Necked Duck - Ring-necked ducks formerly nested in large numbers in the wetlands adjacent to Mud Lake. However, this habitat does not appear to be as important as it once was, possibly due to a change in water quality. Ring-necked ducks usually nest in boggy marshes or in sedges and cattails along the shoreline of small lakes. The best known habitat of this type in the study area is found along the north and south shores of Mud Lake.

Double-Crested Cormorant - There are no known cormorant breeding colonies in the study area. The closest breeding colony is located approximately twenty miles north of Mud Lake. However, Mud Lake is used by immature, non-breeding cormorants as a resting and feeding site during the spring and summer months. Fish constitute the largest portion of the cormorant's diet and those fish species commonly consumed are found in most major water bodies in the study area, including the Prairie River, Mud Lake, Snowball Lake, and Oxhide Lake.

Osprey - The osprey is officially listed by the Mn/DNR as a species of Special Concern. Ospreys are known to nest in Itasca County, particularly in the area within the Chippewa National Forest. However, there are no known osprey nests within or adjacent to the study area. Osprey feed primarily on fish and those species commonly consumed are found in Snowball and Oxhide Lakes.

Sharp-Tailed Grouse - Sharp-tailed grouse used to be quite common in the study area. However, their numbers have drastically declined in recent years, primarily as a result of loss of habitat caused by mining activities, maturing woodlands and developments. Recently, an area of suitable potential habitat has been identified south of Calumet and the Mn/DNR and the Iron Range Resources and Rehabilitation Board are jointly considering an experimental project to reintroduce sharp-tails in this area.

Great Blue Heron - Great blue heron are known to nest in colonies south of Trout Lake and northwest of Coleraine,

however, there are no known heron rookeries within or immediately adjacent to the study area. Great blue heron commonly feed on fish and a variety of small animals found in the study area, and the project personnel have observed herons feeding on several study area lakes and wetlands.

4.2.6 Visual Environment

An inventory of visual experiences along the existing and alternative TH 169 alignments was conducted in order to provide the data necessary for analyzing both views to and from the road. The inventory documented the items listed below and the results are described in detail in the TH 169 Roadside/Visual Technical Report (Mn/DOT, 1985).

- o Forest - for this report, is defined as any natural, indigenous, mature tree and shrub species or successional vegetative cover that visually creates a soft viewshed edge.

- o Savannah - is a grassy plain with scattered trees or those areas in transition from agriculture to savannah or forest.

- o Marsh - is an area of minimal open water and aquatic or successional plant species.

- o Open Water - areas include lakes and rivers where the majority of the basin or channel is water, not aquatic vegetation.

- o Agriculture - are areas where active, agricultural practices are being employed.

- o Institutional - are areas including campuses, cemetaries, parks and churches.

- o Rural Residential - include all areas of houses either individual or in subdivisions that are located between urban areas within the study area.

- o Commercial/Industrial - are areas whose uses or developments typically included in commercial and industrial zoning guidelines and range from urban areas to mining operations.

- o Visually Affected Resident - are those specific houses that may be visually affected by this project. This may also be defined as points which have views to the road.

- o Viewshed - is any visual penetrable space defined by ground plane or water surface and vertical or sloping edges that obscure the horizon. Viewsheds for this report are also defined as views from the road.

- o Hard Viewshed Edge - is an edge of the viewshed space created by vertical or sloping ground plan, i.e., mine tailing piles or by a uniform, tightly-spaced line of structures, i.e., an urban, commercial area.

- o Soft Viewshed Edge - is an edge of the viewshed space created by vegetation.

- o Cultural Modifications - are any man-made elements in the landscape.

- o Natural - refers to an unaltered, indigenous landscape combining or including open water, marsh and native plants.

4.2.7 Air Quality

There are no major sources of carbon monoxide (CO) in the study area, other than TH 169. As a result, monitoring to determine background concentrations was not conducted and CO concentrations of five parts per million (PPM) and two PPM were assumed for the one-hour and eight-hour averages. These background concentrations represent a condition which does not include the effects of TH 169 and intersecting streets, which will be taken into account during the computer modeling analysis for the project.

It should be noted that the assumed one-hour and eight-hour averages are conservative estimates of background CO concentrations and are probably much higher than actual CO levels at locations away from TH 169.

The results of the air quality analysis are documented in the Air Quality Technical Report (Mn/DOT, 1985) and a summary is provided in Section 5.2.7, beginning on page 128.

4.2.8 Noise

Existing noise levels along the TH 169 Alternative Alignments were determined through a combined program of noise monitoring and traffic noise modeling. This section presents the results of the noise monitoring program. A discussion documenting the analysis and the results of the computer modeling effort are presented in Section 5.2.8, beginning on page 132.

Noise monitoring was conducted in September and October, 1984, using the Metosonics dB-602 Statistical Sound Level Analyzer. Monitoring data was collected consistent with noise monitoring procedures issued by the Minnesota Pollution Control Agency (February 13, 1978). The monitoring sites were selected to characterize existing noise levels both adjacent to the existing corridor and in the vicinity of alternative corridors. At five of the sites, monitoring was conducted for a one-hour period. At the other three sites, monitoring was done for a 24-hour period in order to characterize the temporal distribution of corridor traffic noise. The noise monitoring results are presented in Table 17 and the monitoring locations are shown on Figure 17.

4.2.9 Agricultural Land and Farming

Farming activity is very limited in Itasca County as well as the study area because of the short growing season and the presence of the Iron Range with its associated mining activities. However, there is some farming activity within the study area.

In order to adequately analyze the potential impacts associated with the proposed project on farming and farm lands, data was collected regarding present and potential farm operations. The present level of farming activity was measured by determining the number of farmsteads with at least forty acres of land used for crop or hay production. The potential for future farming activity was measured by analyzing the existing soil types and topography and determining the amount of land, soils and slopes suitable for farm operations.

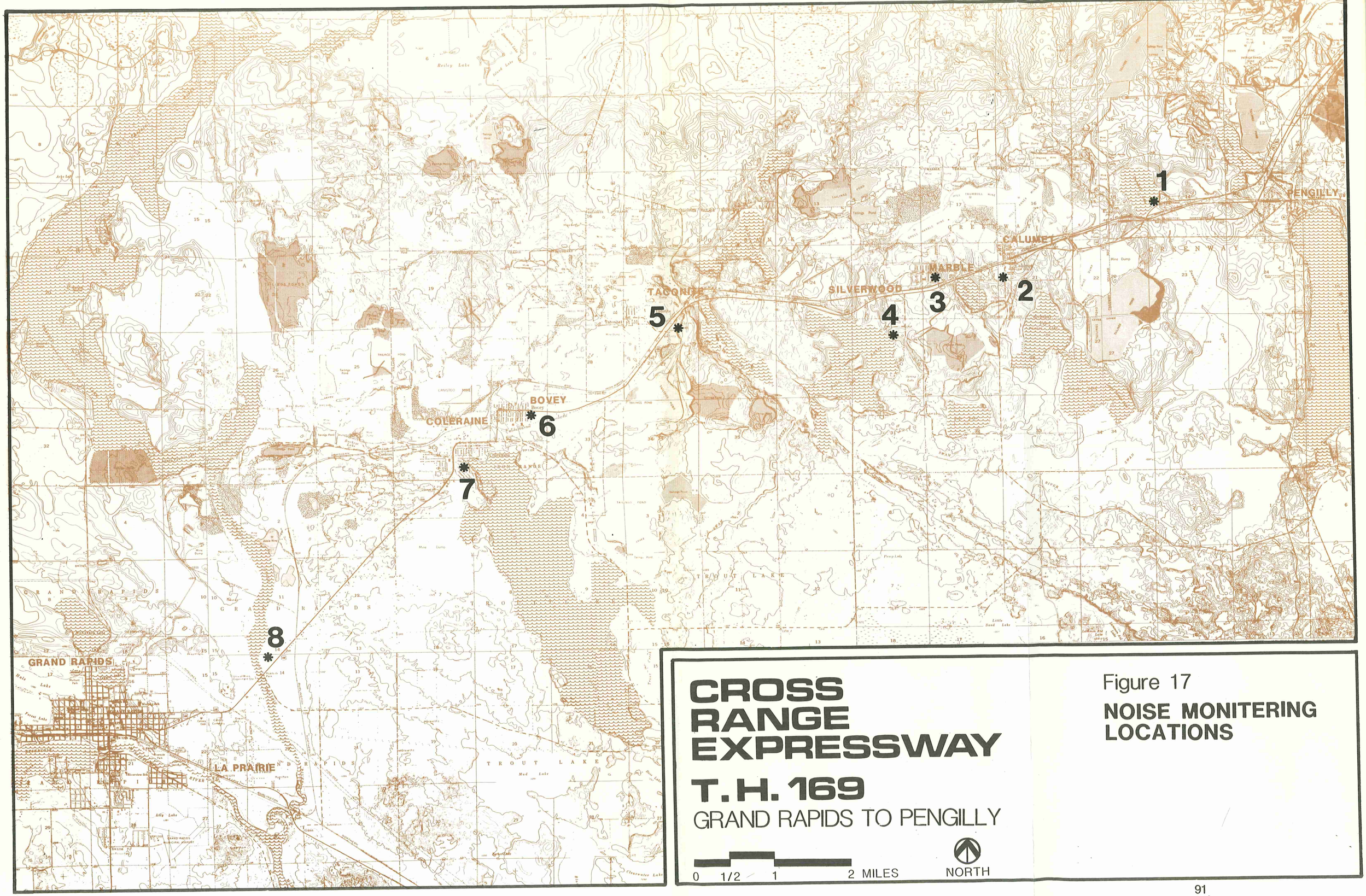
A total of seven existing farm operations of greater than forty acres was found and the locations are shown in Figure 18. Two of these farm operations are owned by the University of Minnesota, and the remainder are privately owned.

Soil information for Itasca County was obtained from the Soil Conservation Service (SCS) which documented 68 different types of soil within the study area. These individual soils types were then aggregated by the SCS District Soil Conservationist into three major categories representing soils of prime or statewide significance and soils which are not significant. The results of this effort are illustrated in Figure 18 and summarized by Alternative Alignment in Table 18.

TABLE 17
MONITORED EXISTING NOISE LEVELS

SITE #	LOCATION	DISTANCE (FT.)	TO ROADWAY	DATE	TIME	MONITORED NOISE LEVELS (dBA) L_{10}	MONITORED NOISE LEVELS (dBA) L_{50}
1	Snowball Lake Rest Area	45	TH 169	9-18-84	0730-0830*	71	60
2	Calumet	1150 350	TH 169 CSAH 12	10-16-84	1320-1418	54	43
3	Marble	400	TH 169	10-16-84	1159-1301	58	51
4	Twin Lake Park	1800	TH 169	10-16-84	1040-1139	39	34
5	Southeast of Taconite	70	TH 169	10-29-84	1655-1755*	69	57
6	Bovey	350	TH 169	10-16-84	0915-1013	53	NA
7	Coleraine	200	TH 169	10-11-84	1035-1138	58	52
8	Prairie River Rest Area	55	TH 169	10-24-84	1550-1650*	68	61

* Monitoring was conducted for 24 hours at these sites. The reported times and noise levels are the highest noise levels recorded.



CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

0 1/2 1 2 MILES

NORTH

Figure 17

NOISE MONITERING LOCATIONS

CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

0 1/2 1 2 MILES

NORTH

Figure 18

FARM OPERATIONS (40+ACRES) & FARMLAND CLASSIFICATIONS

- FARM OPERATIONS
- P — PRIME
- SW — STATEWIDE SIGNIFICANCE
- NS — NOT SIGNIFICANT
- W — WATER

An Agricultural Lands Technical Report was prepared (Mn/DOT, 1985) in response to the 1981 Farmland Protection Policy Act (FPPA). The SCS in a letter dated January 11, 1985, (copy included in the Appendix) indicated that Itasca County had not completed a Land Evaluation System Assessment at the time the Technical Report was prepared. As a result, the SCS would not provide the data necessary to complete the required assessment form within the 45-day time frame called for by Federal Regulations. Therefore, the alternative assessment method described in the Technical Report was utilized.

Completion of this alternative assessment is considered to have satisfied the requirements of the FPPA and to have completed the coordination with the Itasca County Office of the Soil Conservation Service.

TABLE 18
ACRES OF CLASSIFIED FARMLAND BY ALTERNATIVE ALIGNMENT

	ACRES WITHIN CORRIDOR			
CORRIDOR	PRIME	STATEWIDE	NOT SIGNIF.	WATER
1A	99	52	18	3
1B	165	76	52	16
1C	188	42	58	5
2A	24	5	49	0
2D	153	6	62	0
3A	78	0	10	0
4A	63	5	34	0
4B	108	28	138	0
4C	82	14	106	0
5A	42	9	80	20
5C	99	0	72	0

It should be noted that tilled farmlands are not a significant land use in any part of the study area and that most land with prime or statewide significant soil types are currently used for timber production.

4.3 LAND USE PLANNING AND ZONING

4.3.1 Existing Land Use and Zoning

Land use along the Alternative Alignments is composed mostly of forest, open land, open pit mines, mine dumps, wetlands, lakes, farm fields, and low-density residential areas. Most

of the housing and nearly all of the commercial and non-mining industrial activity is associated with the seven municipalities in the Study Area: Grand Rapids, Coleraine, Bovey, Taconite, Marble, Calumet, and Pengilly. The pattern of land use in the study area is illustrated in Figure 19.

Existing developments of note near the western end of the route include Calvary Cemetary, the University of Minnesota Agricultural Experiment Station, Itasca Community College and Lakeview Cemetary. All along the north side of the Corridor are open pit iron mines, mine dumps, and land under which there are valuable mineral deposits. Major land use considerations along the south side of the Corridor include mine dumps, Trout Lake, Holman Lake, and Twin Lakes. Snowball, Oxhide and Big Diamond Lakes are also on the north side of the Corridor. The Burlington Northern and the Duluth, Mesabi, and Iron Range Railroads run along the north side of the Corridor through most of the Study Area but cross to the south side near Snowball Lake.

The current pattern of zoning reflects the existing pattern of land use in the municipalities.

4.3.2 Current Land Use Plans

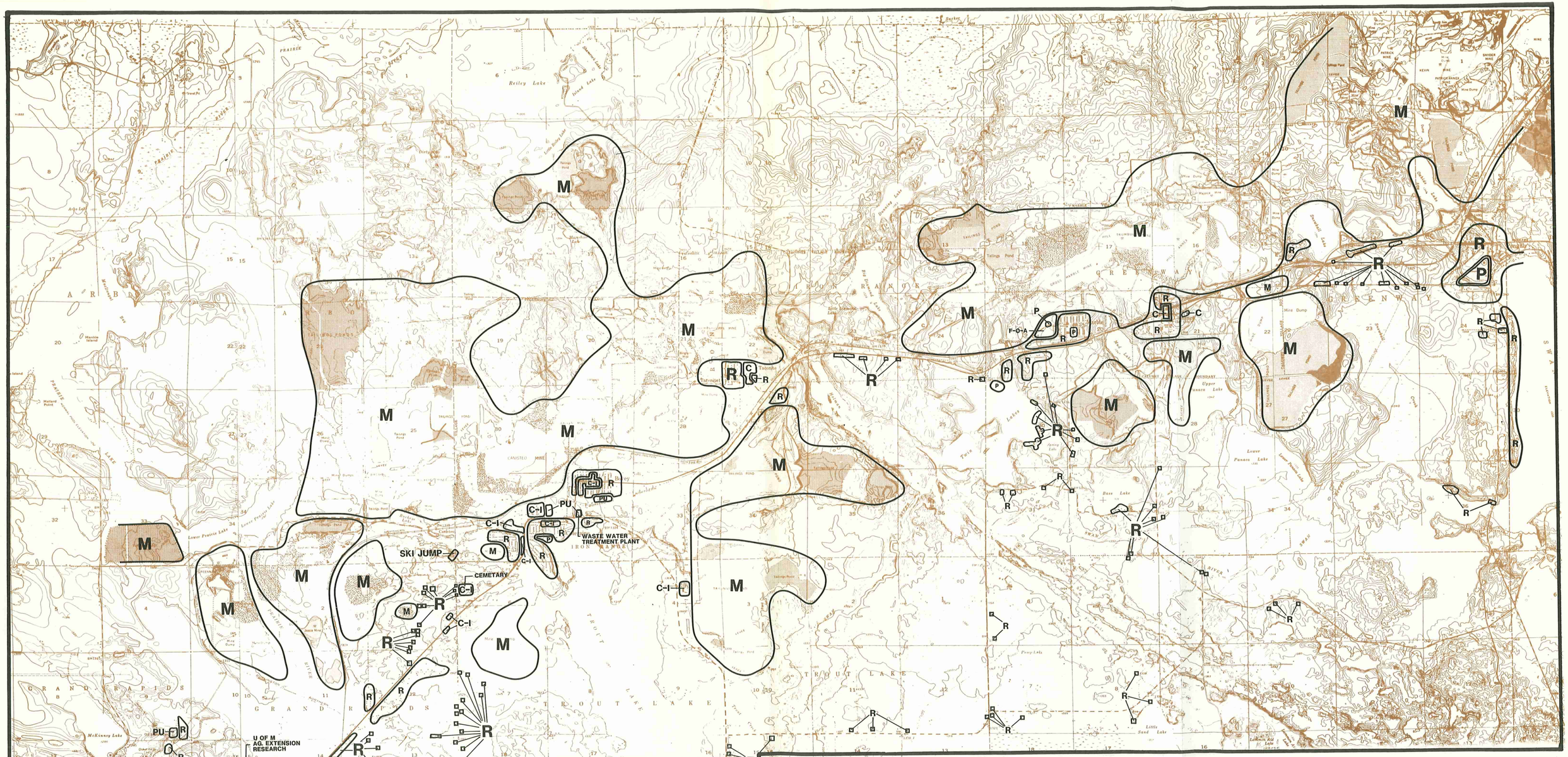
None of the communities in the Study Area has a land use plan with the exception of Grand Rapids. Allowable land use in these communities is determined only by zoning.

4.3.3 Road Relocation in Mineral Lands

The proposed upgrading of TH 169 to a four-lane expressway will require the acquisition of additional right-of-way, and much of this property is in mining areas. As a result, Mn/DOT will acquire the surface rights and subsurface easements subject to mineral rights in accordance with Minnesota Statute 160.10 and the provisions of the 30/20 year reimbursement clause. This arrangement allows the owner of the mineral rights to have the road moved in order to make way for the mining operation. However, the owner of the mineral rights would have to pay for the entire cost of relocating the roadway during the first thirty years of the agreement and a prorated cost during the next twenty years. This type of acquisition is in conformance with the way the right-of-way was acquired for the remainder of the Cross Range Expressway.

4.3.4 Property Ownership

There is a variety of land owners along the Alternative Alignments including private parties, mining companies,



CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

0 1/2 1 2 MILES

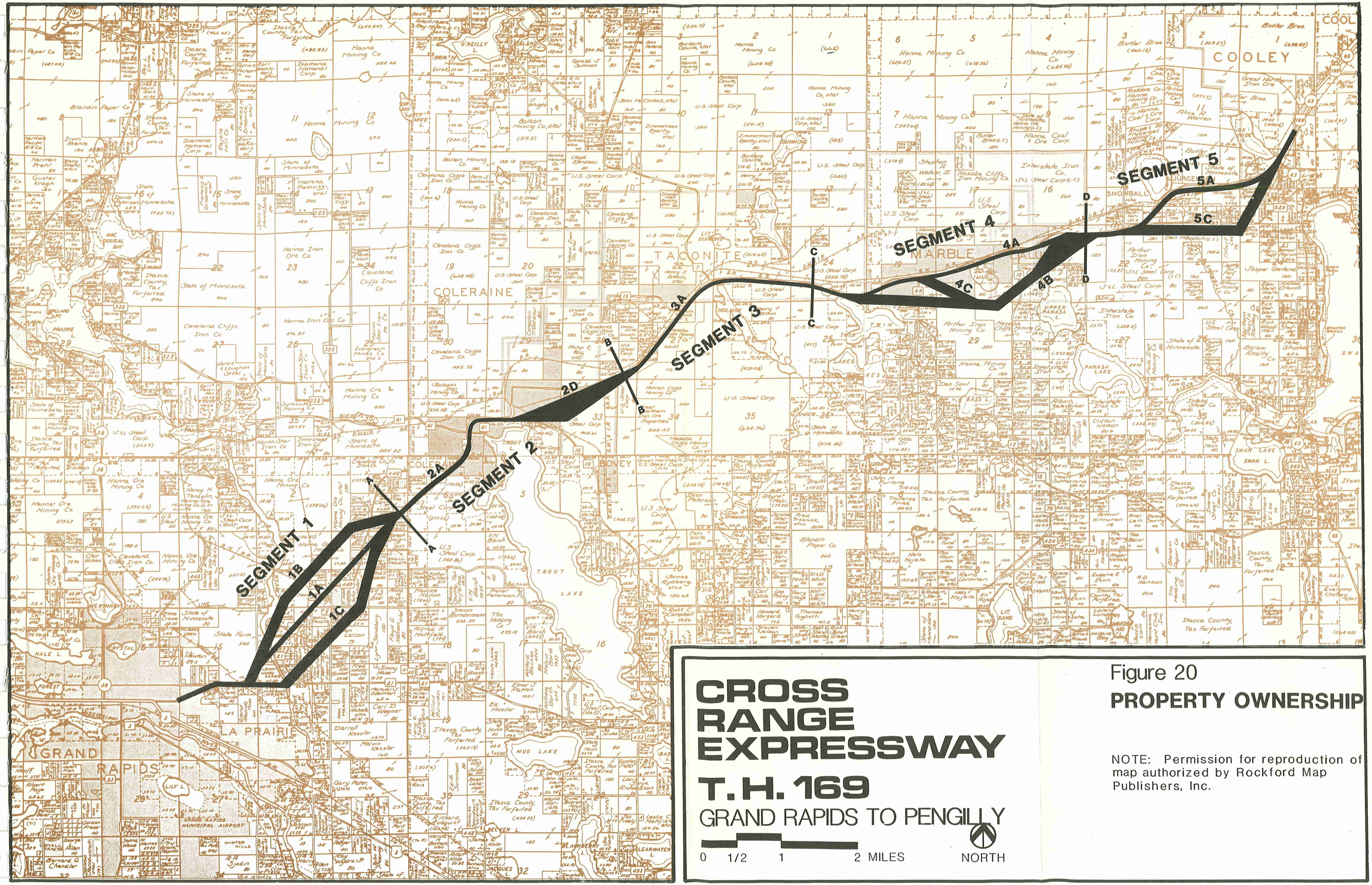
NORTH

Figure 19

LAND USE - 1985

- R RESIDENTIAL
- C-I COMMERCIAL/INDUSTRIAL
- M MINING
- P PUBLIC PARK
- PU OTHER PUBLIC
- FOREST, OPEN, AGRICULTURE

railroads, and the State of Minnesota. Figure 20 illustrates this pattern of parcelization and ownership in the study area. Mining companies owning potentially affected land include Hanna, U.S. Steel, Mesaba Cliffs, and Arthur. Railroads include the BN and DM&IR. The major state property is the University of Minnesota Agricultural Research Station near Grand Rapids. Private individual ownership involves many small parcels.



CROSS RANGE EXPRESSWAY
T.H. 169
GRAND RAPIDS TO PENGILLY

0 1/2 1 2 MILES NORTH

Figure 20
PROPERTY OWNERSHIP

NOTE: Permission for reproduction of map authorized by Rockford Map Publishers, Inc.

5.0 ENVIRONMENTAL CONSEQUENCES

5.1 URBAN AND COMMUNITY IMPACTS AND MITIGATION MEASURES

5.1.1 Population

Right-of-Way Acquisition and Relocation

At the time of the preparation of this DEIS, the amount of right-of-way and the number of buildings which are likely to be acquired to accommodate the reconstruction of TH 169 could only be estimated. Detailed studies to determine the actual limits of construction have not been initiated and will not begin until after a preferred combination of Alternative Alignments has been selected.

The estimated acerage of right-of-way which would be acquired and the number of homes and businesses which would have to be relocated if the project were constructed, is documented in Table 19. Alignments 1A and 1C would result in the largest displacement of homes, and Alignment 4A in the largest number of businesses.

The business displacement along the 4A alignment occurs in the City of Calumet, and it should be noted that the City was presented with three options for reconstructing the roadway through the downtown area of the community. The three alternatives consisted of all roadway widening to the south, widening equally on both sides, and all widening to the north. The City Council requested that the option which results in all widening to the north be considered the preferred choice at this time, even though this option results in the acquisition of one more business than the other alternatives, because of the following benefits.

- Several businesses along the south side of TH 169 would not be affected at all.
- Many of the homes which would be acquired along the north side of TH 169 are currently vacant.
- The homes along the north side of the road are in poor physical condition and conversion to commercial use seems appropriate because of the access and proximity to TH 169.

TABLE 19
RIGHT-OF-WAY ACQUISITION/HOUSING AND BUSINESS DISPLACEMENT

SEGMENT	ALIGNMENT	ACRES OF ROW	RESIDENTIAL DISPLACEMENT*		BUSINESS DISPLACEMENT*	
			HOMES	NUMBER OF PERSONS	NUMBER OF BUSINESSES	NUMBER OF EMPLOYEES
1	A	165	20	52	1	6
	B	180	8	22	2	12
	C	165	23	60	1	3
2	A	20	1	3	0	0
	D	65	0	0	0	0
3	A	150	3	8	0	0
4	A	65	13	34	3	18
	B	165	7	19	1	3
	C	145	0	0	0	0
5	A	80	7	19	0	0
	C	140	3	8	0	0

* Approximate values based on a windshield survey of the corridor and average household and business size.

- The owner of the largest business which would be acquired has indicated that he would move to vacant land he already owns across TH 169 and continue to operate in Calumet.

Right-of-way acquisition for this project, including the displacement of homes and businesses, is not expected to have a significant impact on any of the communities along the corridor.

It is anticipated that relocated households would not have significant difficulty in finding suitable replacement housing. Community leaders have stated that an adequate supply would likely become available if there were a demand for homes, since a large number of homeowners in each community have indicated a desire to move out of the area. In addition, housing for special groups such as the elderly or low-income individuals is available in the study area.

The impacts associated with the displacement of businesses are also expected to be minimal. Interviews with the owners of the affected businesses indicated that most desire to relocate and continue operating in the community where they are presently located. In addition, the owner of one business indicated a strong desire to be purchased because of financial difficulties.

The No-Action Alternative would not require either the acquisition of any additional right-of-way nor the relocation of any homes or businesses.

The following is a summary of the policies and practices of the Minnesota Department of Transportation in regard to the relocation of residences and businesses for highway construction purposes.

- Private property will not be acquired or damaged for public purposes without payment of just compensation. Acquisition may be by gift, direct purchase, or eminent domain.

- No one will be displaced by a construction project unless and until adequate replacement housing has already been provided for or has been built and has been made available to all affected persons, regardless of their race, color, religion, sex, or national origin.

- After property has been acquired, the owner will be given a minimum of 90 days (and in most cases 120 days) in which to vacate. In addition, the owner will be notified by letter of the required moving date.

In accordance with the Federal Uniform Relocation Act of 1970 and/or State law, Mn/DOT will pay relocation benefits to eligible tenants, homeowners, and businesses. These benefits include the following:

1. Tenants

   - o Rent supplement or down payment.
   - o Moving expenses.
   - o Closing costs.

2. Homeowners

   - o Replacement housing payment or rent supplement.
   - o Moving expenses.
   - o Closing costs for the replacement dwelling.
   - o Interest differential.
   - o Appraisal fees.

3. Business/Farm Operation

   - o Moving expenses.
   - o Payment for time spent searching for a replacement site.
   - o Appraisal fees.

After engineering studies have determined what property needs to be acquired to accommodate the proposed construction, the acquisition procedure outlined below will be followed.

- o Mn/DOT will have a qualified real estate appraiser determine how much damage, if any, will be caused by the proposed project. The land owner will be given the opportunity to accompany the appraiser during inspection of the property.

- o Based on the appraisal of the property, Mn/DOT will present the land owner with a direct purchase offer. This offer is firm and not subject to negotiation, except in cases where an item or items of damages were overlooked by the appraiser.

- o The land owner will be given a reasonable length of time to consider the offer. The land owner will then have to decide to either accept or reject the direct purchase offer. The land owner may hire an appraiser to assist in evaluating Mn/DOT's offer and Mn/DOT will pay for this appraisal within the limits established by State law.

- If the direct purchase offer is accepted, Mn/DOT will at its own expense furnish all documents necessary to complete the sale, conduct the necessary examination of title, and record all required documents. Payment for damages and moving expenses will then be made. When relocation is required Mn/DOT will provide between 90 and 120 days notice prior to the date the actual move is required.

If Mn/DOT's direct purchase offer is not accepted by the landowner, eminent domain proceedings will be initiated and the procedure outlined below will be followed.

- Mn/DOT will initiate eminent domain proceedings by filing a petition with the Clerk of Court and by providing the land owner with a notice of a condemnation hearing.

- Three qualified and disinterested residents of the County will be appointed by the Court to act as commissioners and appraise the damage to the property which will result from the acquisition.

- The chairman of the condemnation commission will arrange an inspection of the property and a formal hearing. At this hearing the state will be represented by a lawyer from the Attorney General's Office and an engineer from the Department of Transportation whose function is to assist the commissioners by providing both legal and technical information regarding the proposed roadway construction and right-of-way acquisition. The property owner will likely be asked for an opinion as to the amount of damages and to present evidence regarding damages to the property.

- Following the hearing, the commissioners will determine the amount of damages and decide on an award.

- If either the property owner and/or Mn/DOT is dissatisfied with the commissioners award, both parties have the right to appeal the award in District Court.

More information regarding the right-of-way acquisition process and relocation assistance is available from the following sources within the Department of Transportation:

St. Paul - Director, Office of Right-of-Way
(612) 296-1133

Duluth - District Right-of-Way Engineer (218) 723-4838

Community Cohesion and Attitudes

It is unlikely that the one- to two-year construction period (in any particular segment) will have a significant impact on the cohesiveness of the study area communities. Similarly, since the present feeling of community cohesiveness is strong, the long-term effect of upgrading the roadway with an urban design in its present right-of-way through a community should not appreciably diminish community cohesiveness. Also, choosing an Alternative such as 2D or 4C which removes TH 169 from a town is not expected to improve cohesiveness in Bovey, Marble, or Calumet. Only two minor instances of isolation are anticipated: a new neighborhood in La Prairie could be cut off by Alternative 1C and a mobile home park currently south of TH 169 in Marble could be further isolated by 4A.

In addition, upgrading TH 169 and improving safety, the quality of traffic operations, driving ease, and reducing travel time between Pengilly and Grand Rapids should strengthen the relationship between each study area community and Grand Rapids and, to a lesser extent, among the other communities.

Personal Movement and Access

There will be some inconvenience and confusion for all users of TH 169 during the construction period. To minimize this, construction will be designed to disrupt traffic as little as possible and to provide well-marked alternative routes. Additionally, news media will inform residents of construction schedules. If Alternative 4A which is aligned through Marble and Calumet is selected, provisions will be made to allow the elderly to walk or drive across the construction zone to congregate dining, senior citizen centers, friends, and businesses.

The effect of the proposed project on personal movement over the long term would be positive, particularly for the elderly. Access to the highway would become less direct for some residents and business people. For residents this would be a minor inconvenience while for businesses it may effect the viability of a particular location. Business access is discussed further under Economic and Fiscal Impacts.

The No-Action Alternative would likely result in a deterioration in the quality of traffic operations along TH 169 as a result of the expected increase in traffic volume, particularly the increase in truck traffic associated witn the wood products industry.

There would be no special effects, either short- or long-term, on personal movement for any other special population groups.

Special Social Groups

Several special population groups have been identified in the study area: the elderly, minorities, the disabled and other non-drivers, the low-income, and the unemployed. None of these groups is highly geographically concentrated, although the elderly represent the largest group.

None of these groups is expected to be disproportionately affected by the proposed project, although the elderly and those of low income would likely be more affected than other groups because of their relatively large sizes. Approximately twenty percent of all relocated households would probably be elderly (three to nine elderly households), and while suitable replacement housing is available, the trauma of a forced move could be particularly hard on these people.

Anyone who uses TH 169 would benefit from improved movement, although there would be temporary inconveniences during construction. The unemployed and those of low income might benefit from the construction jobs and the general boost to the county economy that may result from improved access.

5.1.2 Housing

Upgrading TH 169 from Grand Rapids to Pengilly would not have a significant impact on the housing stock in the study area. Fewer than fifty houses would be removed and many replacement structures would likely become available if there were a demand for homes. Furthermore, there are no current plans for residential development which would be affected by any of the Alternatives. None of the alternatives should have a significant effect on housing values. However, there could be some isolated instances where an alternative alignment departs from the existing TH 169 and passes close to but does not take a residence which is now far from a major road. This could result in decreased property values and could occur with any alternative (1B, 1C, 4B, and 5C) which involves new alignment.

The No-Action Alternative would have no effect on the housing stock in the communities along existing TH 169.

5.1.3 Public Services and Facilities

There should be no direct impact on public services or facilities in the study area other than the improvement of travel times and minor changes in accessibility. Most public services are located in either Grand Rapids or Hibbing and the expected travel time improvements associated with the build alternatives should aid study area residents in reaching such services or facilities.

There should be no direct impact on any public or private school. No school property will be acquired and school bus routes will not have to be significantly altered since all major roadways will continue to have access to TH 169 with all of the build alternatives.

Interviews with local officials indicate that they expect emergency services to be improved with the build alternatives because of the expected decrease in congestion and the elimination of the present problems associated with passing slow moving vehicles in the two-lane segments between Pengilly and Grand Rapids.

The effect of the build alternatives on social services is expected to be negligible. In addition, no churches or cemeteries will be acquired.

Preliminary engineering studies indicate that no right-of-way will be acquired from parkland or recreational areas.

However, Alternative Alignment 4B could be both seen and heard from the Greenway Township swimming beach on Twin Lakes south of Marble (Figure 8d). These problems could be mitigated somewhat by landscaping the road edge. Access would be unchanged.

The No-Action Alternative would likely result in a worsening of the existing traffic condition on TH 169 which could make travel to some public services and facilities more difficult.

5.1.4 Economic and Fiscal Conditions

Regional and County Economies

The immediate effect on the regional economy of upgrading TH 169 would range from approximately $20 million to over $50 million during the construction process. The difference

in these regional impacts depends on how much of the necessary labor and material are produced and purchased locally.

Upgrading TH 169 from two to four lanes and eliminating hazardous curves, hills, bridges, etc., would remove a real or perceived transportation constraint which affects the mining, tourism, forest products and retail sales industries. The long-term effect of the project on the regional and county economies would be positive but not dramatic. The Iron Range economy is beginning to diversify, and the transportation system will become more important because manufacturing is particularly dependent upon highway transportation for inbound shipment of raw materials and outbound shipment to market. The paper industry in Grand Rapids would be a prime beneficiary of improvements to TH 169 as 3,000 to 3,600 large trucks travel this section of TH 169 each month. Factory expansion plans would add another 400 trucks monthly. The ability of workers to commute long distances to available jobs would also be enhanced.

The No-Action Alternative would probably hurt the growth of the regional economy over the long term as traffic movement on this portion of TH 169 became worse and discouraged the location of industrial and commercial businesses.

Local Economies

During the construction period when normal travel is disrupted, certain businesses may experience reductions in sales resulting from customer access problems. The net effect would likely be a redistribution of sales to other firms in the vicinity rather than a net loss.

Business disruption would be greatest in Segment 1 west of the Prairie River (twenty businesses) and Segment 4 through Marble and Calument (up to seven businesses would be directly affected by Alternative 4A). Also in Segment 4, access to businesses in the commercial districts of Calumet and Marble which are not on TH 169 could be temporarily restricted because of the highway construction. Some business from eastern Itasca County may be shifted away from Grand Rapids temporarily. Segments 2, 3, and 5 would not experience business disruption.

Mn/DOT will attempt to minimize travel disruptions by providing temporary means of access where feasible and by reducing to a minimum the time any driveway is closed.

There would be several long-term effects associated with reconstructing TH 169. The first would be that any business currently situated in the proposed right-of-way would have

to relocate. In some instances this could be done on the same property if the road alignment were not significantly changed. The second general effect would be that some business locations would be rendered obsolete while new locational opportunities would be created elsewhere. Third, some businesses would lose the non-local portion of their trade if the highway were moved so as to route regional travelers away from their sites.

Significantly improving the quality of traffic operations on TH 169 in the study area could also have the effect of attracting some consumer trips to Grand Rapids which now go to Hibbing. Grand Rapids is closer to all the study area communities than Hibbing, however, the better travel conditions east of Pengilly on the existing four-lane roadway make the longer trip to Hibbing more attractive for many residents.

The No-Action Alternative would have no adverse and no beneficial effect on the local economies in the short term but would probably discourage business growth over the long term because of traffic flow problems.

Outlined below is a summary of the economic impacts associated with each of the Alternative Alignments.

Alternative 1A: This Alternative would support the trend of business growth along this stretch of highway. Existing operations which remain in place with adequate access and site area could benefit.

Alternative 1B: A mobile home sales outlet and a fuel oil company would be acquired; however, it appears that relocation on the same piece of property is possible.

Alternative 1C: This Alternative could have a negative effect on a mobile home sales outlet by moving the highway and eliminating direct access.

Alternative 2A: This Alternative would have no substantial impact on any business.

Alternative 2D: The economy of Bovey and the prosperity of individual firms there could be affected by the shift of TH 169 away from the main streets of town. Businesses most affected would be those that rely on transient sales unless appropriate promotional techniques were employed to draw customers off the highway. On the other hand, the new alignment would provide opportunities for new or existing firms to begin operating in a location with increased traffic. A proposed industrial park to be located along the east side of Bovey could benefit greatly because of improved

access and mobility. For the study area as a whole, this Alternative bolsters economic health by improving movement of goods and people.

Alternative 3A: There would be no impact on the Taconite economy. Access to the community from TH 169 would remain the same.

Alternative 4A: Businesses along the north side of the highway in Calumet would be required to relocate but in most cases this could be done on the same properties or on nearby vacant land. Overall, business would be helped by increased traffic. The Marble economy would be unaffected.

Alternative 4B: This Alternative could have a negative effect on the local economies of both Marble and Calumet by moving the road away from existing businesses. New business locations would be created however.

Alternative 4C: This Alternative would have the same basic economic effects as Alternative 4B except that one less business would be affected.

Alternative 5A: This Alternative would have no impact on any business.

Alternative 5C: No adverse local economic effect is anticipated if this Alternative were used, although Pengilly could capture shopping business from residents of communities to the west.

5.1.5 Historical Archaeological Resources

This Draft EIS is a corridor study with only preliminary alignments available at this time. As a result, the exact nature or degree of the potential impacts to archaeological/historical sites cannot be totally identified.

A cultural resource review and overview of the Alternative Alignments has produced little evidence of National Register of Historic Places (NRHP) eligible historic and prehistoric sites. However, the number of prehistoric and historic archaeological areas located was not the only criteria that was used to determine the cultural resource potential of the study area. The following features were also considered:

- o The level of previous disturbances or prior impacts to the study corridors.
- o The level of previous archaeological survey and investigations.
- o The type and intensity of land development.

- o The general kind and type of settlement patterns that are present (or were present) within the study area.

As a result of this effort the archaeological potential of each Alternative Alignment was determined (Figure 21). All of the alternatives were found to have a low or medium potential, primarily because of the extensive amounts of previous disturbance to the study area.

The Historical/Archaeological Technical Report described the known cultural resource factors that, when combined with the final route reconnaissance investigation, will provide a comprehensive plan for the protection of cultural resources found to occur within the limits of the final route alignment.

At this level of the study, no adverse effects are apparent with any of the Alternative Alignments. A Phase I field reconnaissance is recommended for areas within the final alignment that are determined to exhibit topsoil integrity. This study, in conjunction with a reconnaissance field investigation will provide the archaeological information needed to comply with federal and state requirements for historic preservation. Any adverse impacts to sites of historic or archaeological importance will be discussed in the FEIS, as well as appropriate mitigation measures.

The State Historic Preservation Officer (SHPO) has reviewed the project information and has provided the following comments:

- o "It is staff opinion that none of the structures which will be affected by this project is eligible for listing on the National Register."

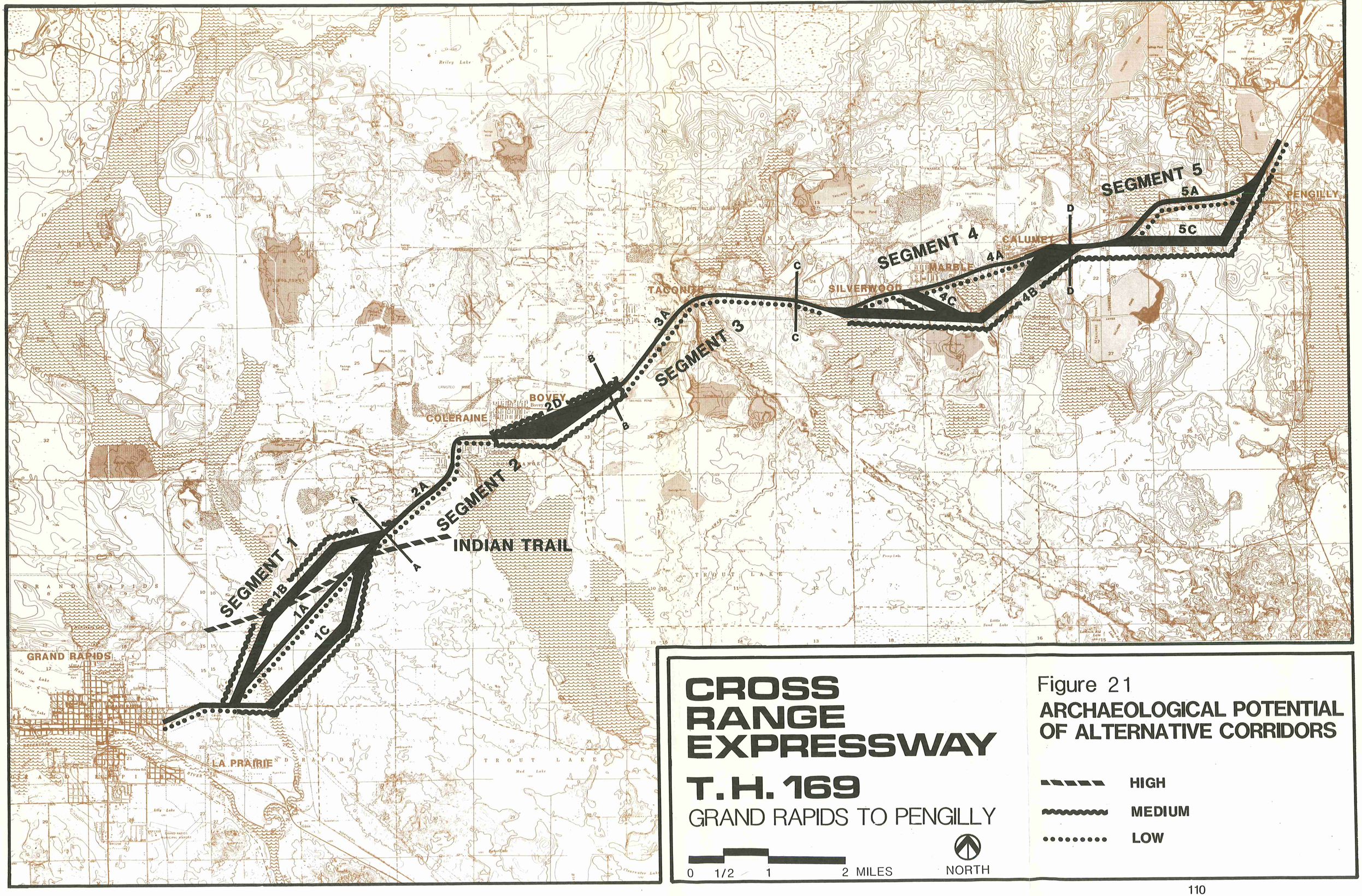
- o "There are no reported archaeological sites along the route."

The SHPO also concurred with the recommendation to conduct a Phase 1 field reconnaissance survey following selection of a preferred combination of alternative alignments.

A copy of the letter from the Minnesota Historical Society is included in the Appendix at the end of this document.

5.1.6 Land Use and Community Development

The anticipated impact on land use or land development because of construction of any of the roadway alignment alternatives under consideration is expected to be relatively minor. Gross changes in the pattern of land use or the pace of investment are not expected. The major changes would have to do with the relocation of homes and businesses



CROSS RANGE EXPRESSWAY

T.H. 169

GRAND RAPIDS TO PENGILLY

0 1/2 1 2 MILES

NORTH

Figure 21

ARCHAEOLOGICAL POTENTIAL OF ALTERNATIVE CORRIDORS

- HIGH
- MEDIUM
- LOW

and with shifts in the viability of retail and service locations, especially for those businesses heavily dependent on non-local trade. Previous sections which addressed the residential relocation, business displacement, and business impact of the Alternatives gave a good indication of the anticipated land use changes. All such changes are considered to be consistent with all local and regional land use plans.

Outlined below is a summary of the expected land use and development impacts associated with each of the Alternative Alignments.

Segment One

Alternative 1A: There would be no land use changes with the exception of conversion of some commercial frontage to highway use. Three businesses would have to move their small buildings out of the right-of-way to a position farther back on the same land parcels.

Alternative 1B: There would be no land use impacts with the exception of the conversion of open land to roadway.

Alternative 1C: Six homes would be acquired for right-of-way and may not be reestablished adjacent to the highway.

Segment Two

Alternative 2A: No land use changes are expected.

Alternative 2D: A small amount of open land would be converted to roadway. Some land uses could change in Bovey as viable business locations shift from existing TH 169 to the new alignment outside the downtown area. Roadside advertising could be used to attract motorists to businesses in Bovey, but this may not be sufficient to maintain the viability of these business sites. Firms not dependent on easy highway access may become replacements.

Segment Three

Alternative 3A: No land use impacts anticipated.

Segment Four

Alternative 4A: A number of homes along the north side of TH 169 in Calumet will be acquired and the remaining area may be converted to commercial uses.

Alternative 4B: Some land uses in Marble and Calumet could change as viable businesses shift from their present locations to the new alignment outside the built-up areas of

these communities. In addition, the westerly portion of this Alternative would be located adjacent to both a residential area and a swimming beach on Twin Lake. Seven homes would be acquired and the beach impacted by increased levels of traffic related air pollution and noise. However, no acquisition of parkland is expected.

Alternative 4C: Some land uses in Calumet could change as viable businesses shift from their present locations to the new alignment outside of the downtown area.

Segment Five

Alternative 5A: Seven residences would be displaced.

Alternative 5C: Three residences would be displaced and open/forest land would be converted to roadway use.

The No-Action Alternative would not require the relocation of any businesses or residences, as would some of the Construction Alternatives. While there would be no short-term effect on land use and community development, over the longer term the effect could be that there would be less new growth and community change. The Itasca County economy is expanding and the roadway improvement is needed so that this local area can keep pace with others.

5.1.7 Pedestrian and Bicyclist Movement

Mn/DOT has established guidelines for rating roadways in accordance to their ability to satisfactorily accommodate bicyclists. The rating scale includes seven categories ranging from GOOD to UNSATISFACTORY and the key evaluating criteria include the following items:

- o Number of Traffic Lanes
- o Divided or Undivided Roadway
- o Lane Width
- o Paved or Unpaved Shoulder
- o Shoulder Width
- o Average Daily Traffic Volume

Both the Build and No Build Alternatives were evaluated in accordance with the Mn/DOT guidelines and the resulting ratings are outlined below:

- o The existing two-lane TH 169 with current traffic volumes and eight-foot paved shoulders is rated POOR from Grand Rapids to Bovey and FAIR from Bovey to Pengilly.

- All of the Build Alternatives with a divided roadway design and ten-foot paved shoulders would be rated FAIR from Grand Rapids to Bovey and GOOD from Bovey to Pengilly under both existing and forecast traffic volume conditions.

- The No Build Alternative would be rated FAIR-UNSATISFACTORY along the entire segment of TH 169 under forecast traffic volume conditions.

No special provisions for pedestrians are planned at this time. However, pedestrians will be able to share the ten-foot paved shoulders with bicyclists. In addition, the Build Alternatives would improve the situation at the Prairie River. Pedestrians currently cross the river on a narrow shoulder; the Build Alternatives would provide full ten-foot shoulders and consideration is being given to providing a physically separated path on the new river bridge for pedestrians and bicyclists.

5.2 PHYSICAL ENVIRONMENT IMPACTS AND MITIGATION MEASURES

5.2.1 Wetlands

The highway design process which was followed, relative to wetlands, considered the following items:

- Avoidance of major bodies of water and major wetlands to the maximum practical extent.

- Minimization of unavoidable encroachments.

- Mitigation of any impacts.

The alternative preliminary alignments shown in Figures 8a through 8h were developed in accordance with this process. At a number of places in the corridor the roadway was widened away from lakes and major wetlands or the roadway was actually realigned in order to avoid encroachment. Examples of this include the following:

- Alternative Alignment 1A (Figure 8b) involves widening the existing roadway in a northwesterly direction, away from Pear Lake, thus avoiding encroachment into the lake.

- Alternative Alignments 4B and 4C (Figure 8f) were modified during the preliminary design process in order to move the roadway away from the south end of Mud Lake and avoid encroachment into the lake.

- o Alternative Alignment 5A (Figures 8g and 8h) involves realigning the existing roadway in the vicinity of both Snowball and Oxhide Lakes in order to move the roadway away from these bodies of water and avoid encroachment into the lakes.

Although a significant effort was made to avoid wetland encroachments, it was not possible to avoid all of the wetlands because of the very large number present in the corridor and the design constraints associated with a high design type expressway. In addition, there are a number of locations where wetlands are located on both sides of the road which makes complete avoidance impossible.

As a result, a total of 47 wetland basins in the study area may be impacted by the various alternative alignments. In order to minimize the impact of encroachment on these wetlands the following measures will be considered during the remainder of the highway design process:

- o Increasing steepness of side slopes in critical areas to minimize roadway fills.

- o Narrowing the roadway cross-section and making minor alignment shifts to minimize lateral encroachments into highly productive wetland areas.

- o Prohibiting the disposal of excess construction material in environmentally sensitive areas.

- o Restricting the use of heavy construction equipment outside construction limits in environmentally sensitive areas.

- o Providing both temporary (during construction) and permanent erosion control measures to prevent erosion and sedimentation into adjacent wetland basins.

- o Providing, as part of the surface water drainage system, special design features to protect wetlands from roadway related pollutants. These features, including terraces, ditch structures, dry ponds, and modified pond and storm sewer outlets are discussed in more detail in the section regarding Water Resources, beginning on page 114.

It should be noted that a structured crossing of the wetland area at the north end of Mud Lake is being considered because of physical contraints at the site and the possibility of a significant change in the vertical alignment. A preliminary investigation indicates that it would be highly desirable to raise the grade of the roadway at this location by at least ten feet. Because of the likelihood of poor subsurface soils in the area and the narrow highway corridor

(bordered on the north by a very long railroad trestle and on the south by Mud Lake) the construction of the required embankment could be very difficult. As a result, a technical and economic feasibility study for a structured crossing is being prepared. If the structured crossing is eventually selected, for technical and/or economic reasons, the long term impacts on Mud Lake and the adjacent wetland would be further minimized and the shallow water fringe of the lake could even be expanded under the elevated roadway.

The potential impacts associated with the wetland encroachments were analyzed using two methods. The first considered the individual wetland basins, and the second considered the groups of wetlands associated with each alternative alignment.

A summary of the expected impact on each individual wetland is presented in Table 20. The amount of impact documented in the table is a percentage of the total wetland basin which would be within the proposed limits of construction. The data indicates that there would be six wetlands with less than one percent of their area impacted and ten with 100 percent of the basin impacted.

A summary of the expected wetland impacts by Alternative Alignment is presented in Table 21. The data indicates that between 23 and 36 wetlands, between 37 and 82 acres of wetland and between 2,957 and 6,118 habitat units could be impacted, depending on the combination of Alternative Alignments finally selected. In addition, in those segments of the corridor where there are alternatives (Segment 1, 4 and 5), the combination of Alternative Alignments which would result in the least impact is 1A, 4A, and 5C and the combination which would result in the greatest impact is 1C, 4B, and 5A. Although Alternative 1C would impact less wetland area than Alternative 1B, Alternative 1C affects a greater number of wetlands and wetlands of greater habitat value.

Based on this analysis, it appears that the two most significant impacts associated with the Build Alternatives are as follows:

- o The total amount of wetland lost due to encroachments.
- o The potential loss of wildlife habitat resulting from wetland encroachment at Mud Lake. A large number of wildlife species were observed in these wetlands, including cormorants, ring-necked ducks, herons and loons.

TABLE 20
SUMMARY OF INDIVIDUAL WETLAND IMPACTS

WET-LAND NO.	IMPACT BY ALT.	CIRC. 39 TYPE IMPACTED	ACRES IN ROW	ACRES IN BASIN	PERCENT IMPACT	HABITAT UNITS**
1*	1A, 1B	-	2.4	252+	1.0	--
1	1C	2	.6	252+	.2	39.6
2a	1B	1L	8.1	86.0	9.4	567.0
2b	1C	6	4.5	9.6	46.9	337.5
3	1B	1L	3.8	55.5	6.8	266.0
4	1B	7	4.1	15.0	27.3	270.6
5	1A	2	1.7	29.5	5.8	112.2
6	1C	5	2.2	2.6	84.6	178.2
7	1C	6	.8	1.1	72.7	60.0
8	1C	3, 6, 7	2.2	56.5	3.9	155.8
9	1C	7	1.2	3.0	40.0	79.2
10	1C	7	4.3	56.5	7.6	283.8
11	2D	3	0.5	1.6	31.3	41.5
12	2D	6	0.5	0.6	83.3	37.5
13	2D	3, 6	0.3	0.3	100.0	23.8
14	2D	3,	2.2	10.0	22.0	182.6
15	3A	3, 6	1.9	26.5	7.2	150.5
16	3A	3, 5	9.0	37.5	24.0	741.2
17a	3A	3	2.8	37.0	7.6	232.4
17b	3A	3	0.6	0.8	75.0	49.8
18	3A	3	0.1	21.5	.5	8.3
19	3A	5	1.4	275.0	.5	113.4
20	3A	2	1.3	1.3	100.0	85.8
21	3A	3	0.3	0.3	100.0	24.9
22	3A	7	0.3	0.3	100.0	19.8
23	3A	5	2.3	500.0	0.5	186.3
24	4A, 4C	2	0.4	0.4	100.0	26.4
25	4B	1L	10.5	500.0	2.1	735.0
26	4B	3	0.1	2.5	4.0	8.3
27	4B	6	3.6	9.5	37.9	270.0
28	4C	3	4.3	10.6	40.6	356.9
29	4A	5	0.8	78.8	1.0	64.8
30	4B, 4C	1L	0.4	78.0	0.5	28.0
31	4B, 4C	5	1.3	3.0	43.3	105.4
32	4B, 4C	5	1.0	1.1	90.9	81.0
33	4A	6	1.5	50.0	3.0	112.5
33	4B, 4C	7	7.6	50.0	15.2	501.6
34	4A, 4B, 4C	3	4.9	4.9	100.0	406.7
35	5A	6	3.5	3.5	100.0	262.5
36	5A	1L	0.9	1.0	90.0	63.0
37	5A	6	1.2	1.2	100.0	90.0
38	5C	3	0.2	0.6	33.3	16.6
39	5A	6	0.3	2.0	15.0	22.5
40	5C	6	2.1	13.5	15.6	157.5
41	5C	6	1.0	1.0	100.0	75.0
42	5A	7	1.9	210.0	0.9	125.4
43	5A	7	2.0	2.0	100.0	132.0
44	5A	5	0.1	145.0	<0.1	8.1
45	5A	2, 6	3.4	33+	10.3	246.5
45	5C	2, 6	1.2	33+	3.6	87.0

* Prairie River - not included in habitat mitigation procedures.

** In cases where two or more wetland types exist habitat units were calculated separately. Additional information regarding the individual wetlands can be found in the wetland data sheets contained in the Wetland Technical Report (Mn/DOT 1985).

Note: Total acres of wetland impacts are not presented because no combinations of alternatives would impact every wetland. Refer to text for additional information regarding total acres of wetland impacts.

TABLE 21
WETLAND IMPACTS BY ALTERNATIVE ALIGNMENT

ALIGNMENT ALTERNATIVE	NO. OF WETLANDS IMPACTED	ACRES OF WETLANDS IMPACTED	PERCENT IMPACTED	HABITAT UNITS IMPACTED
1A*	1	1.7	5.8%	112.2
1B*	3	16.0	10.2%	1,103.6
1C*	6	15.8	12.2%	1,134.1
2A	0	0	0	0
2D	4	3.5	28.0%	285.4
3A	10	20.0	2.2%	1,612.4
4A	4	7.6	5.7%	610.4
4B	8	29.4	4.5%	2,136.0
4C	7	19.9	13.4%	1,506.0
5A	8	13.3	3.2%	950.0
5C	4	4.5	9.4%	336.1

* Does not include the Prairie River.

Note: Total acres of wetland impacts are not presented because no combination of alternatives would impact every wetland. Refer to text for additional information regarding total acres of wetland impact.

Mn/DOT is required to provide specific mitigation for the impacts to wetlands. The proposed wetland mitigation measures for this project will be documented in the Final EIS at the time a preferred alternative is identified. Impact mitigation will be based upon established Habitat Evaluation Procedures in consultation with the Mn/DNR and the U.S. Fish and Wildlife Service. Mitigation procedures typically consist of either providing replacement for wetlands lost to highway construction or habitat improvements at other wetlands. At a minimum, final mitigation measures will provide for no net loss of Habitat Units in the Study Area.

A preliminary assessment of wetlands impacts associated with this project was accomplished through coordination with the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the Minnesota Department of Natural Resources. A preliminary Wetlands Technical Report was prepared and distributed to the above agencies for their review. None of the agencies had any significant comments regarding either the Technical Report or the nature and extent of the project related impacts which were identied.

A Habitat Evaluation Procedures (HEP) meeting was held on June 3, 1986, which was attended by a representative from the U.S. Fish and Wildlife Service and preparers of the Wetlands Technical Report. Wetlands previously classified using the U.S. Fish and Wildlife Service Circular 39 classification method were verified and preliminary Habitat Unit values were assigned to each of the wetlands potentially impacted by the various alternatives. The Habitat Units will be used in the FEIS to determine the extent of wetland impact mitigation required for the preferred alternative.

Impacts which are unavoidable may be mitigated through the creation of additional wetlands either in association with the proposed roadway or at locations approved by the natural resource agencies. For this project, as part of the surface water drainage plan associated with the Build Alternatives, approximately twenty new ponding areas/wetlands would be created. The replacement of additional Habitat Units, if required, would occur at Mn/DNR and U.S. Fish and Wildlife Service approved locations.

The No Build Alternative was also considered. It was determined that this alternative would not have any direct impact on wetlands. However, the No-Build Alternative does not include the special wetland protection features previously described. Therefore, stream associated wetlands could be adversely affected by roadway related pollutants or accidental spills of transported materials.

5.2.2 Water Resources

Potential environmental impacts have been identified in four areas related to water resources: floodplains, deicing salts, traffic related pollutants, and surface water drainage. These impacts are summarized in Table 22 and discussed in further detail below.

Floodplains - There are two bodies of water within the study area that have designated floodplains, the Mississippi River and the Prairie River. The Mississippi River floodplain is not affected by any of the Alternatives while the Prairie River floodplain is impacted by Alternatives 1A, 1B, and 1C.

The Flood Insurance Study (FIS) for the portion of the Prairie River in the vicinity of TH 169 did not include the development of a detailed computer model of the river. Therefore, the limits of the floodplain documented in this report are simply based on the limits shown on the FIS maps.

All of the Build Alternatives involve the construction of new bridges across the Prairie River (Figure 8a). The bridges would cross the river at approximate right angles and result in a small loss of flood storage (0.08 acre-feet) because of the placement of piers and abutments. This loss is considered insignificant and the effects can be mitigated by proper design features including adequate waterway openings and deck elevations. In addition, the placement of the piers and abutments should not result in any flooding that would interrupt traffic flow along TH 169. The bridges will be designed, regardless of the Alternative alignment ultimately chosen, to pass the 100-year flood without inundating the road surface or damaging the bridges.

Alternative 1B would also result in the loss of an additional 140 acre-feet of flood storage caused by a longitudinal fill placed along the easterly edge of the Prairie River floodplain for a highway embankment (Figure 15). This loss of flood storage also includes the floodplain area east of the proposed roadway that would be isolated from the remainder of the floodplain by the embankment.

The loss of flood storage could be mitigated by providing an equal volume of flood storage in the vicinity of the fill. This can be accomplished by excavating the fill material for the proposed highway embankment from the floodplains, in the area between the ordinary highwater level and the 100-year flood elevation. If the soil in the floodplain proves to be unsuitable for embankment material, it could still be used on the side slopes of the fill or simply disposed of.

TABLE 22
SUMMARY OF WATER RESOURCE IMPACTS

CATEGORY	ALTERNATIVES AFFECTED	TYPE OF IMPACT	MITIGATIVE MEASURES	REMARKS
Flooplains	1A & 1C 1B	Insignificant Significant	Yes Yes	All impacts except the logitudinal encroachment assocated with 1B can be mitigated by either flood volume compensation or proper design measures.
Deicing Salt	All	Insignificant	None Req'd.	Deicing salts will peak during the spring runoff but will not be at high enough concentrations in receiving waters to warrant mitigation.
Traffic Related Pollutants	All	Insignificant	Yes	The proposed storm water retention basins will trap or detain pollutants before discharge to receiving waters.
Surface Water Drainage	All	Insignificant	Yes	A surface water drainage system with ponding/ wetland areas will be provided.

The longitudinal fill would also increase both the velocity of the floodwaters and the upstream water levels because of the reduced cross-sectional area of the Prairie River floodplain. Because the proposed fill is on the edge of the floodplain, where the percentage of the total river discharge is small, the associated velocity increase and water level increase should also be small.

The velocity increase should be about one percent, which can be considered insignificant. The water level increase is expected to be between 0.2 feet and 0.6 feet, depending on how much of the lost flood storage is replaced and where the excavation occurs in the floodplain.

No significant impacts or risks resulting from the water level increase associated with the longitudinal fill are expected because there are no homes or unique features located in the floodplain upstream from the proposed embankment. In addition, the longitudinal encroachment is not expected to result in any incompatible floodplain development because most of the land is owned by the State of Minnesota, no new access will be created, and Itasca County has floodplain zoning to prohibit this type of development.

The Minnesota Department of Natural Resources has established an allowable water level increase of 0.5 feet caused by any type of activity in a floodplain. Water level increases of greater than 0.5 feet may be permitted if the increase doesn't damage upstream property or if potential damage is mitigated by flood proofing a damaged property, purchasing the property or modifying the proposal so that the water level increase is less than 0.5 feet.

Further detailed analysis would be required to determine if the water level increase associated with Alternative 1B complies with the Minnesota Department of Natural Resource's guidelines. The analysis would be completed, if Alternative 1B is selected as the preferred Alternative, as part of a technical and economic feasibility study that would be prepared during the preliminary design phase of the project, and the results of which would be documented in the Final EIS.

There are additional undesignated floodplains within the study area which are located adjacent to the major lakes. Potential impacts to these floodplains were considered and determined to be insignificant. In addition, preliminary design studies indicate that roadway grades throughout the length of the project will be well above the estimated 100 year lake elevations (Table 12.) and as a result flooding of the roadway is not likely to occur.

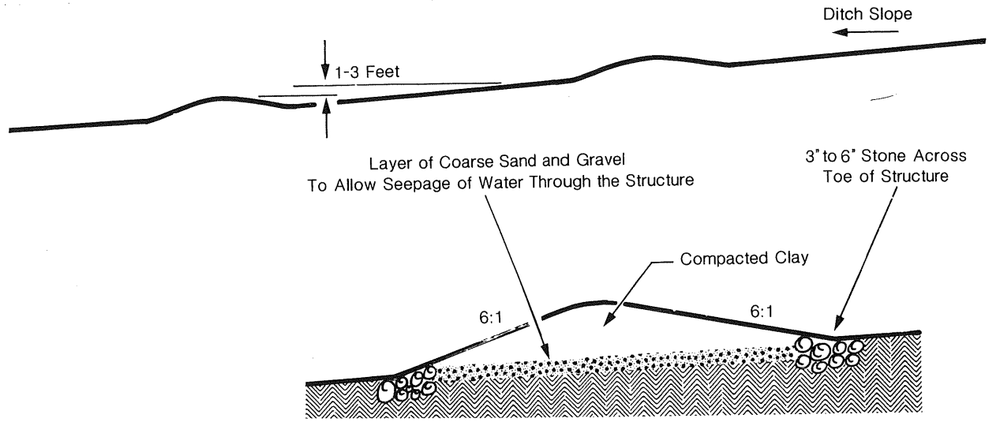
Deicing Salts - Consideration was given to the potential impacts on water quality from increased salt usage associated with the wider, four-lane roadway. A typical application rate for the salt-sand mixture (26 tons per lane-mile annually), a typical average percentage of salt (24 percent), and the background chloride concentrations in the major receiving waters were analyzed. The results of this analysis indicate that chloride concentrations in the proposed storm water ponding areas may exceed MPCA standards but because of the effects of the ponding areas and dilution, no significant impact on the surface water quality of the receiving waters is expected.

Traffic Related Pollutants - Consideration was given to the potential impacts on water quality from increased traffic related pollutants, associated with the wider roadway and the greater forecast traffic volumes. Typical deposition rates for both roadway related pollutants (primarily petroleum products and heavy metals) and commercial/industrial/residential pollutants (primarily phosphates and heavy metals) from adjacent land uses were analyzed. The results were then compared to MPCA water quality standards. These results indicate that increases in traffic related pollutants resulting from the Build Alternatives should be minor and should not have a significant impact on the surface water quality of the receiving waters in the study area.

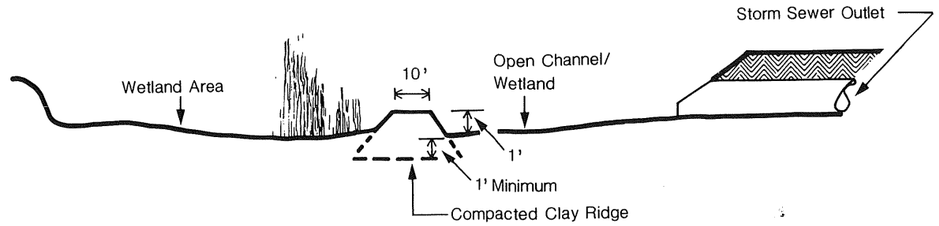
It should be noted that the Minnesota Department of Health recently issued a fish consumption advisory for both Snowball and Oxhide Lakes because of high mercury levels. Research indicates that mercury is not typically a component of highway related pollution. Therefore, the proposed TH 169 project should not aggravate this condition.

Surface Water Drainage - A surface water drainage system consisting of ditches and culverts in rural areas and storm sewer in urban areas is proposed to be implemented with the Build Alternatives. In addition, the proposed drainage system will include the creation of approximately twenty new ponding/storm water retention basins plus the following special features (Figure 22):

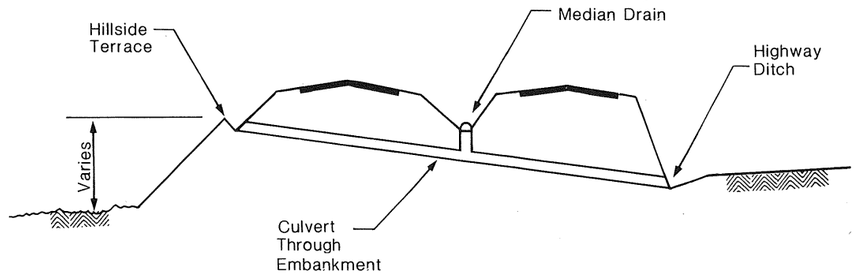
- o Modified storm sewer outlets designed to trap sediment, nutrients, traffic related pollutants, and accidental spills.
- o Dry ponds with submerged outlets that will detain peak discharges and contain pollutants and spills.
- o Ditch structures that will reduce peak discharges from small rainfalls and help trap sediments and spills.



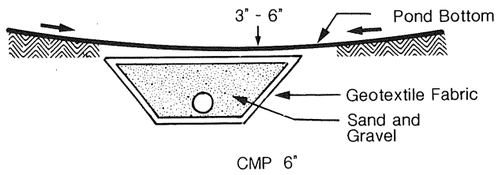
TYPICAL DITCH STRUCTURE



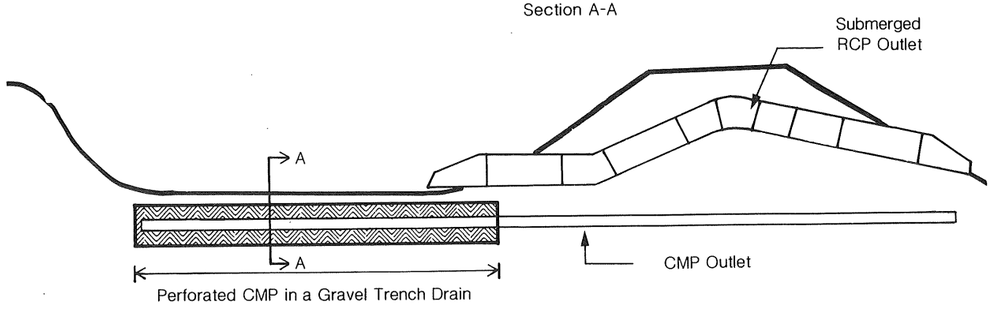
PROPOSED STORM SEWER OUTLET



TYPICAL HILLSIDE TERRACE



Section A-A



TYPICAL DRY POND SUBMERGED OUTLET

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Figure 22

SURFACE WATER DRAINAGE FEATURES

- o Hillside terraces that will direct the initial runoff, which typically carries higher concentrations of pollutants, and accidental spills away from receiving bodies of water and toward the new ponding/detention basins.

The use of these special drainage features will improve the existing surface water drainage system. In addition, these features should also help mitigate the previously documented wetland encroachments by creating new wetlands and protecting existing wetlands, lakes and rivers from sediments, traffic related pollutants and accidental spills.

In conclusion, a variety of water related impacts were considered and evaluated. The only significant adverse impact which was identified is the encroachment into the Prairie River floodplain associated with Alternative 1B. The proposed surface water drainage system should improve drainage and help mitigate wetland impacts by providing new ponding areas and protecting existing wetlands from traffic related pollutants and accidental spills. The No-Build Alternative was also considered, and it was determined that it would not result in any impact on water resources.

5.2.3 Vegetation

The construction associated with the Build Alternatives will result in the loss of some vegetation. The exact amount varies depending on the particular combination of Alternative Alignments ultimately selected. However, the impact would be minimized if the alternatives which follow the existing alignment were selected.

Field investigations indicate that the cover types found in the study area are fairly common throughout northern Minnesota, and all areas showed evidence of recent disturbance. As a result, the loss of vegetation and impact on the various cover types is considered insignificant.

5.2.4 Fisheries

Potential long-term and short-term impacts on the fishery resource were considered. No adverse long-term impacts are expected because no long-term water quality problems are expected and because ponding areas are proposed which will protect any major bodies of water from accidental spills.

Short-term, construction related impacts are possible at the following locations:

- o Mud Lake - either a fill or bridge piers will be constructed in Mud Lake. This is not expected to result

in a significant impact because Mud lake is not considered quality fish habitat, especially for game fish.

- o Prairie River - All build alternatives involve the placement of bridge piers in the Prairie River. Alternatives 1A and 1B could affect walleye, northern pike and bass spawning areas. This potential impact could be mitigated by scheduling the construction so that there is no activity within the river bed during the late spring/early summer spawning season.

Other study area lakes will not be affected by any of the Build Alternatives. In addition, the No Build Alternative would have no impact on the fishery resource.

5.2.5 Wildlife

The Build Alternatives will impact wildlife because of the loss of nesting and breeding habitat. The degree of impact, however, will vary depending on the particular combination of alternatives selected. Reconstruction along the existing alignment would result in fewer impacts than construction along new alignment, and the No-Build Alternative would have the least impact because there would be no distrubance outside the existing right-of-way. Habitat loss caused by the project should not threaten the existence of any local wildlife population, however, total numbers of most wildlife species in the study area will likely decline in direct proportion to the amount of habitat lost to the road construction.

The study area for this project is within the range of three species listed in the U.S. Fish and Wildlife Service Redbook; peregrine falcon, bald eagle, and eastern timber wolf. Peregrine falcons are not known to nest in Minnesota and a field review of the study area indicates that there are no suitable sites for potential peregrine reintroduction. As a result, the proposed project should have no impact on peregrine falcons.

The potential impact on bald eagles and eastern timber wolves associated with the project are expected to be insignificant or indirect. The nearest bald eagle nesting sites are in the Chippewa National Forest and along the south shore of Trout Lake and timber wolves are known to occupy a territory north of Bovey and Coleraine. A small pack of wolves is suspected to occur near Pengilly. This assumption is based on wolf sign that was observed and identified in this area during a wetland verification survey and discussions with a Federal (U.S. Department of Agriculture) predator control specialist working in the area. The major food source for the bald eagle (fish) could be adversely

affected by changes in water quality resulting from roadway construction. This could limit the future establishment of the bald eagle in the study area. Wolves are not expected to be directly or indirectly affected by the proposed expressway to a noticeable degree. Until the recent discovery of wolf sign in May, 1986, it was not thought that wolves inhabited the project area. Deer populations may decline but not significantly. Presently the site does not provide high quality browse since most of the woody vegetation is mature (nutritionally poor relative to younger browse) and out of reach for most deer.

The effects of the proposed project on several species of special interest were also examined. The osprey is officially listed by the Mn/DNR as a species of special concern and the DNR's Area Wildlife Manager indicated that ring-necked ducks, cormorants, sharp-tailed grouse and the great blue heron were of special significance in the study area.

Osprey are not known to nest in the study area or within a close enough distance to be directly impacted by the proposed construction. They do, however, nest in the Chippewa National Forest and appear to be increasing in number. In addition, osprey could be fishing on the lakes in the study area since most contain the fish species most commonly consumed by osprey. As a result, the proposed project should have no direct impact on ospreys in the region, but there could be secondary impacts associated with changes in water quality and any reduction in fish populations in study area lakes.

Pairs of ring-necked ducks and females with broods have been observed on Mud Lake and in the marshy areas at the north and south edge of the lake. In addition, analysis of habitat needs and wetland types indicates that there are probably several additional wetlands located in the eastern portion of the study area between Calumet and Pengilly which offer suitable nesting and brood cover for ring-necked ducks. All of the Alternative Alignments in segments 4 and 5 impact one or more of these wetlands with the degree of impact ranging from less than one percent to up to 100 percent. This loss of habitat could result in a significant adverse impact on ring-necked duck populations in the eastern portion of the study area. Analysis of the wetland encroachments indicates most are unavoidable; however, it appears that the encroachments of Mud Lake (the most crucial ring-necked habitat) could be eliminated or minimized by crossing the area on structure instead of a fill.

Double-crested cormorants have been observed using the northern end of Mud Lake as a resting and feeding site. These birds tend to be juvenile, non-breeding birds and there is no record of nesting activities on Mud Lake. There is, however, a known cormorant breeding colony located approximately twenty miles northwest of Mud Lake. As a result, Mud Lake may be an extremely important area for these juvenile birds, since research indicates that breeding adults will not tolerate the presence of the juvenile birds. The construction activities associated with Alternative Alignment 4A could have an adverse impact on these juvenile birds, especially if suitable replacement habitat is not available. The Alternative Alignments along the south end of Mud Lake (4B and 4C) would probably have less impact than 4A, and the other alternatives do not appear to have any impact on the cormorants. If Alternative 4A is ultimately selected, consideration will be given to scheduling construction activities at times when the cormorants are not present.

The Mn/DNR has indicated that they have plans to undertake an experimental project which would reintroduce sharp-tailed grouse in an area south of Marble and Calumet. This area is outside of the expected limits of construction for Alternatives 4B and 4C but is close enough so there could be secondary impacts from traffic related disturbances in a previously undisturbed area.

Great blue heron do not currently nest in the study area. However, the various wetlands (particularly in the eastern portion of the study area) are important feeding habitat and Mud Lake is probably the most important of all of these. Heron have been observed feeding along nearly the entire edge of the lake. As a result, the potential filling in Mud Lake associated with Alternative 4A would likely result in the most severe impact on heron feeding habitat. All of the remaining Alternative Alignments east of Coleraine (2D, 3A, 4B, 4C, and 5A) except 5C result in some wetland encroachment and would therefore likely result in minor habitat impacts.

A summary of wildlife related impacts is presented in Table 23. This information indicated the following:

- The only major wildlife impacts are associated with Alternative Alignment 4A and the possible encroachment into the wetland at the north edge of Mud Lake. This action would likely result in adverse impacts on ring-necked ducks, cormorants, and great blue herons.

TABLE 23
SUMMARY OF WILDLIFE IMPACTS

	ALTERNATIVE										
	1A	1B	1C	2A	2D	3A	4A	4B	4C	5A	5C
General Species	C	B	B	C	B	C	C	B	B	C	B
Bald Eagle											
- Nesting	C	C	C	C	C	C	C	C	C	C	C
- Feeding	D	D	D	C	C	C	C	B	B	C	C
Timber Wolf	C	C	C	C	C	C	C	C	C	C	C
Ring-necked Duck	C	C	C	C	C	C	B	B	B	B	B
Double-crested Cormorant											
- Nesting	C	C	C	C	C	C	C	C	C	C	C
- Feeding	C	C	C	C	C	C	A	B	B	C	C
Osprey											
- Nesting	C	C	C	C	C	C	C	C	C	C	C
- Feeding	D	D	D	C	C	C	C	B	B	C	C
Sharp-tailed Grouse	C	C	C	C	C	C	C	D	D	C	C
Great Blue Heron											
- Nesting	C	C	C	C	C	C	C	C	C	C	C
- Feeding	C	C	C	C	B	B	A	B	B	B	C

A. Major Impacts: Measurable, detectable and detrimental impacts to a species directly attributable to the project to the extent that a local population of the species would measurably decline.

B. Minor Impacts: Impacts to a local population which may be detectable with extensive pre- and post-construction analyses. Individuals of a species in the immediate project area will be lost, but local populations of the species in the project area will not experience measurable declines which are consistent and directly attributable to the project.

C. No Impacts: No detectable effects or changes to a local population which could be directly attributed to the project.

D. Secondary Impacts: Indirect impacts that could cause alteration in the utilization of an area by a species. For example, changes in the fish population in a lake as a result of the project, might affect the suitability of that lake as a feeding area for osprey.

- o The remaining Alternative Alignments would likely result in minor wildlife impacts primarily associated with the loss of habitat caused by the proposed construction activities.

- o No significant adverse impacts to rare, threatened, or endangered wildlife species are expected.

The detrimental effects on wildlife associated with these impacts can be minimized by adopting various design, construction and maintenance procedures. Mn/DOT is currently considering the following:

- o Creating approximately twenty new wetlands as part of the surface water drainage system. These wetlands will serve as storm water detention basins, protect existing receiving waters from traffic related pollutants and accidental spills, and provide some replacement habitat for that lost to roadway construction.

- o Steepening side slopes and narrowing the roadway cross-section to minimize lateral encroachment into sensitive areas.

- o Implementing the erosion control practices described in the TH 169 Water Resources Technical Report (Mn/DOT; May, 1986) to control sediment runoff into lakes. This will help maintain a high water quality, reduce fisheries impacts, and reduce secondary impacts to bald eagles.

- o If Alternative 4A is selected, replacing the fill in Mud Lake with a structured crossing of the wetland area.

- o Seeding roadside slopes with species of plants that provide food and shelter for wildlife.

- o Stockpiling organic soils, and the living plant material in the soil, after removal from wetland areas that are to be covered with granular fill. The borrow material can then be spread into newly created wetland basins to provide a growing medium and a seed source for aquatic vegetation, thereby improving wildlife habitat.

- o Scheduling construction activities in or adjacent to bodies of water in order to avoid critical spawning or nesting periods.

- o Limiting roadside mowing to provide nesting cover for ducks and songbirds.

5.2.6 Visual Environment

The TH 169 Visual/Roadside Technical Report (Mn/DOT, 1985) contained visual assessment calculations for Corridor

Segments 1 through 5. The calculations are one way to numerically assess the view from the road for each alternative roadway corridor based on landscape types, visual quality ranking, and duration or length of exposure to individual landscape types. For each Alternative Alignment within each Segment, a visual quality "score" was computed by multiplying the value applied to each of eight different landscape types by the number of miles a viewer would be exposed to each landscape type and then summing those products. The eight landscape types and the values assigned to each were as follows:

- o Open Water = 8
- o Marsh = 7
- o Forest = 6
- o Savannah = 5
- o Institutional = 4
- o Agricultural = 3
- o Rural Residential = 2
- o Commercial/Industrial = 1

The visual assessment score for each Alternative Alignment is shown in Figure 23. The higher the score, the "better" the visual experience for the roadway user. The visual assessment exercise indicates that in those segments where there are alternative alignments, the combination consisting of 1C, 4A or 4B, and 5C would result in the best visual experience.

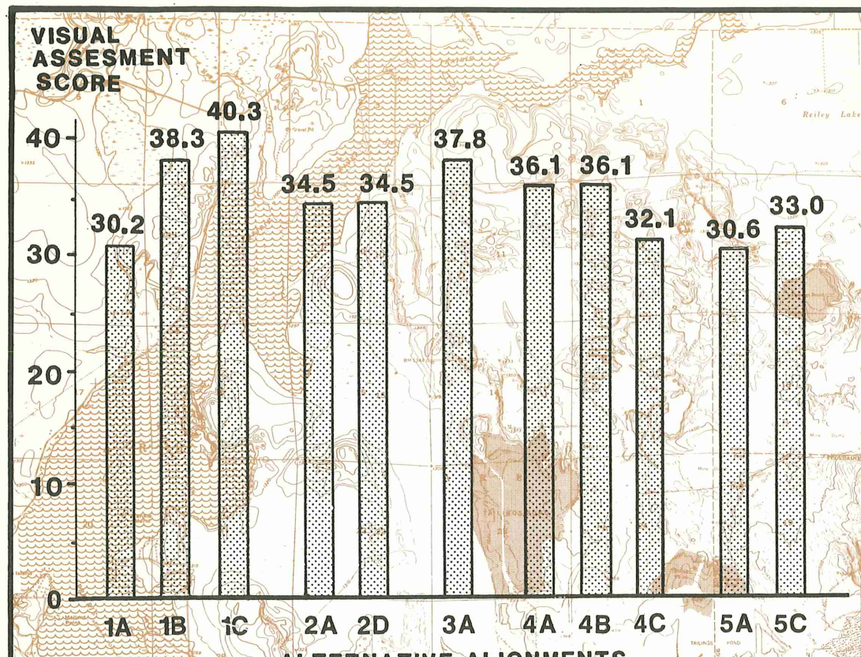
No-Action Alternative

The No-Action Alternative would avoid the negative visual impacts associated with introducing a four-lane divided highway into locations where there is no road presently or where there is only a two-lane road in a minimum right-of-way. Additionally, the No-Action Alternative would avoid the major visual intrusion of a second bridge over the Prairie River. The river crossing in the case of Alternative 1B would involve the placement of a large amount of fill along the eastern riverbank and would be especially noticeable.

However, the No-Action Alternative would eliminate the opportunity to provide somewhat enhanced visual experience for the roadway users.

In addition the visual quality of the driving experience could be enhanced by employing the following techniques:

- o Selectively removing vegetation that screens views to lakes, rivers, marshes, and other identified points of interest.



CROSS RANGE EXPRESSWAY

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0 1/2 1 2 MILES

NORTH

Figure 23

VISUAL ASSESSMENT SCORES

- o Planting new trees and shrubs in such a way as to screen objectional views.

- o Elevating the roadway so as to expose motorists to those features that may be obscured by the ground plane or vegetation.

- o Depressing the roadway profile to screen users from objectionable views. This technique could also be used to direct views to a certain point of interest.

- o Aligning the proposed roadway both horizontally and vertically to respond to existing topography. An obvious visual benefit of this technique would result in an undulating road surface and limited or focused views.

Visual Evaluation of Rest Area Locations

The Visual/Roadside Technical Report also evaluated candidate locations for rest areas based on visual criteria. Table 24 documents the candidate sites and the evaluating visual criteria.

TABLE 24
PRELIMINARY EVALUATION OF CANDIDATE REST AREA LOCATIONS

	CRITERIA				
SITE	WATER ORIENTATION	NATURAL SETTING	SIGNIFICANT BACKGROUND FEATURES	MINIMAL VISUAL IMPACT	SUFFICIENT AREA
Prairie River	X	-	-	X	X
Trout Lake	X	-	-	X	X
Twin Lakes	X	X	-	X	X
Snowball Lake	X	X	-	X	-
Oxhide Lake	X	X	-	-	X

This preliminary analysis indicates that the recommended rest area locations, in order of preference, are as follows:

1) Twin Lakes
2) Snowball Lake
3) Oxhide Lake
4) Prairie River
5) Trout Lake

5.2.7 Air Quality

The impact of vehicular emissions of carbon monoxide (CO) were analyzed. This pollutant was studied because it is the major noxious component of automobile exhaust and because health effects resulting from exposure to CO can occur at relatively low exposures for relatively short time periods. The purpose of the analysis is to determine if future CO concentrations are within established limits needed to protect human health.

Components of vehicle exhaust other than CO were not analyzed because they were assumed to be relatively insignificant. Emissions of hydrocarbons and nitrogen oxides, although of concern because of the chemical reaction these pollutants undergo to form ozone and smog, were not analyzed because analyses have shown that emissions of these pollutants from a single roadway are relatively minor. Lead emissions were not analyzed because they have decreased as a result of the increased use of lead-free gasoline and are expected to continue to decrease and become a minor exhaust component. Sulfur oxides and particulates are not emitted in sufficient quantities to warrant analysis.

CO concentrations were predicted at sensitive receptors near critical intersections in the study area using a computer modeling technique. Ambient background concentrations of five parts per million (PPM) and two PPM were assumed for the one hour and eight hour averages and added to the modeled CO concentrations to determine total CO concentrations. Predicted CO concentrations were then compared to the state and federal ambient air quality standards (Table 25) to determine impacts. In addition, the impact of construction activities on air quality were also considered.

TABLE 25
AMBIENT AIR QUALITY STANDARDS FOR CARBON MONOXIDE

	1-HOUR AVERAGE* CONCENTRATION	8-HOUR AVERAGE* CONCENTRATION
State Standard	30 PPM**	9 PPM
Federal Standard	35 PPM	9 PPM

*These standards are not to be exceeded more than once per year.

**Parts per million.

Carbon Monoxide Analysis

For this project, three locations along existing TH 169 were selected for analysis. These locations are listed below and are shown in Figure 24.

Site A. The intersection of TH 169 at TH 65 in Pengilly.

Site B. The intersection of TH 169 and CSAH 61 in Coleraine.

Site C. The intersection of TH 169 and TH 2 in Grand Rapids.

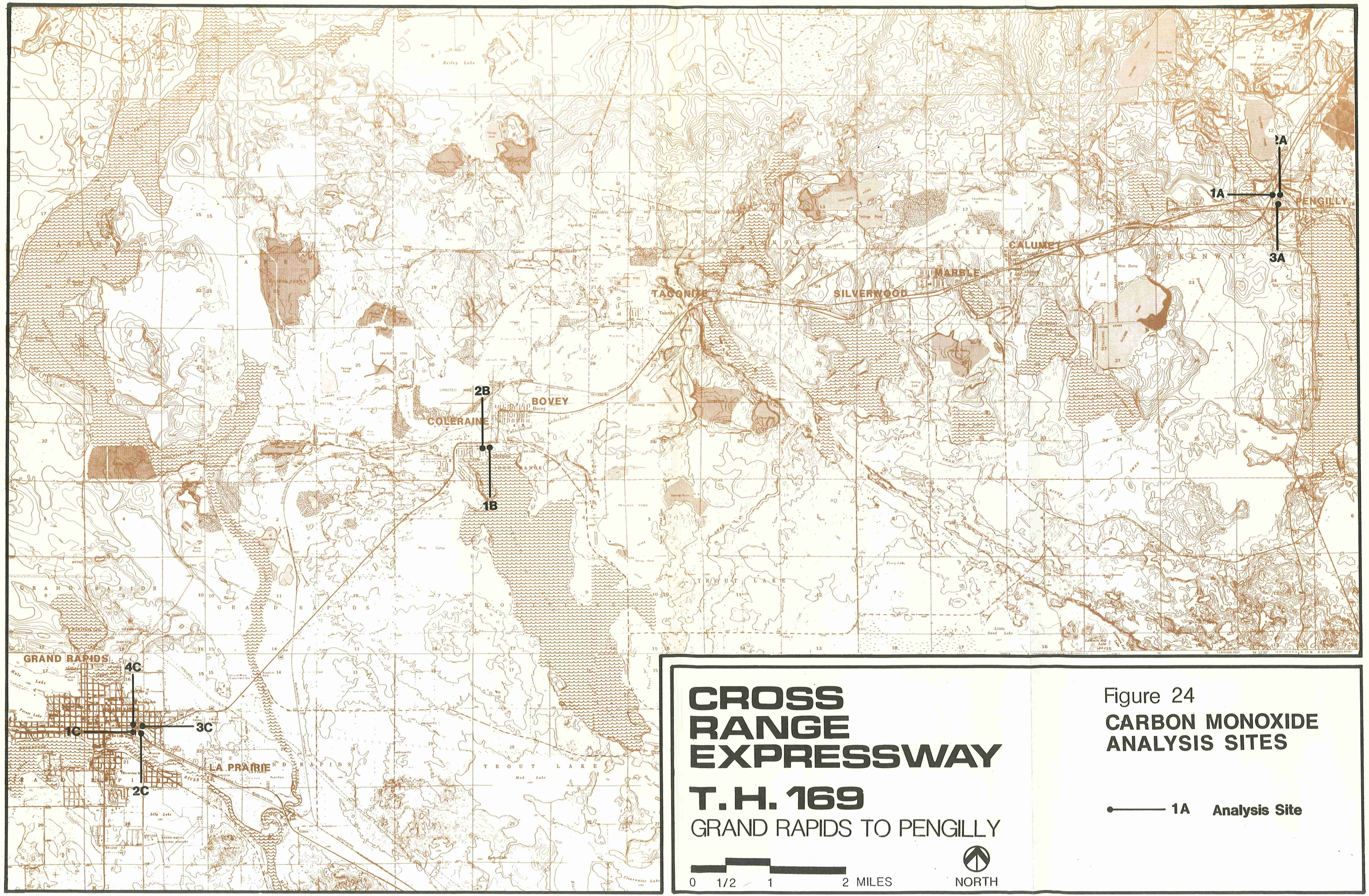
These locations were chosen because they represent areas with the highest vehicle concentrations (intersections) and therefore a worst-case CO concentration situation. At each location, receptor sites were represented by single-family homes. These receptors were chosen because: (1) they were close enough to the roadway to be affected by the increased CO emissions, and (2) they are locations where people are more likely to be exposed to CO for extended periods of time.

The three computer models used were Volume 9, which evaluates traffic flow and CO emission rates on each modeled roadway, MOBILE3, which adjusts the Volume 9 results to the particular scenario, and CALINE3, which is used to simulate emission dispersion over the area.

The results of the analysis are documented in Table 26.

TABLE 26
MAXIMUM PREDICTED PEAK HOUR CARBON MONOXIDE CONCENTRATIONS (PPM)

RECEPTOR	MAXIMUM PREDICTED 1-HOUR CONCENTRATION	STATE 1-HOUR STANDARD	STATE 8-HOUR STANDARD
1A	5.7	30	9
2A	6.2	30	9
3A	5.0	30	9
1B	5.5	30	9
2B	5.7	30	9
1C	6.8	30	9
2C	6.2	30	9
3C	5.5	30	9
4C	7.2	30	9



CROSS RANGE EXPRESSWAY

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GRAND RAPIDS TO PENGILLY

0 1/2 1 2 MILES

NORTH

Figure 24

CARBON MONOXIDE ANALYSIS SITES

1A **Analysis Site**

- The maximum predicted one-hour concentrations of CO are well below the state one-hour standard.

- The maximum predicted one-hour concentrations are also below the state eight-hour standards, as a result estimates of eight-hour CO concentrations were not calculated.

Based on the results of this analysis, it is concluded that the project would not result in violations of either the one-hour or eight-hour ambient air quality standards for carbon monoxide.

Two additional air quality regulations were also considered; the Federal Clean Air Act Amendments of 1977 and the State of Minnesota's Indirect Source Permit requirements.

The Clean Air Act Amendments of 1977 required all states to submit a State Implementation Plan (SIP) documenting control measures needed to attain the federal ambient air quality standards. Highway construction projects are required to conform with the SIP. This project is in an area where the State Implementation Plan is not required to contain any transportation control measures. Therefore, the conformity procedures documented in the Federal regulations do not apply to this project.

The State of Minnesota has an Indirect Source Permit (ISP) requirement for new and modified highway projects which exceed certain traffic volume thresholds. The threshold for a modified highway facility such as TH 169 is an increase in average annual daily traffic volumes of 10,000 or more vehicles per day within ten years of completion. The highest existing (1982) average daily traffic (ADT) volume on TH 169 is 8,700 vehicles per day. The year 2005 forecast for TH 169 shows a maximum ADT of 11,400 vehicles per day. Therefore, the threshold volume is not exceeded and an Indirect Source Permit is not needed for the project.

Construction Impacts

Construction operations have the potential to impact air quality in three ways:

- Reconstruction of the roadway in existing sections will cause some vehicle delays.

- Construction vehicles and equipment will exhaust a variety of combustion-related pollutants.

- Disruption of the existing ground cover and grading activities will generate dust.

Vehicle delays resulting from construction activities are expected to be minimal. Every effort will be made to maintain one through lane of traffic in each direction throughout the construction period. Temporary lane closures may be necessary but are not expected to cause significant traffic flow problems because of the relatively low traffic volumes.

Construction equipment emissions will be minimal. Construction eqiupment will not be concentrated at a specific location and any single piece of equipment will not result in significant pollutant concentrations. The majority of construction equipment is diesel powered with minor carbon monoxide emissions.

Generation of dust will be minimized by means of adherence to Mn/DOT construction specifications and MPCA regulations. Dust control measures may include watering, application of calcium chloride, and street sweeping. Temporary connections will be paved. Paving and replacement of vegetation will be done as soon as possible after site preparation.

No-Action Alternative

The No-Action Alternative would have no significant adverse effect on air quality, which is currently rated as good. This Alternative would, however, avoid the temporary negative effects of the construction activities.

5.2.8 Noise

Predicted Noise Levels

Noise predictions were made using the STAMINA 1.0 Noise Prediction Model. The model was used both to predict specific noise levels at sixteen representative noise sensitive receiver sites and to develop noise level contours along each alternative alignment. The STAMINA Model considered the following types of information:

- o Vehicles Types
- o Vehicle Mix
- o Existing and Forecast Traffic Volumes
- o Distances to Receivers
- o Vehicle Speeds
- o Topography
- o Acoustic Characteristics of Ground Cover

Existing and future noise levels were calculated at the sixteen representative receiver sites shown in Figure 25 and the modeling results are documented in Table 27. The predicted noise levels represent noise from traffic on TH 169 only and do not include noise from other sources such as other roadways, railroads, industrial activities, or natural sources. The noise level contours which were developed document the expected limits of the 65 dBA and 70 dBA noise levels, which correspond to the State (daytime) and Federal noise standards. These noise level contours are shown in Figures 7 through 14 of the Noise Technical Report (Mn/DOT, 1985).

Comparing existing to future noise levels for the no-build alternative indicates that noise levels will increase by approximately 1 dBA as a result of the forecast increase in traffic volumes. At most receiver sites, construction of any of the build alternatives will result in an insignificant (< 3 dBA) increase in noise levels and in many cases noise levels are expected to decrease. Of the receivers analyzed, significant increases are predicted at only three sites:

1) Receiver 2 - Residence in Calumet (Alignment Alternative 4C)

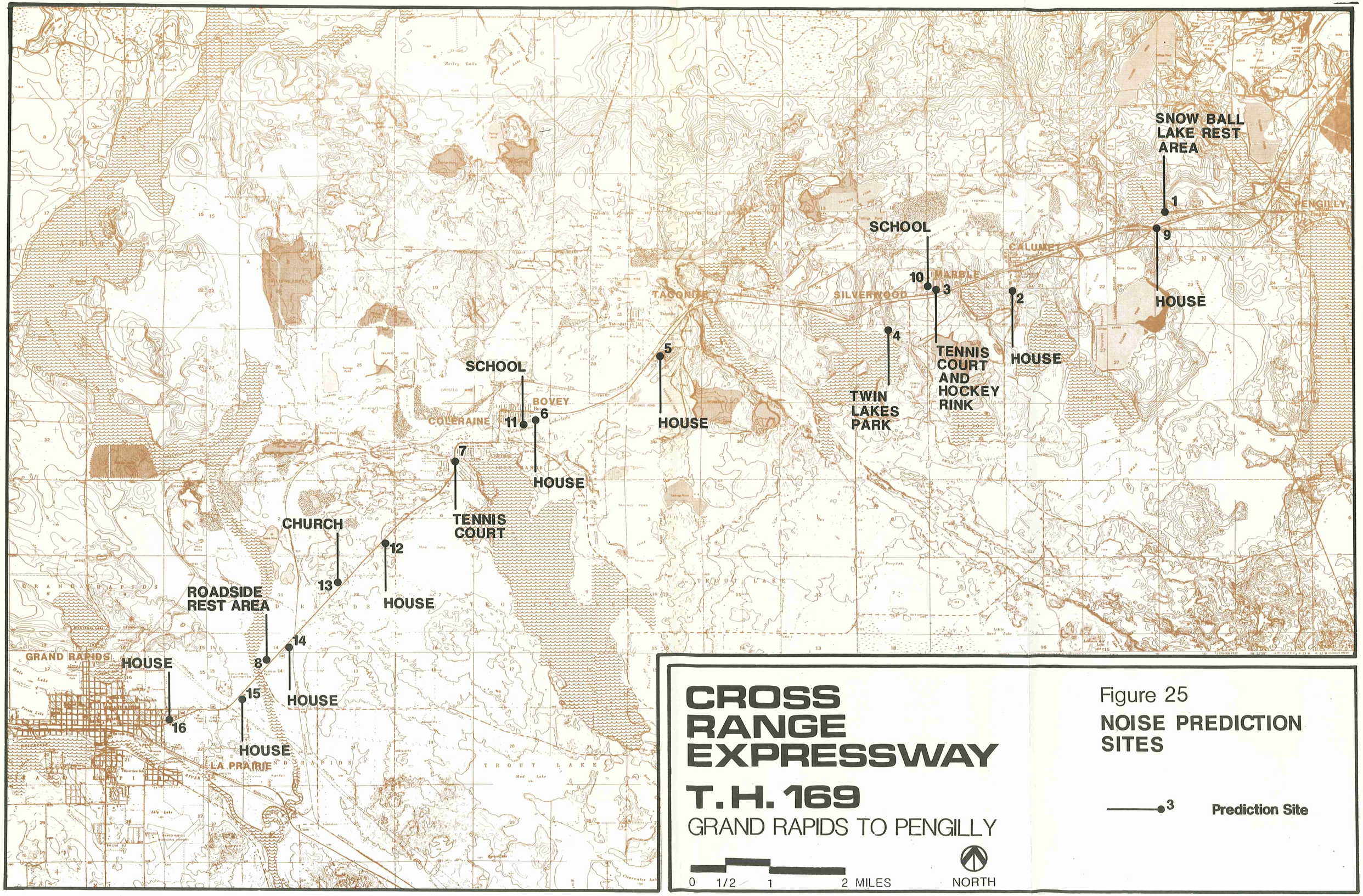
2) Receiver 4 - Park south of Marble (Alignment Alternative 4B)

3) Reciever 11 - School in Bovey (Alignment Alternative 2D)

However, neither the state noise standards nor the federal noise abatement criteria are predicted to be exceeded at these sites.

Noise Impacts

In addition to the specific noise levels predicted in the previous section, noise impacts are addessed by identifying those residences and other uses which are expected to exceed either the state noise standards or the federal noise abatement criteria. This was accomplished by analyzing the previously described noise contours for each Alternative Alignment. The noise contours serve both to identify existing noise-impacted land uses and as a planning tool to guide future land development. Residences and other uses falling within these contours will likely experience noise in excess of the state noise standards and federal noise abatement criteria.



CROSS RANGE EXPRESSWAY

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GRAND RAPIDS TO PENGILLY

0 1/2 1 2 MILES

NORTH

Figure 25

NOISE PREDICTION SITES

3 — Prediction Site

TABLE 27
PREDICTED NOISE LEVELS AT NOISE-SENSITIVE RECEIVERS (dBA)

Receiver	Land Use	Alternative	Existing				Future			
			Day		Night		Day		Night	
			L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
1	Roadside Rest Area	5A	NA	NA	NA	NA	62	53	59	49
		5C	NA	NA	NA	NA	NA	NA	NA	NA
		No Build	68	57	64	53	69	59	66	55
9	Residential	5A	NA	NA	NA	NA	55	49	53	45
		5C	NA	NA	NA	NA	56	50	54	46
		No Build	58	50	55	46	60	52	57	48
2	Residential	4A	NA	NA	NA	NA	NA	NA	NA	NA
		4B	NA	NA	NA	NA	NA	NA	NA	NA
		4C	NA	NA	NA	NA	53	48	51	44
		No Build	49	43	46	40	NA	NA	NA	NA
3	Tennis Ct. & Hockey Rink	4A	NA	NA	NA	NA	57	51	54	47
		4B	NA	NA	NA	NA	NA	NA	NA	NA
		4C	NA	NA	NA	NA	NA	NA	NA	NA
		No Build	56	49	54	46	57	51	54	47
10	School & Play yard	4A	NA	NA	NA	NA	52	47	50	43
		4B	NA	NA	NA	NA	NA	NA	NA	NA
		4C	NA	NA	NA	NA	NA	NA	NA	NA
		No Build	51	45	49	42	52	47	49	43
4	Park	4A	NA	NA	NA	NA	NA	NA	NA	NA
		4B	NA	NA	NA	NA	NA	NA	NA	NA
		4C	NA	NA	NA	NA	55	49	52	45
		No Build	39*	34*	NA	NA	NA	NA	NA	NA
5	Residential	3A	NA	NA	NA	NA	67	58	64	54
		No Build	67	57	64	53	68	59	65	55
6	Residential	2A	NA	NA	NA	NA	NA	NA	NA	NA
		2D	NA	NA	NA	NA	52	48	50	44
		No Build	55	48	52	44	56	49	53	46
11	School	2A	NA	NA	NA	NA	NA	NA	NA	NA
		2D	NA	NA	NA	NA	53	48	50	45
		No Build	48	43	46	39	48	44	46	40

NOTE: All levels are modeled levels considering TH 169 traffic only.

NA - Not applicable - the receiver is not adjacent to the alignment alternative.

T - The receiver site would be taken by the alignment alternative.

* - Monitored sound level.

TABLE 27
(Continued)

Receiver	Land Use	Alternative	Existing				Future			
			Day		Night		Day		Night	
			L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}	L_{10}	L_{50}
7	Tennis Court	2A	NA	NA	NA	NA	61	53	58	49
		2D	NA	NA	NA	NA	NA	NA	NA	NA
		No Build	61	52	58	49	61	53	58	49
12	Residential	1A	NA	NA	NA	NA	67	59	64	55
		1B	NA	NA	NA	NA	58	52	55	49
		1C	NA	NA	NA	NA	T	T	T	T
		No Build	67	58	64	54	68	60	65	56
13	Church	1A	NA	NA	NA	NA	64	58	62	55
		1B	NA	NA	NA	NA	50	47	47	43
		1C	NA	NA	NA	NA	54	51	52	47
		No Build	62	56	59	52	63	57	60	54
14	Residential	1A	NA	NA	NA	NA	T	T	T	T
		1B	NA	NA	NA	NA	50	47	48	44
		1C	NA	NA	NA	NA	55	51	52	48
		No Build	69	61	66	57	70	63	67	59
8	Roadside Rest Area	1A	NA	NA	NA	NA	T	T	T	T
		1B	NA	NA	NA	NA	T	T	T	T
		1C	NA	NA	NA	NA	NA	NA	NA	NA
		No Build	71	63	68	59	72	64	69	60
15	Residential	1A	NA	NA	NA	NA	64	58	61	54
		1B	NA	NA	NA	NA	NA	NA	NA	NA
		1C	NA	NA	NA	NA	54	51	52	47
		No Build	61	55	57	51	65	59	62	55
16	Residential	1A	NA	NA	NA	NA	66	59	64	55
		1B	NA	NA	NA	NA	NA	NA	NA	NA
		1C	NA	NA	NA	NA	NA	NA	NA	NA
		No Build	67	59	64	55	67	60	65	56

NOTE: All levels are modeled levels considering TH 169 traffic only.

NA - Not applicable - the receiver is not adjacent to the alignment alternative.

T - The receiver site would be taken by the alignment alternative.

* - Monitored sound level.

Table 28 presents a summary of expected noise impacts. It should be noted that all noise impacted receivers are residences and this tabulation does not consider noise sheilding by either terrain or intervening structures. The table reports both the total number of residences within each contour and the number of noise impacted residences expected to remain after right-of-way acquisition.

TABLE 28
SUMMARY OF NOISE IMPACTS

ROADWAY SEGMENT	FEDERAL NOISE ABATEMENT CRITERIA L_{10} 70	STATE DAYTIME STANDARD L_{10} 65	STATE NIGHTTIME STANDARD L_{10} 55
1A	13/0	60/36	141/117
1B	6/0	26/19	85/78
1C	12/0	35/18	63/46
2A	0/0	22/22	51/51
2D	0/0	0/0	9/9
3A	2/0	4/1	14/11
4A	2/0	21/8	46/33
4B	0/0	5/0	8/3
4C	0/0	4/3	28/27
5A	1/0	5/0	15/10
5C	2/0	3/0	4/1

X/Y = X total residences within the noise contour and Y remaining noise impacted residences following right-of-way acquisition.

As shown in the table, all residences predicted to exceed the federal noise abatement criteria are expected to be taken for right-of-way. Up to 67 residences are predicted to exceed the state daytime standard even after right-of-way acquisition. The majority of these residences are along the existing TH 169 alignment and are currently impacted by noise from the existing roadway. For example, the 22 residences predicted to exceed the state daytime standard in Segment 2A are all in Coleraine adjacent to the existing roadway. In Segment 1 (Alignment Alternatives A, B, and C), the impacted residences remaining after expected acquisitions are adjacent to the existing roadway and currently experience comparable noise levels. A noise variance from the Minnesota Pollution Control Agency may be required because of the expected violations of the state noise standards.

No-Action Alternative

The No-Action Alternative could result in slightly higher noise levels at a number of existing receiver sites because this alternative does not involve the acquisition of any homes for highway purposes and because future increases in traffic volumes are expected.

Noise Abatement

Once the areas within the study corridor which would be significantly impacted by highway noise were identified, the feasibility of noise abatement alternatives were evaluated. The Federal Highway Administration requires that the following types of noise abatement measures be considered for incorporation into major roadway improvement projects.

- o Traffic management measures: These could include vehicle weight or time limits, the installation of traffic control devices and/or modified speed limits. Because TH 169 is the major transportation artery in the area, these types of measures would be unreasonable and are, therefore, not being considered.

- o Alteration of vertical and horizontal alignments: Improving TH 169 along its existing alignment would affect more noise receivers than would moving the roadway into an area presently undeveloped. Some minor horizontal and/or vertical changes to the selected alignment may be possible and may reduce noise impacts. As a result, minor alignment changes for noise abatement will be considered during final design.

- o Construction of noise barriers: Noise barriers are not proposed for TH 169 project because of the number of places the barriers would be broken for access (thus reducing the barriers' effectiveness) and because of the scattered nature of the housing.

- o Acquisition of property for buffer zones: The acquisition of property along the roadway for noise buffer zones prevents development of incompatible uses in noise impacted areas. In the majority of the corridor, the right-of-way required for the roadway, shoulders, and ditches will encompass the area within the L_{10} 70 dBA noise contour. Therefore, acquisition of additional property for noise buffers is not proposed. The noise contour maps will be provided to affected communities in the corridor and can be used as a guide to compatible development.

- o Noise insulation of public use or non-profit structures: This measure does not appear to be a practical or necessary noise abatement alternative in this instance.

Path of Least Noise Impact

The optimal corridor, based on noise impacts to existing receptors, will be the one with the lowest accumulation of potentially impacted sites. To obtain the path, a segment-by-segment examination was conducted. The result of this examination is displayed in Table 29. The table represents those units within the 65 dBA contour, before property acquisition for right-of-way.

TABLE 29
MINIMUM NOISE IMPACT CORRIDOR

SEGMENTS	UNITS
1B	26
2A	22
2D	0
3A	4
4C	4
5C	3
TOTAL	53

This preferred noise impact corridor is based on the number of residential units exceeding the state daytime standard.

It should be noted that deviations from the existing corridor will introduce noise into areas which are currently extremely quiet. Although the alternative corridors will generally impact fewer existing residences in terms of the standards, introducing "new" noise in existing quiet areas is also an impact.

Construction Noise

It is difficult to estimate the actual equipment that will be used on this project at any given time and the relationship of the equipment to noise sensitive receptors, so no predictions of the noise levels have been made.

Minnesota Standard Specifications for Highway Construction (Section 7, Subsection 1702) states, in part, that the contractor shall comply with all applicable laws, ordinances, regulations, orders and decrees in the performance of construction. In addition the contractor would be bound by any nuisance ordinance a community may have which restricts construction hours.

However, in order to minimize potential construction noise impacts in sensitive areas, consideration will be given to restricting construction activities to the hours of 7 AM to 8 PM, and the contractor will be encouraged to pay careful attention to equipment maintenance and to be sure all machinery is properly muffled.

5.2.9 Energy Impacts

In accordance with FHWA guidelines, the estimated energy usage associated with both the No-Build and Build Alternatives was considered. The analysis compared the expected daily fuel consumption of the same vehicle mix on the present alignment and on each of the proposed Alternative Alignments. The analysis also considered the following variables which can impact fuel consumption:

- o Differences in operating speeds between the No-Build and Build Alternatives.
- o Differences in Level of Service (in the design year 2005) between the present two-lane roadway and the proposed four-lane divided expressway.
- o Differences in the number of stops and starts resulting from turning vehicles on both a two-lane and four-lane facility.
- o Differences in segment length.

The results of the analysis are documented in Table 30 and indicate that there is no significant difference in energy consumption associated with travel along either the No-Build or Build Alternatives. It should be noted that the range of energy consumption reported for Build Alternatives in Segments 1, 4, and 5 is due to the differences in length among the various Alternative Alignments.

TABLE 30
ESTIMATED ENERGY CONSUMPTION

SEGMENT	ENERGY CONSUMPTION (GALLONS/DAY) NO-BUILD ALTERNATIVE	BUILD ALTERNATIVE
1	1,640	1,820-1,900
2	560	360
3	590	580
4	560	580-650
5	390	380-400
TOTAL	3,740	3,720-3,890

5.2.10 Agricultural Lands and Farming

The impacts associated with the proposed project on agricultural lands and farming operations was determined by analyzing the amount of prime and unique agricultural land which would be lost because of construction. In addition, the amount of actively farmed land which would be lost and severance of large parcels was also considered.

Table 31 documents the number of acres of prime and statewide significant agricultural land within the expected right-of-way of each of the Alternative Alignments. The data indicates that the Build Alternative could impact between 263 and 386 acres of prime plus statewide significant farmland, depending on the combination of Alternatives finally selected.

TABLE 31
ACRES OF CLASSIFIED FARMLAND BY ALTERNATIVE ALIGNMENT

ALTERNATIVE	ACRES WITHIN ROW* PRIME	STATEWIDE	PRIME + STATEWIDE	NOT SIGNIFICANT
1A	73	35	108	6
1B	84	34	118	26
1C	88	12	100	33
2A	16	3	19	29
2D	60	4	64	26
3A	78	0	78	10
4A	63	5	68	34
4B	41	14	55	97
4C	28	8	36	80
5A	26	4	30	39
5C	58	0	58	60

* Average width of the existing right-of-way was assumed to be 150' and the future right-of-way was assumed to be 400'.

It should be noted however, the number of acres of land which is actively farmed is significantly less than the number of acres classified as prime or statewide-significant. Table 32 indicates that only 41 acres of land are currently being farmed within the proposed right-of-way of all of the Alternative Alignments and that the amount of farmland possibly taken out of production would range from approximately 16 to 37 acres.

TABLE 32
ACTIVELY FARMED LAND BY ALTERNATIVE ALIGNMENT

	ACRES WITHIN ROW				
LAND USE	1A	1B	1C	4B	5C
Open Pasture	1.06	0.00	0.00	0.26	0.00
Agricultural Meadow	1.04	6.52	0.00	1.92	3.15
Agricultural Field	9.05	15.59	1.61	0.00	0.00
TOTAL	12.14	22.11	1.61	2.18	3.15
ROW Acreage	165.20	177.48	165.16	164.88	137.69
Percent of ROW	7.3	12.5	1.0	1.3	2.3

Only seven owners of farmland tracts of 40 or more acres have been identified. (Figure 18.) One of the potentially affected farmland tracts is a 160-acre parcel owned by the University of Minnesota Agricultural Experiment Station. This parcel, bounded on the west by the Prairie River, would be bisected by Alternative 1B.

Alternative 1C would affect three parcels larger than 40 acres, each held by separate owners. The right-of-way would cut off the corner of two of these and separate a small portion from the larger body of the third.

Alternative 5C would affect two land parcels. The proposed right-of-way lies parallel to existing County Road 83. The new road alignment would affect only that part of the property immediately adjacent to the existing county road.

Table 33 is a summary of the expected impacts on land use, prime and unique agricultural land and land ownership. In general, the impacts on agricultural lands and farming operations should be insignificant because there is so little land within any of the potential rights-of-way which is classified as prime or statewide significant and there is even less land within these potential rights-of-way which is actively farmed.

TABLE 33
SUMMARY OF AGRICULTURAL LAND IMPACTS

ALTERNATIVE	AGRICULTURAL LAND USE				PRIME AND UNIQUE LAND				OWNERSHIP			
	MOST	SOME	LEAST	NONE	MOST	SOME	LEAST	NONE	MOST	SOME	LEAST	NONE
1A		X				X					X	
1B	X				X				X			
1C			X				X			X		
2A				X		X						X
2D				X		X						X
3A				X		X						X
4A				X	X							X
4B	X					X						X
4C				X			X					X
5A				X		X						X
5C	X				X				X			

The most significant agricultural impact is the loss of farmed land and severance associated with Alternative Alignment 1B. This alternative would diagonally bisect a 160-acre parcel located just east of the Prairie River, which is owned by the University of Minnesota's North Central Experiment Station. Discussions with personnel from the Experiment Station indicate that sensitive research plots would not be impacted, however, this loss of land combined with previous losses due to other development could effect the Experiment Station's ability to conduct research.

The combination of Alternative Alignments which would result in the least amount of impact relative to agricultural lands is 1C, 2A, 2D, 3A, 4C, and 5A. The No-Build Alternative would have no impact on agricultural lands and farming.

Mitigation

Several measures to mitigate impacts to agricultural land are available. These include the possibility, where new alignments are used, of reclaiming the abandoned roadbed for agricultural purposes, using slight alignment shifts to minimize severance impacts, narrow the right-of-way, steepen side slopes to minimize encroachments, utilize controlled access rights to permit property access where needed, and provide information about potential replacement lands to those whose property is significantly impacted.

Based on the type of impacts resulting from this particular project, the most appropriate mitigating measures to use will include the use of controlled access and providing information to affected agricultural land owners about the quality and location of potential replacement lands.

The Minnesota Department of Transportation is presently studying ways of mitigating the impacts of Alternative 1B on Experiment Station farm land. This process will include providing the Experiment Station with information about suitable agricultural soils and ownership patterns so that the Experiment Station and Mn/DOT could work together in acquiring replacement land if necessary. Also, Mn/DOT will work with the Experiment Station in an effort to provide reasonable access to the parcel bisected by Alternative 1B.

Final mitigating measures will be identified in the Final EIS once a preferred alternative is selected and the specific nature of the impacts to affected agricultural land is identified.

5.2.11 Construction

The proposed construction would create several temporary impacts. The construction period in any segment of the proposed project will range from one to two years. The most significant construction impacts will be local changes in air quality, noise levels, and water quality caused by the operation of construction equipment. Other short-term effects will include minor traffic disruptions, access difficulties and detours. A construction traffic plan will be developed to minimize disruption to adjacent roads and properties. All of the potential construction impacts can be managed and will not be significant.

Air and Noise Effects

Control of contractor construction activities is provided through the "Mn/DOT Standard Specifications for Highway Construction." In certain cases, the Standard Specifications are supplemented by special contract provisions to further control air and noise emissions from construction equipment. In all cases, the operation of construction equipment will be governed by the standards of the Minnesota Pollution Control Agency, the U.S. Environmental Protection Agency, and local governments.

Mixing plant operations for the production of pavement materials will also be subject to local, state, and federal standards. There are adequate existing mixing plants in the general project area to supply pavement material.

Water Quality

The grading and other construction operations needed to implement the proposed action will cause erosion in some of the project area. If the sediment is transported to receiving waters, temporary water quality impacts will occur.

In areas which require grading and temporary exposure of the soil surface, several techniques will be employed to minimize erosion. These techniques are required by the Mn/DOT Standard Specifications and include setting construction limits, implementing temporary erosion control measures (such as sedimentation basins and slope drains), and promoting rapid revegetation of the construction areas.

There will be no disposal of gasoline or other hazardous liquids in surface waters. These materials will be stored and used in a way to minimize the chance of spills. The contractor will be monitored for compliance with Mn/DOT Standards in the field.

Traffic Flow

The flow of traffic on existing roadways will be generally maintained, although some locations may experience temporary traffic disruption or detours. If construction takes place away from the present TH 169 alignment, there will be very little disruption to traffic flow. When Alternatives along the existing alignment are chosen (e.g., 1A, 2A, 3A, 4A, 5A), the project will be staged in a manner to keep two lanes open during the entire construction period according to a traffic plan which will be developed during the design phase.

5.2.12 Joint Development

The possibility exists that Mn/DOT will work with the Minnesota Department of Natural Resources to construct new or improved recreational and highway rest areas at one or more of the following locations: Twin Lakes, Snowball Lake, Oxhide Lake, Prairie River, and Trout Lake. Decisions on such joint development will be made after a single alignment has been chosen and during the preliminary design stage.

5.3 Section 4(f) and Section 106 Impacts

It appears at this time that no public park land or recreational open space land would need to be acquired for any of the Alternative Alignments. If, however, Alternative 4B is selected as part of the preferred alternative and if further study indicates that right-of-way acquisition from the Greenway Township swimming beach is necessary, a Section 4(f) Statement will be prepared.

6.0 LIST OF PREPARERS

NAME	EDUCATION	EXPERIENCE	RESPONSIBILITY
Brenda Bell BRW, Inc.	B.S. Wildlife Management	2 Years	Fisheries, Vegetation, Wetlands, Wildlife
Mary Blomquist Biocentric, Inc.	PhD Statistics	25 Years	Social and Economic Analysis
Daniel Cook BRW, Inc.	B.S. & M.S. Civil Engineering	7 Years	Water Resources Structural Engineer
Stan Graczyk FHWA	B.S. Civil Engineering	17 Years	Area Engineer
Jean Hoffmeister BRW, Inc.	B.A., B.S., & M.S. Communications	15 Years	EIS Editing and Production
Joseph Hudak BRW, Inc.	B.S. Anthropology M.A. Archaeology	15 Years	Historic and Archaeological
Ronald Lacy FHWA	B.S. Civil Engineering	28 Years	Environmental Coordinator
Richard Nau BRW, Inc.	B.S. Forestry	7 Years	Air Quality and Traffic Noise
Kathleen Novak Biocentric, Inc.	B.A. Economy	10 Years	Social and Economic Analysis
Steve Osmek BRW, Inc.	B.S. Wildlife Management	3 Years	Fisheries, Vegetation Wetlands, Wildlife
Howard Preston BRW, Inc.	B.S. Civil Engineering	13 Years	Project Engineer, Roadway Alternatives EIS Editing
Harold Skjelbostad BRW, Inc.	B.A. Landscape Architecture	12 Years	Visual Analysis
Franklin Svoboda BRW, Inc.	B.S. Wildlife Management	20 Years	Fisheries, Vegetation, Wetlands, Wildlife, Agricultural

NAME	EDUCATION	EXPERIENCE	RESPONSIBILITY
William Troe BRW, Inc.	B.S. & M.A. Transportation Planning	1 Year	Air Quality and Traffic Noise, Computer Modeling
William Weber BRW, Inc.	B.A. & M.A. Sociology and Urban Planning	8 Years	Social and Economic Analysis, Community Plans
Richard Wolsfeld BRW, Inc.	B.S. Civ. Eng./M.S. Traffic Engineering and Urban Planning	19 Years	Project Manager, Roadway Alternatives, EIS Editing

7.0 AGENCIES AND ORGANIZATIONS RECEIVING COPIES OF THE DEIS FOR REVIEW

7.1 FEDERAL AGENCIES

U.S. Department of Agriculture
- Forest Service
- Soil Conservation Service

U.S. Department of the Army, Corps of Engineers, St. Paul District

U.S. Department of Health, Education, and Welfare

U.S. Department of Housing and Urban Development

U.S. Department of the Interior
- Bureau of Land Management
- Fish and Wildlife Service
- National Park Service

U.S. Department of Transportation
- Federal Aviation Administration
- Second Coast Guard District
- Urban Mass Transportation Administration

Advisory Council on Historic Preservation

Defense Council Preparedness Agency

Environmental Protection Agency

Federal Energy Administration

Federal Power Commission

7.2 STATE AGENCIES

Minnesota Department of Agriculture

Minnesota Department of Economic Development

Minnesota Department of Energy, Planning, and Development

Minnesota Department of Health

Minnesota Department of Natural Resources

Minnesota Environmental Quality Board

Minnesota Historical Society

Minnesota Pollution Control Agency

Minnesota State Planning Agency

7.3 REGIONAL GOVERNMENTS/AGENCIES

Arrowhead Regional Development Commission

Iron Range Resources and Rehabilitation Board

7.4 COUNTY GOVERNMENTS/AGENCIES

Itasca County Board of Commissioners

Itasca County Highway Department

7.5 LOCAL GOVERNMENTS

City of Bovey
City of Calumet
City of Coleraine
City of Grand Rapids
City of Keewatin
City of La Prairie
City of Marble
City of Nashwauk
City of Taconite

7.6 TOWNSHIP GOVERNMENTS

Grand Rapids Township
Greenway Township
Iron Range Township
Nashwauk Township
Trout Lake Township

7.7 LIBRARIES

Environmental Conservation Library
Minnesota Legislative Reference Library
Public Libraries - Grand Rapids
Hibbing
Keewatin
Marble

7.8 OTHER ORGANIZATIONS

Concerned Citizens of Swan Lake
Itasca Community College
North Central Experiment Station

8.0 TECHNICAL REPORTS REFERENCED

Ten technical reports were prepared prior to preparation of this DEIS. These reports are listed below and were used extensively as resource materials during the environmental review process.

TECHNICAL REPORT	PREPARER
1) Agricultural Lands	BRW, Inc.
2) Air Quality	BRW, Inc.
3) Historic/Archaeological	BRW, Inc.
4) Noise	BRW, Inc.
5) Roadside/Visual	BRW, Inc.
6) Socio-Economic	Biocentric Inc.
7) Traffic Forecast	BRW, Inc.
8) Vegetation/Fisheries/Wildlife	BRW, Inc.
9) Water Resources	BRW, Inc.
10) Wetlands	BRW, Inc.

9.0 COMMENTS AND COORDINATION

9.1 SCOPING PROCESS

The Scoping process for the extension of the TH 169 Cross Range Expressway began in June, 1984, when a series of informational meetings were held with the communities and major employers along the route. As a result of comments and suggestions received at these meetings a variety of alternative roadway corridors were identified along with potential social, economic and environmental considerations.

During July and August, 1984, a series of maps were developed which showed the recommended location for the alternative corridors. Basically, these corridors consisted of locations adjacent to the existing roadway, except through the City of Bovey, plus new roadway alignments from Grand Rapids to Coleraine, around Bovey, and from Marble to Pengilly.

In September, 1984, a second series of informational meetings were held with the representatives from the affected communities and the major employers in the area. The alternative corridor maps were reviewed and potential issues were identified.

In October, 1984, a Draft Study Outline and Scoping Report was prepared and circulated. This report documented the decision-making process and identified the alternatives and issues associated with the proposed improvement of TH 169. Following distribution of this report, a Scoping Meeting was held on November 13, 1984, at the Bovey City Hall. Approximately 250 people attended the meeting and following a brief presentation documenting the scoping process and the major issues associated with the project, the public was given an opportunity to present comments. The significant comments or issues which were raised are listed below:

- Many people testified in support of the construction of the Cross-Range Expressway to improve safety, mobility, and increase accessibility.

- A group of residents who live along the north side of County State Aid Highway (CSAH) 83 expressed concern

regarding the potential impact on their property associated with the development of Alternative 5B. These residents recommended that Alternative 5B be dropped from further consideration and a new alternative located south of CSAH 83 developed in its place.

9.2 SCOPING DECISION

As a result of comments received at the scoping meeting and during the following public comment period, it was decided to follow the course of action described below:

- o Dismiss the two-lane upgrade design alternative.
- o Dismiss the following alternative roadway corridors (Figure 9) because they did not meet the transportation needs of this project.
    1) Alternative 2C, the northwest bypass of Coleraine.
    2) Alternative 5B, the new alignment north of CSAH 83.
    3) Alternative 6, the south bypass.
- o Add the following alternative roadway corridor (Figure 9).
    1) Alternative 5C, a new alignment south of CSAH 83.
- o Dismiss the following environmental issues.
    1) Coastal Zone Areas
    2) Wild and Scenic Rivers

9.3 PUBLIC HEARING

A formal public hearing regarding the DEIS and the proposed location and design alternatives will be held following the publication and distribution of the DEIS. The Public Hearing has been scheduled for Wednesday, February 25, 1987, at 7 PM in the Bovey City Hall. Appropriate notices will be published in the Federal Register, the Minnesota Environmental Quality Board Monitor, and local newspapers in the project area, in accordnace with State and Federal guidelines.

9.4 COOPERATING AGENCIES

The following governmental agencies have agreed to cooperate in the development of the DEIS.

- o Department of the Army, St. Paul District, Corps of Engineers
- o Department of the Interior, Fish and Wildlife Service
- o Minnesota Department of Natural Resources
- o Minnesota Pollution Control Agency

9.5 PERMITS/APPROVALS

Tne following permits and/or approvals will be required for the TH 169 project:

1) U.S. Army Corps of Engineers - Section 404 Permit
2) Minnesota Pollution Control Agency - 401 Certification
3) Minnesota Department of Natural Resources - Work in Bed of Public Waters.
4) Cities of Bovey, Calumet, Coleraine, Grand Rapids, La Prairie, Marble and Taconite - Plan Approval.

APPENDIX

MINNESOTA HISTORICAL SOCIETY
FOUNDED IN 1849
Fort Snelling History Center, St. Paul, MN 55111 • (612) 726-1171

January 8, 1986

Mr. G. Joseph Hudak
Bennett, Ringrose, Wolsfeld, Jarvis, Gardner, Inc.
Thresher Square
700 Third Street South
Minneapolis, Minnesota 55415

Dear Mr. Hudak:

Re: Cross Range Expressway T.H. 169 Grand
Rapids to Penquilly - Historical/Archaeological Technical Report
SP. 3116-88 & 94
MHS Referral File Number: T-793-798

Thank you for the opportunity to comment on the Historical-Archaeological Technical Report for the above referenced project. As we stated in our letter of September 9, 1985, it is staff opinion that none of the structures which will be affected by this project is eligible for listing on the National Register. Also, there are no reported archaeological sites along the route.

As a consequence, the major unresolved historic preservation issue is the likelihood of unreported archaeological sites, an issue which is addressed by figure 6 and pages 26 and 27. General models of site distribution are appropriate in most situations. This area, however, has seen a very complicated recent land use history which may significantly qualify those generalizations. We therefore recommend that the final decisions on where archaeological reconnaissance will be performed be based on a detailed field review. It is our understanding that this review and the archaeological reconnaissance will be completed by the Minnesota Trunk Highway Archaeological Reconnaissance Survey.

If you have any further questions regarding this project, please contact me at the Minnesota Historical Society, Fort Snelling History Center, St. Paul, Minnesota 55111, (612) 726-1171.

Thank you for the close attention to historical and archaeological values in the planning process.

Sincerely,

Ted Lofstrom

Ted Lofstrom
Environmental Assessment Officer

TL:dmb

cc: Les Peterson
Fort Snelling History Center

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

516 C Pokegama Ave. S.
Grand Rapids, Mn. 55744

January 11, 1985

Mr. Franklin J. Svoboda, Natural Resources Planner
BRW, Inc.
Thresher Square
700 Third Street South
Minneapolis, Mn. 55415

Dear Frank:

Enclosed please find form AD-1006 "Farmland Conversion Impact Rating", plat maps, and the acetate overlay of soil maps for the T.H. 169 project in Itasca County.

Please note that Parts IV. D and V.are not completed on AD-1006. Because this rating procedure is so new the method of determining relative value of land is not available. We simply do not have the technical ability to accurately complete the evaluation at this time. It is my understanding that this will not interfere with completion of the project.

If you have any questions about the information provided feel free to contact me at 218-326-6595.

Sincerely,

T. J. Weber, DC

Soil Conservation Service

TJW:jr

enc.