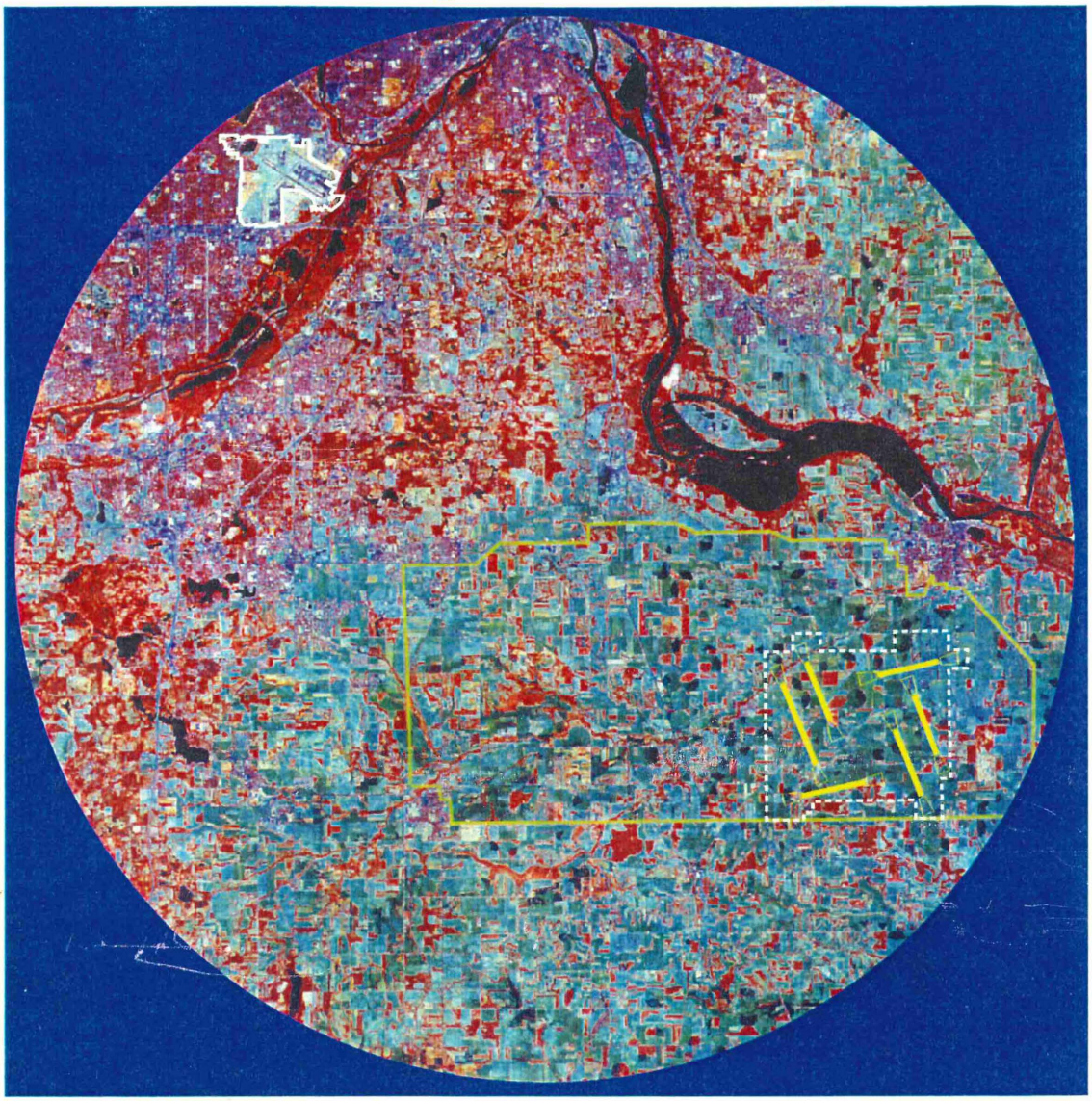
Dual Track Airport Planning Process



Environmental Impact Statement

Second Phase Scoping Report

Metropolitan Airports Commission

SECOND PHASE SCOPING REPORT
TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES (in Appendix A)

Dual Track Environmental Impact Statement (EIS)
Second Phase Scoping Report

Executive Summary

Purpose of the document

The Dual Track process created by the Minnesota Legislature in 1989 directed the Metropolitan Airports Commission (MAC) and the Metropolitan Council to examine how best to meet the region's aviation demand 30 years into the future. The agencies were directed to compare expansion of the Minneapolis-St. Paul International Airport (MSP) with construction of a new replacement airport.

The state and federal Environmental Impact Statements (EIS) for the Dual Track process which are being prepared by MAC and the Federal Aviation Administration (FAA), will compare those and all other feasible alternatives to meet 2020 aviation demand in light of a host of environmental criteria.

The scoping process for the EIS was performed in two phases. In April 1992 a First Phase Scoping Report was prepared which described the Dual Track process for identifying the alternatives and issues/impacts to be addressed in the EIS. The Second Phase Scoping Report documents the results of that process.

This scoping report is a precursor to the Dual Track Environmental Impact Statement and its purpose is to:

1) identify which alternatives are feasible and deserve further evaluation in the EIS, and,

2) identify issues, concerns and impacts of the alternatives, and determine which ones require detailed analysis in the EIS.

Alternatives Considered

The types of alternatives that have been considered include:

No Action
MSP Development
New Airport
Remote Runway Concept
Supplemental Airport Concept (Using MSP and existing airports)
High-Speed Intercity Rail (Twin Cities to Chicago)

The one alternative eliminated from further consideration is the High-Speed Intercity Rail concept which proposed diversion of passengers/operations from MSP through high speed rail service to Madison/Milwaukee/Chicago. Study results determined the rail services would not divert enough passengers and operations by the year 2020 to preclude a new runway and terminal at MSP.

The scoping report also reviews the various new airport search areas, new airport sites and new airport and MSP development plans which were eliminated from further consideration in the course of the Dual Track process. Each was eliminated after environmental analysis under a tiered EIS process approved by the Minnesota Environmental Quality Board (MEQB).

The MSP comprehensive plan approved by MAC in February and the new airport comprehensive plan approved by MAC in April will be carried forward for more detailed analysis in the EIS. For a description of these plans, see page IV-1 and IV-2. The No Action alternative will also be carried forward for further study.

Two other alternatives are currently being studied as potentially feasible for inclusion in the EIS. Studies of the Remote Runway Concept and Supplemental Airport Concept are underway and will be completed this summer. If the alternatives are deemed feasible, they will be included in the EIS for further evaluation. Descriptions of the alternatives are found on page IV-3.

Environmental Impacts

Thirty environmental issue/impact categories have been examined. They are:

> Air quality, archaeological resources, biotic communities, bird-aircraft hazards, construction impacts, coastal barriers, coastal zone management program, endangered and threatened species, economic, energy supply and natural resources, farmland, floodplains, historic/architectural resources, induced socioeconomic impacts, land use, light emissions, noise, parks and recreation, site preservation, social, section 4(f), solid waste impacts, transportation access, major utilities, visual impacts, wastewater, water supply, surface water quality, groundwater quality, wetlands, wild and scenic rivers, and wildlife refuges.

Seven of the 30 environmental categories do not require detailed analysis in the EIS because their impacts have been determined not to be significant. They are:

coastal barriers
coastal zone management program
light emissions
mineral resources
solid waste
visual
wild and scenic rivers

The remaining 23 environmental issue/impact categories will be carried forward for detailed analysis in the EIS.

The Process

The scoping report was reviewed by MAC and made available for public comment in May. June public meetings will follow and MAC is scheduled to review public comments and make a scoping decision in July. A Draft EIS will be released by MAC and FAA for public comment in November with public hearings and information meetings in January 1996. A state Final EIS will be accepted by MAC in March 1996. The MAC and Metropolitan Council will submit a final report and recommendations to the Legislature in July 1996.

MAC reviewed scoping report for public comment	May 15, 1995
Comment period for scoping report	May 26 - July 5, 1995
Public meetings on scoping report	June 26 & 27, 1995
Local, state and federal agency meeting on scoping report	June 27, 1995
Scoping Decision by MAC	July 26, 1995
Draft EIS for public comment	December 4, 1995
Comment period for Draft EIS	December 4 - February 5, 1996
State Final EIS prepared by MAC	March 1996
State Final EIS adequacy determination by MEQB	May 1996
Recommendations to Legislature	July 1, 1996

I. BACKGROUND

A. Project Description

The proposed project is the airport development plan that best accommodates the year 2020 air transportation needs of the Twin Cities metropolitan area. The plan consists of the runways, taxiways, aprons, terminal(s), concourses, roadways, building areas, maintenance and treatment facilities, and supporting local and regional infrastructure improvements.

B. Project History

The Minnesota Legislature in 1989 enacted the Metropolitan Airport Planning Act to determine whether the long-term air transportation needs of the metropolitan area and the state could best be met by enhancing capacity at Minneapolis-St. Paul International Airport (MSP) or by developing a replacement airport within the metropolitan area. Known as the Dual Track Airport Planning Process, the 1989 legislation (as amended) specified the following actions for both the Metropolitan Council (or Council) and the Metropolitan Airports Commission (MAC or Commission) during the 1989-1996 planning period:

- AVIATION PLAN. By February 1, 1990, the Metropolitan Council shall amend its aviation plan to incorporate policies and strategies that will ensure a comprehensive, coordinated, continuing, thorough and timely investigation and evaluation of alternatives for major airport development in the metropolitan area for a prospective 30-year period. The alternatives must include both airport improvements and enhancements of capacity that may be necessary at the existing airport (MSP) and the location and development of a new airport.

- AVIATION GOALS. By March 1, 1990, the Metropolitan Council, shall report to the legislature analyzing and making recommendations on long-range aviation goals for the major airport facility in the metropolitan area for a prospective 30-year period. The report must address goals for safety, environmental impact, and services, including ground access and service levels to other states and countries and to nonmetropolitan areas of the state. In preparing the report, the Council shall consider regional growth patterns, economic development, economic impact, regional and statewide investment, and ground transportation.

- NEW AIRPORT: CONCEPTUAL DESIGN STUDY AND PLAN. By March 1, 1990, the Commission, in consultation with the Council, shall complete a study of facilities requirements, airport functioning, and conceptual design for a major new airport. By January 1, 1991, the Commission shall complete a conceptual design plan for a major new airport. The conceptual design study and plan must describe and satisfy air transportation needs for a prospective 30-year period and be consistent with the development guide of the Council. The concpetual design plan must iclude an analysis of estimated costs, potential financing methods and sources of public and private funding, and cost allocation issues and options. The Council shall use the design study and plan in selecting a search area.

- SEARCH AREA. By January 1, 1992, the Metropolitan Council, in consultation with the Commission, shall designate a search area for a major new airport.

- MSP PLAN. By January 1, 1992, the Commission shall adopt a long-term comprehensive plan (LTCP) for MSP International Airport at its existing location to satisfy the air transportation needs for a 30-year planning period. The plan must be updated at least every five years, and amended as necessary to reflect changes in trends and conditions, facilities requirements, development plans and schedules.

- MSP REUSE STUDY. By January 1, 1993, the Council shall report to the legislature on policies for the reuse of the existing major airport site should a new major airport be developed.

- NEW AIRPORT SITE SELECTION & COMPREHENSIVE PLAN. Within four years after the designation of the search area, MAC shall:

    - select a site for a new major airport within the search area,

    - prepare a comprehensive plan for the development of a new major airport at the selected site to satisfy the air transportation needs for a 30-year period, and

    - prepare and submit for administrative review the environmental documents required for site acquisition.

- AIRPORT PLANNING AND DEVELOPMENT REPORT. Within 180 days following completion of the comprehensive plans for MSP and a new major airport, the Metropolitan Council and MAC shall report to the legislature on the long-range planning and development of major airport facilities in the metropolitan area. The report must include recommendations of the agencies on major airport development for the 30-year period and on acquiring a site for a new major airport, including financing. The report must be completed by July, 1996.

The following actions have been taken since the 1989 legislation was enacted:

1. The Metropolitan Council amended its aviation plan in January, 1990 to include both airport improvements and enhancement of capacity at MSP and the location and development of a new major airport — as alternatives for major airport development in the metropolitan area for the next 30 years. The plan also included the aviation goals and policies to guide major airport development for the next 30 years.

2. The Commission completed the New Airport Conceptual Design Study and Plan in December, 1990.

3. The Council, in December 1991, designated the Dakota Search Area in Dakota County as the location for the planning and development of a new major airport. The process utilized by the Council in designating the search area was approved by the Minnesota Environmental Quality Board (MEQB) on October 18, 1990 as an alternative environmental review process — and was reviewed by the Federal Aviation Administration (FAA) and determined consistent with FAA policies and regulations on December 26, 1990.

4. The Commission adopted a long-term comprehensive plan for MSP in November, 1991.

5. The Commission submitted an alternative environmental review process for the Dual Track Airport Planning Process to the MEQB, which was approved on March 19, 1992. The alternative environmental review process called for the preparation of an Alternative Environmental Document (AED) for each stage of the development of the comprehensive plans for the two "tracks" (MSP and New Airport). The AEDs would assess the environmental impacts of the alternatives under consideration in sufficient detail to select the best alternative.

6. The Council completed the MSP Reuse Study in December 1992.

7. A First Phase Scoping Report describing the Dual Track Airport Planning Process was prepared and made available for public and agency review on March 30, 1992. Three public meetings were held in April 1992 for public and agency comment. Responses to substantive comments were published in March 1993.

8. The Scoping Document and Draft Scoping Decision Document for the selection of a new airport site were prepared by MAC and made available for public and agency review on March 1, 1993. A public scoping meeting was held March 18 and the Scoping Decision Document, including responses to comments, was adopted by the Commission on June 21, 1993.

9. The Draft AED for the selection of a new airport site, including the identification of a preferred site, was reviewed by MAC on September 20, 1993, for public/agency review and comment. A public hearing was held on November 18 and the Final AED was made available on February 28, 1994, for public/agency review and comment. The Commission determined the adequacy of the Final AED and selected Site 3 on March 21, 1994.

10. The Scoping Environmental Assessment Worksheet (EAW) and Draft Scoping Decision Document for the update of the long-term comprehensive plan for MSP were prepared by MAC and made available for public and agency review on January 17, 1994. A public scoping meeting was held February 15 and the Scoping Decision Document was adopted by the Commission on March 21, 1994.

11. The Scoping EAW and Draft Scoping Decision Document for the development of a comprehensive plan at the New Airport Site 3 were prepared by MAC and made available for review and comment on April 25, 1994. A public scoping meeting was held May 12 and the Scoping Decision Document was adopted by the Commission on June 20, 1994.

12. The Draft AED for the selection of the MSP Long-Term Comprehensive Plan was reviewed by MAC on September 19, 1994 for public/agency review and comment. A public hearing was held on October 26, 1994 and the Final AED was made available on January 30, 1995 for public/agency review and comment. The Commission determined the adequacy of the Final AED and selected Alternative 6 (see Section IV.B.1) on February 21, 1995.

13. The Draft AED for the selection of the New Airport Comprehensive Plan was reviewed by MAC on November 21, 1994 for public/agency review and comment. A public hearing was held on January 18, 1995 and the Final AED was made available on March 27, 1995 for public/agency review and comment. The Commission determined the adequacy of the Final AED and selected the New Airport Comprehensive Plan (see Section IV.B.2) on April 18, 1995.

C. Purpose of Scoping Report

The purpose of the Scoping Report is to define the alternatives, issues and impacts that MAC and FAA propose to study, analyze and discuss in the EIS. The report is made available in order to obtain public and agency comments on the adequacy of the proposed scope of the EIS.

D. Schedule

The tentative schedule of activities for scoping and EIS preparation is:

Activity	Date
Second Phase Scoping Report and Beginning of Comment Period	May 26, 1995
Agency Scoping Meeting	June 27, 1995
Public Scoping Meetings	June 26 & 27, 1995
End of Scoping Comment Period	July 5, 1995
Scoping Decision by MAC	July 26, 1995
Draft EIS and Beginning of Comment Period	December 4, 1995
Draft EIS Public Hearings/Information Meetings	January 1996
End of Draft EIS Comment Period	February 5, 1996
State Final EIS	March 1996
MEQB Determination of State Final EIS Adequacy	May 1996
Recommendations to Minnesota Legislature	July 1, 1996

After the Minnesota Legislature selects an airport development alternative, the FAA will prepare the federal Final EIS based on the proposed action.

E. Public and Agency Involvement

The MSP Interactive Planning Group (IPG) was formed in early 1991 to advise MAC of the off-airport impacts and potential migitation measures of the development concepts being considered for the MSP Long-Term Comprehensive Plan. The IPG consisted of representatives of the affected cities. Three advisory committees were subsequently formed to advise MAC throughout the preparation of the Alternative Environmental Documents (AEDs) for the expansion of Minneapolis-St. Paul International Airport, and the selection of the new airport site and development of a new airport comprehensive plan in Dakota County.

The MSP and New Airport Technical Committees each were comprised of staff representatives of the affected cities and counties, regional, state and federal agencies, as well as representatives of airport users and local interest groups. The technical committees reviewed the technical approach and products of the airport planning process.

The Dual Track Task Force is comprised of elected officials or representatives of the affected cities, counties and townships, as well as of regional, state and federal agencies, airport users and local interest groups. The task force reviews the process and products of the planning process and provides advice to the Metropolitan Airports Commission.

The State Advisory Council, which was established by the Minnesota Legislature, has been informed of the progress of the study. The general public continues to be informed through a series of public information meetings, newsletters, informational brochures, press conferences and news releases, as appropriate. The general public has had opportunities to comment both informally and formally. Formal comment was sought at the AED public hearings and during comment periods. Opportunities for informal comment are provided at Task Force and Technical committee meetings, and public information meetings and open houses.

F. Agency Responsibilities for Preparing the EIS

A Draft Environmental Impact Statement, analyzing significant issues associated with the proposed alternatives for airport development, will be prepared and be the subject of a public hearing and public comment period. The Draft EIS will be prepared jointly by MAC and FAA.

However, two Final Environmental Impact Statements will be prepared — one for the state environmental process and one for the federal environmental process. The state Final EIS will be prepared by the Metropolitan Airports Commission as the lead agency. The Minnesota Environmental Quality Board (MEQB) will determine its adequacy. The MEQB action is expected prior to the MAC and Council submittal of their joint report with recommendations to the Minnesota legislature.

The FAA, as the lead federal agency, is responsible for preparing and approving the federal Final EIS. This action will occur after the Minnesota Legislature decides on an airport development alternative.

G. Permits and Approvals

Unit of Government	Type of Permit/Approval
General:	
Minnesota Environmental Quality Board	Determination of State Final EIS Adequacy
MSP Alternative:	
U. S. Army Corps of Engineers	Section 404 Permit (Corps Individual Permit)
Federal Aviation Administration	Airspace Approval, Airport Layout Plan Approval, Approval of Federal EIS including findings of fact and record of decision
Federal Highway Administration	Location and Design Approval, Federal-Aid Roadways
Minnesota Department of Transportation	Design Review and Approval, State-Aid Roadways
Minnesota Department of Natural Resources	Water Appropriation Permit, Protected Waters Permit
Minnesota Board of Water and Soil Resources	Compliance with the Wetland Conservation Action of 1991; Compliance with the Metropolitan Watershed Management Act
Minnesota Pollution Control Agency	MAC NPDES Stormwater Permit; General NPDES Stormwater Permits (Airport Tenants); 401 Water Quality Certification; Indirect Source Permit; Air Emission Facility Permits; Fugitive Dust Control Regulation Approval; Compliance with State Implementation Plan; Compliance with Transportation Conformity Rule; Compliance with Noise Rule (other than aircraft noise)
State Historic Preservation Office	Advisory Council on Historic Preservation (Section 106/Section 110 Review); Section 4(f) Review
Metropolitan Council	Long-Term Comprehensive Airport Plan Review; Annual Review of MAC Capital Improvement Program; Approval to changes in the Metropolitan Highway System; Industrial Discharge Permits
Richfield-Bloomington Watershed Management Organization	Drainage Design Review and Approval
Minnehaha Creek Watershed District	Drainage Design Review and Approval; Grading/Land Alteration Permits
Lower Minnesota River Watershed District	Drainage Design Review and Approval; Grading/Land Alteration Permits

New Airport Alternative:	
U. S. Army Corps of Engineers	Section 404 Permit (Corps Nationwide Permit); Section 10 Permit
Federal Aviation Administration	Site Approval; Airspace Approval; Approval of Airport Layout Plan; Approval of Federal EIS and Record of Decision
Federal Highway Administration	Local and Design Approval, Federal-Aid Highways
Dakota County	Conditional Use Permit for Floodplain and Watershed Management
Minnesota Department of Transportation	Design Review and Approval, State-Aid Roadways
Minnesota Department of Natural Resources	Water Appropriation Permit; Protected Waters Permit; Interbasin Transfer Approval; Dam Permit
Minnesota Pollution Control Agency	NPDES Wastewater/Industrial Process Discharges Permit; NPDES Stormwater Permit; 401 Water Quality Certification; Indirect Source Permit; Air Emission Facility Permits; Fugitive Dust Control Regulation Approval; Compliance with State Implementation Plan; Compliance with Transportation Conformity Rule; Compliance with Noise Rule (other than aircraft noise)
Minnesota Department of Health	Well Permits
State Historic Preservation Officer	Advisory Council on Historic Preservation (Section 106 Review); Section 4(f) Review
Metropolitan Council	Airport Comprehensive Plan Review; Approval to changes in the Metropolitan Highway System; Industrial Discharge Permits
Marshan Township	Compliance with the Wetland Conservation Act of 1991
Vermillion River Watershed Management Organization	Drainage Design Review and Approval; Grading/Land Alteration Permits
Various, including local governments, property owners and Northern States Power	Easements
No Action Alternative:	
U.S. Army Corps of Engineers	Nationwide Permit
Minnesota Board of Water and Soils Resources	Compliance with Wetland Conservation Act of 1991

Minnesota Pollution Control Agency	NPDES Wastewater/Industrial Process Discharges Permit; NPDES Stormwater Permit; 401 Water Quality Certification; Indirect Source Permit; Air Emission Facility Permits; Fugitive Dust Control Regulation Approval; Compliance with State Implementation Plan; Compliance with Transportation Conformity Rule
Metropolitan Council	Industrial Discharge Permits

H. Related Environmental Documents

There have been four environmental documents related to the Dual Track Airport Planning Process that have been prepared prior to this Scoping Report — selection of search area, site selection, new airport comprehensive plan, and MSP long-term comprehensive plan.

A mandate to prepare the necessary environmental documentation was included in the 1989 legislation. Alternative Environmental Documents (AEDs) were approved by the Minnesota Environmental Quality Board (MEQB) as the documents providing the necessary environmental documentation on site selection and detailed the development of the airport comprehensive plans at both Minneapolis-St. Paul International Airport and at the selected Dakota County site. The focus of each AED was the detailed analysis of the differential impacts of the alternatives at MSP and at the Dakota County site, so that the analysis in the Draft EIS could consider the preferred MSP and new airport alternatives the no-action alternative, and any other feasible alternative. The AEDs represent "tiered" EISs, and they followed the same procedures as a regular EIS.

A formal AED was not prepared for the search area location but environmental analysis was performed and documented by the Metropolitan Council in a series of reports.

The Final AED for the selection of the New Airport Site in the Dakota Search Area, dated March 1994, evaluated three alternative sites and discussed the process to select the three sites.

The Final AED for the selection of the New Airport Comprehensive Plan, dated April 1995, evaluated three alternatives for development of a new airport at the selected site in the Dakota Search Area.

The Final AED for the selection of the MSP Long-Term Comprehensive Plan, dated February 1995, evaluated six alternatives for the expansion of the existing airport.

Included in the No Action Alternative is the extension of Runway 4-22, the existing crosswind runway at MSP. The EIS on this project began in 1988, and a Final EIS was approved by the FAA on July 1, 1994. On March 28, 1995, FAA issued a Record of Decision on the extension project.

Selection of one of the alternatives will necessitate the preparation of subsequent environmental documents. For the MSP alternative, an EIS for ground access to the new west terminal would be prepared by the Minnesota Department of Transportation (Mn/DOT). For the new airport alternative, an EIS for ground access linking the airport site to Trunk Highway 55, and any other major roadway improvements on the Trunk Highway system, would be prepared by MN/DOT. In addition, there would be an EIS prepared by MEQB for the location/relocation of powerlines and pipelines for the new airport site.

II. PURPOSE AND NEED

This chapter describes the problem being addressed in this document, explains the airport development options mandated by the Minnesota Legislature in the Dual Track Planning Process, and defines the requested Federal actions and timeframe for action.

A. Purpose

During the 1980s, several Metropolitan Council studies indicated some concern that, because of physical and environmental constraints, it was possible that the Minneapolis-Saint Paul International Airport (MSP) could not be expanded to a degree necessary to meet the region's long-term air transportation needs.

The Minnesota State Legislature recognized the need to examine alternatives to meet the long-term air transportation needs of the Twin Cities metropolitan area, and established the Dual Track Airport Planning Process in the Metropolitan Airport Planning Act of 1989. The alternatives to be examined must include both the airport improvements and enhancements of capacity that may be necessary at the existing airport (MSP), the location and development of a new replacement airport, in addition to the No Action alternative and other reasonable alternatives.

As directed by the Legislature, long-range aviation goals for the major airport facility in the metropolitan area for the 30-year period were to be prepared by the Metropolitan Council and reported to the legislature. The goals must address safety, environmental impact, and service (including ground access and service levels to other states and countries and to nonmetropolitan areas of the state). The following goals were adopted by the Metropolitan Council to direct the development and evaluation of the major airport alternatives.

Goal A. To plan, develop and operate an aviation system that will help promote the orderly growth and economic development of the region.

Goal B. To provide an aviation system that is safe, efficient and economical.

Goal C. To provide aviation facilities and services that produce positive effects on the social and economic environments with minimal adverse effects on the physical environment.

Goal D. To develop, operate and maintain an aviation system that enhances the quality of life for people in the Twin Cities Area by providing them with good access to state, national and international activities and opportunities.

Goal E. To attain a regional aviation planning and programming process that is responsive to the needs and interests of residents, industries, counties, cities, and affected agencies and provides sufficient opportunities for them to participate in formulating and implementing public policies.

The 1989 Metropolitan Airport Planning Act also directed the Metropolitan Council and MAC to undertake a series of studies to identify a preferred MSP and new airport development plan.

The manner in which the sequenced environmental documentation of alternatives was to be addressed was negotiated in approved alternative environmental processes between the Metropolitan Council and the Minnesota Environmental Quality Board (MEQB) in October 1990, and between MAC and MEQB in March 1992. This process requires a series of "tiered" environmental documents, called Alternative Environmental Documents (AEDs), including EIS-level detail but focused only on the alternatives at hand. Separate environmental documents were required for the following alternatives.

- Alternative search areas, with one carried forward to the next phase.
- Alternative sites within the preferred search area, with only one site carried forward to the next phase.
- Alternative development plans on the preferred site, with only one plan carried forward to the EIS.
- Alternative development plans for MSP, with only one plan carried forward to the EIS.

B. Need

B.1 Airport Demand/Capacity

MSP serves both as the regions' primary air carrier airport for local origin and destination passengers, and as a connecting hub for Northwest Airlines. In addition to providing substantial air service and economic benefits, connecting hub operations places a high demand on airfield, terminal, and access facilities. These demands on airport facilities are forecast to intensify in the future.

B.1.1 MSP's Role as a Connecting Hub Airport

Since the deregulation of the airline industry in 1979, many airlines have developed "hub and spoke" route structures which bring flights from many cities together at one airport so that passengers can connect with flights to a wide range of destinations. By combining passengers from many cities, hub and spoke systems permit more air service than could be supported by the volume of passengers between any two cities alone. At connecting hub airports, "hubbing" airlines schedule a large number of arrivals in an arrival "bank, transfer passengers between flights, and then schedule a large number of departures in a departure bank. In order to minimize passenger delay, arrivals and departures should be scheduled as close together as possible. Consequently, a successful connecting hub airport must be able to accommodate a very high level of aircraft operations during the arrival and departure banks, and must permit rapid passenger transfer between aircraft. Inability to accommodate peak period activity during the times that passengers desire to travel will result in loss of service to competing hub airports. Also, since missed connections have a severe effect on air service in a hub and spoke system, connecting hub airports must be able to accommodate peak period operations in all weather conditions.

MSP's role as a connecting hub provides benefits to both air service and the local economy. By increasing the number of nonstop destinations, a connecting hub increases the frequency of service to individual cities, thus decreasing travel time and increasing convenience. Since good air service is a major consideration in corporate location decisions, this level of air service helps to make the Minneapolis-St. Paul region competitive as a business location. Also, investments in payroll and facilities by Northwest Airlines and associated industries further

benefit the economy of the Twin Cities. The 1995 study, *The Local and Regional Economic Impacts of Minneapolis-St. Paul International Airport,* indicated that MSP generated 24,500 jobs directly and $880 million in household income which resulted in $715 million in additional consumption in 1994 and employment of an additional 13,000 people.

B.1.2 Aviation Activity

MSP has experienced substantial growth in activity since the 1970s. Between 1972 and 1994, total airport passenger traffic grew from 5.5 million to 23.0 million, as shown in **Table 1**. Similarly, annual aircraft operations have increased from 230,793 in 1972 to 454,723 in 1994, as shown in **Table 2**. This growth is forecast to continue. Commercial passenger activity is projected to continue to dominate the airport. Total airport passenger traffic is forecast to grow to 33.4 million by the year 2020, and annual aircraft operations to increase to 520,400.

As a connecting hub airport, MSP's ability to accommodate growth in peak period activity is critical. **Table 3** summarizes the forecast of peak hour activity. Peak-hour aircraft arrivals occur from 5:00 to 5:59 p.m. and are projected to rise from 63 in 1992 to 75 in 2020, an average annual increase of 0.6 percent. Peak-hour aircraft departures occur from 9:00 to 9:59 a.m. and are projected to rise from 60 in 1992 to 72 in 2020, an average annual increase of 0.7 percent. Peak-hour operations (both arrivals and departures) occur from 6:00 to 6:59 p.m. and are estimated to increase from 119 in 1992 to 143 in 2020, an average annual increase of 0.7 percent.

B.1.3 Airport Capacity

Recent MAC and Federal Aviation Administration (FAA) studies have independently concluded that, without substantial airfield, terminal, and access improvements, forecast growth in activity at MSP will result in significantly decreased levels of service and increased user costs. Peak-hour demand will exceed the capacity of the runway/taxiway system without major improvements. For example, airfield simulation studies conducted by both MAC and the FAA demonstrated that by the end of the planning period peak hour departure queues for the south parallel runway could reach more than 25 aircraft, resulting in excessive delays, effectively blocking access to the terminal area, and producing gridlock. **Figure 3** shows the effect of peak hour congestion on delays at MSP by the year 2020. Based on airfield simulation studies conducted by MAC, peak-hour delays are expected to reach 30 minutes per aircraft during instrument conditions.

Figure 4, summarizing the results of the FAA's Capacity Enhancement Plan for Minneapolis-St. Paul International Airport, shows that the annual cost of delay would increase from approximately $26 million at current levels of demand to approximately $69 million by the end of the planning period. This projected decline in service and associated increase in user costs threatens MSP's ability to provide good air service and economic benefits to the region as a major connecting hub. This role as a connecting hub is integral to the air service MSP provides to the region.

B.2 Constraints

MSP's airfield configuration complicates development of additional airfield capacity. MSP has three runways, two parallel runways and one crosswind runway. The airport's parallel runways, Runway 11R-29L and 11L-29R, are separated by 3,385 feet (see **Figure 2**). Although

TABLE 1 - Historic Passenger Traffic
1972 to 1994

Year	Domestic Scheduled			Scheduled		Non-	
	Originations (a)	Connections	Enplanements (b)	Regional (c)	International (d)	Scheduled (e)	Total
1972	3,735,720	1,721,676	5,457,396	30,274	256	--	5,487,926
1973	4,061,080	2,077,234	6,138,314	28,804	0	--	6,167,118
1974	4,501,100	1,948,950	6,450,050	32,310	0	--	6,482,360
1975	4,418,220	2,038,908	6,457,128	42,510	0	--	6,499,638
1976	4,740,460	2,379,396	7,119,856	52,968	0	--	7,172,824
1977	5,004,340	2,532,114	7,536,454	56,042	0	260,878	7,853,374
1978	5,429,880	2,283,674	7,713,554	70,452	744	291,878	8,076,628
1979	6,080,080	3,096,462	9,176,542	98,174	0	259,576	9,534,292
1980	5,679,240	2,891,194	8,570,434	85,094	57,462	227,586	8,940,576
1981	5,246,220	3,537,384	8,783,604	60,274	115,742	171,738	9,131,358
1982	5,729,460	4,413,330	10,142,790	151,548	101,148	164,556	10,560,042
1983	6,079,860	5,324,328	11,404,188	237,566	99,276	298,972	12,040,002
1984	7,199,220	4,773,356	11,972,576	261,220	146,028	374,152	12,753,976
1985	7,759,660	6,469,074	14,228,734	313,650	167,066	624,372	15,333,822
1986	8,179,700	7,511,288	15,690,988	581,400	163,400	477,944	16,913,732
1987	8,138,640	8,203,772	16,342,412	732,748	170,046	411,400	17,656,606
1988	8,371,160	7,675,082	16,046,242	795,670	130,530	532,688	17,505,130
1989	8,915,820	7,784,020	16,699,840	831,820	157,820	686,836	18,376,316
1990	9,025,480	8,193,796	17,219,276	990,878	205,346	774,640	19,190,140
1991	8,733,260	8,633,204	17,366,464	984,150	248,250	707,180	19,306,044
1992	9,160,120	9,941,852	19,101,972	1,132,372	288,510	838,120	21,360,974
1993	9,789,700 (f)	9,914,120	19,703,820	1,298,208	341,088	701,836	22,044,952
1994	N/A	N/A	20,522,656	1,293,576	332,228	915,430	23,063,890

Note (a) Originations less estimated regional carrier originations.
(b) Enplanements equals originations plus connections.
(c) Regional carrier enplanements plus non-jet enplanements.
(d) Does not include Canadian traffic.
(e) Includes domestic and international charter activity. Does not include non-scheduled passenger enplanements by scheduled air carriers.
(f) Includes regional carrier originations.

Source: MSP LTCP Volume 6 Revised Activity Forecasts Table 2-1

TABLE 2 - Historic Aircraft Operations
1972 to 1994

Year	Domestic Scheduled (a)	Regional (b)	Scheduled International (c)	Non-Scheduled (d)	All-Cargo	General Aviation	Military	Total
1972	115,698	6,478	20	--	0	92,687	15,910	230,793
1973	126,712	6,532	16	--	0	97,191	14,180	244,631
1974	124,258	6,888	6	--	0	86,353	9,180	226,685
1975	123,826	8,472	0	--	0	89,321	7,985	229,604
1976	128,296	9,364	0	--	0	96,764	6,222	240,646
1977	132,370	9,364	0	1,510	504	103,239	6,260	253,247
1978	118,668	11,014	6	2,414	814	115,106	6,698	254,720
1979	143,246	12,306	0	1,802	948	116,738	6,080	281,120
1980	146,524	12,128	350	1,976	1,214	114,260	6,604	283,056
1981	146,338	9,904	472	2,568	1,446	97,278	5,606	263,612
1982	150,450	22,838	390	2,478	2,556	82,303	5,359	266,374
1983	170,108	33,924	388	3,752	3,192	83,548	5,100	300,012
1984	189,830	35,938	506	2,234	5,966	93,367	7,721	335,562
1985	220,190	31,460	628	3,346	5,338	106,715	14,020	381,697
1986	231,760	50,520	680	2,426	12,360	71,406	6,869	376,021
1987	213,540	56,410	644	3,002	15,434	70,050	8,676	367,756
1988	211,562	58,896	544	2,836	17,958	68,634	6,698	367,128
1989	218,168	59,338	718	3,310	17,194	71,669	4,347	374,744
1990	223,884	74,446	860	4,538	18,526	58,864	2,804	383,922
1991	225,390	75,856	1,078	5,046	20,280	55,702	2,534	385,886
1992	242,670	85,926	1,222	5,824	18,900	60,929	3,003	418,474
1993	258,374	108,237	1,285	4,855	15,198	49,216 (e)	2,825 (e)	439,990
1994	264,519	115,164	1,478	6,103	14,110	50,898 (e)	2,451 (e)	454,723

Note (a) Adjusted to exclude regional activity.
(b) Regional carrier operations plus non-jet operations.
(c) Does not include Canadian traffic.
(d) Includes domestic and international charter activity. Does not include non-scheduled operations by scheduled air carriers.
(e) Does not include local operations.

Source: MSP LTCP Volume 6 Revised Activity Forecasts Table 2-3 and HNTB analysis

TABLE 3 - Hourly Distribution of Aircraft Arrivals, Departures and Operations Average Week-Day Peak Month (August)

Mode	Year	Peak Hour	Commerical	General Aviation	Military	Total
Arrivals	1992	1700-1759	52.6	10.4	0.3	63.3
	2020	1700-1759	65.4	9.3	0.3	75.0
Departures	1992	0900-0959	53.5	6.2	0.4	60.1
	2020	0900-0959	65.8	5.6	0.4	71.8
Operations	1992	1800-1859	109.3	8.9	0.8	119.0
	2020	1800-1859	134.0	7.9	0.8	142.7

Note: Operations equal arrivals plus departures within the hour

Source: MSP LTCP Volume 6 Tables N-24 and N-29

a runway separation of 4,300 feet is normally required for simultaneous independent instrument approaches, this capacity constraint has been addressed by approval of a precision runway monitor (PRM) installation by FAA in 1995. The runway separation at MSP also affects aircraft circulation between the runways and the terminal complex. The parallel runways at MSP are located approximately 1,000 feet from the face of the terminal buildings. The need to provide runway and taxiway separation standards, and aircraft parking and push-back areas within this limited area limits aircraft circulation options in and around the terminal area. Since opportunities to by-pass congested segments of taxiway or to hold aircraft are not always available within the confines of the parallel runways, alternatives for reducing congestion would involve substantial changes in the existing airfield and terminal layouts.

Physical and environmental constraints surrounding MSP further complicate development options. Expansion of MSP is constrained by the proximity of the Minnesota River, several major highways, a state park, historic district, cemetery, and adjoining residential and commercial development, as follows.

B.2.1 Minnesota River

The Minnesota River runs along the southeastern boundary of the airport. The river and its associated steep terrain represent a substantial constraint to airport expansion to the southeast. In addition, a corridor along the Minnesota River adjacent to MSP has been designated as a National River and Recreation Area, a component of the National Park System. The Minnesota Valley National Wildlife Refuge is also located along the Minnesota River to the south of MSP.

B.2.2 Transportation Corridors

MSP is surrounded by major surface transportation corridors. These corridors include Interstate 494 along the southern boundary of the airport, Cedar Avenue (Trunk Highway 77) to the west, the Crosstown Highway (Trunk Highway 62) along the north, and Trunk Highway 5 to the east

of the airport. Substantial expansion of the airport boundaries would affect these major transportation facilities and their associated industrial and commercial development. Relocation of these facilities would entail substantial cost and disruption.

B.2.3 Adjoining Land Use

MSP is surrounded by established land use. Fort Snelling State Park and the Old Fort Snelling Historic District adjoins the airport to the northeast, and Fort Snelling National Cemetery lies immediately adjacent to the airport to the south. Residential development borders the airport to the north and west. As a result, approximately 30,720 residents of Bloomington, Eagan, Fort Snelling, Mendota Heights, Minneapolis, and Richfield were exposed to greater than DNL 65 noise levels in the year 1992. The Mall of America, the largest shopping center in the USA, is part of an extensive commercial complex located to the south of the airport across Interstate 494.

C. Federal Action and Timeframe

Requested Federal actions include the approval of an airport layout plan (ALP) for improvement of the existing MSP or development of a new airport, implementation of necessary air traffic control procedures, potential Federal funding for proposed improvements, including necessary mitigation, and approval and funding of related facilities including highways. The following FAA offices would be responsible for actions related to the proposal.

C.1 Air Traffic (AT)

Air Traffic is responsible for establishing airspace structure, air traffic control sectors, flight routes and air traffic control procedures. Specific Air Traffic actions implementing the proposed action would vary according to the alternative selected.

Development of the recommended MSP alternative could include establishment of new or revised arrival and departure routes and redesign of the Terminal (Class B) airspace surrounding MSP. The FAA is currently conducting an airspace study for MSP to identify airspace and procedural changes needed to accommodate a new runway at MSP. The results of this study will help the FAA to establish the final procedures for all runway ends at MSP.

Development of the New Airport alternative would establish Class B airspace surrounding the new airport location to accommodate operations at the new airport. Class B Airspace generally extends from the surface to an altitude of 10,000 feet above mean sea level (MSL) and may extend 30 or more miles from its center. It generally consists of two or more layers encompassing varying altitudes designed to contain all published instrument procedures for an aircraft operating at the airport or airports for which the airspace was designed. Accordingly, the configuration of Class B airspace is tailored to the operational requirements of each terminal area. Class B airspace often resembles an upside-down wedding cake centered on the principal airport or airports contained within it. Development of a new airport would also entail establishment of new and revised enroute and terminal air traffic control procedures.

C.2 Airway Facilities (AF)

Airways Facilities is responsible for the installation, operation and maintenance of aids to navigation required to support the proposed action. The exact nature of these aids will vary according to the alternative selected.

Development of the recommended MSP alternative would include establishment of new landing aids serving the new runway. It would involve precision-instrument-approach procedures for all runway ends, as well as a wide range of ground based air traffic control, communications, and navigation facilities. Such facilities could include a new air traffic control facility, radars and communications facilities, and radio aids to navigation such as very high frequency omni-directional range (VOR) facilities.

C.3 Airports (AP)

Airports is responsible for approval of airport plans, administration of airport development grants funding airport projects, and environmental approvals under NEPA. Specific Airport actions implementing the proposed action would vary according to the alternative selected. Development of the recommended MSP alternative would involve approval of a Federal EIS for the proposed project, approval of changes in the airport layout plan (ALP) for MSP, and administration of any grants-in-aid funds for airport development projects. Development of the recommended New Airport alternative would involve certification of the new airport, decertification of MSP, and approval of the new airport ALP. Currently, Airports has retained plans of both airport alternatives on file in order to protect the airspace required for either alternative.

C.4 Flight Standards (FS)

Flight Standards is responsible for ensuring the adequacy of flight procedures and operating methods in addition to setting certification criteria for air carriers, commercial operators, and airmen. Specific Flight Standards actions implementing the proposed action would vary according to the alternative selected. Development of the recommended MSP alternative would involve establishment of instrument approach and departure procedures for new runways, and new or revised instrument approach and departure procedures for existing runways. Development of the recommended New Airport alternative would involve approval of airline operations at the new airport in addition to the establishment of instrument approach and departure procedures.

C.5 Other Federal Actions

Action may be required by other Federal agencies such as the Federal Highway Administration, the US Army Corps of Engineers, and the US Environmental Protection Agency.

C.6 Timeframe for Federal Actions

It is expected that by July 1, 1996, the environmental and technical documents including a Final State EIS and Draft Federal EIS, as well as a Metropolitan Airports Commission (MAC) and Metropolitan Council recommended development option, will be complete and presented to the Minnesota State Legislature. Once the Legislature selects a development option, the proposed action will be presented in the Federal Final Environmental Impact Statement for Federal evaluation and approval. Accordingly, the timeframe for the Federal actions described above is contingent upon action of the Legislature.

III. ISSUES AND CONCERNS

The following issues and concerns have been identified thus far. They have been gleaned from public meetings and hearings on the First Phase Scoping Report, the new airport site selection and the long-term comprehensive plans for expansion of MSP and for development of a replacement airport in Dakota County, as well as additional comments since the initiation of the Dual Track Airport Planning process.

Dual Track Airport Planning Process:

1. The impact of airport development on long-term growth and the orderly economic development of the region.

2. Comparison of costs and financing plans for both MSP expansion and a replacement airport, including costs of off-site infrastructure (transportation, etc.) to support the airport.

3. Impacts on airport users (i.e., accessibility to the airport).

4. Regional air quality impact.

5. Regional energy impact.

MSP Alternative:

1. The airport capacity needs, including runways and facilities (terminal, parking, etc.), required to meet Year 2020 aviation demands, and the major assumptions and forecasts determining these needs and requirements.

2. Aircraft overflight noise impacts, including stress-related health disorders.

3. Aircraft ground noise impacts and mitigation (such as replacement of berms on Rich Acres Golf Course that would be removed by the MSP alternative).

4. Impacts on local and metropolitan ground transportation systems, both highways and transit.

5. Highway traffic noise impacts.

6. Impacts resulting from ground access improvements.

7. Air quality impacts.

8. Visual impacts, including light emissions.

9. Impact on wetlands, floodways and floodplains.

10. Water quality impacts, including impact of stormwater runoff on surface water, groundwater (aquifers) and the water supply (the Minneapolis water system).

11. Impacts of spent glycol deicing fluid.

12. Impact of solid and hazardous waste disposal.

13. Safety concerns.

14. Impacts on energy supplies and natural resources.

15. Impacts on Minnesota Valley National Wildlife Refuge.

16. Impact on rare, endangered, threatened species and special-concern species.

17. Impact on natural habitat and wildlife, including migratory birds.

18. Impacts on historic, architectural and archaeological resources, including Fort Snelling historic districts and resources.

19. Impacts on public park and recreation lands, including Fort Snelling State Park.

20. Impacts on cities and neighborhoods surrounding MSP.

21. Compatibility of airport development with land uses in adjacent communities.

22. Impact on local comprehensive plans.

23. Social impacts in adjacent communities.

24. Economic impacts in adjacent jurisdictions.

25. Relocation of residents and businesses.

26. Cost of construction, land acquisition, replacement of displaced military facilities and needed improvements to the local and regional transportation system.

New Airport Alternative:

1. The airport capacity needs, including runways and facilities (terminal, parking, etc.), required to meet Year 2020 aviation demands, and the major assumptions and forecasts determining these needs and requirements.

2. Impact on regional airspace system.

3. Aircraft noise impacts, including stress-related health disorders.

4. Visual impacts of overflights.

5. Air quality impacts.

6. Impact on surface water, groundwater (aquifers) and the water supply.

7. Impacts on wetlands, floodways and floodplains.

8. Impacts resulting from solid and hazardous waste disposal.

9. Impact on mineral resources production and development of new resources.

10. Impact on rare, threatened, endangered and special-concern species.

11. Impact on natural habitat and wildlife, including migratory birds.

12. Travel time and travel costs incurred by airport users.

13. Impacts on regional transportation systems, such as highways and transit, including new access highway.

14. Provisions for utility infrastructures (including sewage treatment plants) to serve the airport and areas of new development.

15. Consistency with Metropolitan Council policies on the MUSA line and on agriculture.

16. Compatibility with land uses and consistency with local comprehensive plans.

17. Impact on agricultural lands and the local agricultural economy

18. Cost of land acquisition and construction, as well as of needed improvements to the local and regional transportation systems.

19. Ability to finance a new airport.

20. Local and regional impacts of induced and spin-off development near the airport site.

21. Effect on property values in areas surrounding the airport site.

22. Social impacts on residents and businesses within the airport site and in adjacent communities.

23. Relocation of residents and businesses.

24. Economic impacts on jurisdictions governing the airport site area.

25. Effect on the lifestyles of Dakota County residents.

26. Uncertainty of new airport development for residents within the airport site and in adjacent areas.

27. Impacts on parks and recreation lands.

28. Impacts on historic, architectural, archaeological and cultural resources.

29. Impact on rivers.

No Action Alternative:

1. Aircraft overflight noise impacts, including stress-related health disorders.

2. Aircraft ground noise impacts.

3. Water quality impacts, including impact of stormwater runoff on surface water, groundwater (aquifers) and the water supply (the Minneapolis water system).

4. Impacts of spent glycol deicing fluid.

IV. ALTERNATIVES

A. Introduction

Many alternatives have been considered in the Dual Track scoping process thus far. The following is a summary of the type of alternatives considered to meet the air transportation needs for the region by the year 2020:

- No Action
- MSP Development
  - runways, taxiways
  - terminals
  - ground access
- New Airport
  - search areas
  - runway layouts
  - sites within selected search area
  - airport layouts within selected site
- Other Alternatives
  - remote runway concept
  - supplemental airport concept (use of MSP and other existing airport)
  - high-speed intercity rail concept (between Twin Cities and Chicago)

B. Alternatives Under Consideration

The following three alternatives will be included in the Dual Track EIS for detailed analysis — MSP Alternative, New Airport Alternative, and No Action Alternative.

B.1 MSP Alternative

Six alternatives were considered for the 2020 MSP Comprehensive Plan, and Alternative 6 was selected as the MSP alternative for further study and comparison with the New Airport Alternative. As shown in **Figure 4**, the MSP Alternative includes construction of a new 8,000-foot north/south runway and a new replacement terminal building on the west side of MSP, and a parking/drop-off facility on the east side of the airport. Ground transportation access will be provided from T.H. 77 and T.H. 62 to the new west-side entrance of the terminal.

B.1.1 MSP Alternative Process

Six airport layout alternatives were considered for the 2020 MSP Comprehensive Plan. This process included a number of reports and studies. A seven volume technical report was prepared which examines capacity, airspace, air service, and other issues. An Alternative Environmental Document (AED) was prepared which analyses the potential environmental impacts of each alternative that were different from the other alternatives.

Community participation was actively solicited. The seven cities surrounding MSP participated in an Interactive Planning Group to assess the impacts on their communities of MSP expansion. Public meetings were held at several steps in the process to hear citizen concerns and comments.

B.1.2 The MSP Alternative and the Purpose

The MSP Alternative meets several of the goals in Section II.A. With respect to Goal B, the MSP Alternative would provide a safe, efficient, and economical major airport for the metropolitan area. With respect to Goal C, the MSP Alternative would provide positive economic benefits with significantly less impact on the physical environment compared to the other MSP options. With respect to Goal D, the MSP Alternative will offer good access to state, national, and international activities and opportunities. With respect to Goal E, the process used to select the MSP Alternative offered multiple opportunities for residents, industries, counties, and affected agencies to participate.

No conclusions can be drawn yet with respect to Goal A on the orderly growth of the region and that part of Goal B related to positive social impacts. These issues will be addressed in the EIS.

B.2 New Airport Alternative

The New Airport Alternative is shown in **Figure 5**. It would be developed on a site that encompasses about 14,100 acres west of Vermillion and south of Hastings in Dakota County. The site boundaries were determined on the basis of property ownership and farming operations.

The New Airport Alternative combines the best operational features of New Airport Comprehensive Plan Alternatives 1, 2 and 3, The New Airport Alternative includes four parallel runways and two crosswind runways. The configuration maintains a full stagger among the four parallel runways, as in Alternatives 1 and 2 (**Figures 18 and 19**). The stagger ensures that taxiing aircraft would avoid crossing active runways, reducing delays and controller workload. The two longest runways, 15R-33L and 16R-34L, are 200 feet wide to meet FAA Group VI Standards for aircraft larger than a B747.

The southern crosswind runway is positioned between its location in Alternative 1 (**Figure 18**) and its location in Alternative 2 (**Figure 19**), taking advantage of reduced taxi distances, while still providing separation from the main parallel runways to permit simultaneous converging approaches during most of the year. The northern crosswind runway is in the location shown for Alternatives 1 and 2.

In the selected plan, the terminal platform is widened to permit one deicing facility on either side of the terminal. These locations provide superior aircraft circulation and taxi times compared to their previous locations beyond the northwest and southeast corners of the terminal area in Alternatives 1, 2 and 3.

The cargo area faces the western inboard runway (Runway 15L-33R), as in Alternative 3 (**Figure 20**). In this location, cargo building heights would be less restricted, and aircraft circulation would be improved.

Maintenance is kept on the western side of the airport, as in Alternatives 1, 2 and 3, to permit fewer restrictions on building heights.

Military facilities are positioned north of Runway 7L-25R above the approach end of 7L, as in Alternatives 1 and 2.

B.2.1 New Airport Alternatives Process

The New Airport Alternative was selected through the following process:

a. Search Area Selection

The Metropolitan Council identified three search areas and finally selected the Dakota Search Area (shown in **Figure 5**) as the preferred search area. Six major criteria and more than three dozen specific measures for these criteria were used in this analysis, including priority rankings for the following criteria:

- Metropolitan Access
- Environmental Impacts
- General Search Area Characteristics (Social and Economic Impacts)
- General Land Requirements
- Airspace Considerations
- Policy Considerations

b. Conceptual Airport Layout Selection

The MAC analyzed several conceptual airport layouts and selected the one (**Figure 6**, for use in search area selection, site selection and development of the New Airport Comprehensive Plan Alternatives.

c. Site Selection

The MAC identified seven feasible sites within the Dakota Search area and selected Site 3 (shown in **Figure 5**). The analysis and evaluation criteria are contained in the New Airport Site Selection AED and included operational and environmental factors.

d. New Airport Alternative Selection

The MAC evaluated three layouts of terminals, runways, taxiways, and other airport facilities. This led to the creation of a forth alternative which drew from took the best elements of the three layouts and modified other elements to address environmental and operational problems. The fourth alternative was selected as the New Airport Alternative.

e. Community Participation

Community participation was actively solicited. Counties and cities, and townships were involved in search area, site selection, and airport layout selection. Both a New Airport Technical Committee and the Dual Track Task Force met regularly to keep elected officials and agency staff informed of progress. Public meetings were held at each step in the process to hear citizen concerns and comments.

B.2.3 The New Airport Alternative And The Purpose

The New Airport Alternative meets several of the key goals outlined by the Metropolitan Council. With respect to Goal B, the New Airport Alternative would provide a safe, efficient, and economical connecting hub airport for the metropolitan area. With respect to Goal C, the New

Airport Alternative would provide positive economic benefits with significantly less impact on the physical environment compared to the other New Airport sites and search areas. With respect to Goal D, the New Airport Alternative will offer good access to state, national, and international activities and opportunities. With respect to Goal E, the process used to select the New Airport Alternative offered multiple opportunities for residents, industries, counties, cities, and affected agencies to participate.

No conclusions can be drawn yet with respect Goal A on the orderly growth of the region and that part of Goal B related to positive social impacts. Analysis of these issues will be performed as part of the Dual Track EIS.

B.3 No Action Alternative

The No Action Alternative consists of the existing airport facilities and access at MSP (**Figure 7**), and those committed projects with funding approved by the Commission in its current Capital Improvement Program through the end of 1997. The committed major projects are:

- New Federal Inspection Services and supporting improvements on the Gold Concourse
- Expanded elevated roadway
- New Sun Country hangar
- New Ground Transportation Center
- Auto Rental/Parking Expansion
- Runway 4-22 extension (shown in **Figure 7**) and supporting taxiway improvements

C. Other Alternatives Being Considered for Inclusion in EIS

Two other alternatives — the Remote Runway Concept and the Supplemental Airport Concept — are currently being studied as potentially feasible for meeting the aviation needs of the metropolitan area in the year 2020. The studies will be completed in the summer of 1995. If the alternatives are determined feasible and meet the purpose and need for the project, they will be included in the EIS for detailed evaluation.

C.1 Remote Runway Concept

In concept, this alternative would retain the ticketing, baggage, and support facilities at MSP, construct new gates and runways at a remote location (15-25 miles from MSP), and construct a high-speed transit link between the existing terminal and the new gates. The purpose of this alternative is to retain the ground accessibility and existing development related to MSP, and move the airfield activity to a remote location.

C.2 Supplemental Airport Concept

This alternative would retain all of the existing and committed facilities at MSP, use the existing runways/facilities at another existing airport in the state for some of the MSP operations, and construct a high-speed transit link between MSP and the "supplemental airport." The purpose of this alternative is to retain good ground accessibility and development related to MSP and relocate some MSP operations to the supplemental airport (e.g., Rochester, St. Cloud, St. Paul Downtown), so that additional runways would not be required at MSP.

D. Alternatives Eliminated

D.1 MSP Alternatives Eliminated

D.1.1 Alternative 1

Alternative 1 is show in **Figure 8** and includes: (1) construction of a second 7,700-foot north-parallel runway north of, and parallel to, the existing north-parallel runway (IIL-29R); (2) an additional passenger terminal east of the existing terminal; and (3) satellite gates and a passenger parking/drop-off facility on the west side of the airport. The new runway would function principally as an arrival (landing) runway.

Alternative 1 was subjected to detailed environmental analysis in the *Final AED for the MSP Long-Term Comprehensive Plan* (LTCP) and detailed operational analysis in the *MSP LTCP Volume 7 Technical Report*. Alternative 1 is being rejected for further consideration in the Dual Track EIS because it does not meet the Metropolitan Council's year 2020 goals.

a. Goal B - Efficient & Economical Operation

Alternative 1 does not meet the part of Goal B relating to efficient and economical operation. Alternative 1 leads to significant delays during peak operations and during inclement weather.

b. Goal C - Minimal Adverse Effects On Environment

Alternative 1 does not meet the part of Goal C which calls for minimal adverse effects on the physical environment.

First, Alternative 1 would necessitate demolition of contributing elements of the Fort Snelling National Historic Landmark and displacement of a nine-hole golf course in Fort Snelling State Park. It appears that neither of these adverse impacts can be mitigated.

Second, Alternative 1 also has a severe noise impact, subjecting 28,740 residents to noise levels greater than DNL 60 (2,250 more than the selected MSP Alternative 6).

D.1.2 Alternative 2

Alternative 2 is shown in **Figure 9** and includes: (1) construction of a second 7,700-foot north-parallel runway as described in Alternative 1; (2) a new, replacement passenger terminal building on the west side of the airport; and (3) a passenger parking/drop-off facility on the east side of the airport. As in Alternative 1, the new runway would function principally as an arrival (landing) runway. Placing the passenger terminal on the west side of the airport creates a "new front door" for MSP.

Alternative 2 was subjected to the same environmental and operational analysis as Alternative 1 and is being rejected for analysis in the Dual Track EIS for the same reasons.

D.1.3 Alternative 3

Alternative 3 is shown in **Figure 10** and includes: (1) construction of a second south-parallel runway south of, and parallel to, the existing south-parallel runway (11R-29L); (2) an additional passenger terminal east of the existing terminal; and (3) satellite gates and a passenger parking/drop-off facility on the west side of the airport. The new runway would function principally as a landing runway. The existing south parallel would function principally as a departure (take-off) runway.

Alternative 3 was subjected to detailed environmental analysis in the *Final AED* and detailed operational analysis in the *Volume 7 Technical Report*. Alternative 3 is being rejected for further consideration in the Dual Track EIS because it does not meet the Metropolitan Council's year 2020 goals.

a. Goal B - Safety

Alternative 3 does not meet the part of Goal B which calls for safe operations. First, safety concerns result from the westward stagger of the new south parallel runway by approximately 5,000 feet from the landing threshold for the existing Runway 29L and the assumption that the airport would operate with departures using the existing parallel runway (closest to the terminal area) and arrivals using the new parallel runway. The stagger of the runway accommodates the approach surface clearance of the elevated terrain in the Fort Snelling National Cemetery. The cemetery has been declared eligible for listing on the National Register of Historic Places and is the third most active cemetery in the National Cemetery System. The cemetery's 436.3 acres hold over 96,000 graves.

The use of the new runway for landings when the airport is operating to the northwest places landing aircraft close to the area of greatest wake turbulence from departures on Runway 29L. In addition, wake turbulence produced by landing aircraft could drift to the takeoff runway (29L) where aircraft would be breaking ground on departure. Interaction with wake turbulence by aircraft in close proximity to the ground is a significant safety issue.

Second, the airlines expressed concern during the preparation of the LTCP for the safety of aircraft as they pass over the higher ground of the national cemetery when landing on the new runway to the northwest or when departing over it to the southeast.

b. Goal B - Efficient And Economical Operation

Alternative 3 does not meet the part of Goal B which calls for efficient and economical operation. First, the principal operational concern involves the penetration of the Terminal Instrument Procedures (TERPS) approach surface to the south parallel runway from aircraft on the taxiway between the existing Runway 11R-29L and the new runway. This would mean that while aircraft are landing on the new south parallel runway, Taxiway B (planned as a full length parallel taxiway to Runway 11R-29L on the south side of the runway) would not be usable in the area of the stagger between the south parallel runway and Runway 11R-29L. This would be a significant operational problem.

Second, if the wake turbulence safety issues noted above were addressed operationally, another capacity constraint would be imposed. Dependencies in the form of separations between landing and departing aircraft would need to be imposed on the two south parallel runways, reducing their peak hour capacities.

Third, this staggered runway layout would require that the FAA runway safety area and object-free area be designed to cross Trunk Highway 77 (TH 77), also known as Cedar Avenue. This would mean "tunneling" of TH 77 beneath a bridge-like structure that would support the required safety areas. This would bring airport facilities across Cedar Avenue into Richfield and would significantly complicate access to the new west terminal area.

c. Goal C - Minimal Adverse Effects On Environment

Third, Alternative 3 does not meet the part of Goal C which calls for minimal adverse effects on the physical environment. A south parallel runway would also generate significant additional noise impacts for south Minneapolis and Richfield. The population within the Year 2000 DNL 60 noise contour for Alternatives 3 and 4, generated during the preparation of the LTCP, would be 49,250 persons. This would be over 10,000 more persons than Alternative 6. Noise impacts would be even greater, if use of the new south runway were changed during northwest-flow conditions to accommodate most of the take-offs, in order to alleviate some operational and capacity concerns. This change would move aircraft departing to the northwest approximately 5,000 feet closer to Minneapolis and Richfield when they begin their "takeoff roll."

D.1.4 Alternative 4

Alternative 4 is shown in **Figure 11** and would include: (1) construction of a second south-parallel runway as described in Alternative 3; (2) a new, replacement west passenger terminal building; and (3) a passenger parking/drop-off facility on the east side of the airport. As in Alternative 3, the new runway would function principally as a landing runway, and the existing south parallel would function principally as a departure runway. Placing the passenger terminal on the west side of the airport creates a "new front door" for MSP.

Alternative 4 was subjected to the same environmental and operational analysis as Alternative 3 and is being rejected for analysis in the Dual Track EIS for the same reasons.

D.1.5 Alternative 5

Alternative 5 is shown in **Figure 12** and includes: (1) construction of an 8,000-foot north/south runway on the west side of MSP; (2) an additional passenger terminal east of the existing terminal; and (3) satellite gates and a passenger parking/drop-off facility on the west side of the airport. The new runway would be used almost exclusively to and from the south for both take-offs and landings.

Alternative 5 was subjected to environmental analysis in the *Final AED* and operational analysis in the *Volume 7 Technical Report*. Alternative 5 is being rejected for further consideration in the Dual Track EIS because it does not meet Goal B of the Metropolitan Council's year 2020 goals. First, construction of an additional terminal building adjacent to the existing terminal would provide an inferior level of service to airport passengers, and would have significant adverse impacts on airport users during construction.

Second, the new east terminal and gates would not have as much expansion potential as a new west terminal.

Third, the new east terminal prevents construction of a cross-field taxiway on the east side of MSP and limits other taxiway development. This places constraints on airfield capacity.

D.2 New Airport Alternatives Eliminated

D.2.1 Search Areas Eliminated

Three search areas were identified and evaluated for the development of a new airport - the Anoka-Isanti-Chisago, Dakota, and Dakota-Scott. The Anoka-Isanti-Chisago and Dakota-Scott Search Areas **(Figure 13)** were eliminated earlier and will not be considered in the Dual Track EIS because they do not meet the Metropolitan Council's year 2020 goals.

a. Anoka-Isanti-Scott Search Area

This search area did not meet the part of Goal B which calls for efficiency and economy because of excessive travel time and distance for metropolitan residents and employees and additional flight time from many other airports. It did not meet the part of Goal C which calls for minimal environmental impacts because of (1) adverse impacts on wetlands, floodplains and organic soils, and (2) adverse impacts on rare, threatened or endangered species.

b. Dakota-Scott Search Area

This search area did not meet the part of Goal B which calls for efficiency and economy because of excessive travel time and distance for metropolitan residents and employees and additional flight time from many other airports. It did not meet the part of Goal C which calls for minimal environmental impacts because of (1) adverse impacts on wetlands and floodplains; and (2) potential adverse impacts on rare, threatened or endangered species.

D.2.2 Runway Layout Concepts Eliminated

Early in the New Airport Comprehensive Plan scoping process, several alternative runway layout concepts were evaluated as part of the *MAC New Airport Conceptual Design Study*. The final alternative concepts evaluated in the study were called Concept P (for parallel-only runways), Concept L (for "L" shaped runway configuration) and Concept T (for runway configuration in the shape of two "T's"). Concept T, shown in **Figure 6**, was selected as the runway layout for the new airport. Concepts P and L, shown in **Figure 14**, were eliminated earlier and will not be considered in the Dual Track EIS because they do not meet the Metropolitan Council's year 2020 goals.

a. Concept P

Concept P does not meet the part of Goal B which calls for efficient and economical airport operation. First, at least one runway would have to accommodate a mixture of arrivals and departures in all operating configurations. Thus, a free-flowing configuration in which arriving and departing aircraft would be segregated would not be achievable in all modes, leading to delays.

Second, because Concept P has no crosswind runways, the airport would have to close for an equivalent of 3 to 4 days a year due to a combination of strong crosswinds and snow/icing conditions.

Third, flight path distances would be higher (34 miles per operation vs. 31 miles per operation for the T Concept) due to the lack of crosswind/converging runways.

Approximately 50 percent of the air traffic would have to traverse a large portion of terminal airspace to reach the opposite airspace gate or runway end.

b. Concept L

Concept L does not meet the part of Goal B which calls for efficient and economical airport operation. First, Concept L has significant operational problems during a substantial portion of wind conditions (approximately 40 percent of the time). Aircraft would have long taxi distances and would have to cross under the flight paths of arriving aircraft. Average taxi distances would be approximately 9,900 feet per operation.

Second, during periods of poor visibility, the airport would have to revert to operations in a single direction which would reduce capacity. Although this would occur only 3 to 4 percent of the year, it results in an inefficient configuration.

Third, Concept L would also have relatively high average flight path distances (34 miles per operation vs. 31 miles per operation for Concept T).

D.2.3 New Airport Sites Eliminated

Seven potential new airport sites were considered within the Dakota County Search Area. Four sites - Sites 1, 4, 5, & 7 - were eliminated in the *New Airport Site Selection Scoping Document and Scoping Decision Document*. See **Figure 15**. Two sites - Sites 2 & 6 - were eliminated after evaluation in the *New Airport Site Selection Final Alternative Environmental Document*, March 1994. See **Figure 16**. These sites will not be considered in the Dual Track EIS because they do not meet the Metropolitan Council's year 2020 goals.

a. Site 1

Site 1 does not meet the part of Goal C which calls for positive impacts on the social and economic environments because of its severe impacts on the City of Vermillion. In addition, Site 1 does not meet the part of Goal C which calls for minimal adverse impacts on the environment because of its impact on floodways.

b. Site 2

Site 2 does not meet the part of Goal B which calls for efficient aviation system operations because of operational constraints. Site 2 does not meet the part of Goal C which calls for positive impacts on the social and economic environments because it constrains future development of Hastings through orderly annexation and displaces the City of Coates. In addition, Site 2 does not meet the part of Goal C which calls for minimal adverse impacts on the environment because of it subjects 320 remaining residents to DNL 65 + noise levels (compared to 220 for Site 3) and fills 2.7 acres of wetland (compared to 0 acres for Site 3).

c. Site 4

Site 4 does not meet that part of Goal B which calls for safe operations because of the potential for bird-strikes. Site 4 does not meet the part of Goal C which calls for positive impacts on the social and economic environments because its displaces the cities of Coates and Vermillion. In addition, Site 4 does not meet the part of Goal C which calls for minimal

adverse impacts on the environment because of its impact on floodways, public park/recreational land, and state-listed rare species.

d. Site 5

Site 5 does not meet that part of Goal B which calls for safe operations because of the potential for bird-strikes. Site 5 does not meet the part of Goal C which calls for positive impacts on the social and economic environments because its displaces the City of Coates and has severe impacts on the City of Vermillion. In addition, Site 5 does not meet the part of Goal C which calls for minimal adverse impacts on the environment because of its noise and wetland impacts.

e. Site 6

Site 6 does not meet the part of Goal A which calls for orderly growth of the region because of its close proximity to the Koch Refinery. This proximity limits the ability of the airport to expand because of the refinery, and the refinery to expand because of the airport. Site 6 does not meet the part of Goal B which calls for efficient aviation system operations because (1) the smoke and induced fog and cloud formations by the refinery would result in more instrument landings and reduced operations and (2) Site 6 has airspace conflicts which would require the closure of South St. Paul Airport, adversely affect instrument landings at St. Paul Downtown Airport, and adversely affect operations at Airlake Airport. Site 6 does not meet the part of Goal C which calls for positive impacts on the social and economic environments because it displaces the City of Coates. In addition, Site 6 does not meet the part of Goal C which calls for minimal adverse impacts on the environment because of its wetland impacts.

f. Site 7

Site 7 does not meet the part of Goal C which calls for positive impacts on the social and economic environments because it has severe impacts on the City of Vermillion. In addition, Site 7 does not meet the part of Goal C which calls for minimal adverse impacts on the environment because of its noise and wetland impacts.

D.2.4 New Airport Plans Eliminated

Four alternative comprehensive plans for the new airport were considered using the selected runway layout (Concept T). Alternative 4 (**Figure 17**) was eliminated in the *Scoping Decision Document for the New Airport Comprehensive Plan Final AED and Technical Report*, MAC, June 1994. Alternatives 1, 2 and 3 were evaluated in detail in the *New Airport Comprehensive Plan Final AED and Technical Report*, MAC, 1995. The selected New Airport is comprised of the best features of Alternates 1, 2, & 3. Alternative 4 will not be considered in the Dual Track EIS because it does not meet the Metropolitan Council's year 2020 goals. Alternatives 1, 2, & 3 will not be considered because their best features have been combined in the New Airport Alternative.

a. Alternative 4

Alternative 4 does not meet the part of Goal B which calls for efficient and economical operations. Alternative 4 attempted to minimize the land area for the new airport. (Alternative 4 consisted of a minimum of 7,350 acres compared to a minimum of 9,800 acres for Alternative 1.) Runway staggers were eliminated and runway separations narrowed

which resulted in several inefficiencies. First, aircraft landing or departing on the outboard runways (about one-third of all aircraft operations) would not have a clear route to/from the terminal as afforded by the other three alternatives. Instead, they would be required to cross active runways, resulting in numerous delays. Second, the elimination of runway stagger would also increase average taxi distances, because many aircraft would have to back-track on their route to/from the terminal. Finally, the location of the crosswind runways would require higher cloud ceiling and visibility minima to operate the desired three-in/three-out flow-through system, reducing the percentage of time this most efficient operation mode could be used. More aircraft would have to fly past the airport to sequence themselves on the final approach course to one of the main parallels instead of flying directly to a crosswind runway -- resulting in greater airspace distances. In addition, Alternative 4 does not meet the part of Goal C which calls for minimal adverse impacts on the environment because greater flight distances would increase air pollution from jet exhaust.

b. Alternative 1, 2, & 3

As discussed previously in this section, the selected New Airport Alternative is comprised of the best features of Alternatives 1, 2 and 3. Comparisons of the alternatives, shown in **Figures 18, 19** and **20**, show the close similarity between them. Differences mainly involve operational features (e.g., taxiways and airport-facility locations), which do not affect the environment. The environmental impacts of the alternative plans are very similar because the size and runway orientation of Site 3 had been "optimized" during site selection -- leaving little room for developing alternative plans.

The New Airport Alternative better meets Goal B which calls for efficient and economical operations. Also the provisions for glycol control better meet Goal C which calls for minimal adverse impacts on the physical environment.

D.2.5 Other Alternatives Eliminated

a. High-Speed Intercity Rail

Mn/DOT performed a study in 1991 on the implications of high-speed rail alternatives on air traffic in the Minneapolis-St. Paul, Madison, Milwaukee and Chicago corridor. Rail technology with operating speeds of 125, 185 and 300 mph were considered. The purpose of this alternative was to retain existing MSP and divert sufficient passengers/operations from air service to rail service, such that new runway and terminal facilities would not be needed by 2020. Results of the study were that the rail services would not divert enough passengers and operations by the year 2020 to preclude a new runway and terminal at MSP. In short, high-speed inner city rail did not meet the year 2020 capacity needs which underlie Goals A, B, C, and D.

E. Preferred Alternative

The Minnesota Legislature will select the preferred alternative after completion of the State Final Dual Track EIS and the Report to the Legislature by the MAC and the Metropolitan Council.

V. POTENTIAL IMPACTS

This section defines for each environmental issue or impact category the following:

- what aspects are to be considered in the EIS
- the affected environment or area of potential effect (APE) for each alternative, and what is currently known about the issue or impact category in the APE
- environmental consequences currently known

A. Air Quality

Pollutants to be Considered

Criteria pollutants to be considered in the EIS are those for which ambient air quality standards have been established and which have been identified by the FAA as potentially critical pollutants[1].

Carbon Monoxide (CO) is a common pollutant generated primarily from the incomplete combustion of fuels such as gasoline, coal, and wood). It is a colorless, odorless and tasteless gas that is slightly lighter than air.

Hydrocarbons (HC) otherwise known as Volatile Organic Compounds (VOCs) are compounds whose molecules include atoms of hydrogen and carbon. The gaseous state of these compounds that exist in the atmosphere also originate from the incomplete combustion of fuels and from volatile materials such as solvents and gasoline.

Nitrogen oxides (NOx) consist of nitric oxide (NO) and nitrogen dioxide (NO2). NO is formed during high temperature combustion processes while NO2 forms when NO reacts with atmospheric oxygen (O2).

Sulfur oxides (SOx) consist primarily of sulfur dioxide (SO2) which is a relatively stable, nonflammable, nonexplosive and colorless gas. Sulfur dioxide is generated during the combustion of any sulfur-bearing fuel and by many industrial processes that use sulfur-bearing raw materials.

Total Suspended Particulates (TSP) are any materials that exist as a solid or liquid in the atmosphere. Particulates discharged into the atmosphere may be in the form of fly ash, soot, dust, fog, fumes and the like. The most critical particulates from a health perspective are those which are less than 10 microns in size (PM-10).

Major Sources of Pollutants to Be Evaluated in the EIS

On-airport sources

On-airport sources include aircraft and support equipment, motor vehicles, and stationary sources such as power plants, incinerators, and fuel storage facilities. Those aircraft operations which are the major contributors to ground level concentrations of pollutants are taxiing and queuing for takeoff although the takeoff roll also contributes a small amount.

---

[1]References are listed in Section VIII.

Emissions associated with aircraft support equipment are also taken into account. Emissions from motor vehicles occur on roadways as well as in parking lots and ramps on the airport.

The location of stationary sources including power plants, boilers, incinerators, and fuel storage facilities can also contribute to the overall concentrations at on- and off-airport receptor sites.

Off-airport sources

Off-airport sources are defined here as motor vehicle traffic on regional roadways which may carry traffic destined to or from the EIS alternatives. The regional roadway network used for this analysis has been developed by the Twin Cities Metropolitan Council and includes primary roadways on the network. Since major at-grade intersections are the primary sources of CO emissions, these will be addressed in the EIS.

A.1 MSP Alternative

A.1.1 Affected Environment

The affected environment or "area of potential effect" (APE) consists of the area within the airport boundary, and receptor sites adjacent to the airport and at-grade intersections of affected roadways.

On-airport sites affected by on-airport emissions

Ground level activities on the airport can be potentially impacted by on-airport emissions and are therefore part of the affected environment. On-airport receptor sites include aviation-related ground employees and other employees on the airport, motor vehicle operators and passengers.

The roadway system at the present (east) terminal area entrance has been previously analyzed in detail by the Metropolitan Airports Commission because of air quality violations. A detailed response plan has been incorporated in the Indirect Source Permit issued to the Metropolitan Airports Commission. The purpose of this response plan is to ensure that no violations of air quality standards for CO will occur under any operating conditions.

Off-airport receptors affected by on-airport emissions

Receptor sites located adjacent to the airport can be impacted by on-airport emissions. A preliminary analysis of sites near MSP indicated concentrations below applicable ambient air quality standards.

Off-airport receptors affected by off-airport emissions

In addition to the area potentially impacted by on-airport emissions, those areas located adjacent to major links of the regional highway network that carry airport-related traffic can also be impacted by motor vehicle emissions. Preliminary analysis showed that concentrations adjacent to at-grade intersections near MSP were below the 9 ppm 8-hour standard for Carbon Monoxide. Most traffic accessing the airport is and will be on controlled-access highways which have less impact on adjacent receptor sites than at-grade intersections.

Existing Pollutant Concentrations

Carbon Monoxide

Within the MSP study area, data are available from a CO monitoring site that was established as part of the I-35W Environmental Impact Statement process. This monitoring site was located on 66th St. east of I-35W approximately two miles west of the airport. The observed background concentrations, and those projected to the year 2010 by SRF and to 2020 by David Braslau Associates, Inc. are shown in **Table 4.**

TABLE 4 - Background CO Concentrations within the Study Area (ppm)

	1989 (observed)		2010 (estimated)		2020 (estimated)	
Location	1-hour	8-hour	1-hour	8-hour	1-hour	8-hour
66th St. East of I-35W	4.9	2.3	3.3	1.5	4.0	1.8

Other Pollutants

Air quality monitoring of hydrocarbons and particulates was performed by the Minnesota Pollution Control Agency at the Wenonah Elementary School in South Minneapolis between October and December 1993[2]. No monitoring of CO was performed. While there is no ambient standard for hydrocarbons, Minnesota relies indirectly upon ozone concentrations which are within acceptable limits. The highest 24-hour concentration of particulates was 29.8 micrograms/m^3 which is well below the National Ambient air quality standards (NAAQS) 24-hour limit of 150 micrograms/m^3.

A.1.2 Environmental Consequences

The impacts will be determined in the EIS.

A.2 New Airport Alternative

A.2.1 Affected Environment

The APE consists of the area within the airport boundary, and receptor sites adjacent to the airport and at-grade intersections of affected roadways.

On-airport sites affected by on-airport emissions

On-airport sites on the new airport similar to those considered for MSP can also be potentially impacted by on-airport emissions and are therefore part of the affected environment. As with MSP, on-airport receptor sites include aviation-related ground employees and other employees on the airport, motor vehicle operators and passengers.

Off-airport receptors affected by on-airport emissions

Receptor sites located adjacent to the new airport can be impacted by on-airport emissions. A preliminary analysis of sites near the new airport indicated concentrations below applicable ambient air quality standards.

Off-airport receptors affected by off-airport emissions

Areas located adjacent to major links of the regional highway network that carry airport-related traffic can also be impacted by motor vehicle emissions. Preliminary analysis of several intersections in the new airport search area showed concentrations to be below the 9 ppm 8-hour standard for Carbon Monoxide. Except for vehicles coming from population or employment centers in Dakota County, most traffic accessing the airport will be on controlled-access highways which will have less impact on adjacent receptor sites than at-grade intersections.

Existing Pollutant Concentrations

Background Carbon Monoxide monitoring was performed in December 1992 and January 1993 at two sites in the new airport search area[3]. At those sites, the maximum observed 1-hour CO concentration was 1.3 ppm and the maximum observed 8-hour CO concentration was 1.0 ppm. These compare with the federal 1-hour (35 ppm and MPCA (1-hour) and 9 ppm (8-hour). Therefore, ambient concentrations of CO are well below federal and state standards.

A.2.2 Environmental Consequences

The impacts will be determined in the EIS.

A.3 No Action Alternative

A.3.1 Affected Environment

The environment affected by the No Action Alternative is identical to that which would be affected by the MSP alternative.

A.3.2 Environmental Consequences

The environmental consequences of the No Action Alternative would be similar in nature but not magnitude as those anticipated from the MSP alternative. The impacts will be determined in the EIS.

B. Archaeological Resources

Archaeological resources affected by federally funded/licensed undertakings come under the protection of the National Historic Preservation Act of 1966 which, in Section 106, requires federal agencies to consider the affects of such undertakings on properties listed, or eligible for listing, in the National Register of Historic Places. Regulations related to this process are described in 36 CFR Part 800: Protection of Historic Properties.

B.1 MSP Alternative

B.1.1 Affected Environment

The Area of Potential Effect (APE) consists of (a) land within the expanded MSP airport boundaries as well as (b) any land that would be affected by the construction/reconstruction of access/exit roads and signal systems needed for the redesigned airport (**Figure 21**). In addition, the APE includes property affected by improvements needed within the regional transportation system due to the changes made at the airport.

Archaeological investigations conducted within undisturbed or minimally disturbed portions of the existing airport have not identified any sites that are eligible for listing in the National Register of Historic Places. It has not, as yet, been possible to conduct such investigations beneath/immediately adjacent to built-up portions of the MSP airport property -- an area which, as indicated by historic records, was intensively used, during the 19th/early 20th centuries, as part of the Fort Snelling military reservation, and which, prior to that, was inhabited by a succession of Native American populations. A comprehensive research design, presently under development, will delineate those portions of the property which still may contain historic evidence beneath existing built-up/paved areas and which, therefore, would need close monitoring and possible intensive survey/data recovery during the implementation of the proposed airport expansion. The research design will also provide for review of areas outside the airport that would be impacted but cannot be archaeologically investigated due to present land use.

B.1.2 Environmental Consequences

The impacts will be determined in the EIS.

B.2 New Airport Alternative

B.2.1 Affected Environment

The known Area of Potential Effect includes all land that would be acquired for the new airport (**Figure 22**) and undeveloped land at MSP that could be developed with the reuse of airport property. It will also encompass land affected by the construction of airport access roadways and by improvements to the regional transportation system necessitated by the relocation of the airport. Intensive archaeological survey within the proposed acquisition boundaries has eliminated all but four archaeological properties from consideration for the National Register of Historic Places. The remaining four -- two Native American habitation sites and two Euro-American homesteads -- will be evaluated during 1995.

As the construction of a new MSP airport would result in the abandonment of the existing facility, and as future development at the latter may not fall under Section 106 review procedures, the APE for the new airport must be considered to include also the existing MSP airport property. Archaeological investigations conducted within undisturbed or minimally disturbed portions of this property have not identified any sites that are eligible for inclusion within the National Register of Historic Places. Refer to B.1.1 for a discussion of the built-up/paved sections of the airport that have not, as yet, been inventoried for archaeological resources.

B.2.2 Environmental Consequences

The impacts will be determined in the EIS.

B.3 No Action Alternative

B.3.1 Affected Environment

The Area of Potential Effect (APE) consists of land located within the existing MSP airport boundary as well as an adjacent portion of Fort Snelling State Park used for the construction of a runway lighting system. Archaeological investigations conducted within undisturbed or minimally disturbed portions of these properties have not identified any sites that are eligible for inclusion within the National Register of Historic Places. Refer to B.1.1 for a discussion of the built-up/paved sections of the airport that have not, as yet, been inventoried for archaeological resources.

B.3.2 Environmental Consequences

The impacts will be determined in the EIS.

C. Biotic Communities

Biotic communities to be considered are fish, vegetation and wildlife. State and federal standards and guidelines for biotic communities are set forth in regulations for the protection of wetlands and threatened and endangered species. These requirements are discussed in AA. and H. of this section.

C.1 MSP Alternative

C.1.1 Affected Environment

The APE for biotic communities at MSP has been defined as the existing airport property. It should be noted that the APEs for threatened/endangered species and bird-aircraft hazards extend beyond existing airport property. Uplands within MSP are almost entirely comprised of impervious surfaces and mowed turf. The only exception is a small area of oak forest adjacent to fuel storage facilities at the east end of the airport property; however, this area is unaffected by the preferred alternative and has not been analyzed in detail. MSP also encompasses about 28.7 acres of floodplain forest which is part of the Minnesota River floodplain. This area also would be unaffected by future expansion of MSP.

Wetland systems comprise the only significant wildlife habitat within MSP. The characteristics of wetlands within MSP are discussed in the Section V. AA. of this Scoping Report. MSP encompasses approximately 200.1 acres of wetland, 71.1 percent of which lies within Mother Lake. Mother Lake is a 142.3 acre semi-permanent palustrine unconsolidated bottom/emergent wetland (PUB/EMF; Circular 39 Type 4 deep marsh) with a forested fringe composed along its northern margin. Mother Lake is most significant element of wildlife habitat within MSP and provides excellent habitat for geese, waterfowl, wading birds (e.g. herons and egrets), furbearers, and raptors.

Mother Lake has been designated by the Minnesota DNR Heritage and Nongame Research Program as a colonial waterbird nesting site due to its long-term use by Forster's Terns, a state special concern species. Mother Lake has had as high as 70 tern nests but last received concentrated use in 1986 when 43 breeding pairs were observed. The Mother Lake tern colony was inactive from 1987 through 1993 but became active again in 1994 when one breeding pair returned. Surveys for breeding Forster's terns will again be conducted during the 1995 breeding season and will be reported in the EIS (see Section V. H.1 of this Scoping Document).

While MSP encompasses 11 other wetlands, their habitat value has been substantially degraded by human activities. Some basins are used for stormwater ponding, some are directly proximate to active runways and some have been disturbed by past grading or excavation activities. Duck Lake is a 13.6 acre semi-permanent palustrine unconsolidated bottom wetland (PUBF; Circular 39 Type 5 open water) and has little wildlife value because it lacks of emergent vegetation and is hypereutrophic due to its historic use for stormwater treatment. The Ball Field wetland is a 12.6 acre seasonally flooded palustrine emergent wetland (PEMB/C; Circular 39 Type 2/3 wet meadow/shallow marsh) which lies immediately south of the City of Richfield softball fields at the west edge of MSP. This basin is a remnant of a larger wetland and has limited wildlife habitat value due to its historic use for stormwater treatment and its being surrounded by mowed airport infield areas. A 0.8 acre remnant of seasonally flooded palustrine emergent wetland (PEMC; Circular 39 Type 3 shallow marsh) lies immediately adjacent to a taxiway for Runway 4-22 and a maintenance access road. This basin receives little wildlife use due to its small size, proximity to aircraft and vehicular traffic, and the fact that it is surrounded by mowed turf. Rich Acres Golf Course encompasses eight small excavated permanent open water wetlands. Two of these basins appear to be entirely man-made while the other six appear to be badly degraded remnants of a larger wetland that was largely filled during golf course construction. These small ponds provide negligible wildlife habitat value.

MSP does not encompass any fisheries habitat due to; (1) the absence of lakes and streams and (2) the isolated nature of on-site wetlands making them unsuitable as spawning habitat for fish. None of the on-site wetlands are deep enough to support viable fish populations.

C.1.2 Environmental Consequences

The impacts will be determined in the EIS.

C.2 New Airport Alternative

C.2.1 Affected Environment

The APE for biotic communities has been identified as the area within the airport boundary. It should be noted that the APEs for threatened/endangered species and bird-aircraft hazards extend beyond airport property, and encompasses primarily cultivated agricultural land with almost no wetland or upland forest. Generally, the agricultural land within the airport is intensively farmed with little undisturbed upland forest or grassland remaining. Most of the upland forest within the site is in the form of small farmstead woodlots, linear windbreaks and pine plantations.

The agricultural lands within the Search Area are inhabited by typical farmland wildlife species such as ring-necked pheasants (Phasianus colchicus), mourning doves (Zenaida macroura), great-horned owls (Bubo virginianus), white-tailed deer (Odocoilus virginianus), cottontail rabbits

(Sylvilagus floridanus), gray and fox squirrels (Sciurus carolinensis and S. niger) red and gray foxes (Vulpes fulva and Urocyon cinereoargenteus), raccoons (Procyon lotor), and striped skunks (Mephitis mephitis). The affected biotic communities are shown in **Figure 23.**

C.2.2 Environmental Consequences

Because the alternative involves almost entirely cultivated agricultural land, impacts to biotic communities within the New Airport site will primarily be through the loss of habitat for common farmland wildlife species. The precise acreage to be affected by grading and placement of impervious surfaces are not known.

C.3 No Action Alternative

C.3.1 Affected Environment

The APE and affected environment under the No Action Alternative are identical to those for the MSP alternative.

C.3.2 Environmental Consequences

The only element of the no action alternative that affects biotic communities within MSP is the extension of existing Runway 4-22. This element of the No Action Alternative will require the filling of the 0.8 acre "4-22" wetland which is discussed in more detail in Section C. AA of this Scoping Document. Because of its small size, its location directly adjacent to Runway 4-22 and the poor habitat quality of the upland surrounding it, the habitat value of this wetland basin is low. The loss of this basin is not considered a major impact to biotic communities.

D. Bird-Aircraft Hazards

The potential for a "bird strike" incident (i.e., collision between one or more birds and an aircraft) is highest over areas where many birds congregate and aircraft are at low altitudes. Bird concentration areas include lakes, wetlands and active landfills. Pursuant to FAA Policy and Procedures Memorandum 5210.2 (dated July 27, 1992), a five-mile radius will be used in identifying potential bird concentration areas. It should be noted that there are no firm, research-based altitude or distance thresholds to be for use in analyzing bird-aircraft hazards. This is because the simultaneous presence of birds and aircraft in the same airspace is a matter of probabilities. Unless otherwise noted, the distance thresholds to be used in this analysis are only for comparing the relative impact potential of the alternatives. They do not represent thresholds within or beyond which bird-aircraft conflicts would or would not occur.

Birds strikes pose the greatest hazard to aircraft at altitudes less than 500 feet above ground level (AGL). According to FAA data, 90% of all known bird-strike incidents occur below 500 feet AGL, and nearly all of the remaining 10% occur between 500 and 3,000 feet AGL, with most below 2,000 feet AGL (based on a conversation with Gene LeBoef, FAA Office of Airport Safety and Standards, August 17, 1993).

D.1 MSP Alternative

D.1.1 Affected Environment

The APE for bird strike hazards around MSP has been defined as all major bird concentration areas that lie within 10,000 feet of runway ends and active landfills within 5 miles (**Figure 24**). No active landfills lie within the APE, the nearest being Kraemer Landfill about 6.1-miles from MSP. Based on the analysis contained in the Final AED for the MSP Long Term Comprehensive Plan, the potential major bird concentration areas within the APE for MSP are Mother Lake, Lake Nokomis, Wood Lake, and the Gun Club/Long Meadow/Black Dog Lake complex in the Minnesota River bottoms. Mother Lake and the Gun Club/Long Meadow/Black Dog Lake complex were identified as the most significant bird concentration areas around MSP. The attractiveness of Mother Lake to Canada geese (Branta canadensis) is augmented by the mowed turf present at Rich Acres Golf Course and Fort Snelling National Cemetery.

Available data on recent bird strikes do not indicate a clear distribution pattern sufficient to ascribe each incident to a specific bird concentration area. However, about 28 percent of reported bird strike incidents between July 1990 and October 1993 appear to be related to Mother Lake. The Canada Goose population using Mother Lake has been the subject of an ongoing research project and control effort being conducted by Dr. James A. Cooper of the University of Minnesota. Due to the apparent bird strike hazard presented by an increase in Canada goose numbers at MSP in the early 1980s, MAC requested assistance from the U.S. Fish and Wildlife Service in developing methods to reduce the number of geese using areas on or near MSP. In response, Dr. Cooper was retained to undertake what initially was to be a 4-year study from 1984 to 1987 to determine; (1) whether geese using MSP could be identified and removed (i.e., translocated) and (2) whether such reductions would, in turn, reduce the number of geese and goose flights within the airspace used by departing and approaching aircraft. This initial study has evolved into an ongoing research and control effort that remains underway in 1994. Continuing selective control efforts have kept goose numbers at MSP extremely low, rendering the goose-aircraft hazard at Mother Lake almost negligible over the last 7 to 8 years. However, since geese from other brood marshes may eventually move into the vacated habitat existing at MSP, ongoing monitoring and control efforts are being maintained to ensure that goose flights into MSP continue to be minimal.

Based on population data provided by the U.S. Fish and Wildlife Service, Gun Club, Long Meadow and Black Dog Lakes are all considered to be major waterfowl and waterbird concentration areas. During the winter, waterfowl concentrations are limited to Black Dog Lake where warm effluent from the NSP Black Dog Power Plant keeps the lake partially free of ice. All of these lakes are heavily used by feeding great blue herons, great egrets and cormorants. A substantial number of cormorants also habitually roost in the dead trees of the abandoned Gun Club Lake heronry, immediately south of the I-494 bridge over the Minnesota River. The MVNWR staff has indicated that the white pelican population at the refuge has been increasing and that these birds may represent a bird-strike hazard due to their habit of soaring at relatively high altitudes in large flocks. However, insufficient data on pelican movements is currently available to indicate which areas within the MVNWR are most heavily used by pelicans.

D.1.2 Environmental Consequences

The impacts will be determined in the EIS.

D.2 New Airport Alternative

D.2.1 Affected Environment

Because the New Airport site does not presently encompass a major airport facility, bird-aircraft hazards are not an existing problem. However, there are a number of habitat features in and around the site which represent attractions to birds which could ultimately conflict with future airport operations. An inventory of habitat components and bird travel corridors which could generate future problems was developed early in the New Airport Site Selection process. Based on ongoing field observations, this inventory has been refined throughout the Dual Track Airport Planning Process. Landforms have been identified which are likely to attract concentrations of birds and lie within 5 miles of the New Airport site (**Figure 25**). Such landforms include large wetland complexes, wildlife management areas, active landfills, and areas where migrating waterfowl and geese were known to stage and feed. Areas identified to date include:

Spring Lake and Spring Lake Park Reserve District:

The Spring Lake area has been identified as a major Canada Goose wintering area and also receives substantial waterfowl use during migration periods. Large numbers of ring-billed gulls (Larus delawarensis) use Spring Lake during migration periods; these birds habitually trade between Spring Lake and Pine Bend Landfill.

Shiely Gravel Pits on Grey Cloud Island:

Roughly 3,000 geese were reported to over-winter in the Shiely Gravel Mine pits on Grey Cloud Island and this area was reported to receive heavy use by migrating ducks during the fall migration.

Lake Rebecca Park:

Lake Rebecca and Lake Rebecca Park are used by the geese wintering in the Spring Lake area as well as a variety of other waterfowl species during migration periods.

Gores Pool Wildlife Management Area:

Gores Pool Wildlife Management Area is a 2,679 acre area of Mississippi River bottoms extending from 3 miles south of Hastings to just north of Red Wing. Because of its extensive wetland resources and position along a major migration flyway, Gores Pool Wildlife Management Area is used by large numbers of migrating waterfowl.

Vermillion River Heronry:

The Vermillion River heronry is located at the northern mouth of the Vermillion River approximately 3 miles northeast of the New Airport site. This great blue heron (Ardea herodius) and great egret (Casmerodius albus) colonial nesting area was first identified in 1955 when it had 255 nests. A total of 816 nests were observed during a 1992 winter nest count.

State Protected Wetland 341W:

Protected Wetland 341W receives heavy feeding use by geese and ducks during spring migration periods. Several hundred tundra swans (Cygnus columbianus) have also been observed feeding in this wetland complex during the spring.

State-Protected Wetland 340W:

State-protected wetland 340W lies about 1 mile north of Vermillion and receives use by up to several hundred ducks, geese and gulls.

Pine Bend Landfill:

The Pine Bend Landfill attracts large numbers of ring-billed gulls during migration periods. Over 1,000 ring-billed gulls have been observed at the landfill and on their habitual flight path between the landfill and their staging/resting area on Spring Lake.

Lake Byllesby:

Lake Byllesby in Cannon Falls has been identified as a major migration staging area for waterfowl. While this the lake lies too far from the New Airport site to represent a bird-aircraft hazard in itself, waterfowl are known to trade between Lake Byllesby and the Spring Lake-Grey Cloud-Rebecca Lake area during migration.

D.2.2 Environmental Consequences

The impacts will be determined in the EIS.

D.3 No Action Alternative

D.3.1 Affected Environment

The APE for bird strike hazards with the No Action Alternative is identical to that for the MSP Alternative, as are the bird concentration areas of concern. Mother Lake and the Gun Club/Long Meadow/Black Dog Lake complex were identified as the most significant bird concentration areas around MSP.

D.3.2 Environmental Consequences

The impacts will be determined in the EIS.

E. Construction Impacts

Construction impacts to be considered in the EIS are the effects of construction on the impact categories that could be substantially affected (e.g., air quality, water quality, ground transportation).

E.1 Affected Environment

The affected environment will be the affected environments or APEs of each impact category to be addressed in the EIS, within which construction would take place for each alternative.

E.2 Environmental Consequences

The impacts will be determined in the EIS.

F. Coastal Barriers

The Coastal Barriers Resources Act of 1982 prohibits federal financing for development within the Coastal Barrier Resources System, which consists of undeveloped coastal barriers along the Atlantic and Gulf coasts. Neither Minneapolis-St. Paul International Airport nor the site of a proposed new airport in Dakota County are coastal barriers as defined by the federal government. Consequently, analysis of the alternatives, with respect to the Coastal Barriers Resources Act, is not required.

G. Coastal Zone Management Program

Coastal Zone Management Programs, prepared by states according to guidelines issued by the National Oceanic and Atmospheric Administration, are designed to address issues affecting coastal areas. While the Great Lakes are considered coastal areas for the purpose of preparing these programs, there is no Coastal Zone Management Program approved by the state of Minnesota for Lake Superior. Neither Minneapolis-St. Paul International Airport nor the site of a proposed new airport in Dakota County are within a coastal area as defined by the federal government. Consequently, analysis of the alternatives, with respect to an approved Coastal Zone Management Program, is not required.

H. Endangered and Threatened Species

Federally threatened and endangered species are protected under the provisions of the Endangered Species Act of 1973 (Public Law 93-205; hereafter referred to as the Federal ESA). The Federal ESA empowers the Secretary of the Interior to develop and implement recovery plans for each listed species. Section 7 of the Federal ESA requires a formal consultation with the U.S. Fish and Wildlife Service for actions authorized, funded, or carried out by Federal agencies that would potentially jeopardize the continued existence of threatened or endangered species or would result in the destruction or adverse modification of their critical habitat. The formal consultation process requires the preparation of a Biological Assessment, from which the U.S. Fish and Wildlife Service renders a Biological Opinion regarding the proposed action. The Federal ESA does not afford candidate species the protections applicable to listed species.

State-listed threatened, endangered and special concern species are protected under the provisions of the Minnesota State Endangered Species Act (Minn. Stat. 84.0895; hereafter referred to as the

State ESA). The State ESA and/or subsequent regulations restrict the taking, possession, importation, transport, purchase, sale or disposal of state threatened and endangered species. Special concern and non-listed rare state species are not legally protected under the Federal ESA.

H.1 MSP Alternative

H.1.1 Affected Environment

The APE for threatened and endangered species with the MSP Alternative is the MSP property plus any areas of critical habitat for bald eagles (Haliaeetus leucocephalus) within the Minnesota Valley National Wildlife Refuge in proximity to MSP. The bald eagle is the only federally listed species having habitat near enough to MSP to be potentially affected. As indicated in Section V. C.1.1, Forster's terns, a state-listed special concern species have historically used Mother Lake at the northwest corner of MSP. Mother Lake has been designated by the Minnesota DNR Heritage and Nongame Research Program as a colonial waterbird nesting site due to its long-term use by Forster's Terns, a state special concern species.

Mother Lake has had as high as 70 tern nests in 1981 but last received concentrated use in 1986 when 43 breeding pairs were observed. Reproductive success among terns at Mother Lake has been extremely poor in some years due to storm-related flooding. Due to the developed nature of Mother Lake's tributary drainage area, the lake experiences substantial water level fluctuations in large storms. The 1986 breeding season is a good example; due to flooding and predation, only 4.4 percent of the tern eggs hatched and no young birds were fledged. The Mother Lake tern colony was inactive from 1987 through 1993 but has become active again in 1994. One Forster's Tern nest with 3 eggs was found at Mother Lake by DNR staff on June 2, 1994, re-activating the site as a designated colonial nesting bird site.

Based on coordination with the U.S. Fish and Wildlife Service (USFWS) and Minnesota Department of Natural Resources (MDNR), the only known essential habitat for bald eagles near MSP is one consistently used eagle breeding territory along Long Meadow and Gun Club Lakes within the Minnesota Valley National Wildlife Refuge. Three nest sites lie within this nesting territory and are all located within one mile of each other. The breeding territory was occupied in 1986 and 1987, but successful nesting did not occur in those years. Eagles have actively nested in this territory since 1988 and successfully nested there in both 1993 and 1994.

Ongoing coordination will be maintained with the Minnesota Department of Natural Resources to monitor the 1995 breeding status of Forster's terns at Mother Lake. Coordination will also be maintained with the Minnesota Valley National Wildlife Refuge to monitor eagle nesting activity in the Long Meadow Lake area. Up-to-date information on both species will be included in the EIS.

H.1.2 Environmental Consequences

The impacts will be determined in the EIS.

H.2 New Airport Alternative

H.2.1 Affected Environment

The APE for threatened and endangered species with the New Airport Alternative consists of the area within the selected New Airport site plus any elements of critical bald eagle habitat along the Mississippi River in close enough proximity to the site to potentially be affected by overflights. The site selected for the New Airport Alternative encompasses two known breeding territories used by loggerhead shrikes (Lanius ludovicianus), which are listed as endangered on the state list of threatened, endangered and special concern species. Initially the New Airport site did not encompass any state or federally listed threatened, endangered or special concern plant species. However, the site boundary has been modified to encompass Chimney Rock, which harbors a remnant sand prairie inhabited by a population of state-endangered kitten-tails (Besseya bullii). By encompassing this area within airport property, it is anticipated that the area can be protected from future degradation.

The Minnesota Department of Natural Resources has identified 5 bald eagle nests and 2 winter night roosting areas along the Mississippi River, that are near enough to the New Airport Alternative site to potentially incur impacts. One nest exists on Spring Lake, one on Lake Rebecca, two within Gores Pool Wildlife Management Area and one at Clear Lake. The two identified night roosting areas lie east of the New Airport site within the Eagle Point and Big River coulees.

H.2.2 Environmental Consequences

The impacts will be determined in the EIS.

H.3 No Action Alternative

H.3.1 Affected Environment

The APE for the No Action Alternative is identical to that for the MSP Alternative and encompasses the Forster's tern nesting colony in Mother Lake and the active bald eagle breeding territory in Long Meadow Lake.

H.3.2 Environmental Consequences

The No Action Alternative will not entail any impacts to Mother Lake and, thus, is not anticipated to have any adverse effect upon Forster's terns. The potential for impacts to bald eagles was explored in the Biological Assessment for the Runway 4-22 extension completed in 1990. No adverse impacts to this eagle breeding territory are anticipated from the Runway 4-22 extension and the U.S. Fish and Wildlife Service issued a "no jeopardy" Biological Opinion on the project.

The conclusion regarding the potential for impacts to bald eagles will be re-evaluated in the EIS, should any refinements be made to flight tracks or aircraft operations relating to the No Action Alternative.

I. Economic

Economic impacts include two issues — the costs to develop each airport alternative and the financing sources and mechanisms which could be used to pay for airport development. The categories of development costs for each alternative are detailed below. The Metropolitan Airports Commission has retained a consultant to prepare a financing plan for airport development; this financing plan is expected to include potential sources of funds and funding mechanisms. The financing plan will be detailed in the Draft Environmental Impact Statement.

In addition, the economic impacts include the effects of each alternative on the tax base of local jurisdictions and school districts.

(Impacts on business and employment are detailed in Section T; induced socioeconomic impacts are detailed in Section N.)

I.1 MSP Alternative

I.1.1 Affected Environment

The APE for impacts on the tax base includes all land and property acquisition. The APE for financing impacts are the users of MSP.

Development of the MSP alternative would involve the acquisition of commercial properties in the city of Bloomington, immediately south of I-494 and east of Trunk Highway 77, to provide a Runway Protection Zone (RPZ) for the south end of the proposed north-south runway. (The RPZ for the north end of the runway would be within existing airport property.) The FAA mandates the RPZ, a trapezoid extending 2,500 feet from both ends of a runway, with the recommendation that the airport operator retain control over the RPZ to eliminate anything that could be hazardous to aircraft and to protect the safety of people on the ground. Under FAA guidelines, all structures in the RPZs for new runways, to the extent possible, should be removed.

In addition, development of the MSP alternative would involve the acquisition of properties in the cities of Minneapolis and Richfield to permit highway improvements associated with the development of a new terminal. Specifically, properties along either side of Trunk Highway 62 in Minneapolis and Richfield west of its intersection with Trunk Highway 77 could be acquired. In addition, properties near the intersection of Trunk Highway 77 and 66th Street, in the city of Richfield, could be acquired.

Development on airport property would involve the demolition of existing commercial, industrial and institutional buildings to permit construction of new facilities. They are generally located in the southwest and northern areas of the airport.

All land acquisition, both on airport property and in the surrounding communities, would involve the relocation of affected businesses and residents under the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

I.1.2 Environmental Consequences

The impacts will be determined in the EIS.

I.2 New Airport Alternative

I.2.1 Affected Environment

The APE for impacts on the tax base includes all land and property acquisition. The APE for financing impacts includes the users of the airport and potentially the State of Minnesota.

Development of the new airport alternative would include the acquisition of properties within the airport boundary (**Figure 5**). The site of the new airport alternative is in Marshan and Vermillion Townships. The area is within Independent School District 200. Most of the area is farmland; there also are single-family residences and businesses within the area.

All land acquisition, both on airport property and in the surrounding communities, would involve the relocation of affected businesses and residents under the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

In addition, new airport development would include construction of an eight-lane highway connecting Highway 55 to the airport site and the interchange at the intersection of these highways, as well as of powerlines and pipelines serving the site. A potential corridor for the access highway, the power-lines and the pipelines will be identified and evaluated in the EIS.

I.2.2 Environmental Consequences

The impacts will be determined in the EIS.

I.3 No Action Alternative

I.3.1 Affected Environment

All airport development under the No Action alternative would be wholly within existing MSP property, involving no land acquisition off airport property and no removal of residences and businesses located in the surrounding area. Development costs include demolition of existing buildings and structures and construction.

I.3.2 Environmental Consequences

The impacts will be determined in the EIS.

J. Energy Supply and Natural Resources

Energy requirements in the year 2020 will be addressed, which will include (1) activities related to demands for stationary facilities (e.g., airfield lighting, terminal building lighting and heating, on-airport utilities) and (2) activities involving the movement of air and ground vehicles.

For vehicular traffic (ground access), annual vehicle miles of travel of airport-related traffic will be translated into annual regional fuel consumption. Annual aircraft energy requirements within the regional airspace will also be addressed.

J.1 MSP and No Action Alternatives

J.1.1 Affected Environment

The natural resource environment affected by energy consumption is national and international depending upon the sources used. Indirectly, the region and state are affected by revenues generated by the amount and type of energy consumed.

J.1.2 Environmental Consequences

The impacts will be determined in the EIS.

J.2 New Airport Alternative

J.2.1 Affected Environment

The natural resource environment affected by energy consumption is national and international depending upon the sources used. Indirectly, the region and state are affected by revenues generated by the amount and type of energy consumed. Regarding mineral resources, there are two active limestone-dolomite quarries in the vicinity of the new airport.

J.2.2 Environmental Consequences

In general, the impacts will be determined in the EIS. The two quarries will not be disturbed or adversely impacted.

K. Farmland

Farmland, farming operations, and the farm economy affected by airport development will be addressed.

K.1 MSP and No Action Alternatives

No farmland will be impacted by the development of the MSP and No Action alternatives.

K.2 New Airport Alternative

K.2.1 Affected Environment

The APE includes all farmland that would be acquired, and the remaining farms and related businesses that could be adversely affected by displaced farming operations.

Farmland is the predominate land use in Marshan and Vermillion Townships, the location of the new airport alternative; typical crops are corn and soybeans. Additional crops, from year to year, include alfalfa, oats, wheat and a variety of vegetables. Feedlots, both for dairy cattle and hog production, also are found on area farms. There are commercial nursery operations and a vineyard

in the area. Most farming operations are family farms, some having been in existence for more than 100 years.

There are three classifications of farmland in Dakota County, each defined by the Soil Conservation Service according to such characteristics as soil quality, growing season and moisture supply.

Prime farmland. Prime farmland has the best combination of physical and chemical characteristics necessary to produce high crop yields over time without intolerable erosion.

Farmland of statewide importance. This farmland, while similar to prime farmland in its characteristics, has soil limitations that require more intense management to produce high crop yields.

Other farmland. Land which has severe limitations, such as being undrained or with steep slopes, that make it virtually unusable for farming.

Figures 26 and 27 depict the location of prime farmland and farmland of statewide importance in the area. Within the airport property, there are 8,206 acres of prime farmland and 2,245 acres of farmland of statewide importance.

Because a new airport in Dakota County would involve the expenditure of federal funds, and because it includes land classified as prime farmland and farmland of statewide importance, the new airport alternative is covered by the Farmland Protection Policy Act (Public Law 97-98). The legislation requires the U. S. Department of Agriculture to identify prime farmland and farmland of statewide importance permanently taken out of production by either federal projects or projects involving federal funds. While the legislation permits federal agencies to consider alternatives to a proposed project, it does not require it.

The Metropolitan Agricultural Preserves Act was enacted in 1980 by the Minnesota legislature with the intention of retaining agricultural uses on farmland, thus protecting it from potential redevelopment with urban and suburban uses. Individual properties eligible for this protection are designated for agricultural use on local comprehensive plans. Under the legislation, a farm owner agrees to continue agricultural use of the land, thus excluding such urban and suburban uses as higher density housing and commercial businesses, in exchange for such benefits as a lower assessed value of the farmland and, therefore lower property taxes. This agreement, or covenant, establishes the farmland as an "agricultural preserve." The covenants place the farmland in the agricultural preserve program in perpetuity, unless the farm owner files a notice of expiration that becomes valid eight years hence. Agricultural preserve lands are depicted in **Figure 28**. Within the airport property, there are 6,331 acres in the agricultural preserve program.

K.2.2 Environmental Consequences

The impacts will be determined in the EIS.

L. Floodplains

Floodplains are defined as that portion of lowland and flat areas adjoining waters, that are subject to a one percent or greater chance of flooding in any given year, i.e., a 100-year flood event.

Floodplain impacts are evaluated to determine potential risks to human safety and property damage, as well as adverse impacts on natural and beneficial floodplain values.

L.1 MSP and No Action Alternatives

L.1.1 Affected Environment

The affected floodplain is the Minnesota River floodplain shown in **Figure 29.**

L.1.2 Environmental Consequences

The only impact to the floodplain is the placement of supporting structures for the runway lighting system in each alternative. The effect of this encroachment on the floodplain is negligible — both in terms of flooding and the natural and beneficial values served by the floodplain.

L.2 New Airport Alternative

L.2.1 Affected Environment

The APE is the area that would be inundated by a 100-year flood.

The new airport site is located within the Vermillion River Watershed. Existing floodway and flood fringe (100-year flood elevation) have been delineated by the U.S. Army Corps of Engineers and FEMA. The Vermillion River drains a primarily agricultural watershed and is susceptible to flooding during large rainfall events. The Vermillion River passes through the City of Hastings prior to entering the Mississippi River Valley and ultimately flowing into the Mississippi River. **Figure 30** illustrates the floodplains (floodway and floodway fringe areas) in and around the new airport site

The Vermillion River and watershed is subject to a watershed management plan developed by the Vermillion River Watershed Management Organization (VRWMO) which does not allow increases in flood elevation (100-year) from runoff associated with new development. The plan also requires storage and has discharge limits for subwatershed areas affected by new development.

L.2.2 Environmental Consequences

The impacts will be determined in the EIS.

M. Historic/Architectural Resources

A number of federal laws and regulations address the protection of the country's cultural resources. The statute specifically devoted to cultural resource issues is the National Historic Preservation Act of 1966 (16 U.S.C. 470), as amended, which contains two provisions that are pertinent to future airport development. Section 106 of the statute requires federal agencies to consider the effect of federally funded or licensed projects on properties and districts listed, or eligible for listing, in the National Register of Historic Places. Regulations related to the Section 106 process are outlined in 36 CFR Part 800: Protection of Historic Properties. National Historic Landmarks, a designation bestowed on a very limited number of particularly significant cultural

resources, are afforded special protection under Section 110 of the National Historic Preservation Act and 36 CFR Part 800.10.

M.1 MSP Alternative

M.1.1 Affected Environment

The Area of Potential Effect (APE) is illustrated in **Figure 31**. It consists of land within the expanded MSP airport boundaries, and land within the projected year 2005 DNL 65 noise contours for runways included in MSP airport's Long-term Comprehensive Plan. The APE also includes land affected by construction/reconstruction of access roadways and interchanges directly serving the expanded airport. In addition, the APE encompasses property affected by improvements to the regional highway and transit systems, if the improvements are due to the expansion of MSP airport.

The known APE for the MSP airport affects the following properties and districts listed, or eligible for listing, in the National Register of Historic Places: the Original Wold-Chamberlain Terminal Historic District, the Old Fort Snelling Historic District, Fort Snelling National Cemetery, Hale Elementary School, West Lake Nokomis Residential Historic District, Spruce Shadows Farm Historic District, and the Soo Line Corridor. The APE also encompasses part of the Fort Snelling National Historic Landmark District.

M.1.2 Environmental Consequences

Plans to expand MSP airport call for the demolition of the Original Wold Chamberlain Terminal Historic District. Other National Register properties in the APE could be adversely affected by noise and vibration, potentially resulting in structural damage or functional obsolescence.

M.2 New Airport Alternative

M.2.1 Affected Environment

The known Area of Potential Effect (APE) includes all land that would be acquired for the new airport, as well as property falling within the projected DNL 65 noise contour for the year 2005 and property within State Safety Zone A (see **Figure 32**). The APE will also include land affected by construction of airport access roadways and related interchanges, and by improvements to the regional highway and transit systems required by the airport's relocation; the nature and extent of this construction, however, have not been determined at this time. Only one property in the known APE appears to be eligible for the National Register: a farmstead at 22005 Lewiston Boulevard, which includes the southern half of the southeast quarter of Section 34 west of Lewiston Boulevard in Vermillion Township. Although Chimney Rock, another National Register-eligible property, is technically outside of the APE, it will be retained in the study area because of its close proximity.

M.2.2 Environmental Consequences

Plans do not require demolition of any National Register properties within the known APE. These properties could be adversely affected by noise and vibration, potentially resulting in structural damage or functional obsolescence.

M.3 No Action Alternative

M.3.1 Affected Environment

The Area of Potential Effect (APE) consists of land within the existing MSP airport boundary, as well as land within the projected DNL 65 noise contour for the year 2005 for existing airport runways. The projected noise contours are currently being developed.

Laws and regulations relating to historic properties in the APE are the same as those for the existing MSP airport (see M.1.1).

M.3.2 Environmental Consequences

Demolition, as well as damage from noise and vibration, are the most likely effects facing National Register properties in the APE.

N. Induced Socioeconomic Impacts

N.1 MSP and No Action Alternatives

N.1.1 Affected Environment

The APE consists of the cities within the I-494 corridor between Eden Prairie and Mendota Heights. Development induced due to the airport at the current location has already occurred. Future development due to the airport is included in demographic and employment projections previously prepared for the APE of the airport. However, additional development due to capacity increases (as opposed to the limited capacity of the No Action Alternative) will need to be assessed.

N.1.2 Environmental Consequences

The impacts are not known for the MSP Alternative. There will be no impacts due to the No Action Alternative.

N.2 New Airport Alternative

N.2.1 Affected Environment

The APE consists of the affected cities and townships in the counties of Dakota, Goodhue, Hennepin and Washington in Minnesota, and Pepin, Pierce and St. Croix in Wisconsin. The Metropolitan Council had rates of induced development growth prepared by a consultant in 1993-1994. These rates were further refined with the assistance of Dakota County and local communities. Subsequently, the development was generally allocated in Dakota County for further analysis. Ongoing work with Wisconsin communities is following a similar process to refine and allocate induced development.

N.2.2 Environmental Consequences

The impacts will be determined in the EIS.

O. Land Use

The compatibility of the affected existing and planned land use with the implementation of each alternative will be considered in the EIS.

O.1 MSP and No Action Alternatives

O.1.1 Affected Environment

The APE is the existing and planned land use around MSP, as defined by the adopted comprehensive plans of the affected municipalities.

The portions of Minneapolis and Richfield adjoining Minneapolis-St. Paul International Airport are largely residential in nature (**see Figure 33**). Commercial concentrations are scattered throughout the neighborhoods, oriented along arterials with larger concentrations found at the intersections of arterials. This pattern has developed over a period of decades, some of which predates the presence of an airport. Many local parks are scattered throughout the two cities.

The portion of Bloomington which adjoins the airport to the south is primarily commercial in nature. Many hotels, business and office buildings are located in the area, with the Mall of America a predominant feature. The area also contains a major nature preserve along the Minnesota River. Residential uses are located south and west of the commercial uses.

O.1.2 Environmental Consequences

The impacts will be detailed in the EIS.

O.2 New Airport Alternative

O.2.1 Affected Environment

The APE is the existing and planned land use within and around the airport boundary, as defined by the adopted comprehensive plans of the affected jurisdictions.

Local comprehensive plans were used as a facsimile for current land use (**see Figure 34**). Most of the land in and adjacent to the site is currently in agricultural use. In addition, most of the land adjacent to the site has been designated for Agricultural Preserves in the affected communities' comprehensive plans. This planning designation represents a long term commitment to agriculture. Although the current long term planning horizon for local communities extends only through the year 2000, the Metropolitan Council has reviewed regional forecasts for 2020 with all local governments in the region. These forecasts reflect a continuation of agriculture in this portion of the region.

The other major use of land in and adjacent to the site is conservation. This use is also forecast to remain the same.

There are several small, commercial sites within the site. There are residences in the site area associated with farms and non-farm property. However, there are roughly 300 acres of land adjacent to the site designated for rural residential development.

Communities near the site include the City of Hastings and the following rural centers - Miesville, New Trier, Hampton and Vermillion. Because very little growth is expected in the four rural centers, in the absence of a new major airport, current land uses (primarily residential with some commercial and public uses) would not be expected to change significantly in the future.

The City of Hastings is a freestanding growth center that has sustained modest growth over the past 20 years. The city completed all of its approved orderly annexations. Recent annexations have occurred south (from Marshan Township) and west (from Nininger Township) of the city. Although the city has no approved plans for additional annexations, the location of the Mississippi River and other natural environmental features suggest that any future annexations would continue both south and west of the current city limits.

The Wisconsin Counties to the east of the region and the area of the Dakota County Site are primarily agricultural in nature with scattered non-agricultural homesteads and medium to small communities. The main area of impact in Wisconsin would be in Pierce County and extreme southern St. Croix County. The main communities in Pierce County are Prescott (the Wisconsin community closest to the site), River Falls and Ellsworth. The countryside consists of gently to moderately rolling topography with scattered woodlands.

O.2.2 Environmental Consequences

The impacts will be determined in the EIS.

P. Light Emissions

Lighting associated with airport development includes that used to guide aircraft as they arrive and depart. There are two kinds of approach lights at the ends of each runway and in the Runway Protection Zones (RPZ). They include steadily burning approach lights within a distance of 2,400 feet from both ends of the runway. Approach lights are on when a runway is used during inclement weather conditions and at night. In addition, strobe lights, installed 1,400 feet from each end of a runway and extending a distance of 1,000 feet, are used during inclement weather conditions.

There will also be lighting associated with landside facilities -- the terminal, parking ramps and lots, the roadways, and aircraft and airport maintenance buildings.

P.1 MSP Alternative

P.1.1 Affected Environment

The APE is the areas adjacent to MSP where the lights are visible.

There will be approach lights and strobe lights at the ends of the proposed north-south runway, and the affected environment would be residences in south Minneapolis and businesses in Bloomington.

Each of the buildings proposed for the MSP Alternative will have lighting needed for identification and for use during the nighttime hours. The new west terminal would be flanked on its north and south sides by a parking ramp; the parking ramp is proposed to be higher than the terminal building. Lighting will be used for identification and nighttime use on new cargo buildings and aircraft maintenance buildings in the southwesterly area of airport property, as well as at a new remote parking lot in the easterly area of the airport.

There will be lights illuminating new roadways, including lights for the new interchanges at the intersection of Trunk Highways 62 and 77 and at the intersection of Trunk Highway 77 and 66th Street, as well as new access roads from these interchanges onto airport property and new roadways within airport property.

The affected environment for illumination on new buildings and new roadways would be adjacent neighborhoods in south Minneapolis, east Richfield and north Bloomington.

P.1.2 Environmental Consequences

The impact of nighttime runway lights for the proposed north-south runway will be identical to that of runway lights for the existing runways at MSP. These lights, which meet FAA standards, are installed and angled to minimize impacts to buildings in surrounding areas. Further, the expanse of open spaces at both ends of the runway means illumination will not be visible in surrounding neighborhoods.

Lighting on new buildings and roadways is not yet designed in sufficient detail to determine the extent of light spillover into surrounding areas. However, it is known that the west end of the new terminal, facing residential neighborhoods in south Minneapolis, is the shortest dimension of the building. The longer dimensions of the new terminal, along the north and south sides, would be shielded from surrounding areas by the new parking ramp. It is anticipated this illumination will be shielded and directed in such a way as not to be visible in adjacent neighborhoods. Roadway lights would be designed according to federal and state standards.

The design of the lighting, and its distance from homes and businesses in surrounding areas, is not expected to be an annoyance. Consequently, it is concluded that there will be no significant impact from light emissions at MSP.

P.2 New Airport Alternative

P.2.1 Affected Environment

The affected environment for light emissions from the new airport would be the town of Vermillion, west of the airport site, as well as residences, both at farmsteads and on single-family lots, in the area surrounding the airport.

Approach and strobe lights at both ends of each of the six runways of the new airport alternative would be designed according to FAA standards.

The terminal area, including the terminal, concourses and parking ramp, as well as other buildings on the airport site, will be illuminated for identification and use during nighttime hours. These lights will be designed so that they will be shielded, with light directed away from the area surrounding the airport property. Roadway lights, for roads on airport property and for access highways on the north side of the airport site, will be designed according to federal and state standards.

P.2.2 Environmental Consequences

Runway lighting, both approach lights and strobe lights, would be wholly within airport property.

Buildings that are closest to the town of Vermillion, the closest population center, are the hangars on the west side of the airport site, a distance of approximately a half-mile. Other buildings are further away; for example, the terminal area is approximately four miles from the town of Vermillion.

Because of the design of the lighting, shielded and directed away from the perimeter of the airport property, and its distance from Vermillion and residences in the surrounding area, light emissions are not expected to be an annoyance. Consequently, it is concluded that there will be no significant impact from light emissions at the new airport.

P.3 No Action Alternative

P.3.1 Affected Environment

The affected environment for runway lights at the southwesterly end of the Runway 4-22 extension would be east Richfield. The new Sun Country hangar, as well as improvements in the terminal area, are located generally in the eastern portion of the existing airport property, at some distance from adjacent residential and business neighborhoods.

P.3.2 Environmental Consequences

The impact of light emissions from the approach and strobe lights at the end of the Runway 4-22 extension would be identical to that of the existing runway length. Open space along the west side of the airport property would provide a buffer zone between the lights and adjacent neighborhoods in east Richfield.

Lighting planned for improvements in the terminal area and the new Sun Country hangar would not intrude into surrounding areas. These facilities are some distance from area residences and businesses. In addition, lighting designed for these improvements will be shielded and angled in such a manner so that they will not be visible in surrounding areas. It is concluded there will be no significant impact from these light emissions.

Q. Noise

Aircraft noise can affect residents, businesses and certain land uses in the vicinity of an airport. The criteria for determining land use compatibility with aircraft noise are given in **Table 5**, and are based on FAA criteria.

TABLE 5 - Land Use Compatibility Criteria

(1 of 2)

Land Use	DNL 65-70	DNL 70-75	DNL 75+
Residential			
Residential, other than hotels[1]	N	N	N
Hotels	R(25)	R(30)	R(30)
Nursing homes[1]	N	N	N
Public Use			
Schools (public and private)	R(30)	N	N
Child care centers	R(25)	R(30)	N
Churches	R(25)	R(30)	N
Auditoriums, concert halls	R(30)	R(35)	N
Parking	Y	Y	Y
Hospitals	R(30)	R(35)	N
Commercial Use			
Offices: business, professional, government	Y	R(25)	R(30)
Retail trade	Y	R(25)	R(30)
Wholesale trade and retail of building materials, hardware and farm equipment[2]	Y	Y	Y
Utilities[2]	Y	Y	Y
Manufacturing and Production			
Manufacturing, general[2]	Y	Y	Y
Research and laboratory uses sensitive to vibration	Y	N	N
Agriculture and forestry[3]	Y	Y	Y
Mining, fishing, resource production and extraction	Y	Y	Y
Recreational			
Outdoor sports arenas and spectator sports	Y	Y	N
Outdoor amphitheaters, music shells	N	N	N
Nature exhibits and zoos	Y	N	N
Parks, golf courses, riding stables and other active recreation areas	Y	Y	N

KEY

Y-Land use and related structures are compatible without restrictions.

N-Land use and related structures are not compatible and should be prohibited.

R(25),(30) or (35)-Land use and related structures are generally compatible; measures to achieve Noise Level Reduction of at least 25, 30, or 35 dBA must be incorporated into design and construction of structures. Normal construction can be expected to provide an NLR of 20 dBA; thus, the reduction requirements are often stated as 5, 10, or 15 dBA over standard construction. These requirements assume mechanical ventilation and closed windows year round. The use of NLR criteria will not eliminate outdoor noise problems.

---

[1] Where the city determines that residential uses must be allowed, measures to achieve sufficient outdoor to indoor Noise Level Reduction (NLR) should be incorporated into building and/or zoning codes and be considered in individual approvals. Federal guidelines recommend NLR of at least 25 dBA in DNL 65-70, and 30 dBA in DNL 70-75. Adjustments to these recommendations may be necessary in considering specific local conditions. In addition to acoustical treatment, potential residents in noise zones should be notified of the noise environment.

[2] Appropriate Noise Level Reduction (as specified in Footnote 1) must be incorporated into the design and construction of portions of these buildings where the public is received, office areas or noise sensitive areas.

[3] Noise Level Reduction specified in Footnote 1 required for residential buildings.

Source: MSP FAR Part 150 Study Update, March 1992

Noise sensitive areas and facilities (residences, schools, parks, etc.) will be identified and analyzed to determine the noise impacts of each alternative. Future noise levels will be calculated and compared with existing levels, according to several federal and state criteria. The future sound levels will be calculated using the latest version of the Federal Aviation Administration's Integrated Noise Model (INM). Five metrics will be used: Day Night Level (DNL), the State L_{10} descriptor, time-above-threshold (TA), sound exposure levels (SEL), and numbers of overflights.

The DNL metric was developed under the auspices of the U.S. EPA for use in describing aircraft noise impacts and other environmental noise impacts. DNL is the logarithmic average sound level measured in decibels weighted to closely approximate the sensitivity of the human ear (dBA). It is based on the yearly average for a 24-hour Equivalent Sound Level (L_{eq}). The metric is also weighted to account for increased noise sensitivity between 10:00 PM and 7:00 AM by applying a 10 dBA penalty to noise events occurring during that nighttime period. The output of the noise model includes a noise contour connecting points of equal noise level, which can be used to estimate the number of people and noise sensitive land used within specified DNL sound levels. For this study, DNL 65 and DNL 60 contours will be determined for a conservative future year.

The L_{10} metric is used by the State of Minnesota in setting State noise standards. While recent court decisions have concluded that it cannot be enforced at MSP, the data will be presented in the EIS for information purposes. L_{10} is based on a sound level in dBA exceeded 10 percent of the time (6 minutes per hour). It will be calculated for the worst hourly noise condition that could occur off each runway end, showing what short-term conditions could be in those areas. This metric does not take into account how often that condition actually occurs. For this study, $L_{10}65$ contours will be determined.

The time-above-threshold (TA) is a measure of the time during a 24-hour period that a point on the ground experiences aircraft-generated noise above specified levels. The level of 85 dBA represents the point at which single-event (not DNL) levels are considered potentially disruptive. Unlike the DNL metric, which uses logarithmic averages in its internal calculations, the TA metric uses

arithmetic means to calculate total noise. This latter technique can better demonstrate small changes in noise patterns, and can show changes in noise on a scale commensurate with changes in the number of aircraft overflights.

Sound Exposure Level (SEL) is a metric designed to compare single noise events of differing duration and intensity by compressing or expanding the duration of a single event to a period of one second. Since in reality, the noise energy produced from an aircraft overflight lasts many seconds, SEL values cannot be compared to DNL or standard decibel readings. FAA and EPA typically require use of both DNL and single event metrics (like SEL) to address noise impacts in an EIS.

The analysis of aircraft overflights provides a straight forward comparison of runway use by alternative, showing locations of each major arrival and departure flight track and numbers of flights on these tracks occurring in an average month.

Noise abatement measures and land use compatibility measures will be considered for each of the alternatives to mitigate potential impacts.

The analysis results provided in this EIS Scoping Document are preliminary, reflecting work completed under the AED process. Updated noise analysis will be provided in the EIS based on the most current data available.

Q.1 MSP Alternative

Q.1.1 Affected Environment

The Area of Potential Effect (APE) of aircraft noise is the area within the Year 2005 DNL 60, 65, 70 and 75+ noise contours for MSP. The 1992 DNL contours are shown in **Figure 35**.

Year 2005 aircraft activity was used for analysis purposes since it represents a likely earliest year for implementation of major runway projects for MSP or a new airport. Although a new runway could be in operation a year or two earlier, and the Airport Noise and Capacity Act permits the use of up to 15 percent of noisier Stage 2 aircraft until the end of 2003 (for "hardship" cases), airline representatives, local communities, and the airport all agreed that this impact, even if it were likely to occur, was of such short duration (from the time when a new runway could be completed until 2003) that it was not the best measure of long-term impacts. In fact, Northwest Airlines, the dominant carrier at MSP, has stated that they do not intend to seek a waiver allowing continued use of Stage 2 aircraft beyond the year 2000.

Year 2020 (i.e., a later year) was also not selected because, even though there would be more aircraft operations in 2020 versus 2005, it was assumed that by 2020, all operations would be with newer technology, quieter Stage 3 aircraft. For 2005, many Stage 2 aircraft "hush-kitted" to meet Stage 3 requirements were assumed to be in operation. These assumptions result in a Year 2005 contour that is as large as the Year 2020 contour. Finally, the later the forecast horizon, the more uncertainty there is about the fleet mix and levels of activity. **Figure 36** compares the DNL contours developed for the three forecast years.

Figure 37 shows the Year 2005 contours generated by aircraft operations at MSP that was included in the MSP AED. Approximately 8.5 square miles of land area are contained within the DNL 65 contour.

Q.1.2 Environmental Consequences

Table 6 shows the forecast population and households within each contour for the Year 2005. Approximately 5,800 people residing in 2,600 dwelling units are forecast to be within the DNL 65 contour. An additional 20,800 people and 11,600 homes would be within the DNL 60 noise contour. Other potential impacts are not known.

TABLE 6 - Population and Households Within Year 2005 DNL Noise Contours - MSP Alternatives

Jurisdiction	1990 Population					1990 Dwellings				
	DNL 75	DNL 70	DNL 65	DNL 60	Total	DNL 75	DNL 70	DNL 65	DNL 60	Total
Minneapolis	0	680	4,410	16,870	21,960	0	280	1,970	7,100	9,350
Richfield (w/o NFT/RA)	0	10	290	1,750	2,050	0	10	130	750	890
Fort Snelling	0	0	0	30	30	0	0	0	30	30
Bloomington	0	10	430[2]	1,520	1,960	0	10	250[2]	800	1,060
Inver Grove Heights	0	0	0	0	0	0	0	0	0	0
Mendota Heights	0	0	0	140	140	0	0	0	50	50
Eagan	0	0	0[2]	350[2]	350	0	0	0[2]	140[2]	140
Total	0	700	5,130	20,660	26,490	0	300	2,350	8,870	11,520
New Ford Town & Rich Acres	810	150	80	90	1,130	320	50	30	30	430

Notes: (1) Totals may not add due to rounding.
(2) Year 2000.

Source: HNTB analysis based on year 2005 fleet mix.

Q.2 New Airport Alternative

Q.2.1 Affected Environment

As with the MSP Alternative, the Area of Potential Effect (APE) of aircraft noise for the New Airport Alternative is the area within the DNL 60, 65, and 70 and 75+ noise contours for the airport in the Year 2005. As discussed in Section R.1.1., Year 2005 was selected for several reasons. First, it was assumed that the new airport would not likely be open until then. Second, since the same fleet mix was used for the MSP Alternative, the 2005 fleet mix includes Stage 2 aircraft "hush-kitted" to meet Stage 3 requirements. These aircraft are typically noisier than "true" Stage 3 airplanes, and it was considered desirable to measure their impact. Finally, it is desirable to use the same forecast year being used to analyze noise impacts for MSP. The ambient DNL values in the Search Area are shown in **Figure 38.**

Q.2.2 Environmental Consequences

Figure 39 shows the forecast Year 2005 approximate DNL 60, DNL 65, DNL 70 and DNL 75+ noise contours generated by future aircraft operations under the new airport alternative. The potential impacts are not known.

Q.3 No Action Alternative

Q.3.1 Affected Environment

The Area of Potential Effect (APE) for the no action alternative will be the area within the DNL 60, DNL 65, and DNL 70+ noise contours for Year 2005. The 2005 approximate DNL contours are shown in **Figure 40.** The level of operations will likely be lower for this alternative, due the capacity constraints that no action imposes.

Q.3.2 Environmental Consequences

The impacts will be determined in the EIS.

R. Parks and Recreation

Parks and recreation areas to be considered include all public and private parks and recreation areas.

R.1 MSP Alternative

R.1.1 Affected Environment

The APE consists of land to be acquired and land within the DNL 65 noise contours **(Figure 41).**

Park and recreation lands in the APE include:

Fort Snelling State Park, owned by the state of Minnesota, is located on both sides of the Mississippi River north and south of I-494. That portion of the park within the DNL 65 noise contour lies between I-494 on the south and Picnic Island on the north and includes the following recreational facilities: hiking trails, a canoe landing, swimming and picnic facilities and a proposed visitor/interpretive center to be located below the Mendota Bridge. There is a nine-hole golf course in Fort Snelling State Park, southwesterly of the Trunk Highway 5/Trunk Highway 55 interchange. The golf course (and adjacent recreation facilities that are not within the DNL 65 noise contour) is operated by the Minneapolis Park Board under a five-year agreement with the Minnesota Department of Natural Resources (DNR) that is scheduled to expire November 30, 1997. Fort Snelling State Park, including the recreational facilities being operated by the Minneapolis Park Board, has been under the jurisdiction of the DNR since 1971, when the state acquired the land from the U. S. Department of Interior under a quitclaim deed.

Bossen Field is a neighborhood park located in the Wenonah neighborhood of the city of Minneapolis, immediately north of Trunk Highway 62 at 28th Avenue South. The 39.1-acre park

includes softball fields, one of which is illuminated for night games, play equipment, a running track, a children's wading pool and a basketball court.

Lake Nokomis is a 407.68-acre lake and park lying on both sides of Cedar Avenue north of Trunk Highway 62, in the city of Minneapolis. The southerly third of the lake area is within the DNL 65 noise contour. The lake is circled by a greenbelt area; recreational facilities are located outside the DNL 65 noise contour.

Diamond Lake and Todd Parks are located north of Trunk Highway 62 and east of I-35W, adjacent to each other, in the city of Minneapolis. Todd Park is a 13.24-acre park that includes open play areas and four softball fields. Diamond Lake is a 68.83-acre lake circumvented by a greenbelt. Virtually all of Todd Park and the northeasterly tip of Diamond Lake Park would be within the DNL 65 noise contour.

Taft Park is a 42-acre park southwesterly of the interchange of Trunk Highways 62 and 77, in the city of Richfield. Ten acres of the park are owned by the city of Richfield, and 32 acres are owned by the Metropolitan Airports Commission (MAC) and leased to the city. Both portions are within the DNL 65 noise contour. The park includes the following facilities: four lighted softball fields, a lighted football/soccer field, park buildings, two hockey rinks and a skating area, four basketball nets, as well as playground areas and trails and a fishing pier.

River Ridge Playground is a seven-acre park located at the intersection of River Ridge Road and 88th Street, in the city of Bloomington. It includes two tennis courts, a soccer field, a shelter building and passive play equipment.

The Mississippi National River and Recreation Area, established by Congress in 1988, stretches along the Mississippi River in a 72-mile corridor from a point near Elk River, MN, on the north to a point between Hastings, MN, and Red Wing, MN, on the south. It also includes an approximate four-mile stretch of the Minnesota River that is adjacent to the Mississippi River, near MSP. While the recreation area encompasses about 54,000 acres of public and private lands, very little of it -- approximately 43 acres -- is owned by the federal government. Hence, it is not a Section 4(f) park and recreation area as defined by the Department of Transportation Act. The portion of the recreation area impacted by the MSP alternative is coterminous with Fort Snelling State Park. A management plan for the recreation area has been prepared and is being reviewed, prior to approval, by the Secretary of the Interior. The Draft EIS will analyze the impacts of the MSP alternative on provisions of the management plan for the recreation area.

Rich Acres Golf Course lies immediately east of Trunk Highway 77 on land owned by the Metropolitan Airports Commission. The golf course will be removed to permit development of the MSP alternative. The land is leased to the city of Richfield under terms of a 1978 lease, which includes a provision that the "Commission at any time during the lease term or renewal term shall have the right to retake possession of all or portions of the premises . . . for airport purposes based upon a real and present need for use of such land by Commission for aeronautical or other purposes directly relating to the development and use of the airport . . ." Therefore, under federal Department of Transportation guidelines, if land is owned by a transportation agency and recreation use of the land is only on an interim basis, it is not considered a Section 4(f) publicly-owned park.

R.1.2 Environmental Consequences

These impacts are not known.

R.2 New Airport Alternative

R.2.1 Affected Environment

The APE consists of land to be acquired and land within the DNL 65 noise contours (**Figure 42**).

R.2.2 Environmental Consequences

No parks are within the APE. Snowmobile trails are located in the APE. The locations of these trails may vary from season to season as landowners choose to grant or deny permits for using private property for this use. Each trail averages 10 feet in width with a right-of-way varying from 8 to 50 feet.

These trails are designated by local clubs and funded by the MDNR's grant-in-aid program as well as private sources. Trail maintenance is funded primarily by Minnesota gas tax revenues. The MDNR has no documentation of such grant-in-aid trails being previously impacted and as such does not consider these impacts to be considered under Section 4(f) of the Department of Transportation Act.

R.3 No Action Alternative

R.3.1 Affected Environment

The APE consists of land to be acquired and land within the DNL 65 noise contours (**Figure 41**).

Park and recreation areas in the APE include:

Fort Snelling State Park, owned by the state of Minnesota, is located on both sides of the Mississippi River north and south of I-494. That portion of the park within the DNL 65 noise contour lies between I-494 on the south and Picnic Island on the north and includes the following recreational facilities: hiking trails, a canoe landing, swimming and picnic facilities and a proposed visitor/interpretive center to be located below the Mendota Bridge. Also within the DNL 65 noise contour is a nine-hole golf course southwesterly of the Trunk Highway 5/Trunk Highway 55 interchange that is operated by the Minneapolis Park Board under a five-year agreement with the Minnesota Department of Natural Resources (DNR), which is scheduled to expire November 30, 1997. Fort Snelling State Park, including the facilities operated by the Minneapolis Park Board, has been under the jurisdiction of the DNR since 1971, when the state acquired the land from the U. S. Department of Interior under a quitclaim deed.

Bossen Field is a neighborhood park located in the Wenonah neighborhood of the city of Minneapolis, immediately north of Trunk Highway 62 at 28th Avenue South. The 39.1-acre park includes softball fields, one of which is illuminated for night games, play equipment, a running track, a children's wading pool and a basketball court.

Lake Nokomis is a 407.68-acre lake and park lying on both sides of Cedar Avenue north of Trunk Highway 62, in the city of Minneapolis. The southern lake area is within the DNL 65 noise contour. The lake is circled by a greenbelt area, with the following recreational facilities: baseball, soccer and football fields; two tennis courts, a beach, a community center and a playground.

Diamond Lake and Todd Parks are located north of Trunk Highway 62 and east of I-35W, adjacent to each other, in the city of Minneapolis. Todd Park is a 13.24-acre park that includes open play areas and four softball fields. Diamond Lake is a 68.83-acre lake circumvented by a greenbelt. Almost all of Todd Park and the northeasterly tip of Diamond Lake Park would be within the DNL 65 noise contour.

Minnehaha Creek Parkway East is a linear greenbelt park running along both sides of Minnehaha Creek, in the city of Minneapolis. All of Minnehaha Creek Parkway East comprises more than 240 acres; the area impacted by the no action alternative lies between I-35W on the west and Lake Nokomis on the east. There are bikeways and pedestrian paths located in the greenbelt.

Taft Park is a 42-acre park southwesterly of the interchange of Trunk Highways 62 and 77, in the city of Richfield. Ten acres of the park are owned by the city of Richfield and 32 acres are owned by the Metropolitan Airports Commission (MAC) and leased to the city. Both portions are within the DNL 65 noise contour. The park includes the following facilities: four lighted softball fields, a lighted football/soccer field, park buildings, two hockey rinks and a skating area, four basketball nets, as well as playground areas and trails and a fishing pier.

Washington Park, in the city of Richfield, is being expanded to nine acres. With the completion of construction, it will include the following recreation facilities: a field for softball, soccer and football; two tennis courts, basketball court, volleyball area, playground area, as well as walking trails, open play areas and skating area.

The Mississippi National River and Recreation Area, established by Congress in 1988, stretches along the Mississippi River in a 72-mile corridor from a point near Elk River, MN, on the north to a point between Hastings, MN, and Red Wing, MN, on the south. It also includes an approximate four-mile stretch of the Minnesota River that is adjacent to the Mississippi River, near MSP. While the recreation area encompasses about 54,000 acres of public and private lands, very little of it -- approximately 43 acres -- is owned by the federal government. Hence, it is not a Section 4(f) park and recreation area as defined by the Department of Transportation Act. The portion of the recreation area impacted by the no action alternative is coterminous with Fort Snelling State Park. A management plan for the recreation area has been prepared and is being reviewed, prior to approval, by the Secretary of the Interior.

R.3.2 Environmental Consequences

The impacts will be determined in the EIS.

S. Site Preservation

Site preservation will consider options for preserving the new airport site in Dakota County, should the Minnesota Legislature decide to relocate the existing airport.

The site preservation analysis addresses concerns that have been expressed by elected and agency officials and citizens groups from Dakota County. The workscope for this analysis, which is currently underway, was developed in coordination with these groups, as well as with representatives of the Metropolitan Council.

The site preservation analysis will not determine the impacts of purchasing property for development of a new airport, if construction were to begin immediately following the purchase of the land. Those impacts will be addressed in other sections of the Draft EIS. Rather, the analysis will attempt to determine the impacts of preserving the site for the period of time after the Minnesota legislature decides to relocate the airport and prior to the start of construction.

Preserving a site for a new airport could be accomplished by using two techniques, either singly or in combination. These techniques are:

- Purchasing property in 1998, the base year, and leasing it back (or leasing it out) until airport construction is begun; and

- Limiting development through land use regulation until construction begins, when the property would be acquired.

The analysis will assess the impacts of preserving a site in Dakota County under the following airport development scenarios:

- The site is preserved for 10 years, when air traffic at Minneapolis-St. Paul International Airport is greater than the capacity of the airport and it is decided to proceed with construction.

- Growth in air traffic occurs at a slower rate and it is determined that the capacity of MSP will not be exceeded for 20 years, at which time construction of the new airport proceeds. The site would be preserved for 20 years under this scenario.

As a contingency, one other site preservation scenario will be assessed. If, after preserving the site for 20 years, growth in air traffic at MSP is significantly slower than originally anticipated and it is determined MSP can handle air traffic in the foreseeable future, it could be determined that a new airport is not necessary. At that time, land originally purchased for the airport would be sold.

S.1 Affected Environment

The APE consists of land within the airport property, the DNL 65+ noise contours, and State Safety Zone A. See **Figure 43**. The area includes 18,720 acres, in Marshan, Vermillion, Douglas, Hampton and Nininger Townships.

This APE does not include properties which would be needed for construction of an eight-lane access highway connecting the airport site with Trunk Highway 55.

Most of the property within the site preservation APE is farmland. There are also single-family homes and approximately two dozen non-farm businesses, serving both agriculture and general needs.

S.2 Environmental Consequences

The impacts will be determined in the EIS.

T. Social

Social impacts to be considered include those associated with the disruption of established entities, such as residences and businesses, as well as patterns in a community.

The following impacts will be addressed: relocation of residents and businesses; impacts on employment; and, changes to the use of established community institutions, such as schools and parks. There will be an estimate of the numbers of individuals and households impacted by each airport alternative, as well as an estimate of those displaying specified characteristics. Those characteristics include minority status, income level, renter or homeowner, length of residence in a community, age (estimates of the number of children and the elderly) and disability status.

There will be an analysis of the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 and how the legislation applies to those displaced by each of the alternatives. Included in this analysis will be not only the impacts and costs of relocation but also the availability of replacement housing. In addition, the relocation of businesses and the impact of that relocation will be examined, including the impacts on employees and on the community from which the business is moving. Impacts on businesses will include farming operations affected by development of the new airport alternative. Related issues regarding farming as a business operation will be examined in Section V.K (Farmland).

Social impacts due to changes in surface transportation patterns resulting from airport development will also be addressed, in terms of access to local and regional opportunities and services (i.e., commercial airline service, community business and institutional centers) and emergency vehicle response time.

T.1 MSP Alternative

T.1.1 Affected Environment

The APE will be those areas within the Runway Protection Zones for the new north-south runway. Under FAA guidelines, all structures in the RPZs for new runways, to the extent possible, should be removed. Also, the APE includes properties that would be acquired for access to a new west terminal. Lastly, the APE will be areas on airport property itself where existing buildings will be removed to permit development of the MSP alternative.

Economic impacts are discussed in Section V.I.

T.1.2 Environmental Consequences

The impacts will be determined in the EIS.

T.2 New Airport Alternative

T.2.1 Affected Environment

The APE is the area where residents and businesses will be removed to permit development of the new airport alternative.

The airport site is south and east of the city of Hastings and includes portions of Marshan and Vermillion Townships. It is a rural setting, with agriculture the predominate land use. (Farmland impacts are discussed in Section V.K.) In addition, there are single-family residences and businesses within the airport site.

Properties within the airport property will be acquired for development of the new airport. (Airport property depicted in **Figure 41**.)

The route of the eight-lane highway connecting the airport site to Highway 55 will be identified in the Draft Environmental Impact Statement.

T.2.2 Environmental Consequences

The impacts will be determined in the EIS.

T.3 No Action Alternative

The no action alternative will result in no social impacts. All planned and proposed projects involve on site construction involving no displacement of residents and businesses.

U. Section 4(f)

The intent of Section 4(f) of the Department of Transportation Act is to protect specific types of publicly-owned land from use by transportation agencies unless there is no feasible and prudent alternative to the use of that land and unless the project is planned so that harm resulting from the use of the publicly-owned land is minimized.

These publicly-owned lands include parks, recreation areas, wildlife and waterfowl refuges of national, state or local significance, and historic sites of national, state or local significance. The determination of significance is made by the officials having jurisdiction over the property. In addition, the determination of significance must consider the entire property and not simply the portion of the property being used for the proposed project.

U.1 MSP Alternative

U.1.1 Affected Environment

The areas of potential effect for Section 4(f) land are described in parts B, M, R and FF of this section.

Section 4(f) lands in the APE are:

Archeological resources: No sites within undisturbed or minimally disturbed portions of the existing airport have been identified. Potential sites within built-up portions of the existing airport have yet to be investigated.

Historic/architectural resources: the Original Wold-Chamberlain Terminal Historic District, the Old Fort Snelling Historic District, Fort Snelling National Cemetery, Hale Elementary School, West Lake Nokomis Residential Historic District, Spruce Shadows Farm Historic District, the Soo Line Corridor, as well as a part of the Fort Snelling National Historic Landmark District.

Parks and recreation areas: Fort Snelling State Park; in Minneapolis, Bossen Field, Lake Nokomis, Diamond Lake Park, Todd Park; in Richfield, Taft Park; in Bloomington, River Ridge Playground.

Wildlife refuges: the Minnesota Valley National Wildlife Refuge.

U.1.2 Environmental Consequences

The impacts will be determined in the EIS.

U.2 New Airport Alternative

U.2.1 Affected Environment

The areas of potential effect for Section 4(f) land are described in parts B, M, R and FF of this section.

Section 4(f) lands within the APE are:

Archaeological resources: potentially includes two Native American habitation sites and two Euro-American homesteads.

Historic/architectural resources: a farmstead at 22005 Lewiston Boulevard and Chimney Rock.

Parks and recreation areas: there are no parks and recreation lands in the APE.

Wildlife refuges: there are no wildlife refuges in the APE.

U.2.2 Environmental Consequences

The impacts will be determined in the EIS.

U.3 No Action Alternative

U.3.1 Affected Environment

The areas of potential effect for Section 4(f) land are described in parts B, M, R and FF of this section.

Section 4(f) lands in the APE are:

Archeological resources: No sites within undisturbed or minimally disturbed portions of the existing airport have been identified. Potential sites within built-up portions of the existing airport have yet to be investigated.

Historic/architectural resources: the Original Wold-Chamberlain Terminal Historic District, the Old Fort Snelling Historic District, Fort Snelling National Cemetery, Hale Elementary School, West Lake Nokomis Residential Historic District, Spruce Shadows Farm Historic District, the Soo Line Corridor, as well as a part of the Fort Snelling National Historic Landmark District.

Parks and recreation areas: Fort Snelling State Park; in Minneapolis, Bossen Field, Lake Nokomis, Diamond Lake Park, Todd Park; in Richfield, Taft Park; in Bloomington, River Ridge Playground.

Wildlife refuges: the Minnesota Valley National Wildlife Refuge.

U.3.2 Environmental Consequences

The impacts will be determined in the EIS.

V. Solid Waste Impacts

Solid waste to be considered is the municipal solid waste (MSW) generated by the airport.

V.1 MSP Alternative

V.1.1 Affected Environment

The APE consists of the solid waste management system which serves Hennepin County and the metropolitan area.

The MSP facility is located within Hennepin County. According to Hennepin County records, approximately 750,000 tons of mixed municipal solid waste requiring management/disposal were generated within the County in 1994. The primary processing facilities used to manage Hennepin County solid waste are: a) the Hennepin Energy Resource Company (HERC) waste-to-energy facility located in downtown Minneapolis, and b) the Elk River Resource Recovery Facility (ERRRF) located outside of Elk River, MN. The HERC facility is owned by Ogden Martin, Inc, and processes approximately 1,000 tons per day. The ERRRF facility is owned by United Power Association (under contract to Northern States Power) and processes approximately 1,500 tons per day. Hennepin County also has waste capacity sharing agreements with neighboring counties, most notably with Ramsey and Washington Counties (Newport refuse derived fuel facility). There is an extensive network of waste haulers which currently service

Hennepin County. These haulers have ready access to the airport facility through Trunk Highway 5 or Trunk Highway 62.

The Hennepin County Solid Waste Management Master Plan (November, 1992) presents estimates for Hennepin County generation of mixed municipal solid waste generation through 2010 as prepared by Hennepin County and by the Metropolitan Council. These estimates were extrapolated to 2020 using the rates of increase assumed by Hennepin County and the Metropolitan Council. The projected 2020 Hennepin County generation of solid waste is 805,000 tons using the Hennepin County figures, and 986,400 tons using the Metropolitan Council figures.

There are six primary generators of solid waste at MSP which contract to have waste removed from the airport and managed off-site. These entities, along with the approximate annual generation rates associated with each, are presented on **Table 7.**

TABLE 7 - MSP Solid Waste Generators

Generator	Annual Tons Generated (Approx.)
Metropolitan Airports Commission	3,500
Caterair International	2,700
Northwest Airlines	1,700
Air National Guard	100
Air Force Reserve	250
McDonalds Restaurant	100
TOTAL	8,350

The total generation of solid waste at the MSP facility is currently about 8,350 tons per year.

Based on the above rates, there were approximately 1.5 lbs of solid waste generated at MSP per enplanement in 1994. This unit generation rate was used to estimate the solid waste requiring management in 2020 for the MSP Alternative at 12,700 tons. This is seen as being a conservative (high) figure, because it does not account for gains in recycling rates which are anticipated for the future.

V.1.2 Environmental Consequences

Solid waste generated by the MSP Alternative represents between 1.3 percent and 1.6 percent of the overall solid waste stream in Hennepin County that will require management. The expansion and continued use of MSP will not adversely impact the waste management system within Hennepin County.

V.2 New Airport Alternative

V.2.1 Affected Environment

The APE consists of the landfills, transfer stations and waste processing facilities in the Metropolitan Area.

The existing airport is located in Hennepin County, whose solid waste management plan provides for an integrated waste management system of transfer stations, waste processing, combustion facilities, recycling programs and facilities, yard waste composting and landfilling. A new airport near Hastings would fall within the jurisdiction of Dakota County's waste management plan, which has provisions for resource recovery, recycling, yard waste composting and landfilling. Existing waste management facilities in Dakota County include public and private operations which provide recycling services, yard waste composting and landfilling for municipal solid waste and for demolition waste.

V.2.2 Environmental Consequences

Development of a new airport facility in Dakota County will result in relocation of waste generating activities from the present site to the new facility. State law obligates MAC to seek to achieve significant recycling of wastes. Wastes from the new airport which will not be recycled will be managed through available disposal alternatives. The exact mix of facilities which may be available at the time a new airport becomes operational cannot be identified with certainty at this time.

V.3 No Action

V.3.1 Affected Environment

The affected environment is the same as that for the MSP Alternative.

V.3.2 Environmental Consequences

There would be less solid waste generated under the No Action Alternative than the MSP Alternative (fewer enplanements). The No Action Alternative will not have significant impact on the waste management system serving Hennepin County.

W. Transportation Access

Transportation access includes the surface transportation system serving the airport (roads, highways, bridges and transit facilities and services).

W.1 MSP Alternative

W.1.1 Affected Environment

The APE consists of all roadways and bridges affected by airport-related traffic.

Figure 44 shows 1992 daily traffic ground counts for the airport area and its environs and the 2020 forecast is given in **Figure 45**. The airport currently accesses the regional highway system at several points. The primary access point is Glumack Drive off TH 5 which serves both the Lindbergh Terminal, several car rental agencies, a branch of the U.S. Post Office and provides employee access to Northwest Airlines maintenance facilities. The next busiest access point to the airport is 34th Avenue off of I-494 which provides access to more Northwest Airline facilities, aircargo companies, the HHH International Terminal and fixed base operators. This street also provides access to the National Cemetery. Several other access points serve other airport-related businesses, the GSA Building, residential areas, airport facilities and several military bases.

Truck traffic accesses the airport at several locations, but primarily at 28th Avenue from TH 62 and 34th Avenue from I-494. The percent of truck traffic on these roads is five to six percent, totalling almost a thousand truck trips a day, with over seventy-five percent located on 34th Avenue.

The airport is served by transit and paratransit (courtesy vehicles, limousines, limo. service, buses and taxis) service. All forms of transit and paratransit carry just under two percent (1.8%) of all person trips to and from the airport. Buses carry only two-tenths of a percent of the total person trips.

W.1.2 Environmental Consequences

The impacts will be determined in the EIS.

W.2 New Airport Alternative

W.2.1 Affected Environment

Information from the 1990 Travel Behavior Inventory (TBI) indicates that the area of the airport site has ties to the greater portion of the region. On a daily basis trips were made to virtually every part of the region. Some of the strongest ties (outside of central Dakota County) were to the Shakopee-Prior Lake-Burnsville area, the Bloomington-Richfield-Edina area, southwestern Washington County, and the Inver Grove Heights-South St. P-West St. Paul area. However, some trips did travel as far as Carver County and northern Anoka County.

The existing 1992 average daily traffic (ADT) is shown on **Figure 46** and the 2020 forecast is given in **Figure 47**.

W.2.2 Environmental Consequences

The impacts will be determined in the EIS.

W.3 No Action Alternative

W.3.1 Affected Environment

Figures 44 and 46 show the 1992 traffic ground counts for the airport areas and environs. The No Action 2020 daily traffic forecasts are given in **Figures 48 and 49.** The existing environment is described in Section V.W.1.1. The existing airport currently accesses the regional highway system at several points.

W.3.2 Environmental Consequences

The impacts will be determined in the EIS.

X. Major Utilities

Major utilities are defined as the major trunk lines that feed the utilities that provide service on a local basis. Major utility impacts are evaluated to determine the extent to which major utility systems will need to be expanded or relocated for the alternatives.

X.1 MSP Alternative

X.1.1 Affected Environment

The affected environment is those areas on the periphery of the airport that contain major power lines that are not compatible with the expanded airport. The incompatibility would most likely be due to airspace incursions or interference with electronic navigational aids. The affected environment also includes those areas where the power lines must be relocated in order to not interfere with airport operations.

X.1.2 Environmental Consequences

A 69 KV power line which runs along 79th Street is incompatible with the approach to proposed north-south runway. The size of the power line is such that it should be feasible to bury it. If this course of action is followed there should not be a significant environmental impact.

X.2 New Airport Alternative

X.2.1 Affected Environment

The affected environment is those areas on the periphery of the airport that contain major power lines that are not compatible with the expanded airport. The incompatibility would most likely be due to airspace incursions or interference with electronic navigational aids. The affected environment also includes those areas where the power lines must be relocated to, in order to not interfere with airport operations.

Two power lines run through the proposed new airport site. The first is a 69KV line that runs east/west along 190th Street (C.O. RD 62) and north/south along Joan Ave.(C.O.89). The second power line is a 345 KV line that runs east/west parallel to, and approximately 1/2 mile north of 220th Street. These power lines are shown in **Figure 50**. Both of these power lines must be relocated in order to provide proper airspace clearance, and protection of navigational aid signals.

X.2.2 Environmental Consequences

A corridor will be identified for the relocation of each of these power lines. The impacts in these corridors are not known.

X.3 No Action Alternative

There are no impacts.

Y. Visual Impacts

Visual impacts are those created when airport improvements, both airside and landside, are a barrier to seeing natural vistas surrounding the airport site.

Y.1 MSP Alternative

Y.1.1 Affected Environment

The APE is the existing airport, which encompasses 2,480 acres northwest of the confluence of the Mississippi and Minnesota Rivers. It has natural elevations that range from 810 feet above sea level near the intersection of Trunk Highway 5 and the airport access road, to an elevation of 851 feet above sea level easterly of the military installations and 850 feet at the northerly part of the Rich Acres Golf Course, east of Trunk Highway 77.

The FAA tower, at approximately 963 feet, is the tallest existing building at MSP, located at an elevation of 828 feet; an antenna extends another 10 feet on top of the FAA tower. The heights of other buildings at MSP, including the proposed terminal building built at a location where the elevation, are less than the height of the tower. The height of the proposed terminal building, to be constructed at a location where the elevation is approximately 820 feet above sea level, would not exceed 900 feet in height.

Y.1.2 Environmental Consequences

The airport property provides broad expanses of open space surrounding existing buildings and structures. The FAA tower is almost a mile from the closest residential neighborhood. While the FAA tower can be seen from areas surrounding the airport, it does not present an intrusion on the vistas found at MSP. It is concluded that the MSP alternative would not significantly impact the existing vistas.

Y.2 New Airport Alternative

Y.2.1 Affected Environment

The APE is Marshan and Vermillion Townships, where the new airport would encompass 14,100 acres in an area south and west of the city of Hastings, in Dakota County. Elevations of the land proposed for airport development range from 900 feet above sea level at the southwesterly portion of the site, to 820 feet above sea level at the northeasterly portion of the site. It is expected that the control tower will be the tallest building on the base airport property; the height of the control tower is not expected to exceed 1,000 feet. The control tower will be located in the terminal area, a distance of almost four miles from the closest population center, the town of Vermillion west of the airport property.

Y.2.2 Environmental Consequences

The airport property of the new airport alternative will include expanses of open spaces surrounding landside facilities. Airport facilities will be constructed at heights to meet FAA regulations to avoid hazards to aircraft. As such, the heights of buildings are not expected to intrude on the vistas at the airport site. It is concluded that buildings proposed for construction for the new airport alternative will not significantly impact existing vistas.

Y.3 No Action Alternative

There are no visual impacts.

Z. Wastewater

Wastewater consists of domestic sanitary and industrial wastes. Under the MSP and No Action Alternatives, wastewater would be discharged to the Metropolitan Council Wastewater Services (MCWS) interceptor and treatment system. Under the New Airport Alternative, wastewater would be treated with an on-site facility.

Z.1 MSP and No Action Alternatives

Z.1.1 Affected Environment

The APE is the MCWS interceptor conveyence network and the MCWS Metro Treatment plant on Child's Road in St. Paul.

Currently, approximately 500 million gallons of total wastewater is generated annually at MSP. This figure includes domestic sanitary and industrial wastewater. The primary sources of industrial wastewater are aircraft maintenance facilities and the Caterair flight kitchen. Approximately 85 percent of MSP wastewater discharges to the Minneapolis sewer system, with approximately 15 percent discharging to the Richfield sewer system. **Figure 51** depicts the sewer lines on the airport (MAC property). All sanitary wastewater from MSP is ultimately delivered to the MCWS Metro Treatment plant located on Childs Road in St. Paul. The Metro plant is an activated sludge facility providing secondary treatment, and is the largest treatment

facility in the Minneapolis/St. Paul metropolitan area. It has a rated capacity of 250 million gallons per day (annual average) and discharges to the Mississippi River.

Z.1.2 Environmental Consequences

Potential impacts will be determined in the EIS.

Z.2 New Airport Alternative

The discussion of wastewater for the New Airport Alternative is included in Surface Water Quality, BB.2.

AA. Water Supply

The following types of water supply will be considered:

- potable/domestic
- cooling water
- industrial (flight kitchen and aircraft maintenance bases); and
- fire control.

AA.1 MSP and No Action Alternatives

AA.1.1 Affected Environment

The APE consists of the two sources of water supply for MSP — the Prairie du Chien/Jordan Sandstone aquifer, and the City of Minneapolis. **Table 8** provides information regarding the types of water usage at the airport and the associated water supply sources.

Prairie du Chien/Jordan Sandstone

The Prairie du Chien Group and the Jordan Sandstone (PdC/Jordan) generally function as one aquifer because there is no regional confining bed between them. All of the water supply wells which are used at MSP draw from the PdC/Jordan aquifer. It is the preferred source of groundwater supply in the metro region and beyond because of its favorable water transmission characteristics and relative consistency of high yields, as well as proven well designs and construction techniques. The production capacity associated with PdC/Jordan wells typically ranges from 1,000 gallons per minute (gpm) to in excess of 2,000 gpm.

In 1988, the MAC commissioned a hydrogeologic investigation regarding the potential construction of a fourth well to supply non-contact cooling water. Based upon review of existing literature and well log information, and upon extensive pump test information, this study (Metropolitan Airports Commission Water Supply Investigation (B. A. Liesch Associates, January 1989) concluded that a fourth water supply well could be constructed to serve the Energy Center which would perform consistently with existing wells, and which would not

TABLE 8 - MSP Water Supply Functions/Sources

Function	Facility/Location	Water Source
Potable/Domestic	All facilities except NWA Building B	City of Minneapolis
	NWA Building B	Wells-PdC/Jordan aquifer
Cooling systems	MAC system	Wells-PdC/Jordan aquifer[1](>90%) City of Minneapolis (<10%)
	NWA system	Wells-PdC/Jordan aquifer[2]
Industrial	NWA Building B	Wells-PdC/Jordan aquifer
	NWA Building C	City of Minneapolis
	Caterair Flight Kitchen	City of Minneapolis
Fire Control	All facilities/areas other than NWA Building B	City of Minneapolis
	NWA Building B	Wells-PdC/Jordan aquifer

NOTE: NWA = Northwest Airlines
PdC = Prairie du Chien

[1]In 1998, the MAC will convert its primary cooling system to a "closed loop" configuration which will utilize Minneapolis water as opposed to well water.
[2]As of June 1995, NWA will use a "closed loop" cooling configuration which will utilize Minneapolis water as opposed to well water.

impact the performance of the existing wells. The fourth well was constructed later in 1989, and has performed as anticipated.

According to regional information and water levels measured at MSP, the PdC/Jordan Aquifer is believed to discharge to the Minnesota River at the airport location. Since there are no water supply wells between the airport and the Minnesota River, the use of water from this aquifer for airport activities would likely not affect water availability for downgradient users.

City of Minneapolis Water System

The sole water supply source for the City of Minneapolis water works is the Mississippi River. The City has approximately 100,000 accounts and supplies approximately 65 million gallons per day (yearly average). Peak delivery on the Minneapolis system takes place during the summer months and can reach 180 million gallons per day. Minneapolis water is delivered to MSP from a trunk water main (48"). The feeder to the airport is an 18" pipe which comes off the 48" main at 56th Street and 38th Avenue. The water main distribution system on the airport itself is presented on **Figure 52.**

AA.1.2 Environmental Consequences

Prairie du Chien/Jordan Aquifer

Over the last two years the MAC has drawn an average of 375 million gallons (combined total) of water from its four MSP wells, and Northwest Airlines has drawn an average of 400 million gallons (combined total) from its two MSP wells. In June of 1995, Northwest airlines will begin using a new "closed loop" cooling system which will use water from the City of Minneapolis. This will decrease Northwest's requirements for groundwater drawn from the PdC/Jordan aquifer by approximately 175 million gallons per year. In 1998, the MAC will also convert to a closed loop system, which should decrease its requirements of well water by approximately 280 million gallons per year.

The water bearing characteristics of the PdC/Jordan aquifer in the area of MSP are well understood. Existing well water use associated with airport operations does not significantly impact water availability for other users of the aquifer. Water demand for the airport will substantially decrease as Northwest airlines and the MAC convert to cooling systems which will not utilize well water. Because of these factors, analysis in the EIS regarding the demand associated with the MSP and No Action Alternatives on the PdC/Jordan aquifer is not warranted.

City of Minneapolis Water System

Potential impacts will be determined in the EIS.

AA.2 New Airport Alternative

AA.2.1 Affected Environment

The APE consists of the Prairie Du Chien Aquifer and the existing wells affected by the New Airport Alternatives.

The new airport site is located in an area which is over the Prairie DuChien Aquifer. Some areas of the site have relatively little separation between the surface and the aquifer. Restrictions exist on use of new wells to the Prairie DuChien for a potable water supply for much of the site area. The Prairie DuChien aquifer likely has sufficient capacity to supply airport water needs; however, it is already heavily used for water supply purposes.

There are numerous existing wells within the site and in the vicinity of the site.

AA.2.2 Environmental Consequences

The impacts will be determined in the EIS.

BB. Surface Water Quality

For the MSP and No Action Alternatives, the source of potential impact on surface water quality is storm water discharge. For the New Airport Alternative, the sources of potential impact on surface water quality are a) storm water discharge, and b) discharge from the envisioned on-site wastewater treatment facility.

The storm water quality parameters to be considered are carbonaceous biochemical oxygen demand ($CBOD_5$), nitrogen/ammonia, pH, total suspended solids (TSS), and oil and grease (OG). The primary activities/materials which can impact on these parameters are:

- $CBOD_5$ -- glycol products used for aircraft and ground surface deicing operations;
- nitrogen/ammonia -- urea used for ground surface snow/ice control operations;
- pH -- urea used for ground surface snow/ice control operations;
- TSS -- expanse of hard surfaced areas upon which airport operations take place; and
- OG -- aviation fueling activities.

For the MSP and No Action Alternatives, phosphorous will not be addressed in the EIS. There are no known sources of phosphorous specifically related to airport operations. Water quality monitoring results for phosphorous at MSP have historically been in the same range as typical urban run-off. Phosphorous is not regulated under the current MSP NPDES permit.

BB.1 MSP and No Action Alternatives

BB.1.1 Affected Environment

The APE consists of the existing stormwater drainage/control system and the waters receiving the runoff/discharge.

Stormwater Drainage/Treatment System

MSP is, with minor exceptions, a self-contained watershed. There is very little off-site drainage which flows onto MAC property. The Airport property is divided into four sub-watersheds, each draining to its own outfall (see **Figure 53**); these are: Mother Lake, Snelling Lake, Minnesota River North, and Minnesota River South. The four drainage areas discharging from MSP comprise approximately 2,600 acres, of which approximately 1,135 are hard surfaced.

Most of the run-off from the Mother Lake drainage area flows initially into a detention pond which is referred to as Duck Lake; discharge from Duck Lake to Mother Lake occurs rarely, if ever. Run-off from the Snelling Lake drainage area flows to the Minnesota River through two detention ponds constructed in series. Snelling Lake can also receive run-off from this drainage area. This would occur during storms larger than a 10-year recurrence event via an emergency spillway at the first detention pond or if the gate at the second detention pond outlet control structure is manually opened to allow discharge into Snelling Lake. This only occurs when Fort Snelling State Park officials wish to augment lake levels. The Minnesota River South drainage area flows to the Minnesota River through a detention pond. The Minnesota River North drainage area flows to the Minnesota River through a control structure at an earthen embankment. The embankment is designed to contain stormwater in the event of a fuel spill, but a permanent pool is not currently maintained.

The stormwater detention ponds were designed and constructed primarily to provide capability to contain fuel spills in the event of fuel spills reaching the storm sewer system. The detention basins also provide limited sediment removal, but essentially no ammonia or BOD removal.

Receiving Waters

Duck/Mother Lake:
Duck Lake is approximately 8 acres in size and Mother Lake is approximately 100 acres in size. The Minnesota Department of Natural Resources (DNR) and the Minnesota Pollution Control Agency (MPCA) were contacted to determine if any historical water quality data exists for these bodies of water. These agencies are not aware of any such data.

Minnesota River:
The Minnesota River is one of the most polluted rivers in the state. It flows 335 miles through the state, including some of the state's richest agricultural land. Pollutants of greatest concern in the river are nutrients, oxygen demanding materials, sediments and bacteria. Elevated levels of these pollutants are primarily the result of non-point source loading. The most significant non-point sources are as follows:

- agricultural fields;
- feedlots;
- roads;
- septic tank discharges;
- parking areas;
- construction sites;
- mining operations; and
- lawns.

The first of three MSP outfalls on the Minnesota River is located approximately four miles upstream of the confluence of the Minnesota River and the Mississippi River. The Minnesota River carries a substantial pollutant load from the sources identified above prior to arriving at these lower reaches. Of note are the concentrations and mass loadings of $CBOD_5$, TSS, unionized ammonia (NH_3) and total phosphorus (P), as well as the resultant turbidity and decreased dissolved oxygen (DO) levels.

The Minnesota River is a major tributary to the Mississippi River. The Mississippi River has substantially higher water quality and greater flow than the Minnesota River at their confluence. The 1988 Mississippi River Low Flow Survey (Metropolitan Waste Control Commission, August 1989) shows dissolved oxygen levels in the Mississippi River immediately upstream of the confluence to be four to five mg/l higher than those in the incoming Minnesota River. It also shows concentrations of TSS, un-ionized ammonia, and total phosphorous to be substantially lower in the Mississippi River than the Minnesota River. The Minnesota River Assessment Project Report (Minnesota Pollution Control Agency, January 1994) notes that from 1976 to 1991, TSS concentrations in the Minnesota River averaged 5.6 times those in the Mississippi River, and average flows in the Mississippi were 1.8 times those of the Minnesota River at the confluence.

Biochemical Oxygen Demand

There are two activities and associated chemicals unique to airport operations which can cause elevated loadings of carbonaceous biochemical oxygen demand ($CBOD_5$): a) aircraft deicing; and b) ground surface snow/ice control. Through the 1994/95 winter season, the most significant source of CBOD loading to the MSP stormwater system by an overwhelming margin was the use of glycol products during aircraft deicing operations. Over the last four winter seasons, an average of approximately 600,000 gallons per season of glycol product have been used at MSP to deice aircraft. In the future, an increasingly significant source of CBOD loading will likely be new ground surface snow/ice control chemicals such as sodium formate and potassium acetate. It is anticipated that these chemicals will be used to replace urea.

Un-Ionized Ammonia/pH

The only significant source of ammonia loading and problematic pH conditions in MSP stormwater is the use of urea as a ground surface snow/ice control agent. Urea breaks down to ammonia, which is a weak base. Ammonia is soluble in water and is found in two forms, ionized and un-ionized. The un-ionized form can be toxic to aquatic life. Over the past four seasons, the MAC has used an average of approximately 750 tons of urea per winter for ground surface snow/ice control purposes.

During the 1993/94 winter, MAC began to work with potassium acetate as a liquid ground surface snow/ice control product. Potassium acetate has no nitrogen content and thus no potential to cause loading of un-ionized ammonia to receiving waters. The work with potassium acetate was enhanced in the 1994/95 season and will continue in the future.

MAC intends to commence the use of sodium formate on a trial basis during the 1995/96 winter season. Sodium formate is a granular product which is used like urea and which could be a replacement for urea. Like potassium acetate, it would not cause loading of un-ionized ammonia to receiving waters. This product has been extensively and successfully field tested in Canada and has received approval for use at airports by Transport Canada and the U.S. Federal Aviation Administration (FAA). With successful trial testing of sodium formate and/or sodium acetate (another granular product which reportedly works like urea but contains no nitrogen) the MAC will ultimately eliminate the use of urea at MSP.

Total Suspended Solids

The primary source of elevated levels of total suspended solids (TSS) to the MSP stormwater drainage system is the expanse of hard surfaced areas upon which airport operations take place. A total of 1,135 acres of hard surfaced area are served by the MSP stormwater drainage system. MAC keeps operating surfaces as free of sand and grit as possible, through extensive sweeping and other measures, because this type of loose material gets pulled into jet engines and can cause excessive mechanical wear.

As discussed in the Minneapolis-St. Paul International Airport Decision Report for Stormwater Control Measures (Metropolitan Airports Commission, December 1994), the MAC intends to enhance its existing stormwater drainage facilities to improve TSS control. For each of the four surface water drainage areas, detention ponds will be improved or constructed such that National Urban Runoff Program (NURP) or comparable design standards (Detpond) for wet detention are met. Based upon discussion with Minnesota Pollution Control Agency (MPCA)

staff, it is anticipated that Detpond design criteria will meet NPDES requirements for TSS control at MSP.

Oil and Grease

The most significant source category for oil and grease loading at MSP is aircraft fueling and the associated support facilities and operations. All aviation fuel storage and handling at MSP is the responsibility of tenants which perform aircraft fueling operations.

There are two primary aviation fueling systems which are utilized at MSP. First, fueling of aircraft at the main terminal is conducted using a hydrant system operated by Signature Minneapolis Fuel Consortium (MFC), Inc. Fuel from off-site suppliers is pumped underground either directly to the hydrant system or to a MAC-constructed fuel farm. This fuel farm is located on Post Road just west of Trunk Highway 5, and consists of three aboveground tanks with a combined storage capacity of 6.9 million gallons. From the fuel farm, product is pumped through underground piping to hydrants at each gate position in the main terminal. There are also two hydrants in the ramp area of the Northwest Airlines Main Maintenance Base (Building B) which are used on an infrequent basis to fuel military charter aircraft.

The second aviation fueling system at MSP is operated by Signature Ground Support Corporation (Signature GS). Signature GS utilizes tanker trucks to load fuel onto aircraft. These tanker trucks are filled at either the underground tank facility at the HHH International Terminal or the underground tank facility located at the Executive Terminal. Signature GS's aircraft fueling operations take place at the HHH International Terminal, the Regional Terminal, the Signature Executive Terminal, and the Southwest Cargo Ramp.

Additional tanker truck fueling operations are performed by the Air National Guard and the Air Force Reserve on their respective facilities.

Tenants which perform aviation fueling activities have National Pollutant Discharge Elimination System (NPDES) General Permit responsibilities to limit the loading of pollutants to surface water run-off from their facilities. Under NPDES requirements, they must generate Stormwater Pollution Prevention Plans (SWPPPs) for their respective facilities. All the facilities at MSP associated with both aviation and non-aviation fueling operations are identified in the Oil Spill Prevention Control and Countermeasure Plan--Minneapolis St. Paul International Airport (Metropolitan Airports Commission, June 1993, revised November 1993).

BB.1.2 Environmental Consequences

Biochemical Oxygen Demand

Potential environmental impacts will be evaluated in the EIS.

Un-Ionized Ammonia/pH

With the anticipated elimination of urea use at MSP, un-ionized ammonia and pH will not be an issue regarding NPDES compliance for the MSP facility. In the very unlikely event that urea were still in use at MSP in 2020, a treatment system utilizing air stripping facilities at each outfall almost certainly would have been implemented to maintain compliance with NPDES permit requirements. No analysis for this parameter will be required in the EIS.

federal, state and local requirements regarding minimizing environmental impact on groundwater and surface water resources.

All the facilities at MSP associated with both aviation and non-aviation fueling operations are identified in the Oil Spill Prevention Control and Countermeasure Plan--Minneapolis St. Paul International Airport (Metropolitan Airports Commission, June 1993, revised November 1993). Spill Prevention Control and Countermeasure Plans (SPCCPs) document structural and operational controls to minimize the potential for spills and associated environmental impact. The SPCCP for MSP compiles summary information on tenant facilities and provides control documentation for MAC non-aviation fueling facilities and operations.

Aircraft Deicing Operations

Based upon extensive glycol tracking and mass balance analysis performed at MSP, approximately 60 percent of the glycol applied for aircraft deicing purposes during the 1993/94 season did not run into the storm sewer system. It is assumed that the majority of this glycol infiltrated soils at the following locations:

- through cracks in pavement at points of glycol application and/or along taxiway routes (residuals dripping from applied aircraft), and/or runways (residuals shearing during takeoff);
- snow stockpile locations;
- grassed areas adjacent to glycol application areas and/or taxiway routes, and/or runways.

The general biodegradability of glycols has been extensively studied, and existing literature indicates that glycols are readily biotreated in soils. Both ethylene and propylene glycol (the only types of glycol currently used in aircraft deicing products) have chemical compositions similar to simple sugars and are very amenable to biodegradation, both aerobically and anaerobically.

In an article entitled "Biodegradation of Aircraft Deicing Fluids in Soil at Low Temperatures" (Ecotoxicology and Environmental Safety; vol. 25, 1993) G.M. Klecka et al. provide the results of and discussion regarding experimentation which they performed. The results of the study showed that all the glycols analyzed were very biodegradable by soil microorganisms. There was no measured toxicity of the soil microorganisms even at the highest glycol loading, which was approximately 5,000 mg glycol/kg soil. The average degradation rate ranged from 3 mg glycol/kg soil/day at -2° C to 25 mg glycol/kg soil/day at 8° C to 80 mg glycol/kg soil/day at 25° C.

CC.1.2 Environmental Consequences

Development associated with the MSP Alternative would not have substantial impact on the potential for fueling operations and facilities to impact groundwater. The MSP scenario is seen as being a marginal improvement over the existing MSP conditions in this regard. This is because:

- International flights would be serviced at the redeveloped main terminal (which in 2020 would be the southeast terminal). This would be in (hydrogeologic) Zone A, as opposed to Zone B.

- Air cargo fueling operations would take place on the western edge of the airfield or directly north of the existing HHH terminal (both locations in Zone B), as opposed to the existing Southwest Cargo Ramp which is in Zone C.

- Any new pipelines, tanks or other fuel handling installations may have improved spill/leak prevention and containment measures relative to existing installations.

With the MSP Alternative, aircraft deicing activities would take place on dedicated deicing locations ("pads") with underdrainage segregated from the main MSP storm sewer system. These pad facilities would be designed specifically to maximize the capture of spent glycol fluids at the point of glycol application, and would be located at runway ends such that taxiing requirements between glycol application and takeoff would be minimized. Use of these facilities would substantially decrease the amount of glycol product infiltrating soils at MSP.

The geology and hydrogeology of the MSP facility are well understood and there have been no observed impacts from MSP activities to the St. Peter Sandstone or Prairie du Chien/Jordan aquifers. The existing airport site is an attractive hydrogeological setting in terms of natural protection of significant aquifers from potential airport-related impacts. Development associated with the MSP Alternative would not substantially affect the potential for fueling operations to impact groundwater relative to existing conditions. If anything, it is believed that the this potential would be somewhat decreased. With the utilization of dedicated deicing pads, the potential for groundwater impact associated with aircraft deicing operations would be decreased relative to existing conditions.

In light of the information and factors presented above, further investigation of the potential for groundwater impacts associated with the MSP Alternative in the EIS is not warranted.

CC.2 New Airport Alternative

CC.2.1 Affected Environment

The airport site is comprised mostly of mixed outwash and outwash soils which are sandy, loamy sand and gravel (**Figure 56**). These soils overlay the dolomitic limestone bedrock which comprises the Prairie DuChien Aquifer. Bedrock is 50 feet or less beneath the surface for most of the southern half of the site (**Figure 57**). The depth to bedrock increases over the northern half of the site to about 400 feet, due to a buried bedrock valley along the course of the Vermillion River.

Due to the soils, geologic and hydrogeologic setting of the new airport site, there is potential for contaminants to reach groundwater if they are released on unprotected areas of the site. Fuel storage facilities and water quality basins have been located on areas of the site where there is more than 50 feet of soil above bedrock.

C.C.2.2 Environmental Consequences

The impacts will be determined in the EIS.

CC.3 No Action Alternative

CC.3.1 Affected Environment

The affected environment is the same as that for the MSP Alternative.

CC.3.2 Environmental Consequences

Fueling facilities and operations are currently regulated by Federal, State, and local requirements to limit environmental impact on groundwater and surface water resources. As was discussed in CC.1. of this section, MSP is in an advantageous hydrogeological setting, and no impacts associated with airport activities have been detected in the St. Peter or PdC/Jordan aquifers.

Dedicated deicing pads might or might not be utilized for glycol containment under the No Action Alternative. As was discussed in CC.1.2, the construction and use of such pad facilities would substantially decrease the amount of glycol product infiltrating soils relative to existing conditions. Even if pads are not constructed under the No Action Alternative, the current glycol containment program will be enhanced such that the percentage of "unaccounted for" glycol (that which is not contained or discharged into receiving waters) will be significantly reduced. Measures such as the following will effectively limit the amount of glycol reaching soils:

- sealing of pavement cracks;
- limiting the number of and size of deicing locations; and
- structural and operational improvements to promote rapid and efficient runoff of glycol-impacted stormwater directly to designed containment.

As was discussed in Section CC.1., glycols are readily biotreated in soils. With enhancements to the glycol-impacted stormwater containment system, the treatment capacity associated with soils for glycol, and the advantageous hydrogeological setting present at the airport, the potential for glycol product impacting groundwater resources in the year 2020 under the No Action Alternative is considered minimal.

In light of the above discussion and information presented in CC.1., further investigation in the EIS of the potential for groundwater impacts associated with the No Action Scenario is not warranted.

DD. Wetlands

Jurisdictional wetlands are regulated by; (1) the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act (see 33 C.F.R. Parts 320 and 330), (2) the Minnesota Department of Natural Resources under Minn. Stat. 103G.245 (public water wetlands only) and (3) the Minnesota Board of Water and Soil Resources under the Wetland Conservation Act (Minn. Stat. 103G.222). Executive Order 11990 on the Protection of Wetlands (May 24, 1977) also requires federally funded or authorized projects to include all practicable measures to minimize harm to wetlands.

DD.1 MSP Alternative

DD.1.1 Affected Environment

The APE for wetlands associated with the MSP alternative consists of the existing MSP property and any contiguous property that would be affected by the MSP Long Term Comprehensive Plan. A total of 13 wetland basins exist within MSP (**Figure 58**) with a cumulative acreage of approximately 200.1 acres. Eight of these basins lie within the Rich Acres Golf Course and are ponds or water hazards that were either created from upland or constitute excavated remnants of pre-existing wetlands, the remainder of which have been filled. The characteristics of these wetlands are discussed in Section V.C. of this Scoping Report. Wetland resources existing within or potentially affected by MSP are summarized in **Table 10**.

TABLE 10 - Wetland Resources within MSP

Basin	Size (Acres)	Cowardin Classif.	Notes
Mother Lake	142.3	PEM/UBF	State-protected water 23-P
SW Quad TH62/TH77	14.2	PUBG	State-protected water 683-P (not w/in MSP)
Duck Lake	13.6	PEMA/Bd	State-protected water 25-P
"Ball Field" Wetland	12.6	PEMB/C	
"4-22" Wetland	0.8	PEMC	
Golf Course Wetlands	2.1	PUBx	8 small excavated basins
Floodplain Forest	28.7	PF01C	Minnesota River floodplain
TOTAL	200.1		

DD.1.2 Environment Consequences

The wetland impacts are not known.

DD.2 New Airport Alternative

DD.2.1 Affected Environment

The APE for wetlands associated with the New Airport Alternative consists of the area within the New Airport Site. Based on National Wetland Inventory Maps, Soil Conservation Service (now the National Resource Conservation Service) FSA/FACTA determinations, and the Soil Conservation Service County Soil Survey for Dakota County, a total of 0.2 acre of temporary palustrine emergent wetland (PEMA; Circular 39 Type 1 seasonally flooded flat) exist within the New Airport Alternative site.

DD.2.2 Environmental Consequences

The New Airport Alternative would require the filling of 0.2 acres of wetland located within the New Airport site. Under the Wetland Conservation Act, this impact will need to be offset at a minimum 2 to 1 acreage ratio; thus, 0.4 acre of replacement wetland will be required. Sufficient space would exist within the New Airport site to create the necessary replacement wetland.

Given the very small magnitude of wetland involvement associated with the New Airport Alternative, the EIS will not include a more detailed analysis of anticipated impacts. Potential locations within the site for the required replacement wetland will be explored in the EIS.

DD.3 No Action Alternative

DD.3.1 Affected Environment

The APE for wetlands associated with the No Action Alternative consists of the existing MSP property. Wetland resources within MSP are described in Section V. AA.1 of this Scoping Document.

DD.3.2 Environmental Consequences

The only element of the No Action Alternative that would have wetland impacts is the Runway 4-22 extension and associated taxiway improvements. These improvements would require the filling of the 0.8 acre "4-22" wetland described in Section V. AA.1.1 of this Scoping Report. The Wetland Conservation Act would require that at least 1.6 acres of replacement wetland be provided to offset this impact. Off-site replacement is anticipated and will be explored in the EIS.

EE. Wild and Scenic Rivers

The Wild and Scenic Rivers Act describes river areas, eligible for protection under the legislation, that are free flowing and have "outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values." River segments that appear to qualify for inclusion in the National Wild and Scenic River System are listed on the National Inventory, compiled by the federal Department of Transportation.

EE.1 MSP Alternative

EE.1.1 Affected Environment

EE.1.2 Environment Consequences

EE.2 New Airport Alternative

EE.2.1 Affected Environment

The APE consists of wild and scenic rivers closest to the site of the new airport. They include the Lower St. Croix River, from Taylors Falls Dam to its confluence with the Mississippi River, and the Cannon River, from a point north of the city of Faribault to its confluence with the Mississippi River. The Lower St. Croix River is designated as a wild a scenic river by the federal and state governments; the Cannon River is a state-designated wild and scenic river.

EE.2.2 Environmental Consequences

The impacts will be determined in the EIS. It is noted the FAA has executed a Memorandum of Agreement with the National Park Service and the U. S. Fish and Wildlife Service establishing a 2,000-foot altitude threshold over National Parks and National Wildlife Refuges with the express intent of reducing impacts on parks and wildlife. For purposes of this analysis, it will be assumed that overflights above this 2,000-foot threshold will not generate unacceptable disturbance impacts to wild and scenic rivers.

EE.3 No Action Alternative

EE.3.1 Affected Environment

EE.3.2 Environmental Consequences

FF. Wildlife Refuges

Wildlife refuges will consider impacts on wildlife and waterfowl habitat areas.

FF.1 MSP Alternative

FF.1.1 Affected Environment

The APE is the Minnesota Valley National Wildlife Refuge, which includes the Minnesota River floodplain from Fort Snelling State Park on the north to Louisville Swamp in Chaska on the south; it is approximately 9,500 acres. The acquisition and development of the wildlife refuge was begun in 1976 with the Minnesota National Valley Wildlife Refuge Act (Public Law 94-466). The eastern end of the wildlife refuge lies immediately south of MSP (**Figure 60**).

Both human use areas and areas of waterfowl concentration lie within the DNL 65 noise contour. (**Figure 60**). Development of the MSP alternative would not involve the acquisition of any land in the wildlife refuge.

There are three human use areas within the DNL 65 noise contour. The MVNWR Visitor Center is located immediately south of I-494, about two blocks east of 34th Avenue South. The Bass Ponds are an old series of bass-rearing ponds historically constructed and operated by the Izaak Walton League. They are located about one mile south of I-494 and less than a mile east of Trunk Highway 77, along the north side of the Minnesota River. The active use of the ponds for fish rearing ended in the mid-1960s; the facility is now an interpretive area used to demonstrate wildlife and fisheries management techniques and to provide environmental educational opportunities.

Lastly, there are several trailheads and trails within the wildlife refuge located between Visitor Center and I-35W. They include the Old Cedar Avenue trailhead; the Highway 77 Trail, which runs over the Minnesota River and connects to a bicycle trail leading to the Old Cedar Avenue trailhead; a trail running along Long Meadow Lake, connecting Caretaker's Walk and the Old Cedar Avenue trailhead; the Hillside trail, running from the Visitor Center to an observation deck overlooking Long Meadow Lake; and, Black Dog and MTC trailheads in Black Dog Park.

Most land within the wildlife refuge consists of wetland habitats managed for waterfowl and other waterbirds. Waterfowl populations vary by season, with the fall migration being the peak period. Areas with the highest concentration of waterfowl and waterbirds are Blue, Fisher, Rice, Black Dog and Long Meadow Lakes. Black Dog and Long Meadow Lakes appear to be the only areas within the wildlife refuge sufficiently close to MSP to incur any potential impacts to waterfowl concentrations. It is also noted that winter waterfowl concentrations are almost exclusively associated with Black Dog Lake, where waterfowl are attracted by the warm effluent water being discharged from NSP's Black Dog Lake power plant. Blue, Fisher and Rice Lakes are more than seven miles from MSP. Overflying aircraft over these lakes are sufficiently dispersed and in excess of 5,000 feet in altitude; these areas appear to be too distant from MSP for waterfowl to be affected by air traffic.

FF.1.2 Environment Consequences

The impacts will be determined in the EIS.

FF.2 New Airport Alternative

FF.2.1 Affected Environment

The APE is a portion of the Bellwood State Game Refuge lying within the DNL 65 noise contour for the new airport alternative. The refuge is located in Marshan Township of Dakota County, generally between Highway 61 on the west, Highway 91 on the east, 190th Street on the north and 200th Street on the south. See **Figure 61.**

The refuge is a statutory game refuge. Like other statutory game refuges throughout the state, it was created by petition of local landowners to provide a refuge for wildlife so they would not be vulnerable to declining populations because of hunting. The Bellwood State Game Refuge was created in 1951. There is a variety of wildlife, particularly deer and small game, within the refuge.

The Bellwood State Game Refuge includes no publicly owned land; consequently, it would not be impacted in ways that other land uses, such as public parks, would be impacted. Privately

owned land uses located within the refuge include a cemetery, two privately-owned golf courses that are open to the public, farms and residences.

While there is no publicly-owned land within the refuge, public funds are used to pay a local conservation officer to post signs indicating that the area is a game refuge and to handle complaints that arise.

FF.2.2 Environmental Consequences

The impacts will be determined in the EIS.

FF.3 No Action Alternative

FF.3.1 Affected Environment

All planned improvements would be wholly within existing airport property. The DNL 65 noise contour does not impact the Minnesota Valley National Wildlife Refuge.

FF.3.2 Environmental Consequences

No environmental consequences on the Minnesota Valley National Wildlife Refuge resulting from the no action alternative have been identified.

VI. PROPOSED SCOPE OF ENVIRONMENTAL IMPACT STATEMENT

A. Alternatives

The alternatives proposed for further study, analysis and evaluation in the EIS are the following:

Alternative 1 — MSP Expansion

The MSP Expansion alternative, shown in **Figure 4**, consists of the existing airport facilities, the construction of Runway 4-22 extension, construction of a new 8,000-foot north/south runway and a new replacement terminal building on the west side of MSP, and a parking/drop-off facility on the east side of the airport for ticketed passengers with carry-on baggage. Ground transportation access will be provided from T.H. 77 and T.H. 62 to the new west-side entrance of the terminal.

Alternative 2 - New Airport

The New Airport alternative, shown in **Figure 5**, consists of the acquisition of about 14,100 acres in Dakota County, the construction of six runways, terminal, taxiways, internal roadways, building areas, support facilities, parking and new highway access from T.H. 55.

Alternative 3 - No Action

The No Action Alternative consists of the existing airport facilities and access at MSP (**Figure 7**), and those committed projects with funding approved by the Commission in its current Capital Improvement Program. The committed major projects are:

- New Federal Inspection Services and supporting improvements on the Gold Concourse
- Expanded elevation roadway
- New Sun Country hangar
- Expanded Ground Transportation Center
- Auto Rental Parking Expansion
- Runway 4-22 extension (shown in **Figure 7**) and supporting taxiway improvements

Other Alternatives

Two other alternatives are currently being studied as potentially feasible for meeting the air transportation needs of the region in the year 2020 (as defined in Section II). The studies will be completed in the summer of 1995. If the alternatives are determined feasible, they will be included in the EIS for detailed evaluation.

The alternatives are:

1. Remote Runway Concept

This alternative would retain the ticketing, baggage and support facilities at MSP, construct new gates and runways at a remote location (15-25 miles from MSP), and construct a high-speed transit link between the existing terminal and the new gates.

The purpose of this alternative is to retain the existing good ground accessibility and development related to the existing airport, and move the existing and future noise impacts and runway capacity needs to a remote location.

2. Supplemental Airport Concept

This alternative would retain all of the existing and committed facilities at MSP, utilize the existing runways/facilities at an existing airport in the state for some of the MSP operations, and construct a high-speed transit link between MSP and the supplemental airport. The purpose of this alternative is to retain the existing good ground accessibility and development related to the airport, and relocate some MSP operations to a supplemental airport (e.g., Rochester, St. Cloud, St. Paul Downtown) such that additional runways would not be required at MSP.

B. Issues and Impacts Requiring Detailed Analysis

The following environmental issues and impact categories are determined to be potentially significant and to require detailed analysis in the EIS. Measures to mitigate the potential impacts will be discussed, where appropriate. The area of potential effect (APE) for the environmental issues and impact categories are defined in Section V. Non environmental issues (e.g., ability to finance a new airport) will be addressed in a companion document, Alternative Evaluation Technical Report.

Air Quality Issues and Impacts requiring Detailed Analysis in EIS

Major Sources of Pollutants to Be Evaluated in the EIS

On-airport sources

On-airport sources include aircraft and support equipment, motor vehicles, and stationary sources such as power plants, incinerators, and fuel storage facilities. Those aircraft operations which are the major contributors to ground level concentrations of pollutants are taxiing and queuing for takeoff although the takeoff roll also contributes a small amount. Emissions associated with aircraft support equipment are also taken into account. Emissions from motor vehicles occur on roadways as well as in parking lots and ramps on the airport.

The location of stationary sources including power plants, boilers, incinerators, and fuel storage facilities can also contribute to the overall concentrations at on- and off-airport receptor sites.

Off-airport sources

Off-airport sources are defined here as motor vehicle traffic on regional roadways which may carry traffic destined to or from the EIS alternatives. The regional roadway network used for this analysis has been developed by the Twin Cities Metropolitan Council and includes primary roadways on the network. Since major at-grade intersections are the primary sources of CO emissions, these will be addressed in the EIS.

Methodology and Assumptions

Liaison with the Minnesota Pollution Control Agency, Metropolitan Council, and Wisconsin DNR will help establish assumptions and identify receptor sites to be used in air quality modeling.

CO and other criteria pollutant emissions and concentrations will be estimated for on-airport sources using the FAA Emissions and Dispersion Modeling System (EDMS) airport air pollution model. Aircraft operations in the year 2020 will be evaluated using aircraft and engine categories expected in the 2020 time period including re-engined DC-9s, if appropriate. On-airport motor vehicle activity will be based upon airport roadways and parking facilities. It will be assumed in the EIS that any new terminal and associated roadways will be designed to ensure compliance with air quality standards. Stationary sources will include expected fuel storage and on-airport utilities. Annual meteorological data from 1992 will be used to estimate annual, 24-hour (TSP), 8-hour (CO), 3-hour (HC and SOx), and 1-hour (CO and NOx) concentrations.

Annual CO, total VOC (volatile organic compounds), HC, and NOx emissions will be estimated for off-airport traffic that is associated with the airport. These estimates will be derived from traffic volumes on Metropolitan Council regional highway network model and the EDMS model.

Pollutant concentrations derived from the EDMS model for receptor sites located in the vicinity of each EIS alternative will be considered. This modeling will build upon the preliminary work already completed for the MSP LTCP AED and New Airport Comprehensive Plan AED. Only receptor sites in Minnesota and adjacent areas of Wisconsin that are expected to exist in the year 2020 will be evaluated.

CO is the only pollutant for which a microscale air quality analysis will be performed for off-airport sources. For the microscale analysis, vehicle emissions will be projected using the MOBILE 5A emissions model (adjusted to the appropriate regional vehicle mix in Minnesota or Wisconsin). CO concentrations will be estimated using the CAL3QHC highway queuing and dispersion model. Air quality guidelines established by the Metropolitan Council will be used to identify critical intersections for which a microscale CO analysis will be performed based on information from the regional highway network. Intersections will be screened on the basis of the volume and percentage of airport-related traffic handled and the expected level of service with this traffic. The objective of the CO analysis is to assess compliance with state and federal ambient CO standards. A refined analysis will be performed for those intersections already evaluated in the New Airport Site Selection AED and the MSP LTCP AED.

Background CO concentrations from the New Airport Site Selection AED and the MSP LTCP AED will be used to determine overall CO concentrations. Background levels of other criteria pollutants will be based upon available monitoring data or estimated from emissions data where feasible.

Dust and construction emissions will be addressed in the EIS. The level of this analysis or discussion will be established through liaison with Minnesota Pollution Control Agency staff.

Consistency with the State Implementation Plan (SIP) and conformity with the Clean Air Act Amendments of 1990 will be addressed in the EIS.

The potential for mitigation of emissions and concentrations for stationary and mobile sources both on and off the airport will be addressed for each EIS alternative. These measures may include changes in technology for stationary and mobile sources as well as changes in aircraft operations and traffic management programs. Examples of mitigation strategies to be examined are:

- Airport ground access and distribution (transit, people movers, etc.)
- New aircraft engine technologies
- New energy-efficient and emission-efficient stationary facilities

Archaeological Resources

MSP Airport

Undisturbed/minimally undisturbed portions of the property do not feature any archaeological properties that are eligible for the National Register of Historic Places. Built-up/paved portions which have not yet been accessible for archaeological survey will need to be reviewed in accordance with a comprehensive research design still to be developed in consultation with the State Historic Preservation Office (SHPO): a memorandum of agreement which will state when and how archaeologically sensitive areas will be investigated during future modifications of the existing facilities.

New Airport

Four archaeological properties identified within the proposed new airport boundaries will be subjected to intensive survey (evaluation) during 1995. Reconnaissance survey, if necessary supplemented by evaluative survey, will focus on access roads not covered by previous archaeological surveys, all in accordance with a research design which will be submitted to SHPO for approval prior to the initiation of field work. Methodology and findings will be described in a technical report which specifies whether any of the inventoried archaeological resources are eligible for the National Register of Historic Places.

Biotic Communities

In the Biotic Communities section, the EIS will discuss in more detail the biotic communities potentially affected by each of the three alternatives being considered. Since other sections of the EIS will provide detailed analyses of threatened and endangered species, wetlands and bird-aircraft impacts, the Biotic Communities section will address all other ecological features not covered in the other sections.

Bird Aircraft Hazards

The EIS will include a detailed analysis of potential bird aircraft hazards associated with the three alternatives being analyzed. Existing data on migratory bird numbers and movements

at identified bird concentration areas are being supplemented with more intensive field surveys during the Spring 1995 migration season. Each alternative will be re-analyzed using the same methodology applied in the AEDs for the MSP and New Airport Long-Term Comprehensive Plans. Integrated Noise Model (INM) data will again be used to obtain typical departure flight profiles for the various flight tracks associated with each runway for each alternative. The standard instrument glide path will be used to develop approach profiles. The bird aircraft hazard analysis contained in the EIS will address all flight tracks associated with the various alternatives and will include any flight track refinements that may be developed as the design process proceeds. The most current MAC aircraft operation projections will be used in the analysis. For any flight tracks potentially involving a significant bird-aircraft conflict, mitigation measures will also be explored.

Construction Impacts

Environmental impacts during construction that are potentially significant will be addressed.

Economic

The costs of developing each alternative, including estimates of land acquisition and construction, will be detailed. Standardized cost factors used in other capital projects, including airport projects, will be used to formulate these estimates.

Relocation costs will be determined according to provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act.

Potential funding sources and potential financing mechanisms for airport development will be spelled out. The availability of funds and the feasibility of these financing mechanisms will be explored.

The tax capacity of properties displaced by airport development will be detailed, and the reduction in tax revenues of local jurisdictions will be determined.

Endangered and Threatened Species

The EIS will include a detailed analysis of potential threatened and endangered species impacts associated with the three alternatives being analyzed. Additional coordination will be undertaken with the Minnesota DNR Nongame Wildlife Program to obtain the most up-to-date information of occurrences of threatened, endangered and special concerns. For the MSP Alternative, the EIS will include a more detailed analysis of potential impacts to Forster's terns in Mother Lake. The distribution of current and historic Forster's tern breeding activity within Mother Lake will be explored to further define the relationship of fill and structures to the portions of the lake receiving use for nesting. Based on this information, the EIS will contain a refined analysis of potential impacts to Forster's tern habitat and movements at Mother Lake.

For both the MSP and No Action Alternatives, the EIS will re-analyze potential disturbance impacts to a bald eagle breeding territory existing within Long Meadow Lake in the

Minnesota Valley National Wildlife Refuge. For the New Airport Alternative, the EIS will re-analyze potential disturbance impacts to all elements of essential bald eagle habitat (i.e. breeding territories or winter night roosts) existing along the Mississippi River adjacent to the New Airport site. The re-analyses of potential bald eagle impacts will be carried out using the same methodology applied in the AEDs for the MSP and New Airport Long-Term Comprehensive Plans and will use the latest data on eagle habitat use and any refinements to previously analyzed flight tracks and projections of aircraft operations. In order to estimate the minimum distance (considering both altitude and horizontal distance) at which commercial aircraft would pass near each essential habitat element, an Integrated Noise Model (INM) analysis will carried out for each departure flight track. The standard instrument glide path will be used to determine approach profiles for the same purpose. The three alternatives will be analyzed based on the proximity of essential habitat elements to overflights, the projected number of such overflights and approximate disturbance thresholds derived from the scientific literature.

The EIS will analyze in detail the potential for impacts to loggerhead shrikes associated with the New Airport Alternative. Existing data on shrike breeding territories will be supplemented with new data collected during the 1995 breeding season. The anticipated impacts to these territories will be analyzed in detail based on grading concepts for the New Airport site and the proximity of these territories to future airport facilities. The EIS will also expand upon the potential mitigation measures described in the AED for the New Airport Comprehensive Plan. The EIS will also describe threatened and endangered plant species at Chimney Rock which would be incorporated within airport property to foster their preservation.

Energy Supply and Natural Resources

Energy Issues and Impacts Requiring Detailed Analysis in the EIS

Energy issues to be addressed and analyzed in the EIS include:

- Energy consumption by aircraft within the regional airspace (arrival/departure)
- Energy consumption by aircraft on the ground (taxi/takeoff/landing)
- Energy consumption by fixed sources on airport (boilers/utilities/etc.)
- Energy consumption by fixed sources off airport (energy suppliers)
- Energy consumption by mobile sources on airport (equipment/motor vehicles)
- Energy consumption by mobile sources off airport (motor vehicles)

Annual aircraft energy requirements within the regional airspace will be estimated based upon typical origins and destinations. Aircraft energy requirements on the airport will be estimated based upon typical taxi times and delays from queing for each of the EIS alternatives.

Energy requirements for stationary facilities on the airport will be identified. Power companies or other suppliers of energy will be contacted to determine how projected demands can be met by existing or new facilities.

For vehicular traffic (ground access), annual vehicle miles of travel of airport-related traffic will be translated into annual regional fuel consumption for each EIS alternative. This

will be based upon traffic volumes on the Metropolitan Council regional highway network model.

Mitigation of energy consumption through the use of energy-efficient designs, traffic management and energy-efficient aircraft operations will be discussed in the EIS.

Farmland

The economic impacts arising from the loss of farm production in Dakota County on the rest of the county, the state, the region and the nation will be determined.

The relationship between development of the new airport alternative and the Farmland Protection Policy Act will be explored. This will involve an assessment of soils, both prime farmland and farmland of statewide importance, as classified by the federal Soil Conservation Service, to determine the applicability of the act to the new airport alternative.

The potential for farming on remnant fields available for farm operations once the airport is constructed will be analyzed.

Floodplains/Hydrology

The existing U.S. Army Corps of Engineers HEC-2 model of the Vermillion River will be used to estimate the change in stage within the Vermillion River for the discharge from the airport site for a 100-year flood event. This will provide information on the incremental effect of the new airport as compared to conditions used to establish the existing 100-year flood elevations. The results will be presented graphically showing the water surface profile with and without the proposed airport facility from the proposed airport to the most downstream location within the existing model.

Historic/Architectural Resources

MSP and No Action Alternatives

The historic significance of above-ground properties within the known Area of Potential Effect (APE) for the MSP alternative has been determined by a previous survey. An assessment must be completed, however, on the impact of the "no action" alternative. The APE for this alternative will consist of the existing airport property and the associated DNL 65 noise contour for the year 2005. A number of properties in the APE have been evaluated by previous surveys; this information will be reviewed, and additional reconnaissance and intensive-level survey will be completed as necessary. The project research design and recommendations for intensive-level survey will be reviewed and approved by the State Historic Preservation Office (SHPO). The final technical report will describe the survey's methodology and findings, including a list of properties in the APE that are listed, or eligible for listing, in the National Register of Historic Places under Criteria A, B, or C.

New Airport Alternative

Previous surveys have evaluated the effect on above-ground properties of developing the New Airport Alternative. Since these surveys were completed, additional information on roadway improvements and the Year 2005 DNL 65 noise contours has expanded the APE. A reconnaissance survey will assess parts of the APE not previously studied. The research design for the reconnaissance survey will be submitted to SHPO for approval. Findings from field work and archival research and recommendations for intensive-level survey will be reviewed with SHPO before intensive-level survey work is initiated. The survey's methodology and findings will be detailed in the final technical report, which will include the properties in the APE that are listed, or eligible for listing, in the National Register of Historic Places under Criteria A, B, or C.

Induced Socioeconomic Impacts

Further analysis of the induced development due to capacity improvements at the current MSP site will have to be conducted. The amount of development and its location in Minnesota and Wisconsin counties and communities will be determined. This data will be used in the analysis of other impacts such as, but not limited to, ground access, community impacts and wastewater services. Work will continue with affected jurisdictions throughout the preparation of the Draft EIS to allocate the geographic location of induced development.

Land Use

The land use impacts of potentially moving the region's airport could be enormous. The Minneapolis-Saint Paul International Airport build alternative and the No-Build alternative will have impacts on the communities and land uses surrounding the airport. The New Airport Build Alternative will have impacts on Dakota County, Washington County, Rice County, Goodhue County and Wisconsin from the construction of an airport in Dakota County. This alternative will also have impacts to be assessed around the current site due to the removal of the airport.

The evaluation of community and land use impacts will assess changes or pressures for land use changes and the need for services of all types.

Noise

Noise sensitive areas and facilities (residences, schools, parks, etc.) will be identified and analyzed to determine the noise impacts of each alternative. Future noise levels will be calculated and compared with existing levels, according to several federal and state criteria. The future sound levels will be calculated using the latest version of the Federal Aviation Administration's Integrated Noise Model (INM). Five metrics will be used: Day Night Level (DNL), the State L_{10} descriptor, time-above-threshold (TA), sound exposure levels (SEL), and numbers of overflights.

The DNL metric was developed under the auspices of the U.S. EPA for use in describing aircraft noise impacts and other environmental noise impacts. DNL is the logarithmic average sound level measured in decibels weighted to closely approximate the sensitivity of the human ear (dBA). It is based on the yearly average for a 24-hour Equivalent Sound Level (L_{eq}). The metric is also weighted to account for increased noise sensitivity between 10:00 PM and 7:00 AM by applying a 10 dBA penalty to noise events occurring during that nighttime period. The output of the noise model includes a noise contour connecting points of equal noise level, which can be used to estimate the number of people and noise sensitive land used within specified DNL sound levels. The EIS will present the number of residences and population within the updated contours, as well as identify noise-sensitive land uses and peak DNL values for select noise sensitive use locations under each alternative.

The L_{10} metric is used by the State of Minnesota in setting State noise standards. While recent court decisions have concluded that it cannot be enforced at MSP, data will be presented in the EIS for information purposes. L_{10} is based on a sound level in dBA exceeded 10 percent of the time (6 minutes per hour). It will be calculated for the worst hourly noise condition that could occur off each runway end, showing what short-term conditions could be in those areas. This metric does not take into account how often that condition actually occurs. The EIS will present data on population within the $L_{10}65$ contours under each alternative.

The time-above-threshold (TA) is a measure of the time during a 24-hour period that a point on the ground experiences aircraft-generated noise above specified levels. The level of 85 dBA represents the point at which single-event (not DNL) levels are considered potentially disruptive. Unlike the DNL metric, which uses logarithmic averages in its internal calculations, the TA metric uses arithmetic means to calculate total noise. This latter technique can better demonstrate small changes in noise patterns, and can show changes in noise on a scale commensurate with changes in the number of aircraft overflights. The EIS will present data on minutes of time above 85 dBA for select noise sensitive use locations under each alternative.

Sound Exposure Level (SEL) is a metric designed to compare single noise events of differing duration and intensity by compressing or expanding the duration of a single event to a period of one second. Since in reality, the noise energy produced from an aircraft overflight lasts many seconds, SEL values cannot be compared to DNL or standard decibel readings. FAA and EPA typically require use of both DNL and single event metrics (like SEL) to address noise impacts in an EIS. The EIS will present data on peak SEL values for select noise sensitive use locations under each alternative.

The analysis of aircraft overflights provides a straight forward comparison of runway use by alternative, showing locations of each major arrival and departure flight track and numbers of flights on these tracks occurring in an average month. The EIS will present data on the number of aircraft overflights along major flight tracks for each alternative.

Noise abatement measures and land use compatibility measures will be considered for each of the alternatives to mitigate potential impacts. Possible mitigation measures, addressing both noise abatement and land use measures will be addressed in the EIS. Noise abatement measures include operating procedures, modified arrival and departure flight tracks, preferential runway use system, a noise monitoring system, and a public

information program. Land use measures include, amendments to local land use plans and modified zoning, sound insulation programs, and purchase guarantee and land acquisition programs.

Parks and Recreation

The impact of aircraft noise on activities at parks and recreation areas within the DNL 65 noise contours will be explored.

Section 4(f)

Properties/land that meet the requirements of Section 4(f) will be identified, and the officials/agencies having jurisdiction over the Section 4(f) lands will be consulted. Alternatives that would avoid the Section 4(f) lands will be documented and analyzed. Detailed measures that would minimize harm to the lands will be provided.

Site Preservation (of New Airport Alternatives)

The analysis will use data from the following sources--the Dakota County assessors office, the Dakota County surveyor, the Minnesota Department of Agriculture, the Minnesota Pollution Control Agency, the U.S. Census Bureau and the Uniform Relocation Assistance and Real Property Acquisition Policies Act. Data from these sources will be used to determine the impacts of preserving a site in Dakota County for a new airport for both a 10-year and 20-year period beginning in 1998.

Social

The analysis of social impacts as described in part V will use data from the U. S. Census, 1990, as amended by additional surveys that have been completed by the affected jurisdictions since the 1990 census.

A qualitative assessment of community disruptions will be included.

Social impacts due to relocation of residents and businesses, including numbers of residents and employees, as well as changes in surface transportation patterns resulting from airport development will also be addressed, in terms of access to local and regional opportunities and services (i.e., commercial airline service, community business and institutional centers) and emergency vehicle response time.

Relocation impacts will be analyzed according to the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act.

Transportation Access

The updated regional travel demand forecast model will be applied to all three alternatives for the year 2020, taking into consideration induced development. Items to be addressed include the following:

In-depth analysis of roadway requirements to provide access to MSP and New Airport sites;
Impacts of induced development assumptions (in Minnesota and Wisconsin);
Analysis of environmental impacts and costs of additional roadways, new alignments, and additional laneage;
Express transit routes between the two central business districts and the new airport site and the impacts of such routes;
Travel demand management;
Necessary river crossing improvements, costs and impacts;
Interconnectivity of regions within state and areas within the region;
Impacts of new roadway system on adjoining communities; and
Analysis of impacts on principal arterials providing access to site.

The analysis will involve the participation of the Minnesota and Wisconsin DOTs and the Metropolitan Council.

Major Utilities

A corridor will be identified for the relocation of each of these power lines. The corridors will be studied to identify the environmental consequences of the power line relocations.

Wastewater

MSP and No Action Alternatives

There would be a significant increase in the volume of wastewater generated at the airport under the MSP and No Action Alternatives. This is due to increased general utilization of the airport and because water used in the MAC and Northwest Airlines cooling systems will be discharged to the sanitary sewer in the future. Volumes of wastewater generated at MSP through 2020 will be projected based on current discharge information, enplanement projections for future years, and projections regarding cooling water requirements and discharge. Relative to these volumes, the capacity associated with the MCWS conveyance and treatment systems will be evaluated with work to be coordinated with MCWS.

New Airport Alternative

The average and maximum daily discharge rates (cubic feet per second -- cfs) will be estimated for the proposed airport wastewater treatment facility. The wastewater discharge will be characterized by estimating the average and maximum daily concentrations of 5-day biochemical oxygen demand, chemical oxygen demand, total kjeldahl nitrogen, total suspended solids, total phosphorus and fecal coliform bacteria.

The approach to addressing the impacts of wastewater discharge is included in the New Airport alternative discussion of stormwater discharge under Surface Water Quality of this section.

Water Supply

MSP and No Action Alternatives

There would be a significant increase in the demand for water supplied by the City of Minneapolis associated with the MSP and No Action Alternatives relative to existing conditions. This is primarily due to increased general utilization of the airport and because the water used in the MAC and Northwest Airlines cooling systems will be drawn from the Minneapolis system in the future. In the EIS, future demand for Minneapolis water will be estimated using projected enplanement information along with proposed new building dimensions and associated cooling and fire control requirements. The impact of the future demand on water supply capabilities will be addressed through work to be coordinated with the City of Minneapolis.

New Airport Alternative

Available existing data on wells in the vicinity of the site will be reviewed and evaluated to estimate the number and type of wells on-site, existing withdrawal capacity of such wells and aquifer used. Existing wells will be evaluated to see if any could be used to meet the water supply needs projected for the new airport. If existing wells cannot meet such needs, the location and capacity of potential new wells to serve airport needs will be discussed.

In the event new wells are needed to serve the airport water supply needs, the zone of influence of such wells will be estimated relative to the proximity of other water supply wells in the immediate vicinity.

Surface Water Quality

MSP and No Action Alternatives

Biochemical Oxygen Demand

MSP is currently operating under an interim NPDES permit which will expire on September 30, 1995. It is not known what future NPDES limits will be for $CBOD_5$ discharge from MSP. It is known that the MPCA intends to base the ultimate standard for $CBOD_5$ discharge from MSP to the Minnesota River on a waste load allocation (WLA) study to be performed by the MPCA in the coming years during low flow conditions. This study will essentially replace a WLA study for the lower reaches of the Minnesota River which was conducted in 1985 (updated 1987).

To evaluate the potential impacts of airport operations on dissolved oxygen (DO) levels in receiving waters, it is necessary to assume a given control approach/system which would not allow surface water quality standards to be exceeded. The only defining document

regarding allowable $CBOD_5$ discharge to the lower Minnesota River is the 1985/87 WLA. This study allocated 100 lbs $CBOD_5$ per day to MSP. As has been generally acknowledged by the MPCA, the 1985/87 WLA was inherently flawed in that it did not account for baseline MSP discharges during the winter and spring months. For this reason, the new WLA study will be performed as discussed above.

As is addressed in Decision Report for Stormwater Control Measures (Metropolitan Airports Commission, December 1994), the 100 lb per day BOD_5 discharge limit is essentially unattainable for MSP. For analytical purposes, it will be assumed that stormwater discharge from MSP will be conveyed to the Mississippi River, which has substantially higher assimilative capacity than the Minnesota River.

The scenario of piping all MSP discharge to the Mississippi River represents an extremely conservative approach; one which allows the MSP and No Action alternatives and the New Airport alternative to be evaluated within a consistent framework. It will be emphasized that the control approach which would actually be implemented at MSP will be determined by the outcome of the new WLA. It is possible that this approach could be very different from the approach to be used for analytical purposes in the EIS.

To analyze the potential impacts of MSP operations on the Mississippi River, the glycol loading associated with a severe deicing event will be estimated. This will be based upon the following:

- projected extreme glycol application level (single event);
- projected percentage residual escape (glycol) to the storm sewer system;
- projected $CBOD_5$ attenuation associated with Detponds;
- projected river flow rate, oxygen content, and resulting assimilative capacity at the location of discharge from the envisioned pipeline.

A source of $CBOD_5$ loading much less important than glycol, but significant nonetheless, will be chemical products used for ground surface snow/ice control purposes. At this time, urea is the primary chemical used for this function. It is believed that urea will be replaced in the future by some combination of potassium acetate, sodium formate, and sodium acetate. The $CBOD_5$ levels associated with these products are known. Loading factors generated from data collected at MSP will be utilized to estimate the percentage of ground surface snow/ice control product (and associated $CBOD_5$) which would enter the MSP storm sewer system.

Discussion with MPCA staff has indicated that the MPCA can provide engineering estimates regarding the assimilative capacity of the Mississippi River at the envisioned point of discharge under seasonal low flow conditions. These estimates will be compared with the $CBOD_5$ load associated with a severe aircraft/ground surface deicing event as attenuated through the Detponds and conveyed through the envisioned pipeline.

Development issues associated with conveyance of MSP stormwater to the Mississippi River (as assumed for analytical purposes) will be evaluated in the EIS.

Total Suspended Solids

Detpond is a computer model used to size detention basins such that given TSS control performance standards can be met. Detpond design requirements associated with the acreages of impervious surface for the MSP and No Action Alternatives will be evaluated. The development requirements and anticipated control performance associated with constructing the required Detponds for each of the four drainage areas will also be evaluated.

New Airport Alternative

Stormwater Discharge Characteristics

Assumptions used for performing the stormwater analysis at the existing MSP airport and the proposed airport will be standardized to the extent possible. This will include the use of monitoring data from the existing MSP airport to refine event mean concentrations. New peak discharge rates will be estimated for the 2-year, 10-year, and 100-year rainfall events. Event mean concentrations and loads for the 2-year and 10-year events will be estimated for the following: 5-day biochemical oxygen demand, chemical oxygen demand, oil and grease, total nitrogen, total phosphorus and total suspended solids.

The concept for the new airport stormwater management system will be refined as follows:

- Airport Boundary - the airport boundary will be evaluated based on the new boundary encompassing 14,100 acres. The Stormwater Management Model will be used to estimate peak discharge rates for the 2-year, 10-year and 100-year rainfall events.

- Sizing of the Stormwater Treatment System - The present concept design will be reevaluated considering the change in airport boundary. Adequacy of the conveyance and treatment system will be evaluated.

- New estimates of the amount of potential run-on will be performed. A concept design will be prepared for rerouting the run-on and the location of the diversion identified.

- Glycol/Deicing Agents - assumptions used to derive COD loads in stormwater runoff will be reviewed and revised to more accurately reflect anticipated use. These will be based to the extent possible on existing mass balance data from MSP.

- Loads - revised load estimates will be generated for the 2-year and 10-year storm events, considering the revised airport boundary.

- The specific amount of stormwater (peak discharge and load) bypassed to Vermillion River and discharged to the Mississippi River will be identified.

Evaluate Potential Corridor to Mississippi River for Discharges

An "outfall corridor" could follow two principal alignments. One would run west of the city of Hastings, north from the proposed New Airport wastewater treatment facility and then east through Hastings to the receiving water. This corridor could result in a potentially unacceptable level of (local) impacts associated with construction and traffic disruption in Hastings. An alternative corridor would run south of Hastings, east from the wastewater treatment facility location on the proposed New Airport site to a discharge point on the Vermillion or Mississippi Rivers. This potential corridor avoids the potential disruptive impacts associated with a corridor through Hastings. To the extent that the corridor alignment can be routed within or along existing (or planned) roadway or utility rights-of-way, potential impacts on environmentally sensitive areas can be minimized. This easterly corridor south of the City of Hastings is the "outfall corridor" which will be evaluated in the DEIS. The purpose of the evaluation will focus on the identification of a potentially feasible alignment based largely on existing rights-of-way and the identification of known environmentally sensitive areas traversed by corridor segments where there is no existing right-of-way.

Evaluate Wastewater and Stormwater Discharges Relative to Assimilative Capacity of Receiving Water

The assessment of potential water quality impact to the Mississippi River will focus on oxygen demand assimilative capacity. The general approach will be dependent upon receiving information from the MPCA about the minimum amount and location of assimilative capacity remaining within the Mississippi River for seasonal 7Q10 flows. Wastewater and stormwater load estimates for oxygen demanding substances for the 10-year design storm in addition to the wastewater discharge, will be compared to the estimates of available assimilative capacity.

A screening approach based on the remaining assimilative capacity within the Mississippi River will be used to identify potential impacts for the wastewater and stormwater outfalls. The amount of remaining assimilative capacity will be provided by the MPCA for seasonal (spring, summer, fall and winter) 7Q10 flows. Remaining assimilative capacity will be defined as the ability of a stream reach to meet the dissolved oxygen water quality standard now or in the foreseeable future and expressed in terms of dissolved oxygen mass. Remaining assimilative capacity will be quantified in terms of the location within the Mississippi River and the dissolved oxygen concentration increment in excess of the standard.

Groundwater/Hydrogeology

MSP and No Action Alternatives

Refer to discussion provided in Section V.

New Airport Alternative

Published geological reports and well log information pertinent to the site will be reviewed and evaluated for further definition of site and local geology. Available well logs will be

used to describe depth of unconsolidated sediments and bedrock surface topography. The location of bedrock valleys will be refined if possible.

Site and local hydrogeologic characteristics will be described where possible based on published reports, maps and well log information. The hydrogeologic units will be defined in terms of thickness, extent and occurrence of groundwater. Groundwater depth, hydraulic parameters and flow directions will be described.

Existing baseline groundwater quality data for the site area will be described. Baseline groundwater quality information will be obtained from available information and studies such as the MPCA's ambient monitoring program, Minnesota Health Department monitoring, and University of Minnesota work on pesticide occurrence in groundwater.

Groundwater susceptibility to contamination will be qualitatively discussed considering post-development conditions. The analysis will be based on previously published data. Development activities will include grading of site soils and establishment of surface water retention ponds. The mobility of substances such as fuel or deicing fluids which may be released at the facility will be discussed. Likely paths of migration will be discussed, as well as travel times to receptors such as municipal wells. The presence of multiaquifer wells and sinkholes and their effect on potential water quality impacts will be discussed qualitatively.

The requirements of the Dakota County Groundwater Protection Plan will be evaluated to determine compatibility relative to activities at the proposed site. Potential compliance issues will be identified and discussed.

Wetlands

As more detailed design and wetland boundary information becomes available, wetland impact figures for all alternatives will be refined in the EIS (particularly the MSP Alternative). Given the very small magnitude of wetland involvement associated with the New Airport Alternative, the EIS will not include a substantially more detailed analysis of anticipated impacts. For the MSP and No-Action alternatives, off-site wetland replacement options will be explored and anticipated replacement ratios will be more precisely determined. For the New Airport Alternative, potential wetland replacement locations within the New Airport site will be explored.

Wildlife Refuges

No land within wildlife refuges will be acquired. The impacts of aircraft overflights on human use areas and wildlife will be assessed. Adverse impacts will be based on DNL 65+ noise levels for human use areas, and overflights of less than 2,000 feet above the ground for wildlife.

C. Issues and Impacts Not Requiring Detailed Analysis

The impacts of the following issues and impact categories have been determined to be not significant and therefore will not be analyzed. The basis for the determination is presented in the preceding section (V) of this report. If potentially significant impacts are identified during preparation of the EIS, they will be analyzed in detail and mitigation measures will be determined.

Coastal Barriers (see Section V.F)
Coastal Zone Management Program (V.G)
Light Emission (V.P.)
Mineral Resources (V.J.2)
Solid Waste (V.V)
Visual (V.Y)
Wild and Scenic Rivers (V.EE)

VII. LIST OF ACRONYMS AND GLOSSARY

acre-ft -- measurement of water storage, equivalent to amount of water needed to cover 1 acre with water 1 foot deep

ADT -- Average Daily Traffic

AED -- Alternative Environmental Document. The AED is a document that included the analysis of environmental impacts and issues in sufficient detail to select the "best" of the alternatives that were under consideration for both MSP expansion and a new airport in Dakota County. It is similar to an EIS, but differs in that the "no action" alternative and reasonable alternatives are not considered. That is, the AED's addressed only the alternatives and impacts included in the SDD for the Long-Term Comprehensive plans at MSP and the Dakota County site.

AGL -- Above Ground Level

Agriculture preserve -- Farmland designated by covenant for long term agricultural use, for which the property owner receives such benefits as lower assessed valuations and, therefore, lower taxes.

ANOMS -- Airport Noise and Operations Monitoring System, the noise monitoring system in use at MSP

APE -- Area of Potential Effect, or the affected environment of each of the alternatives under consideration for Dual Track Airport Planning process.

Biotic Communities -- Fish, wildlife and ecologically sensitive resources, including rare, threatened and endangered species

BOD -- Biochemical Oxygen Demand

CAL 3QHC -- Carbon Monoxide dispersion model used to estimate CO concentrations

CBOD -- Carbonaceous Biochemical Oxygen Demand

cfs -- cubic feet per second

CO -- Carbon Monoxide

COD -- Chemical Oxygen Demand

COE -- U.S. Army Corps of Engineers

dB -- decibels, used to measure sound levels

dBA -- "A"-weighted decibel scale used to measure aircraft and other sound levels

DNL -- Day Night Level metric that describes aircraft noise. It is the logarithmic average sound level measured in decibels weighted to closely approximate the sensitivity of the human ear. DNL is based on the annual average of 24-hour Equivalent Sound Level, (Leq), which is weighted to account for increased noise sensitivity during nighttime hours (10:00 p.m. to 7:00 a.m.). DNL 65 dBA is the Day Night Level of 65 decibels on the A-weighted scale, for example.

List of Acronyms and Glossary (Cont'd)

EDMS -- Emissions and Dispersion Modeling System, used to calculate pollutant emissions and concentrations due to on-airport sources, including aircraft and motor vehicles.

EIS -- Environmental Impact Statement. This is a document required by federal (if federal funds or properties are involved) and state law for proposed projects that could have potentially significant adverse impacts on the social, economic and natural environments. The EIS must address the environmental impacts of all reasonable alternatives, including the "no action" alternative, and commit to measures that would mitigate those adverse impacts that cannot be avoided.

EPA -- Environmental Protection Agency (of the United States government)

ESA -- Minnesota Endangered Species Act

FAA -- Federal Aviation Administration (of the United States Department of Transportation)

FAR Part 150 -- The procedures, standards, and methodology governing the development, submission, and review of the airport noise exposure maps and airport noise compatibility programs, including the process for evaluating and approving or disapproving those programs, required by FAA to be eligible for federal funds.

Farmland remnants -- Portions of farms remaining after land is acquired for the airport. There are three types of farmland remnants, defined as follows:

> Isolated farmlands. Farmland that is not accessible because the road leading to it is within the airport boundary.
>
> Triangulated farmlands. Farmland with one or more property lines at an angle. This factor could make farming on the field difficult. While there is no minimum acreage for triangulated farmland, a smaller triangulated field also would be difficult to farm.
>
> Severed farmlands. Farmlands under one ownership that are separated from each other by the airport project. For example, a large farm may be bisected by a roadway leading to the new airport or the farmstead could be separated from the fields themselves.

FICON -- Federal Interagency Committee on Noise

Footprint -- Area within the boundary of the proposed airport site

FEMA -- Federal Emergency Management Agency

GIS -- Geographic Information System

GISW -- Glycol-Impacted Stormwater

HABS -- Historic American Buildings Survey

HAER -- Historic American Engineering Record

HC -- Hydrocarbons

List of Acronyms and Glossary (Cont'd)

HNTB - HNTB Corporation, lead consultant for MAC

INM -- Integrated Noise Model, which estimates an aircraft's altitude at various distances from point of departure.

IPG -- Interactive Planning Group, a 1991 group formed to study potential long-term comprehensive planning options for MSP, including the cities of Bloomington, Burnsville, Eagan, Mendota Heights, Minneapolis, Richfield and St. Paul.

LTCP -- Long-Term Comprehensive Plan for MSP and the Dakota County site

MAC -- Metropolitan Airports Commission (of the Twin Cities Metropolitan Area)

MC -- Metropolitan Council (of the Twin Cities Metropolitan Area)

MCBS -- Minnesota County Biological Survey

MDNR -- Minnesota Department of Natural Resources

MDS -- Metropolitan Disposal System

MEQB -- Minnesota Environmental Quality Board

$\mu g/m^3$ -- micrograms per cubic meter

mg/l -- milligrams per liter

mgd -- million gallons per day

mg/m^3 -- Milligrams per cubic meter

Mn/DOT -- Minnesota Department of Transportation

MOBILE 5.0 -- Carbon monoxide emission model developed by EPA

MPCA -- Metropolitan Pollution Control Agency

MSP -- Minneapolis-St. Paul International Airport

MSW -- Metropolitan Solid Waste

MRAP -- Minnesota River Assessment Project

MVNWR -- Minnesota Valley National Wildlife Refuge

MNRRA -- Mississippi National River and Recreation Area

MWCC -- Metropolitan Waste Control Commission

List of Acronyms and Glossary (Cont'd)

MWWTP -- Metropolitan Wastewater Treatment Plant

NLR -- Noise Level Reduction

NO_x -- Nitrogen Oxide

NO_2 -- Nitrogen Dioxide

NPDES -- National Pollution Discharge Elimination System (permit governing discharge of pollutants into storm sewer systems and outfalls)

NRHP -- National Register of Historic Places

NSBERT -- Northern States Bald Eagle Recovery Team

NWI -- National Wetland Inventory, referring to maps prepared by the U.S. Fish and Wildlife Service

OPDC -- Ordovician Prairie du Chien aquifer

O_2 -- Oxygen

PM-10 -- Particulate matter less than 10 microns in diameter

ppm -- parts per million

RPZ -- Runway Protection Zone. This is a trapezoidal area at the end of a runway that must be acquired to afford a safety zone for aircraft landings and take-offs. The FAA requires that RPZ's be a part of airport property.

SD -- Scoping Document. A report that describes the purpose of the project, identifies feasible alternatives, and describes the affected social, economic and natural environment and potential impacts of the alternatives.

SDD -- Scoping Decision Document. The SDD presents the alternatives, issues and impacts that the Responsible Governmental Unit (RGU) has decided to study in the EIS or AED. The SDD is adopted by the RGU after receiving comments on the Draft SDD from the public and affected agencies.

Site 3 -- The area within Dakota County for a potential new airport. The location was selected at the end of a site selection process. It is in Marshan and Vermillion Townships.

SEL -- Sound Exposure Level (level of sound by individual aircraft at specified location)

Section 4(f) Land -- This is land afforded protection under Section 4(f) of the 1966 US Department of Transportation Act of Congress. All publicly-owned park and recreation land, wildlife and waterfowl refuges and historic lands of national, state or local significance are included in Section 4(f). These lands cannot be adversely impacted unless there is no feasible and prudent alternative to the use of the lands.

Section 6(f) Land -- Section 6(f) of the 1965 Land and Water Conservation Fund (LAWCON) Act of Congress stipulates that any land that was planned, developed or improved with LAWCON funds cannot be converted to other than outdoor recreational use unless replacement land of at least equal value and usefulness is provided. Section 6(f) land is outdoor recreational land and can include publicly-owned parks, tennis courts, county trails, golf courses, etc.

SHPO -- State Historic Preservation Office (of the Minnesota Historical Society)

SIP -- State Implementation Plan (for federal air quality standards)

SO_x -- Sulfur Oxide

SPCCP -- Spill Prevention Control and Countermeasure Plans used to track equipment and methods to deal with spills

State Safety Zones -- These are trapezoidal areas beyond the ends of the runways, labeled "A" and "B" that can be regulated to prevent the use of the included land for purposes which can be hazardous to aircraft operations. Minnesota Statute 360.063 provides authority for the establishment of a joint airport zoning board consisting of the directly affected municipalities. The board regulates zoning within the safety zones. The established zoning regulations cannot be retroactive (i.e., affecting existing land use and structures).

SWMF -- Stormwater Management Facility

SWPPP -- Stormwater Pollution Prevention Plans, designed to meet NPDES permit requirements

TBI -- Travel Behavior Inventory

TH -- Trunk Highway, under jurisdiction of Mn/DOT

TKN -- Total kjeldahl nitrogen

TP -- Total Phosphorous

TSP -- Total Suspended Particulates

TSS -- Total Suspended Solids

USFWS -- U.S. Fish and Wildlife Service

VRWMO -- Vermillion River Watershed Management Organization

VOC -- Volatile Organic Compound

WCA -- Wetlands Conservation Act of 1991

WMS -- Watershed Management Sector

WWTF -- Wastewater Treatment Facility

VIII. LIST OF REFERENCES

1. Air Quality Procedures for Civilian Airports and Air Force Bases, U.S. Department of Transportation, Federal Aviation Administration, Report FAA-EE-82-21, December 1982.

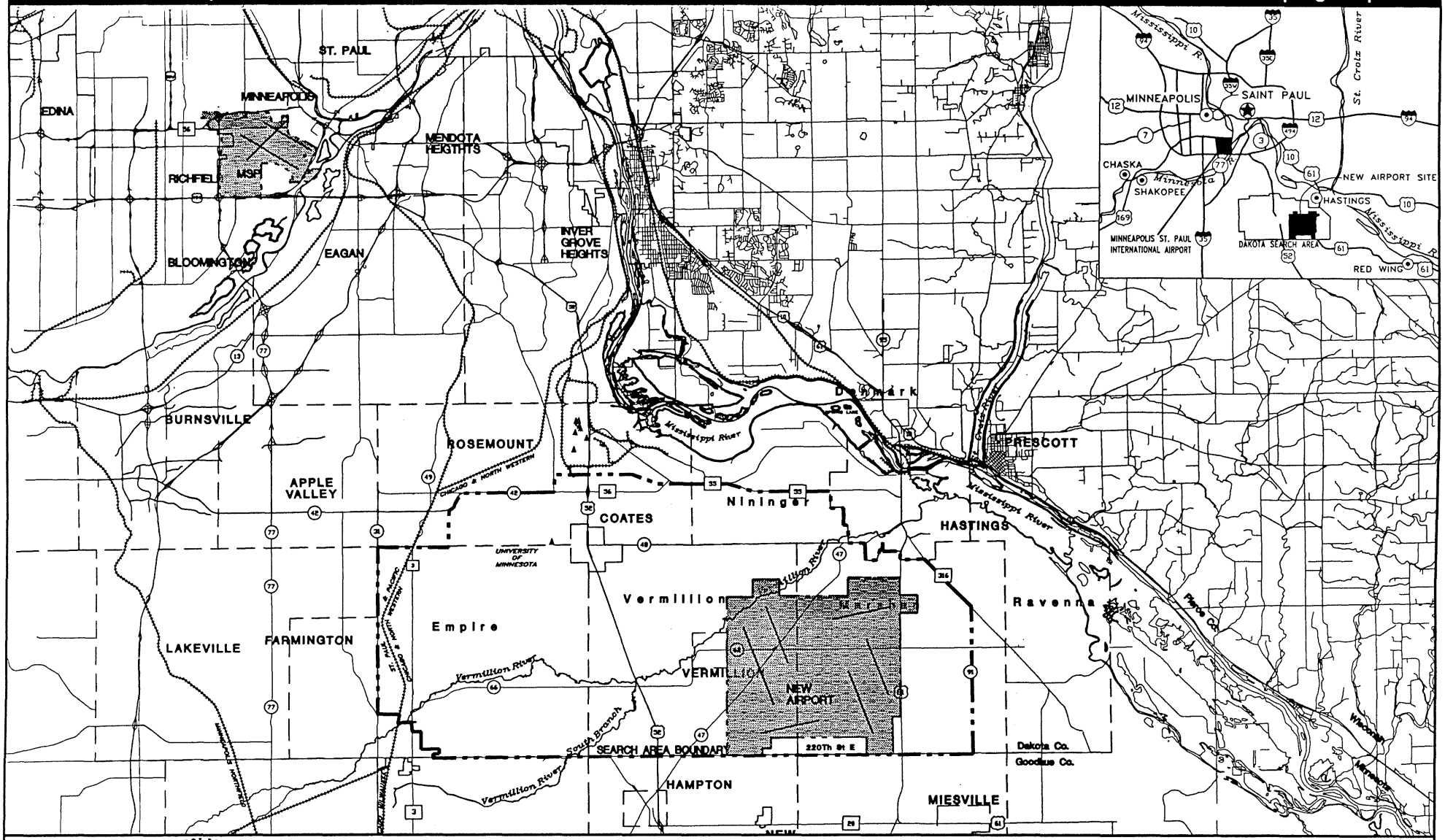
2. "Minneapolis-St. Paul International Airport: Air Quality Analysis Study Report", MPCA Air Quality Division, August 1994.

3. Carbon Monoxide Background Monitoring Study, David Braslau Associates, Inc. 1993.

APPENDIX A -- FIGURES 1 - 61

Figure No.	Title
1	Location Map
2	Year 2020 Average IFR Hourly Operations - No Build Scenario
3	Avg. Delays per Operation-FAA Capacity Enhancement Plan
4	MSP Alternative
5	New Airport Alternative
6	New Airport Conceptual Layout
7	No Action Alternative
8	MSP Alternative Plan 1 Eliminated
9	MSP Alternative Plan 2 Eliminated
10	MSP Alternative Plan 3 Eliminated
11	MSP Alternative Plan 4 Eliminated
12	MSP Alternative Plan 5 Eliminated
13	Alternative Search Areas Eliminated
14	Alternative Runway Layout Concepts Eliminated
15	Alternative Sites Eliminated in Scoping
16	Alternative Sites Eliminated in Final AED
17	New Airport Alternative Plan 4 Eliminated in Scoping
18	Alternative Plan 1 - New Airport
19	Alternative Plan 2 - New Airport
20	Alternative Plan 3 - New Airport
21	Archaeological Resources - MSP & No Action Alternatives
22	Archaeological Resources - New Airport Alternative
23	Biotic Communities - New Airport Alternative
24	Potential Bird-Aircraft-Hazard Areas-MSP & No Action Alternatives
25	Potential Bird-Aircraft-Hazard Areas-New Airport Alterantive
26	Prime Farmland - New Airport Alternatives
27	Farmland of Statewide Importance - New Airport Alternative
28	Agricultural Preserves - New Airport Alternative
29	Floodplains - MSP & No Action Alternatives
30	Floodplains - New Airport Alternative
31	Historic/Architectural Resources - MSP Alternatives
32	Historic/Architectural Resources - New Airport Alternative
33	Planned Land Use - MSP & No Action Alternatives
34	Land Use - New Airport Alternative
35	1992 DNL Contours - MSP & No Action Alternatives

Figure No.	Title
36	DNL 65 Contour Comparison - Years 2000, 2005, 2020
37	2005 DNL Contours - MSP Alternative
38	Ambient DNL Contours - New Airport Alternative
39	Approximate 2005 DNL Contours - New Airport Alternative
40	2005 DNL Contours - No Action Alternative
41	Park and Recreation Land - MSP & No Action Alternatives
42	Park and Recreation Land - New Airport Alternative
43	Site Preservation Areas - New Airport Alternative
44	1992 Daily Vehicular Traffic - MSP & No Action Alternatives
45	2020 Daily Vehicular Traffic - MSP Alternative
46	1992 Daily Vehicular Traffic - New Airport Alternative
47	2020 Daily Vehicular Traffic - New Airport Alternative
48	2020 Daily Vehicular Traffic - No Action Alternative (MSP)
49	2020 Daily Vehicular Traffic - No Action Alternative (New Airport)
50	Major Utilities - New Airport Alternative
51	Sanitary Sewer Layout - MPS & No Action Alternatives
52	Watermain Layout - MSP & No Action Alternatives
53	Stormwater Drainage Areas, Basins and Structures - MSP & No Action Alternatives
54	Vermillion River Watershed Management Sectors
55	Bedrock Geology - MSP & No Action Alternatives
56	Soils - New Airport Alternative
57	Depth to Bedrock - New Airport Alternative
58	Wetlands - MSP & No Action Alternatives
59	Wetlands - New Airport Alternative
60	Wildlife Refuges - MSP & No Action Alternative
61	Wildlife Refuges - New Airport Alternative



Source: HNTB

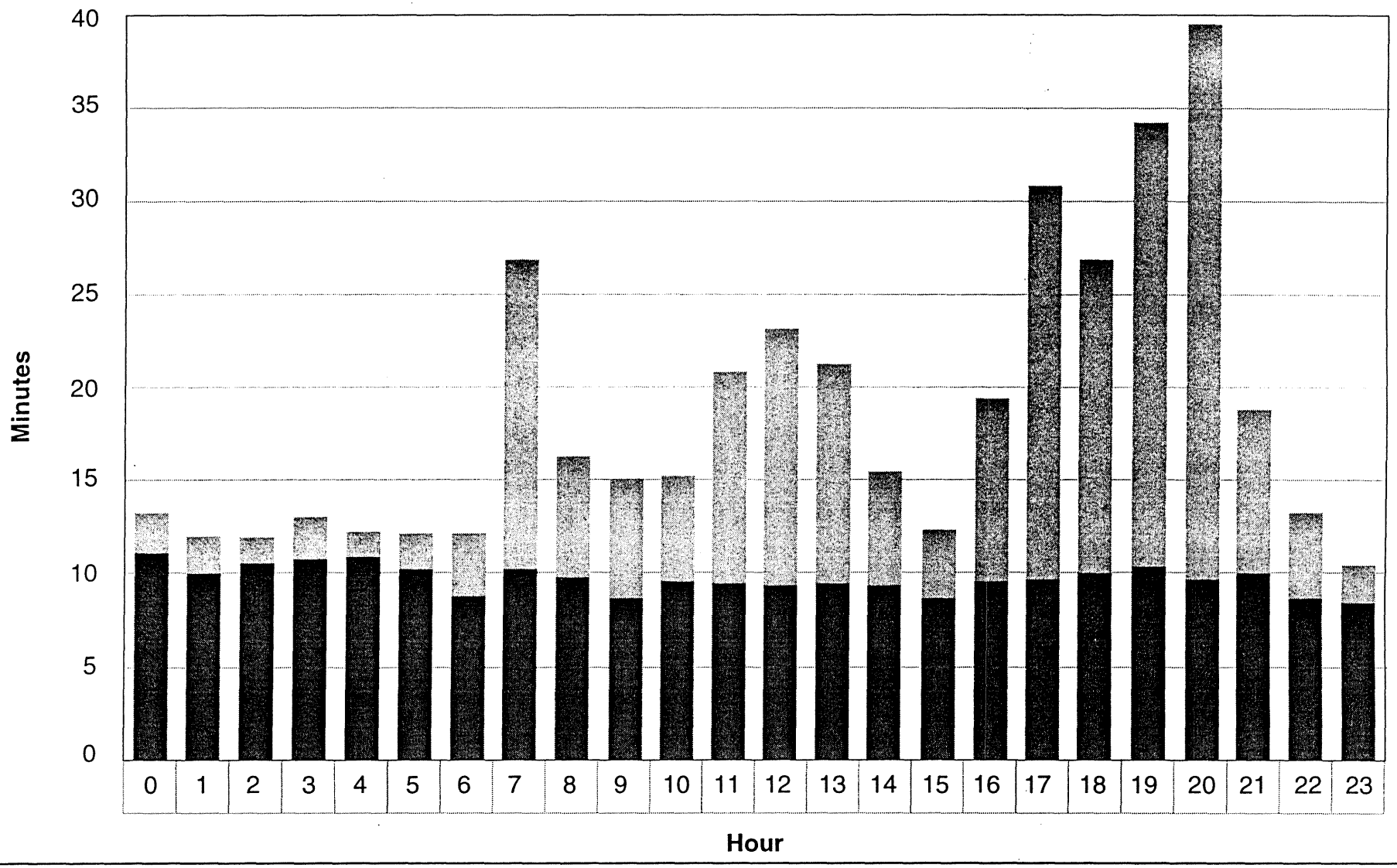
0 2 4
Scale in Miles

N

HNTB

Figure 1

Location Map



Source : HNTB Analysis

Delay

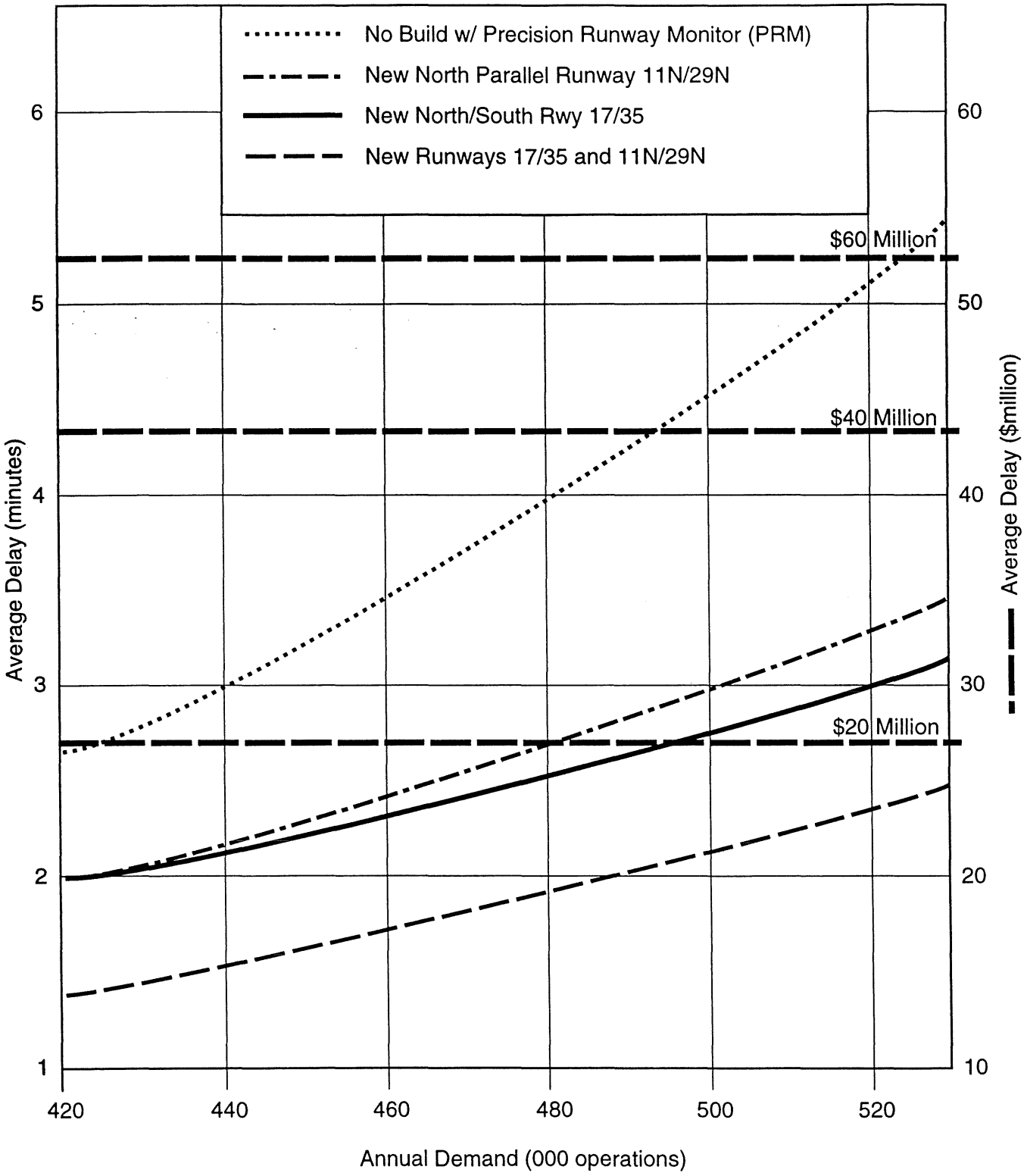
Travel Time

N

HNTB

Figure 2

Year 2020 Average IFR Hourly Operations - No Build Scenario

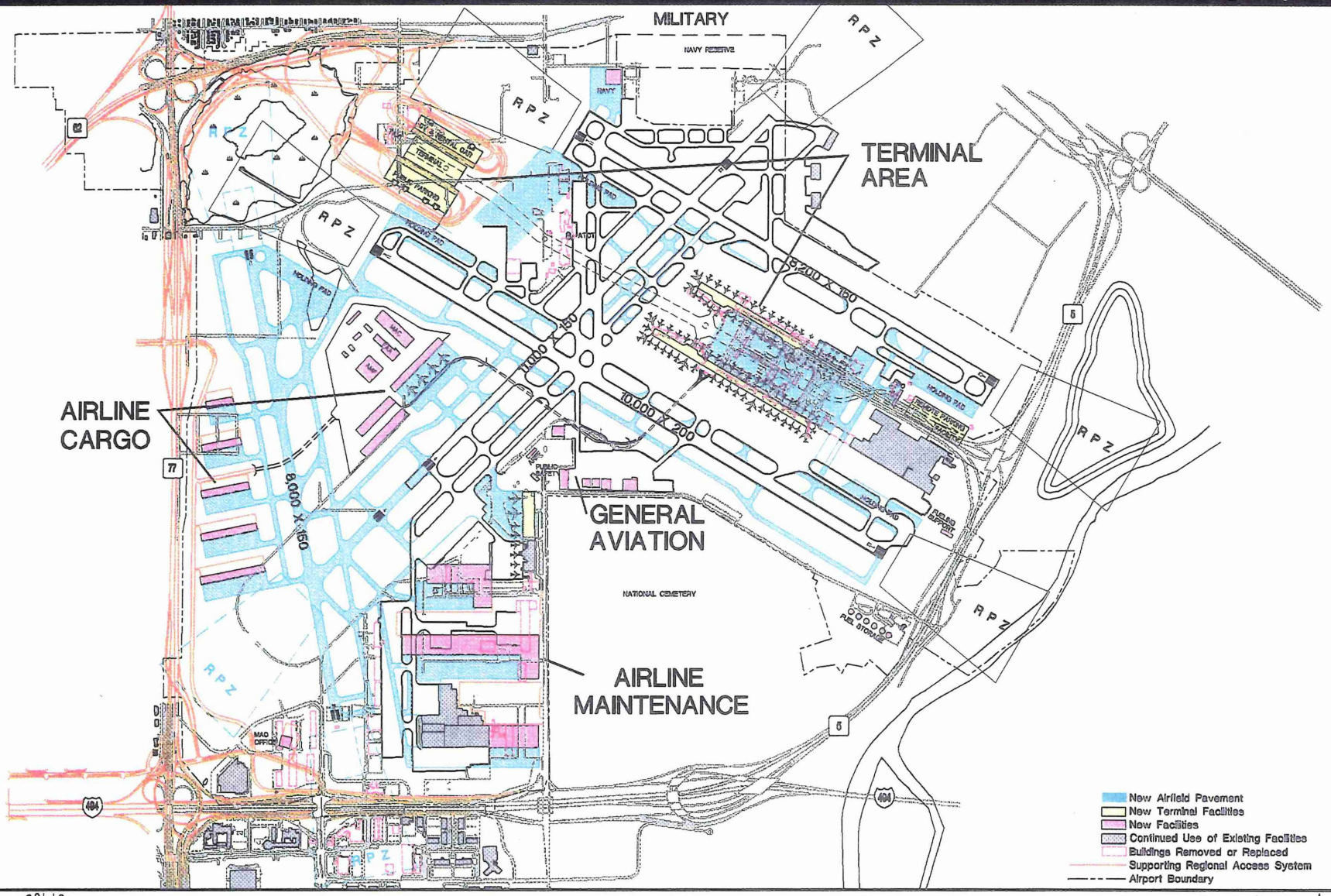


Source: FAA Minneapolis-St. Paul International Airport Capacity Enhancement Plan, Figures 5 & 6

HNTB

Figure 3

Average Delays Per Operation - FAA Capacity Enhancement Plan

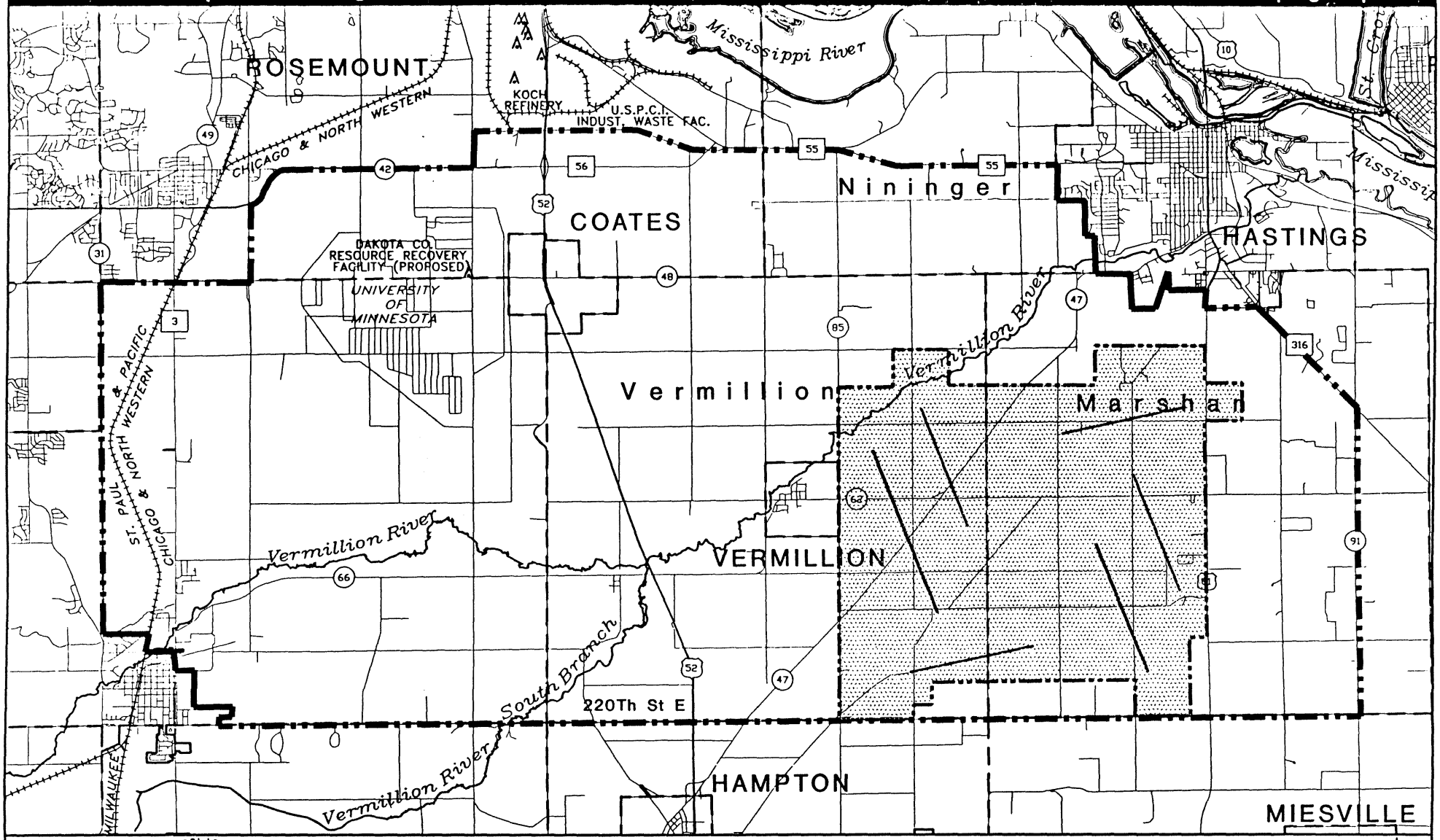


Source: HNTB

HNTB

Figure 4

MSP Alternative

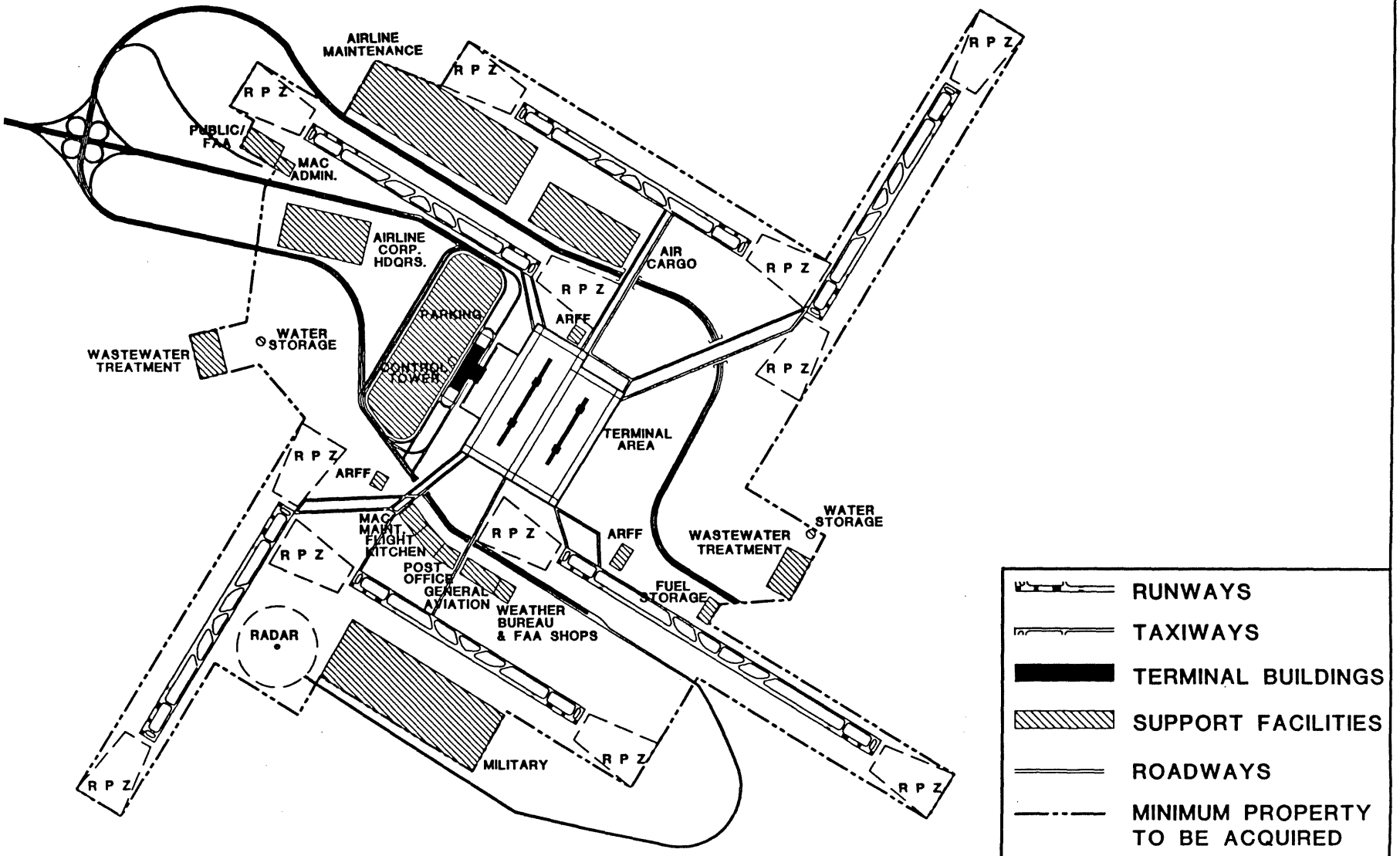


Source: HNTB

HNTB

Figure 5

New Airport Alternative

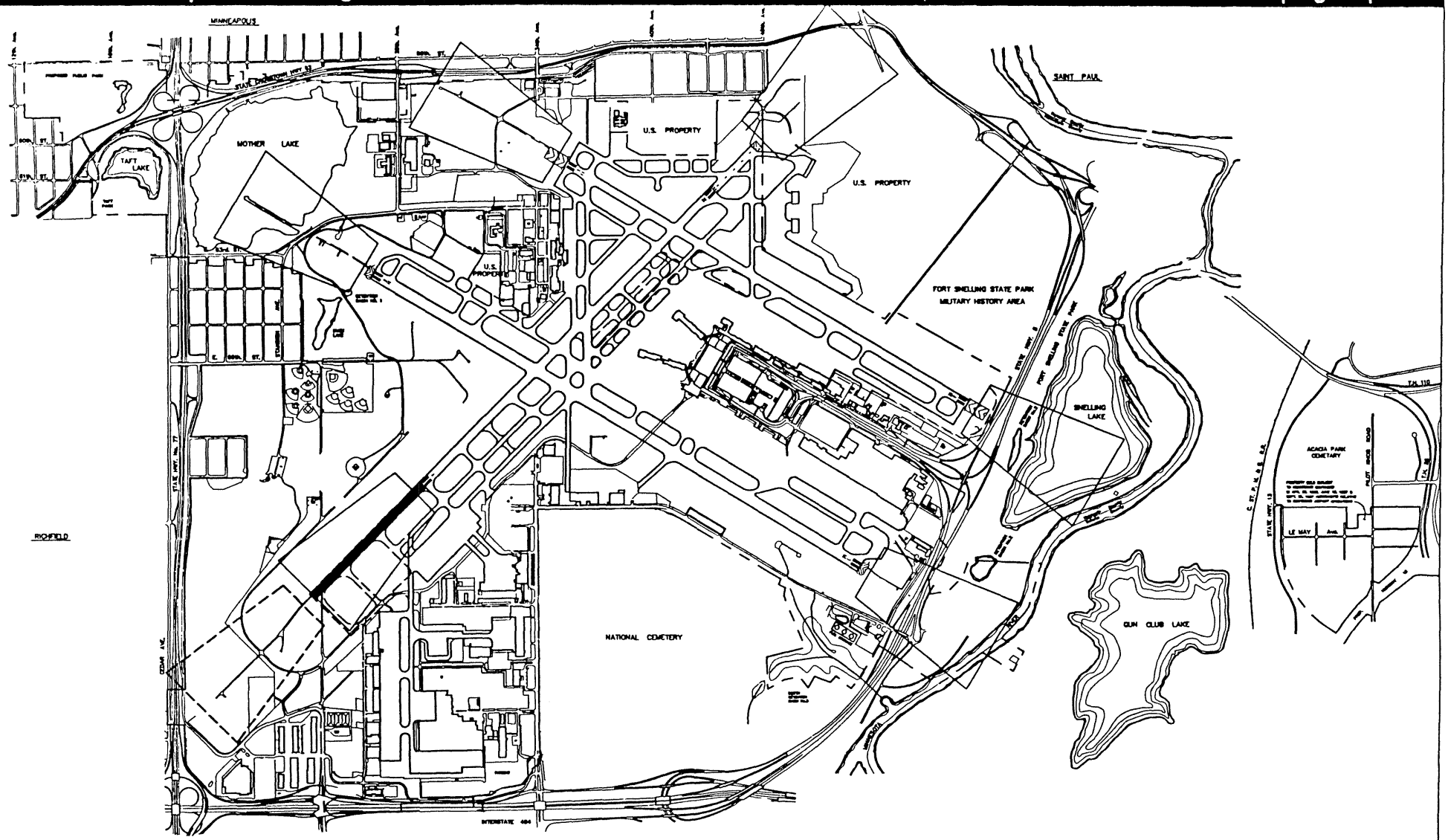


Source: HNTB

HNTB

Figure 6

New Airport Conceptual Layout



Runway 4-22 Extension

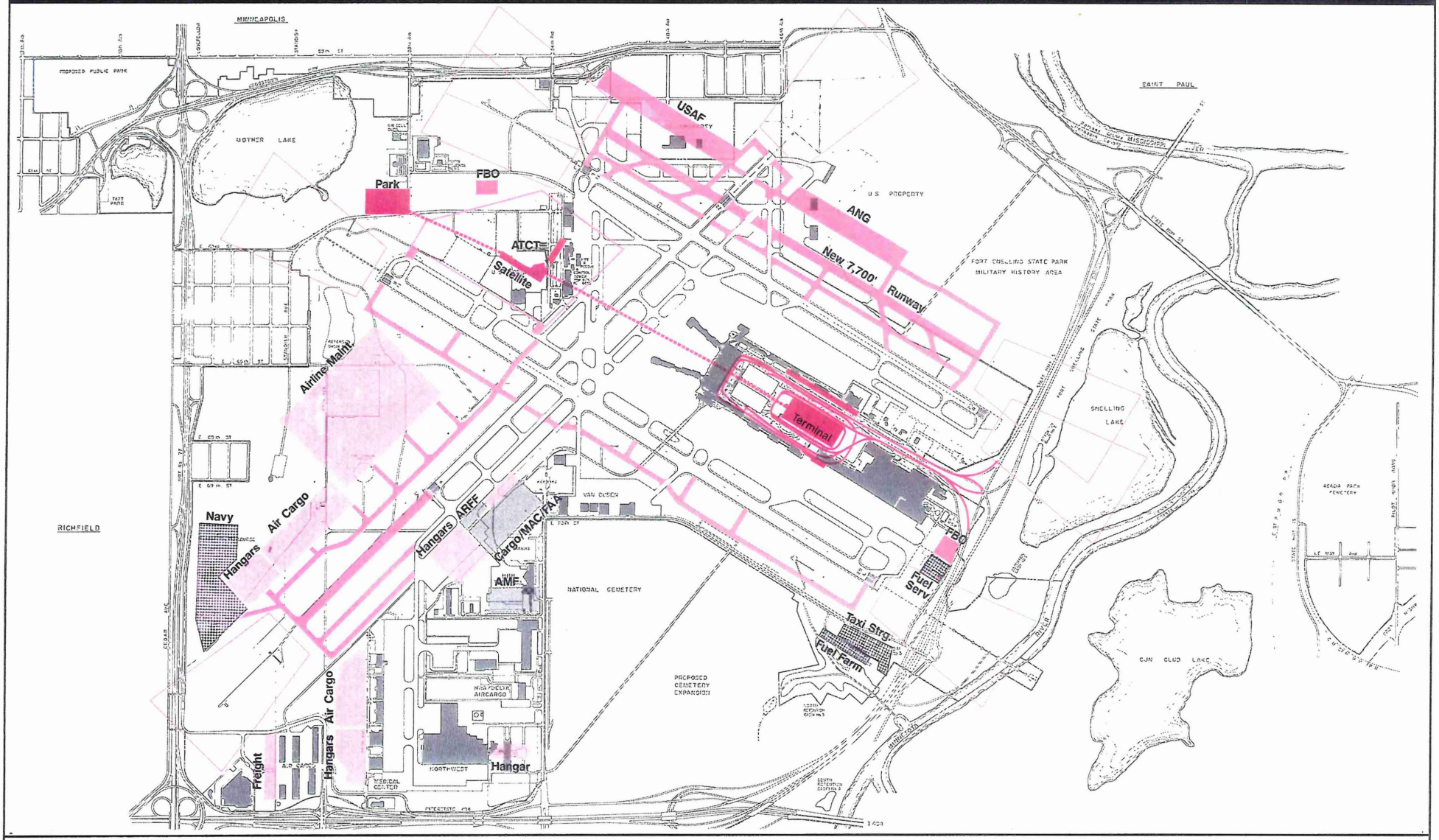
Source: HNTB

N

HNTB

Figure 7

No Action Alternative



Source : HNTB

Airfield
Airline/Cargo
Gen. Aviation
Terminal Area
Administration
Other

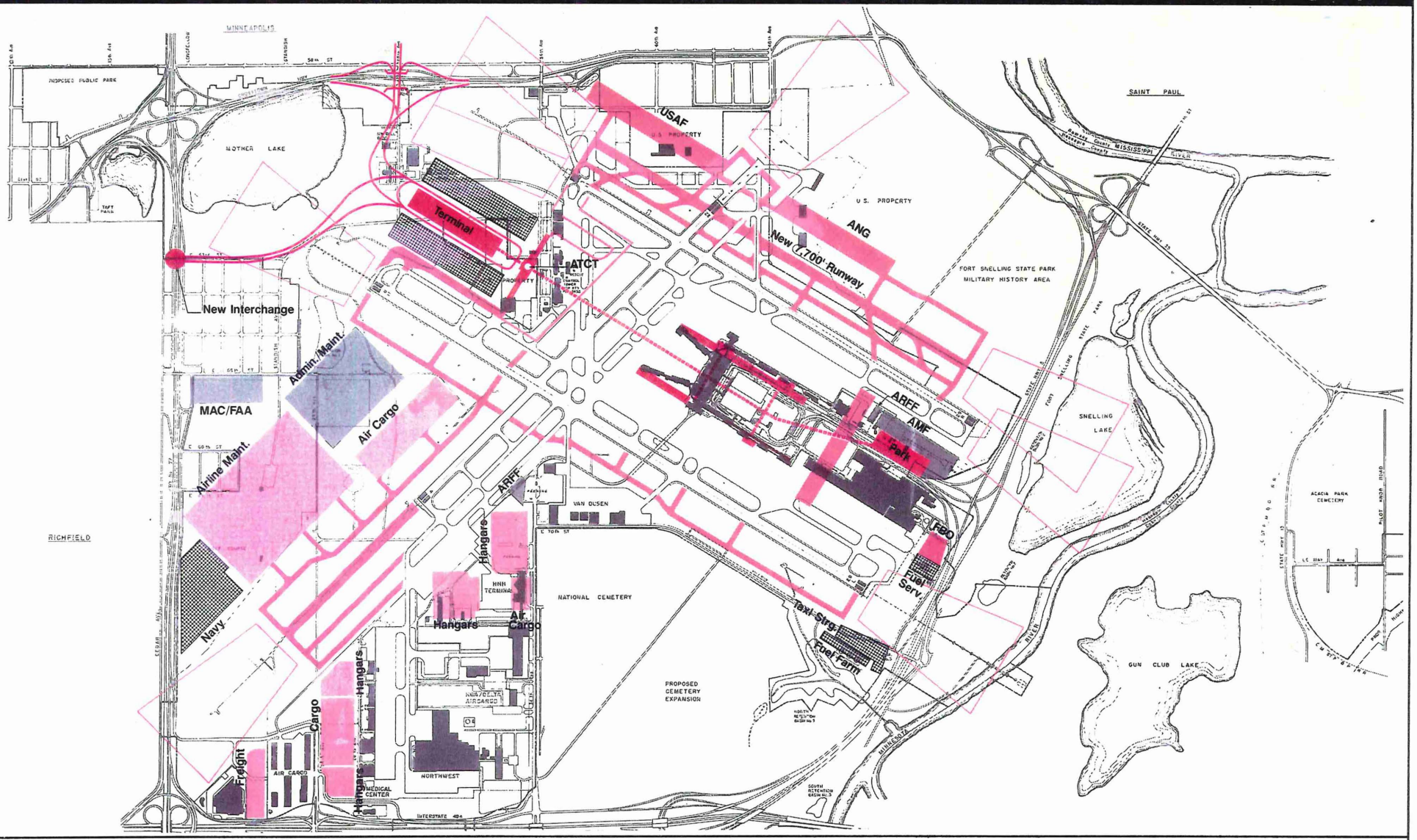
0 1,200 2,400
Scale in Feet

N

HNTB

Figure 8

MSP Alternative Plan 1 Eliminated



Source : HNTB

Airfield
Airline/Cargo
Gen. Aviation
Terminal Area
Administration
Other

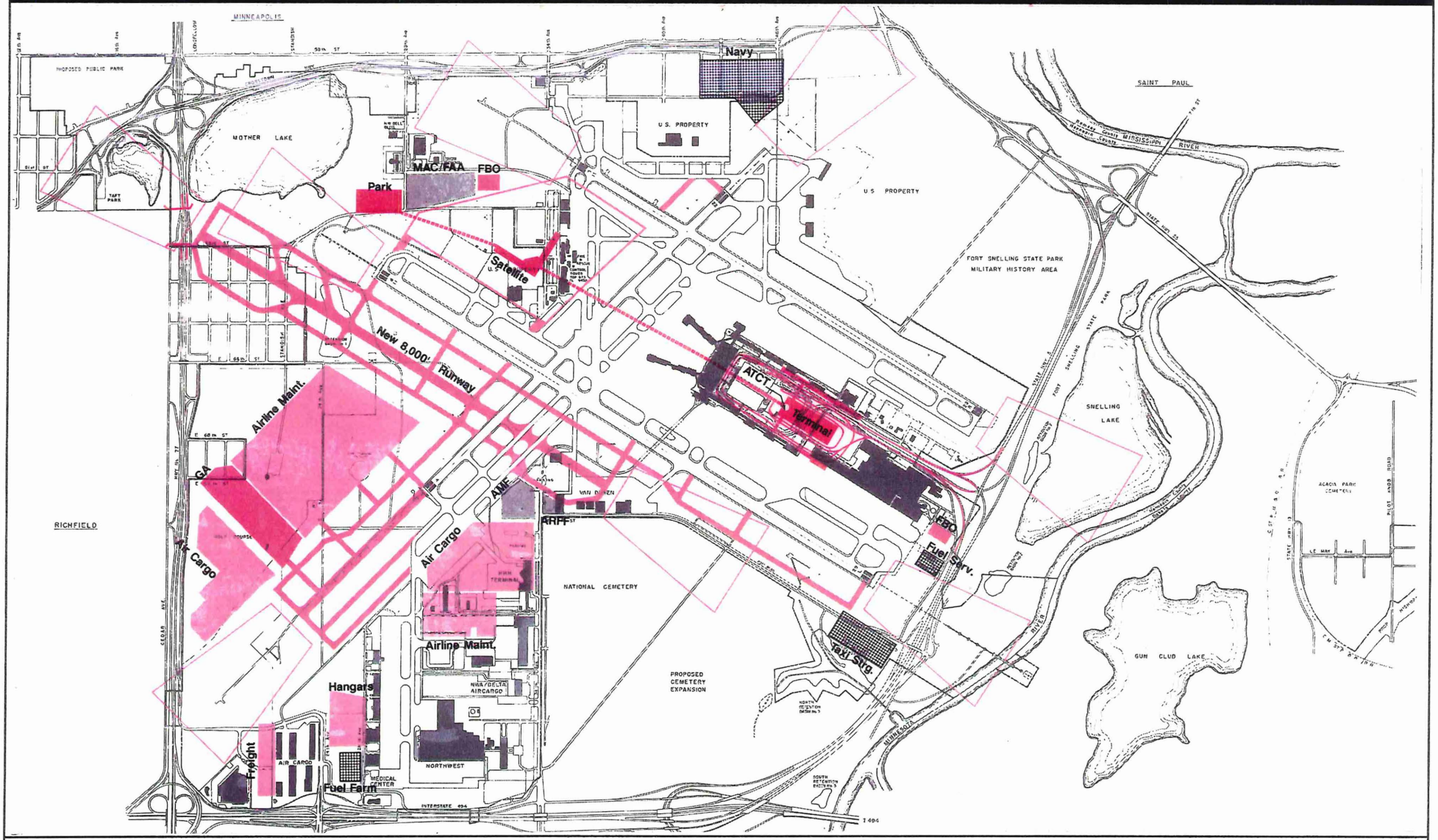
0 1,200 2,400
Scale in Feet

N

HNTB

Figure 9

MSP Alternative 2 Plan Eliminated



Source : HNTB

Airfield
Airline/Cargo
Gen. Aviation
Terminal Area
Administration
Other

0 1,200 2,400
Scale in Feet

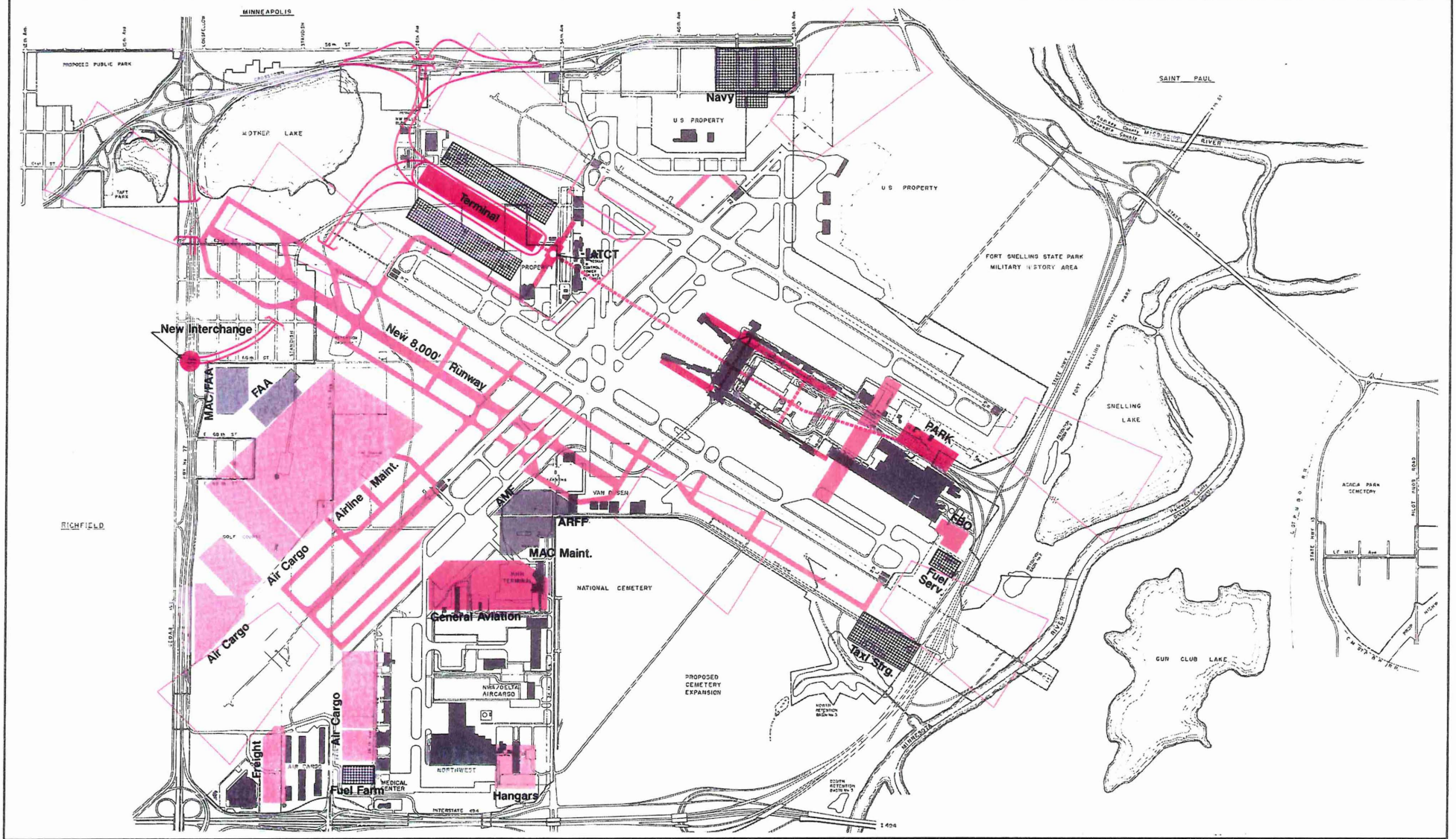
N

HNTB

MINNEAPOLIS SAINT PAUL METROPOLITAN AIRPORTS COMMISSION MAC

Figure 10

MSP Alternative Plan 3 Eliminated



Source : HNTB

Airfield
Airline/Cargo
Gen. Aviation
Terminal Area
Administration
Other

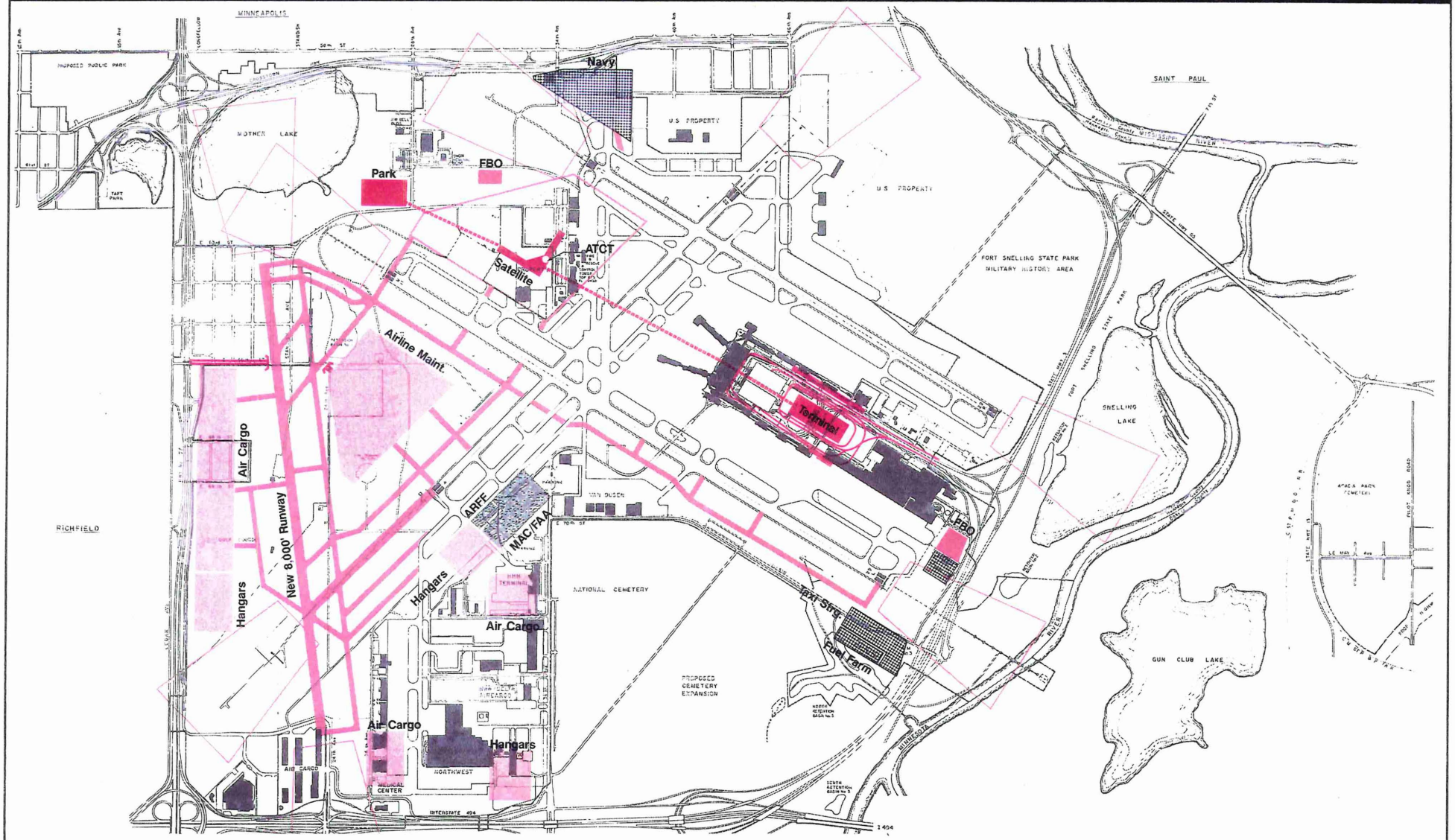
0 1,200 2,400
Scale in Feet

N

HNTB

Figure 11

MSP Alternative Plan 4 Eliminated



Source : HNTB

Airfield
Airline/Cargo
Gen. Aviation
Terminal Area
Administration
Other

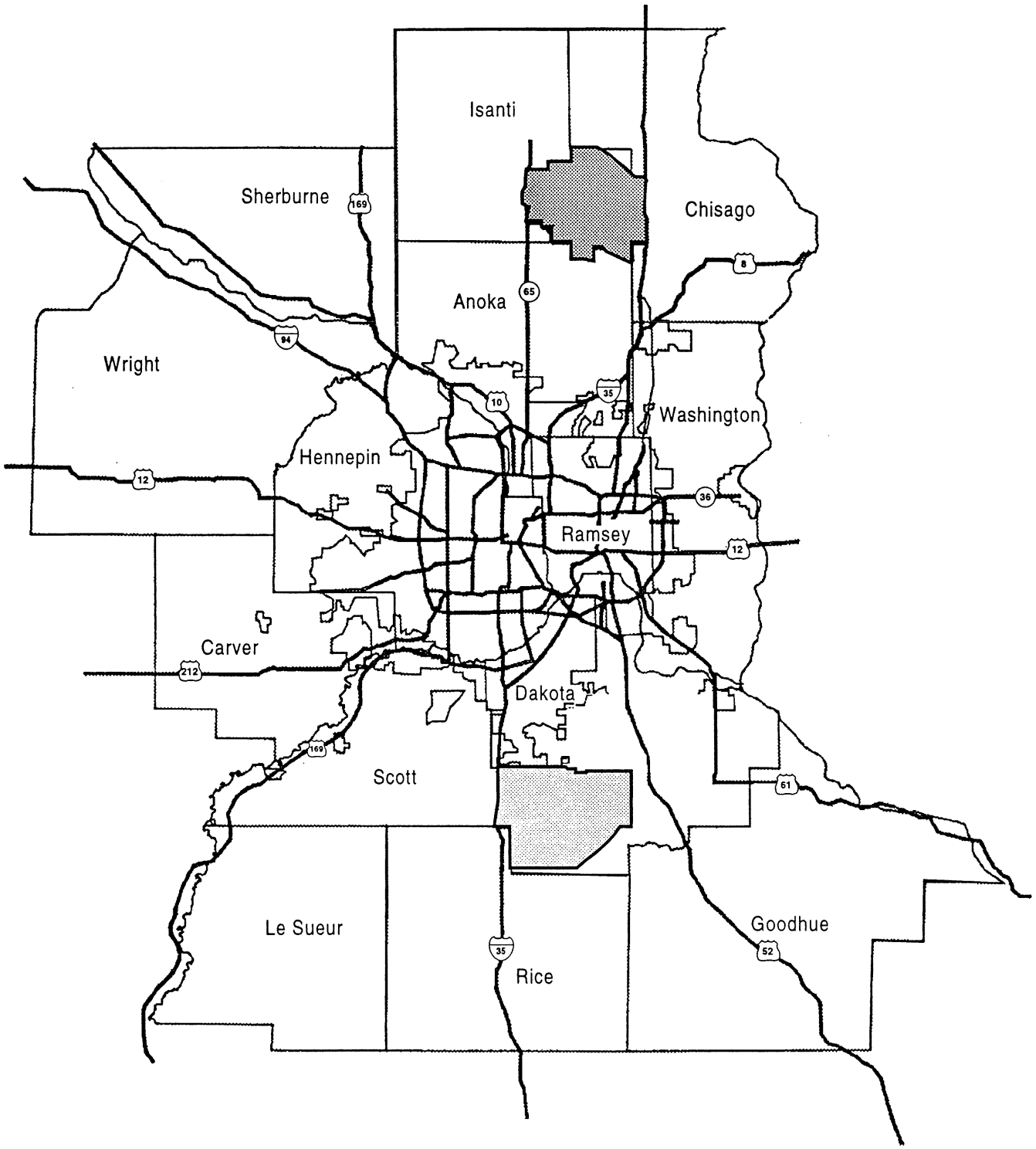
0 1,200 2,400
Scale in Feet

N

HNTB

Figure 12

MSP Alternative Plan 5 Eliminated



Anoka-Isanti-Chisago Search Area

Dakota-Scott Search Area

MUSA Line

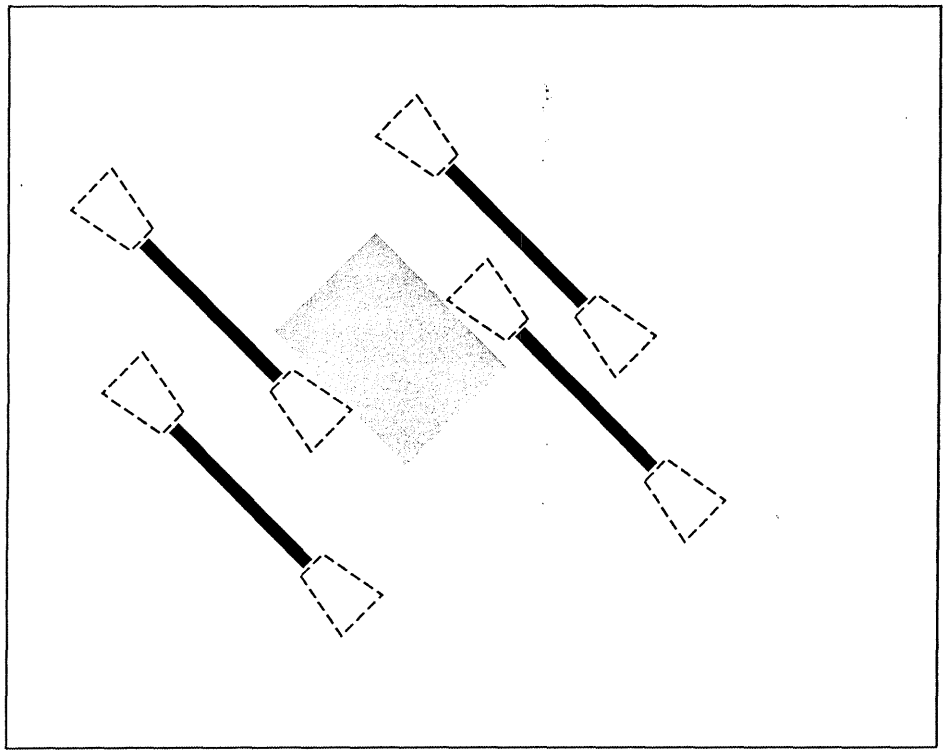
HNTB

MAC

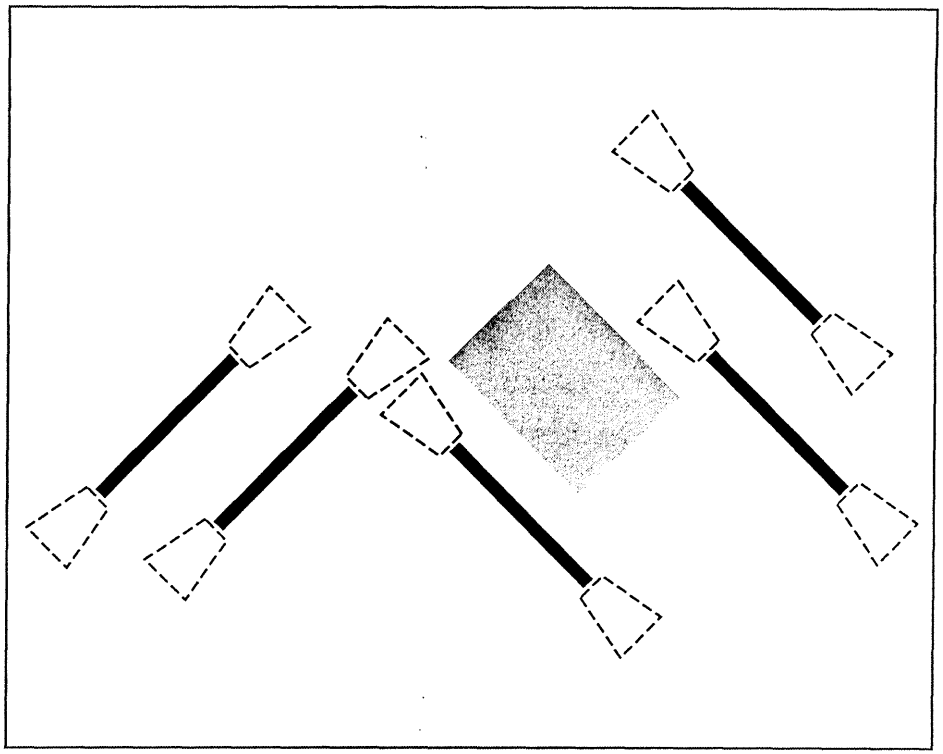
Minneapolis Saint Paul Metropolitan Airports Commission

Figure 13

Alternative Search Areas Eliminated



Concept P



Concept L

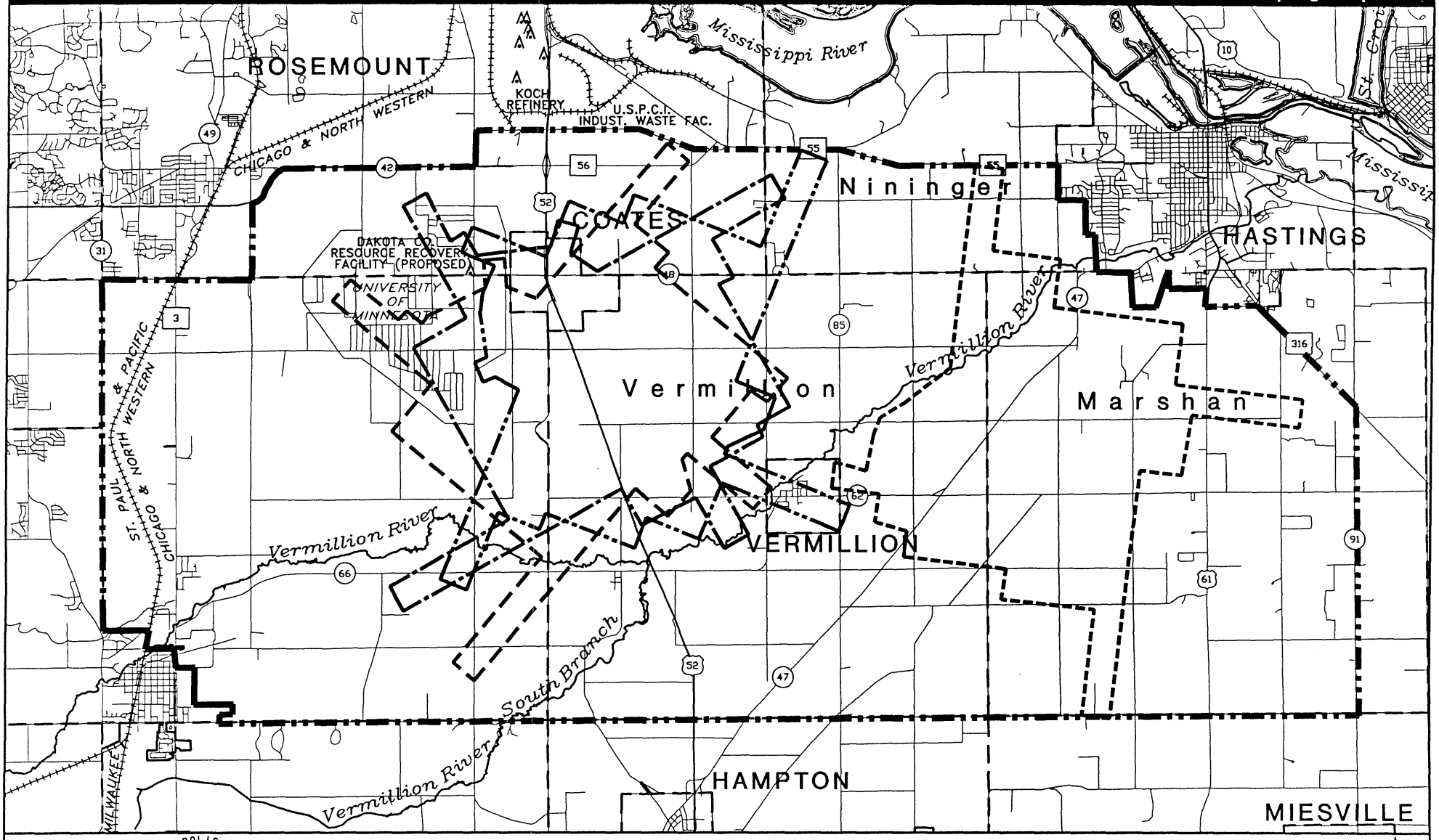
Not to Scale

N

HNTB

Figure 14

Alternative Runway Layout Concepts Eliminated

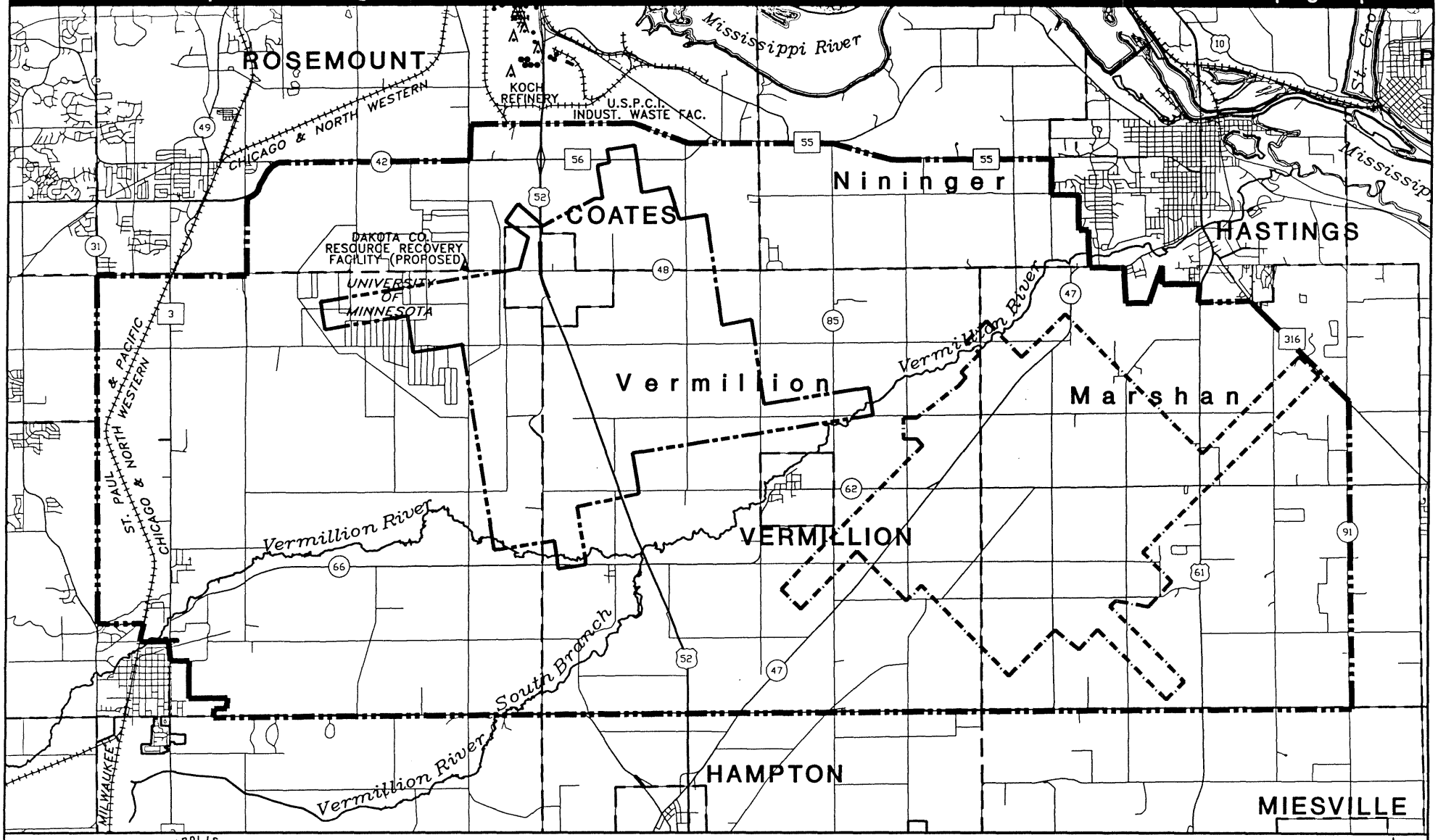


HNTB

MAC Minneapolis Saint Paul Metropolitan Airports Commission

Figure 15

Alternative Sites Eliminated

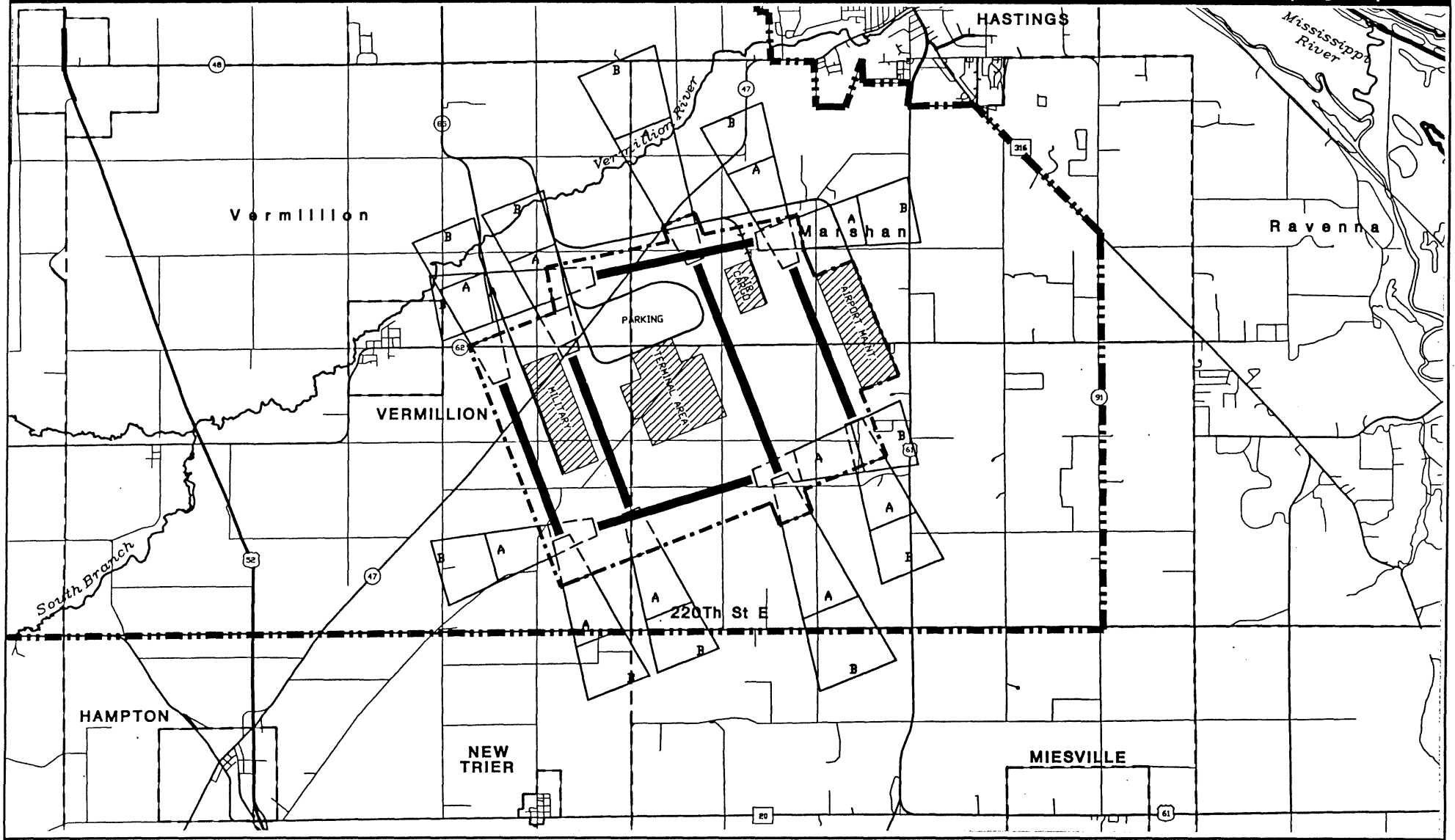


HNTB

MAC Minneapolis Saint Paul Metropolitan Airports Commission

Figure 16

Alternative Sites Elminated in Final AED

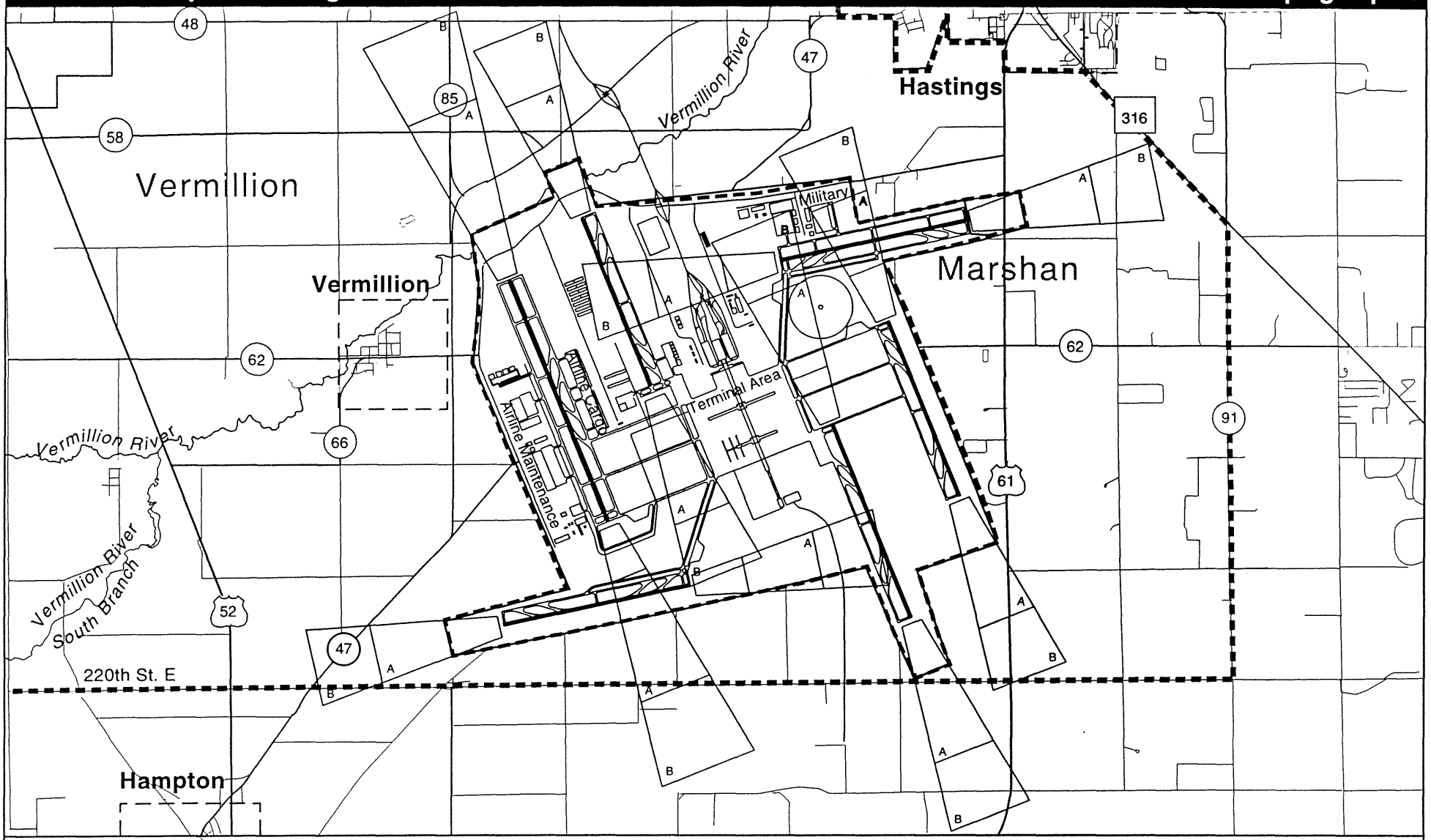


Source: HNTB

HNTB

Figure 17

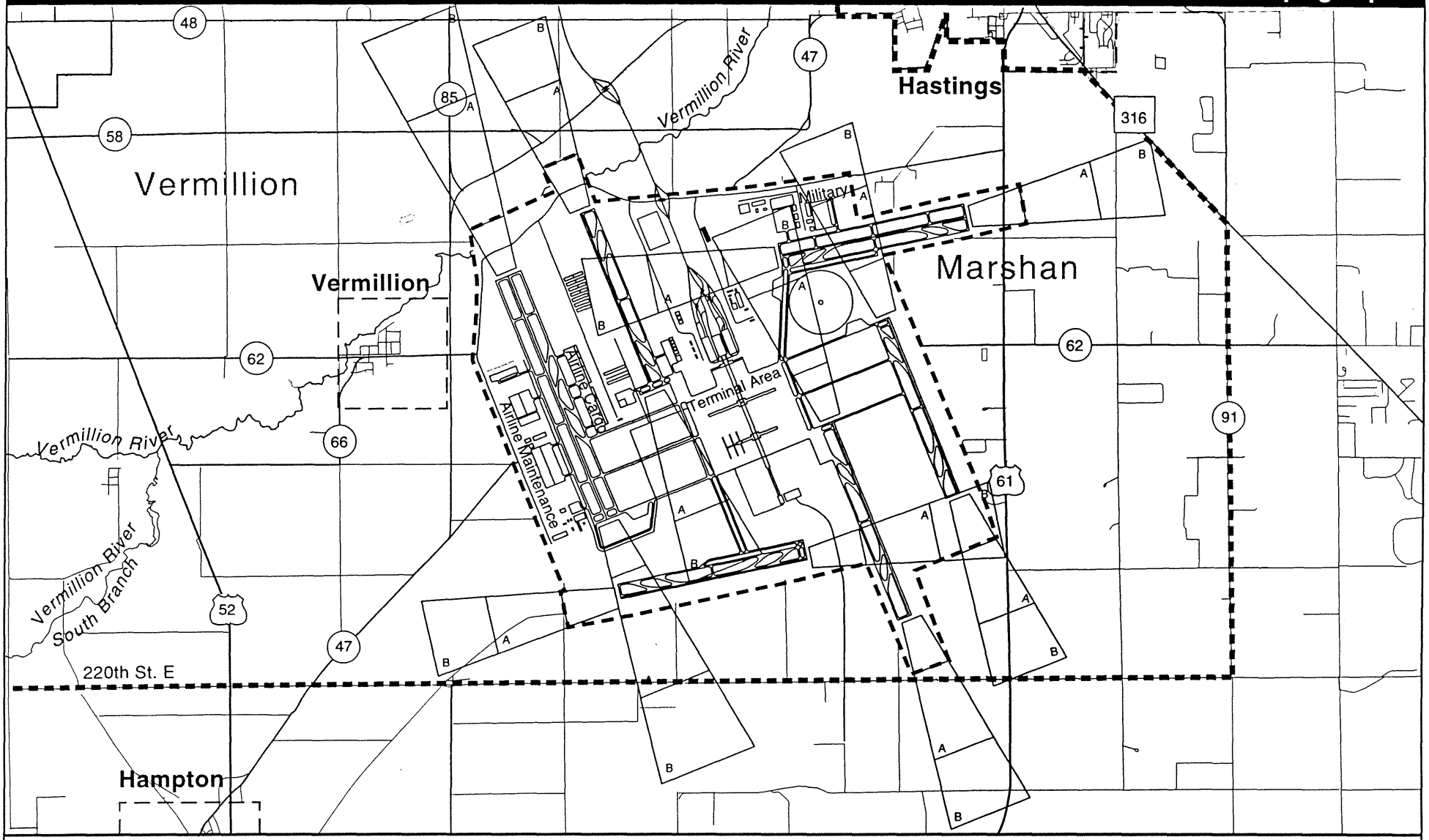
New Airport Alternative Plan 4 Eliminated In Scoping



HNTB

Figure 18

Alternative Plan 1 - New Airport



Search Area Boundary
Airport Boundary

0 1 2 3 4 5
Thousands of Feet

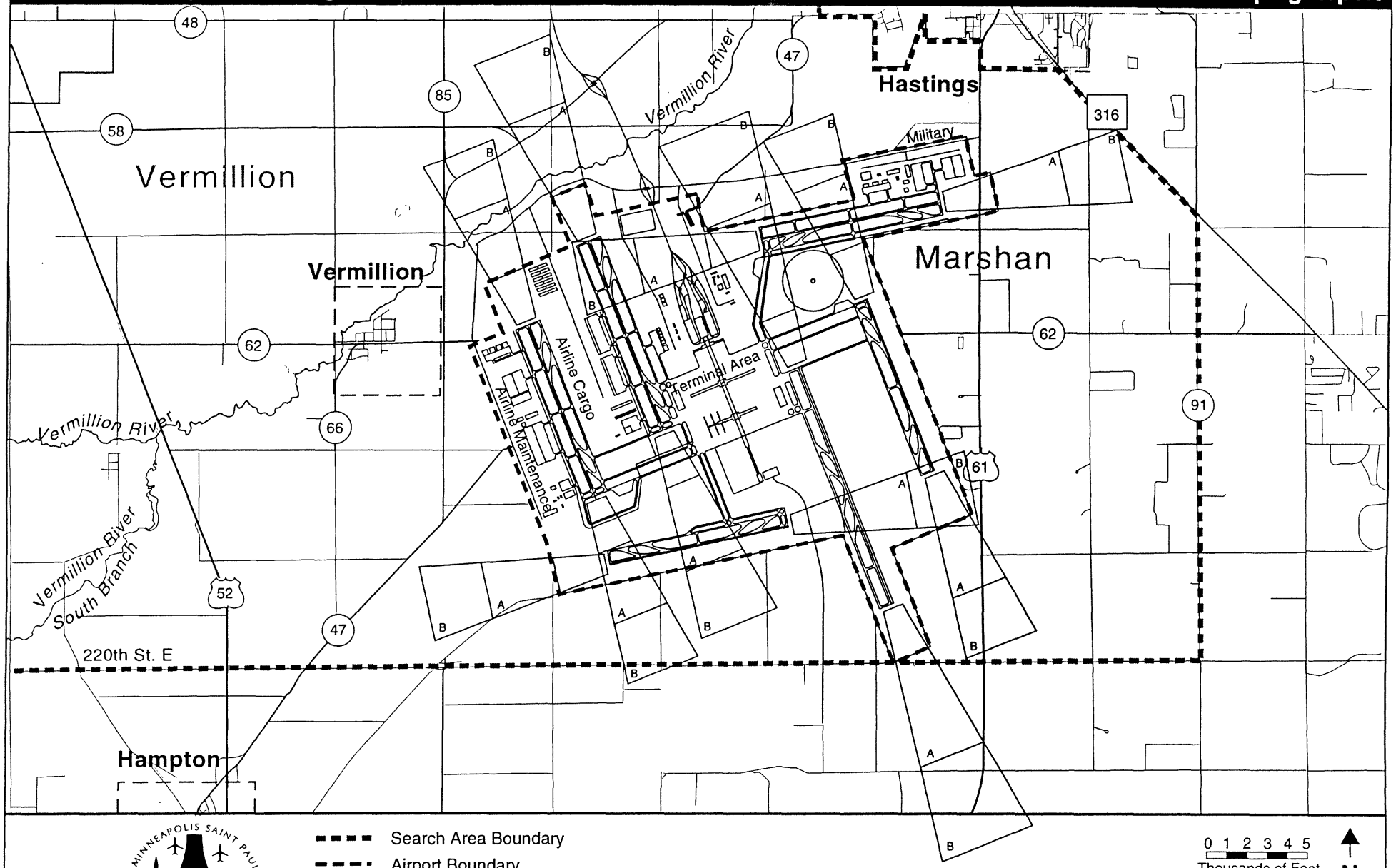
N

HNTB

MAC Minneapolis Saint Paul Metropolitan Airports Commission

Figure 19

Alternative Plan 2 - New Airport



HNTB

Figure 20

Alternative Plan 3 - New Airport

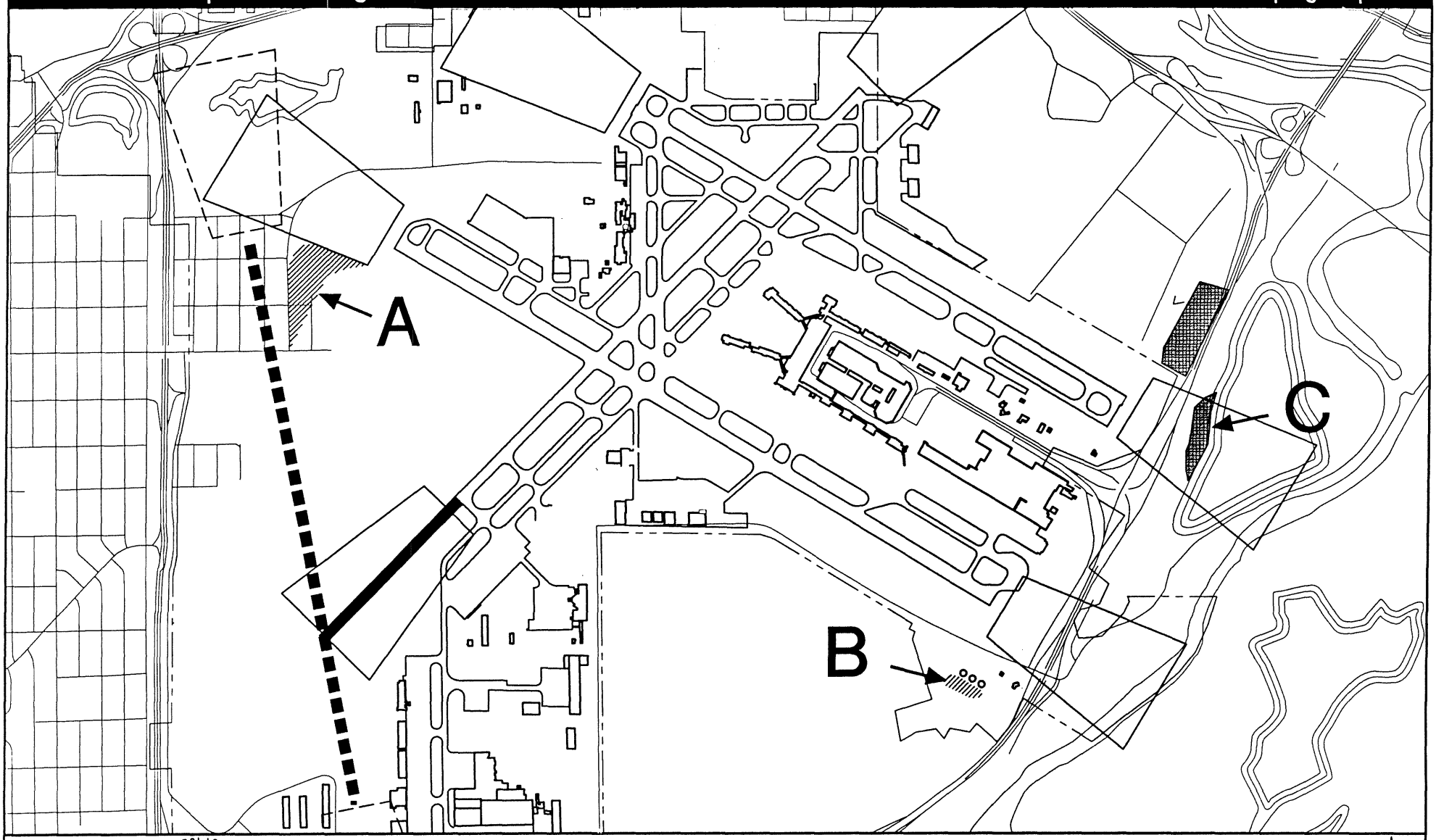
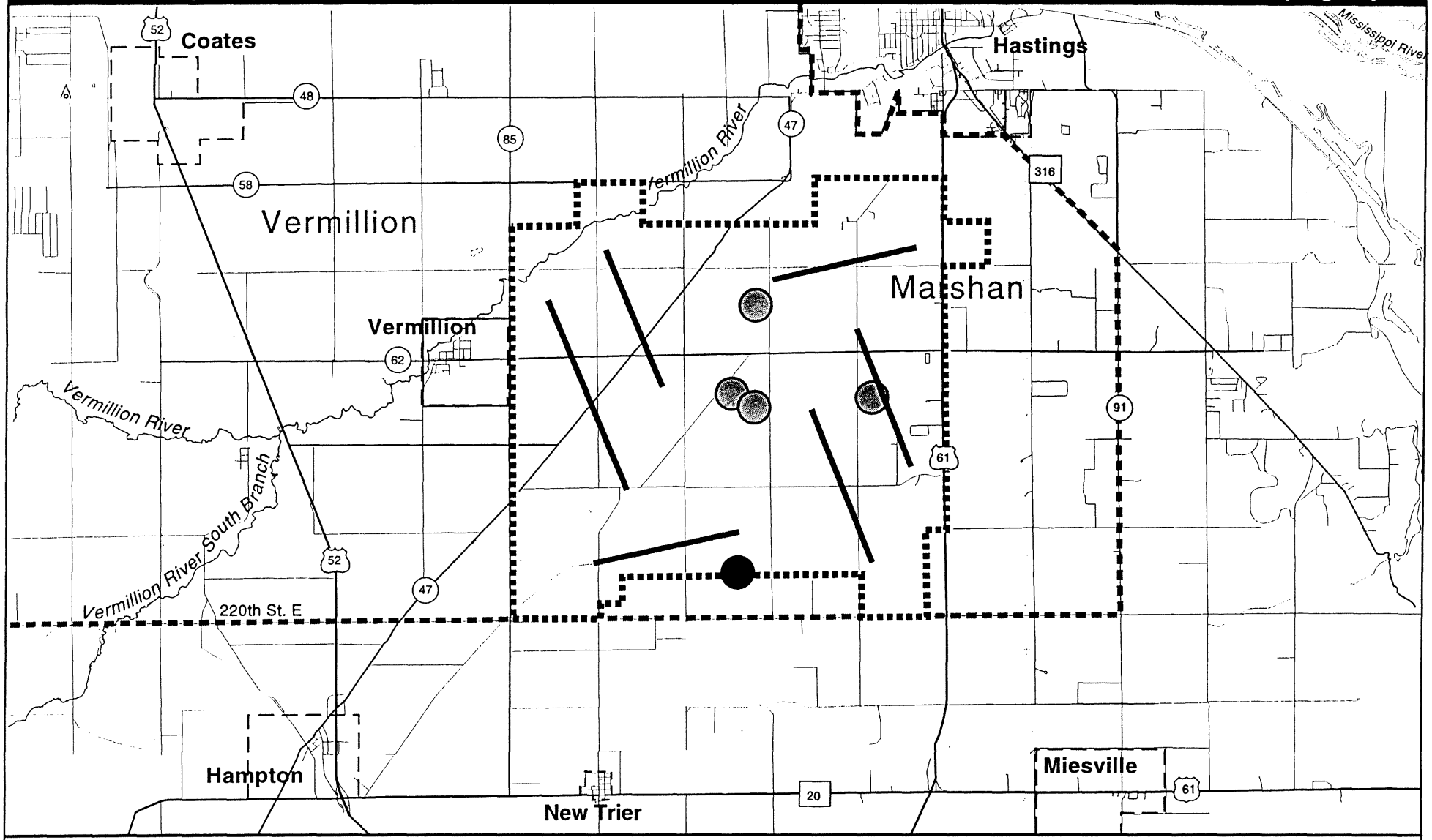


Figure 21

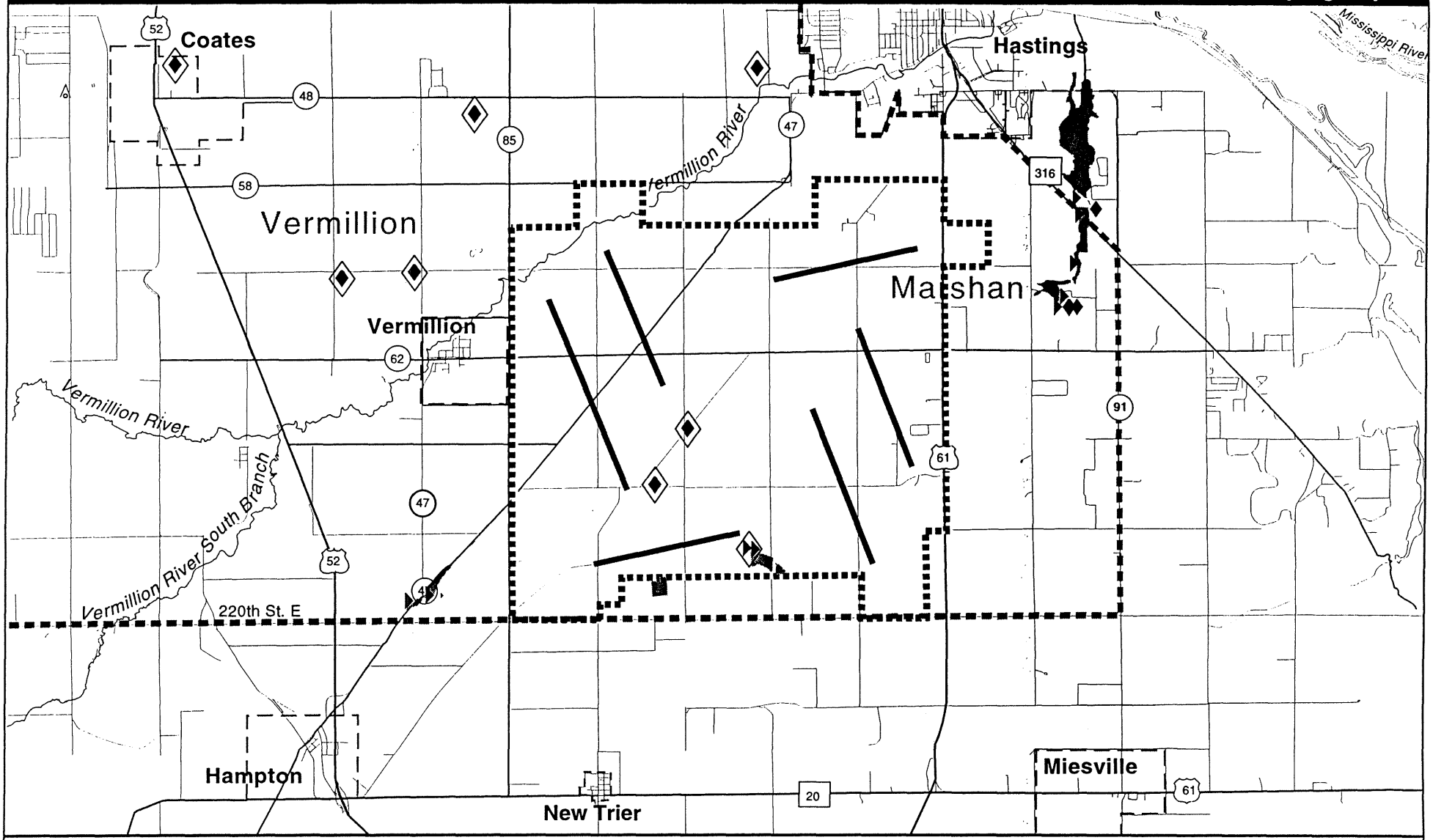
Archaeological Resources - MSP and No Action Alternatives



HNTB

Figure 22

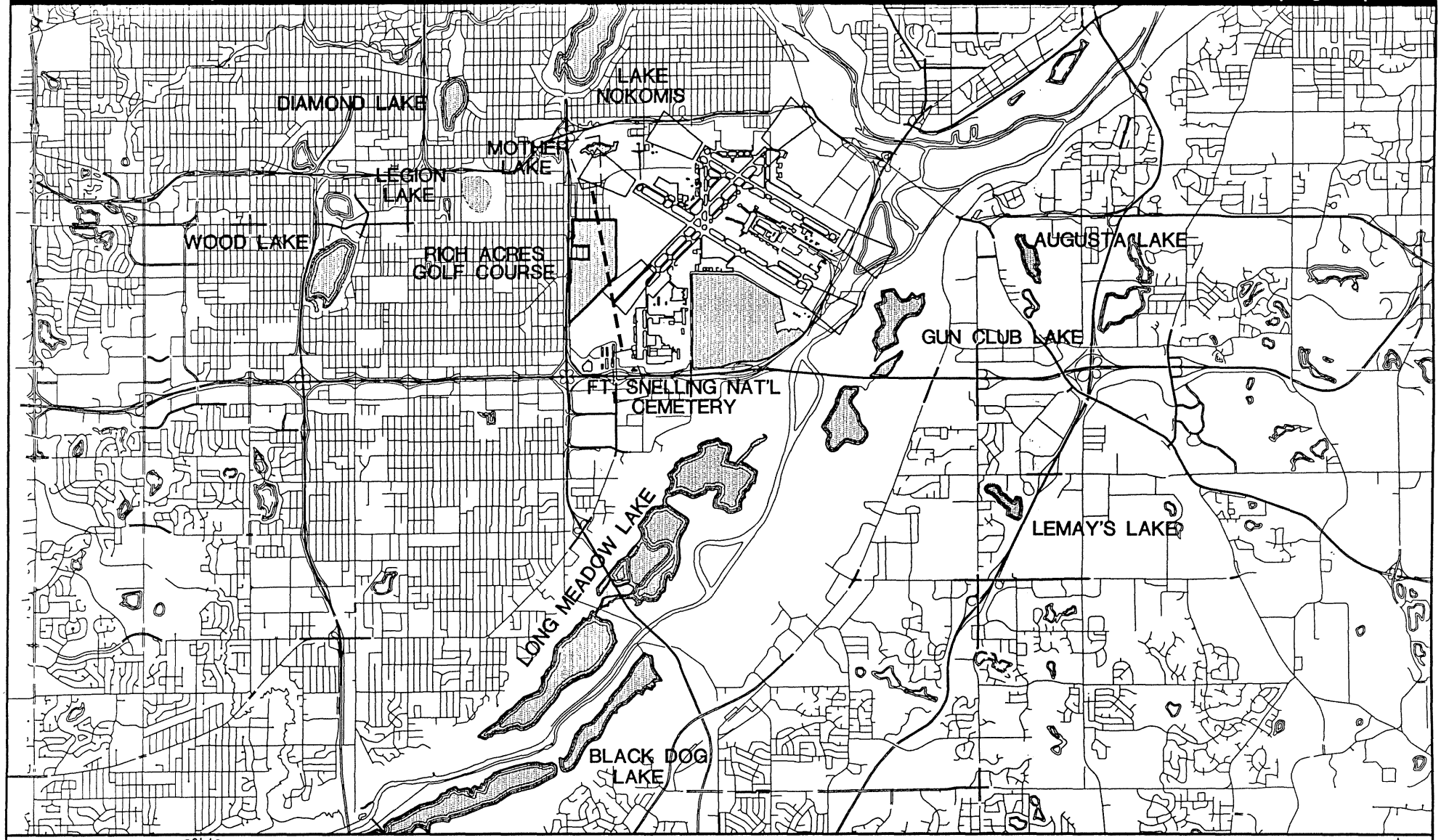
Archaeological Resources - New Airport Alternative



HNTB

Figure 23

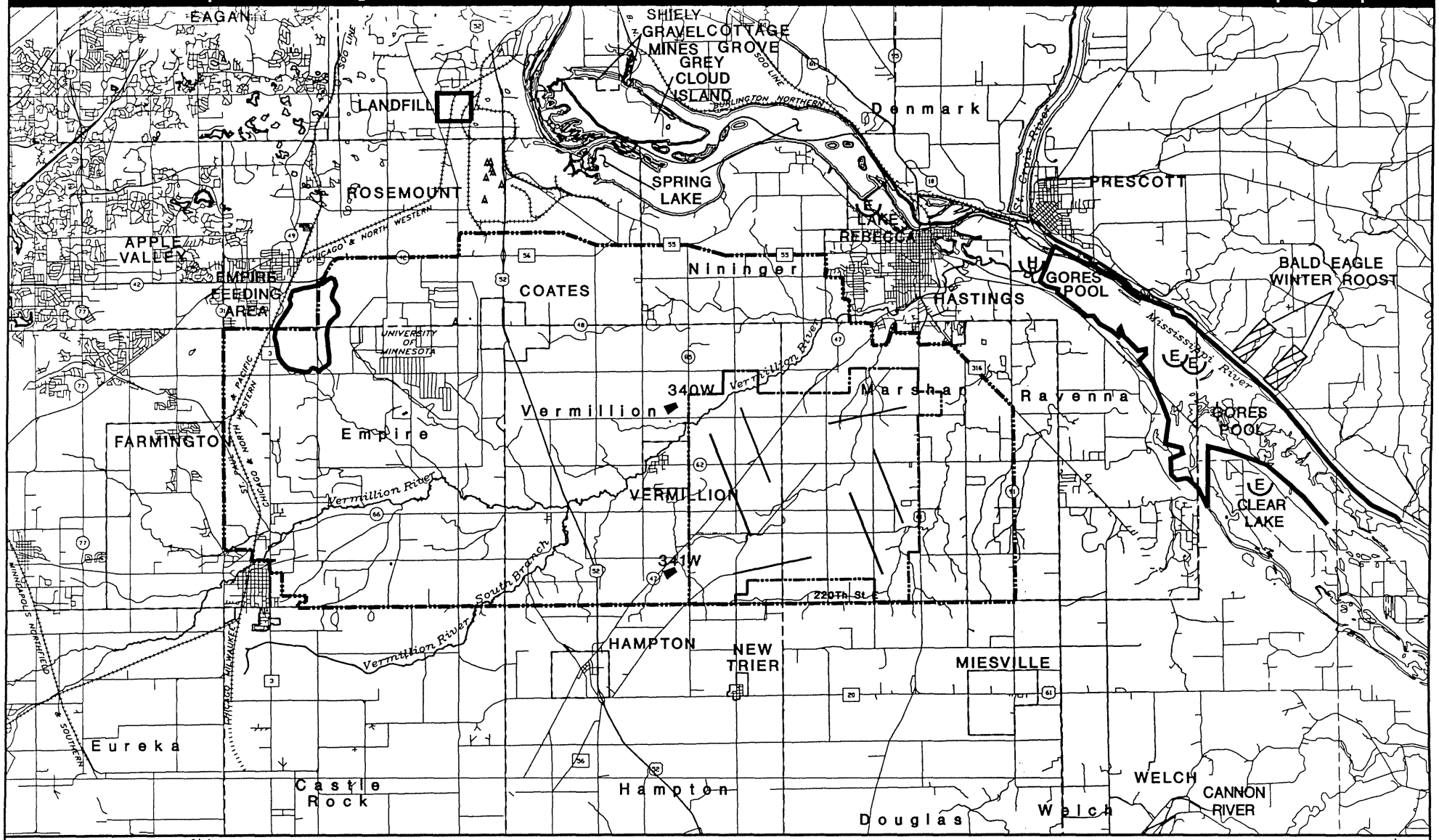
Biotic Communities - New Airport Alternative



HNTB

Figure 24

Potential Bird-Aircraft Hazard Areas - MSP and No Action Alternative



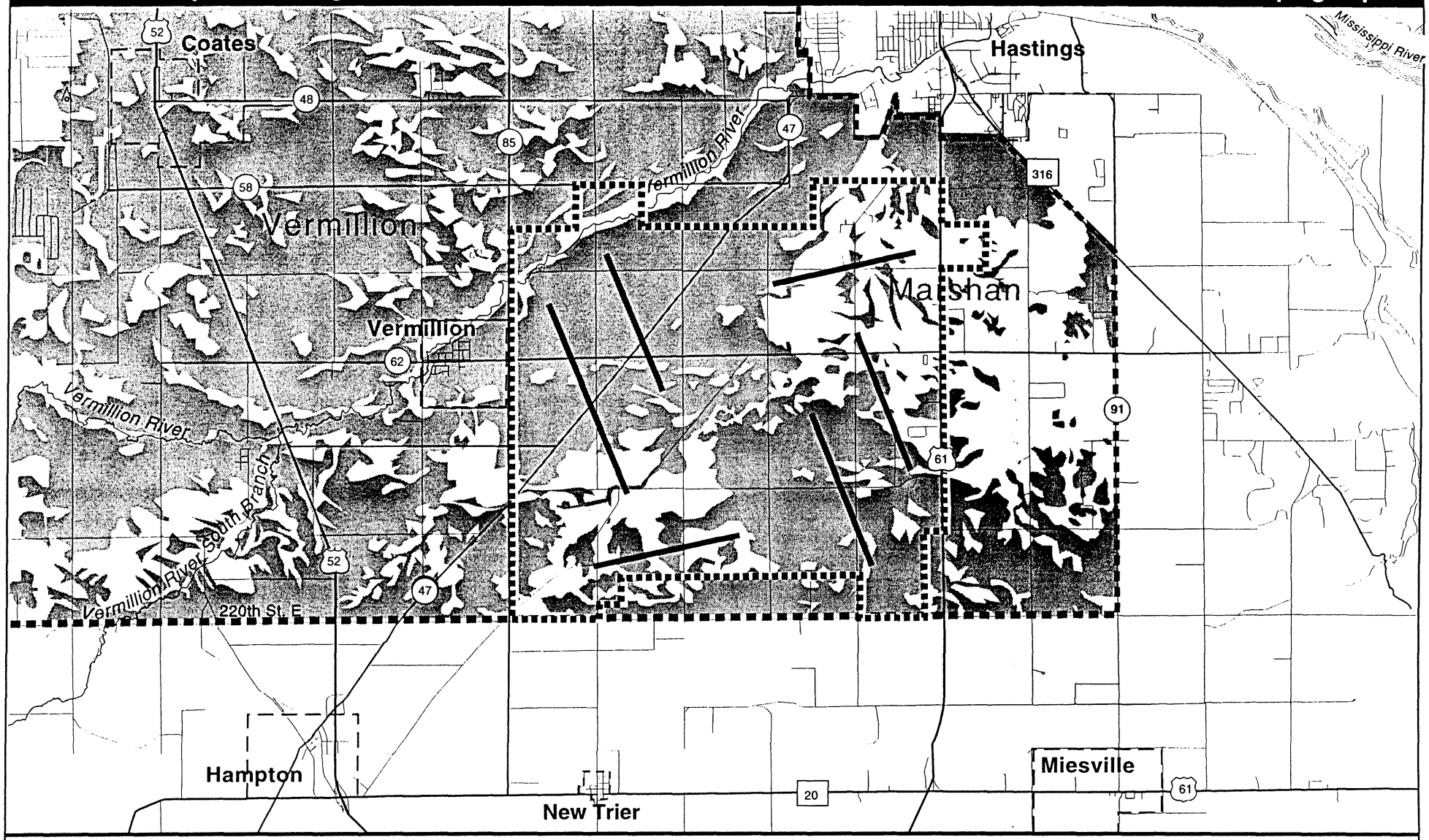
H Frietz Heron Rookery
E Bald Eagle Nests
MDNR Protected Wetland
Airport Boundary
Search Area Boundary
0 1 2 3
Scale In Miles
N

MAC Metropolitan Airports Commission — Minneapolis Saint Paul

HNTB

Figure 25

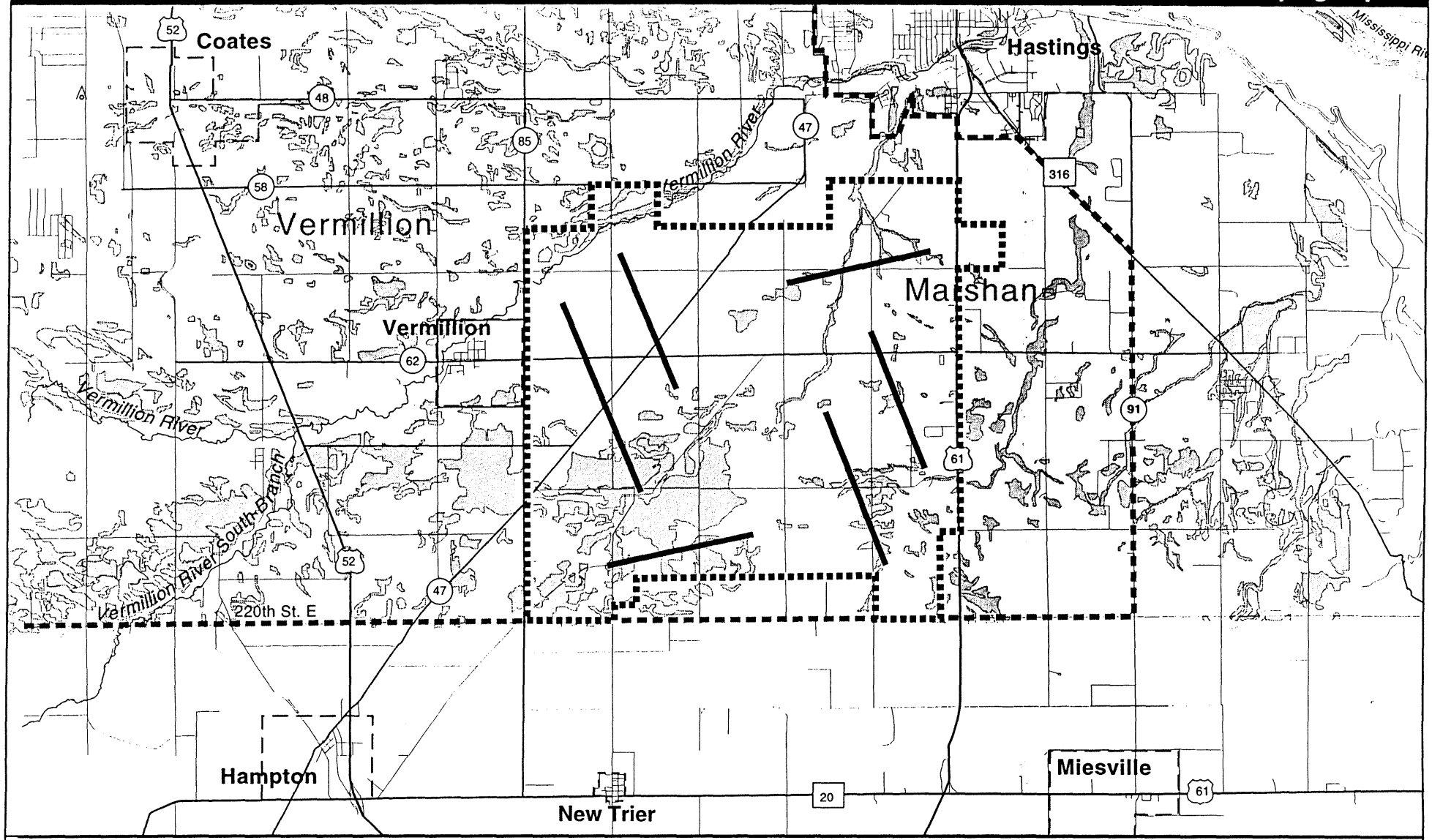
Potential Bird-Aircraft Hazard Areas - New Airport Alternative



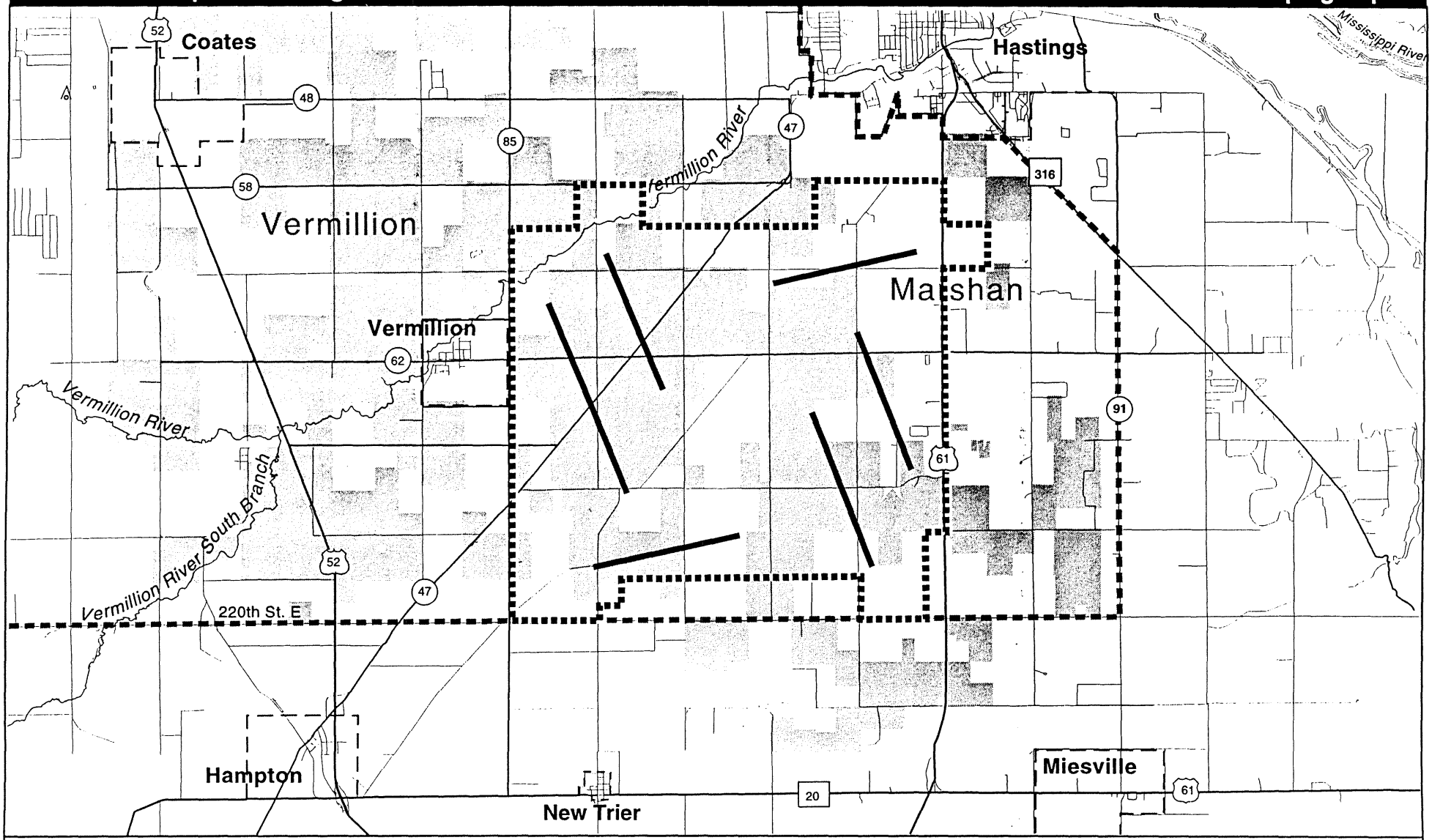
HNTB

Figure 26

Prime Farmland - New Airport Alternative



Farmlands of Statewide Importance - New Airport Alternative



HNTB

MAC Minneapolis Saint Paul Metropolitan Airports Commission

Figure 28

Agricultural Preserves - New Airport Alternative

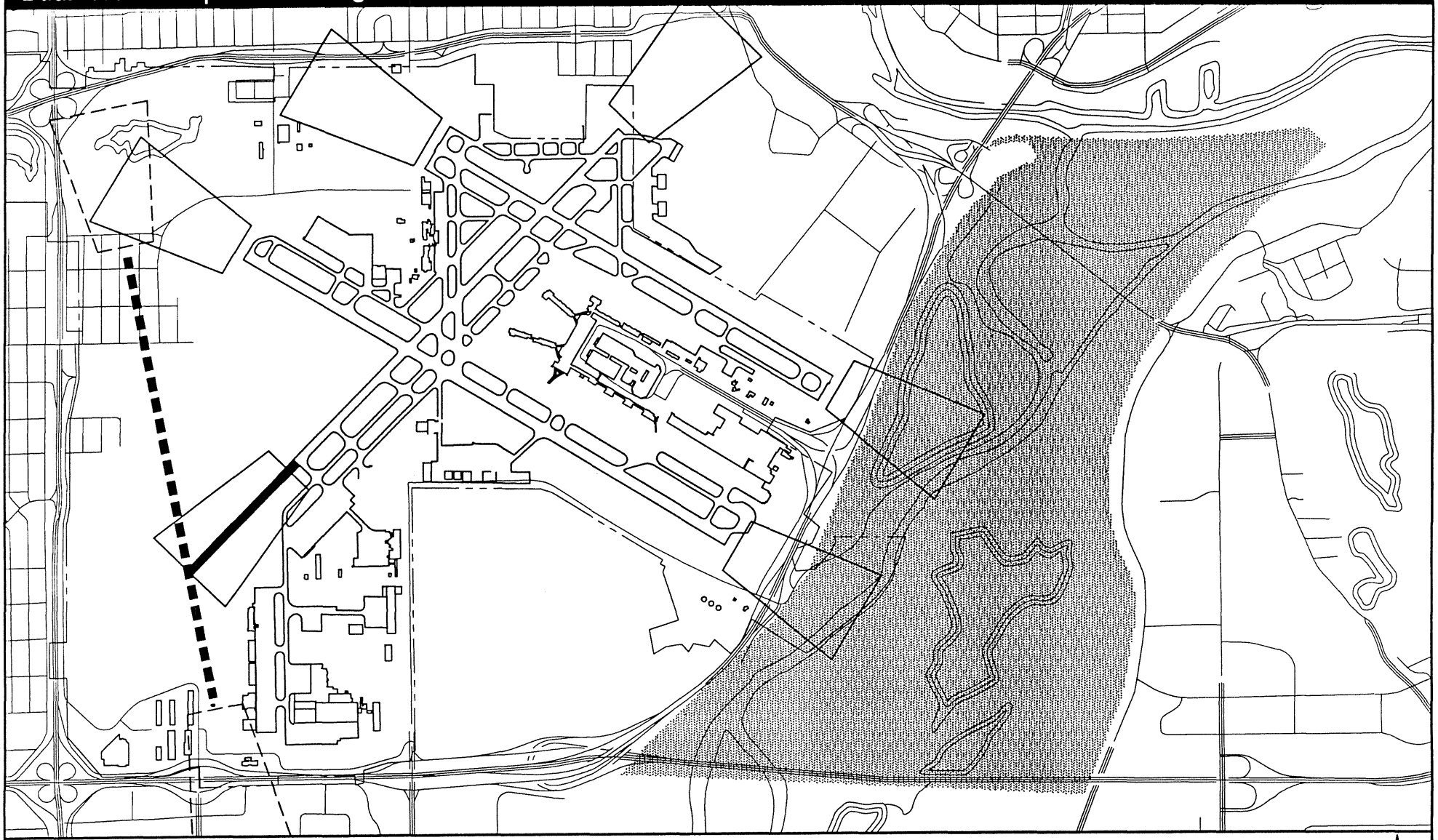
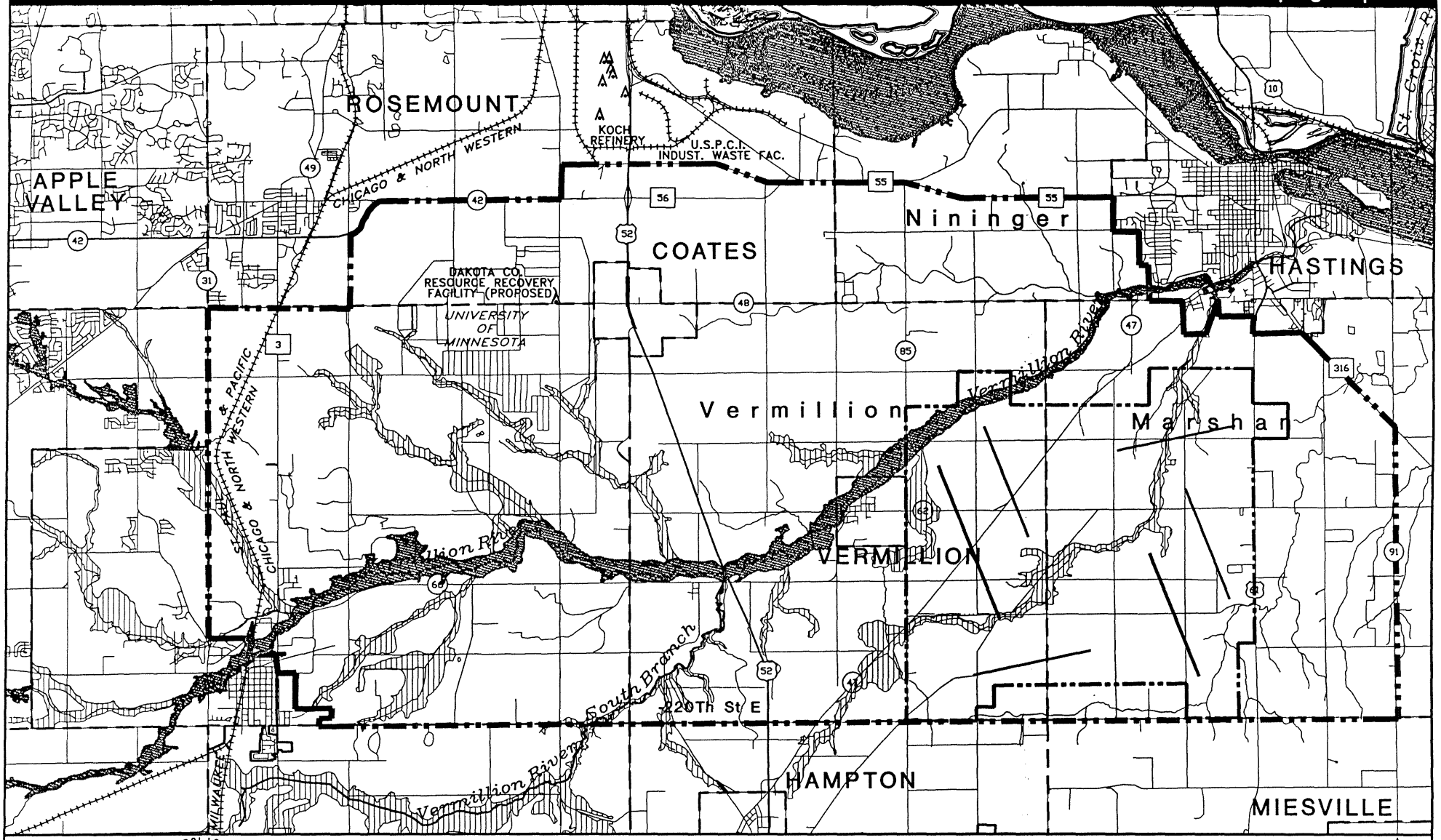


Figure 29

Floodplains - MSP and No Action Alternatives

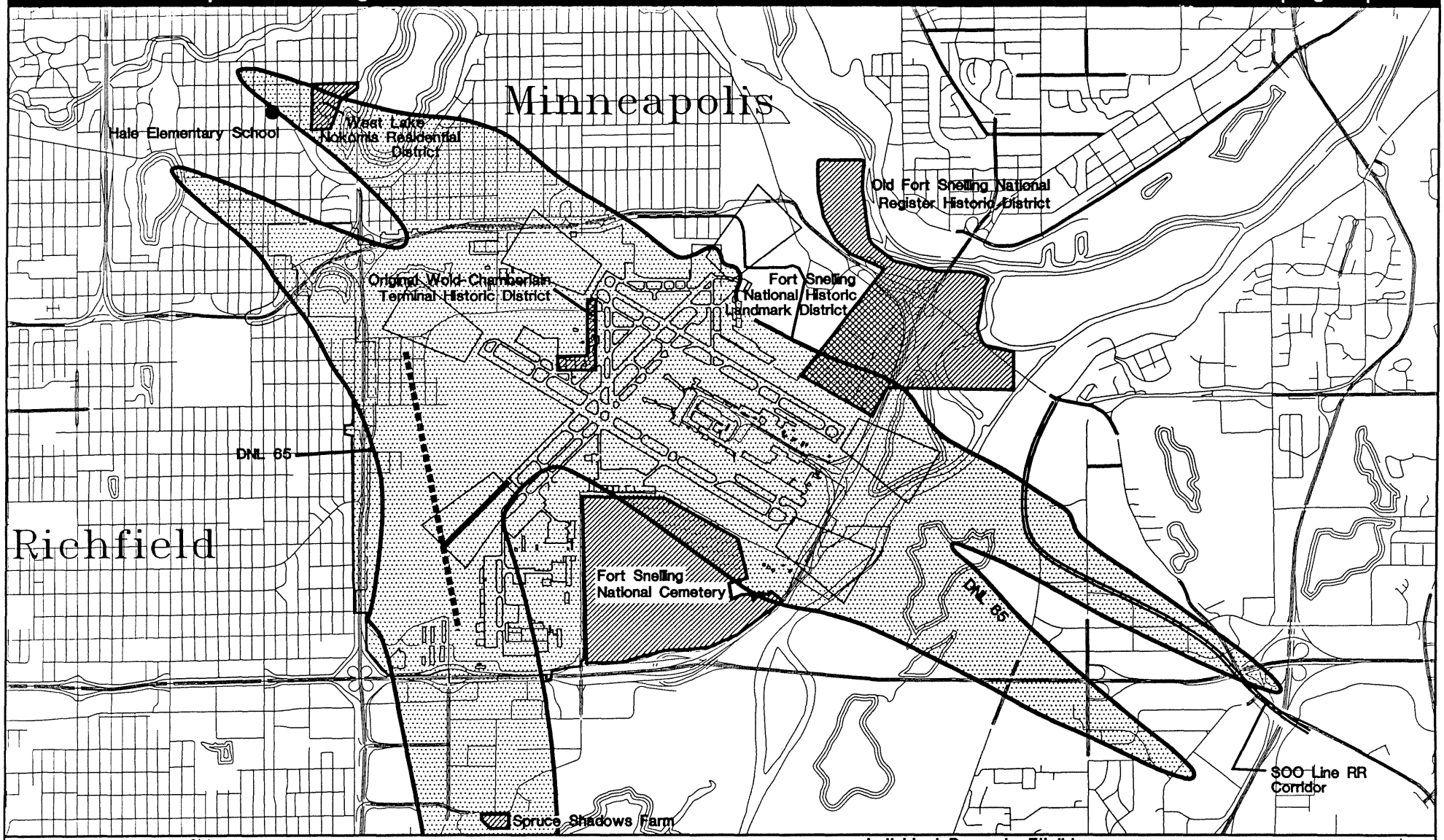


Source: HNTB

HNTB

Figure 30

Floodplains - New Airport Alternative

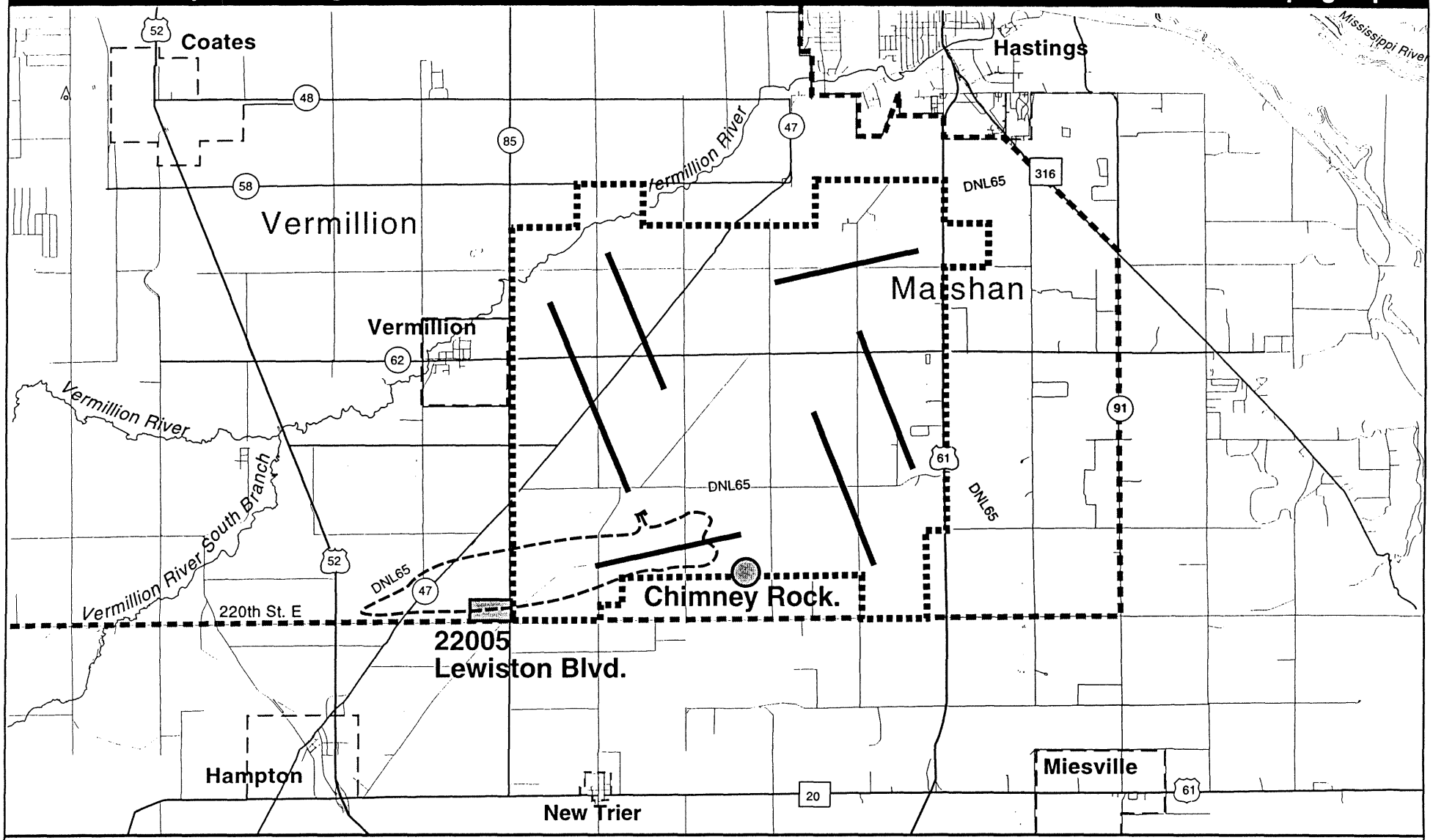


HNTB

Figure 31

Source: Hess Roise

Historic/Architectual Resources - MSP Alternative



DNL 65 - Alt 1

Property Eligible for National Register

Search Area Boundary

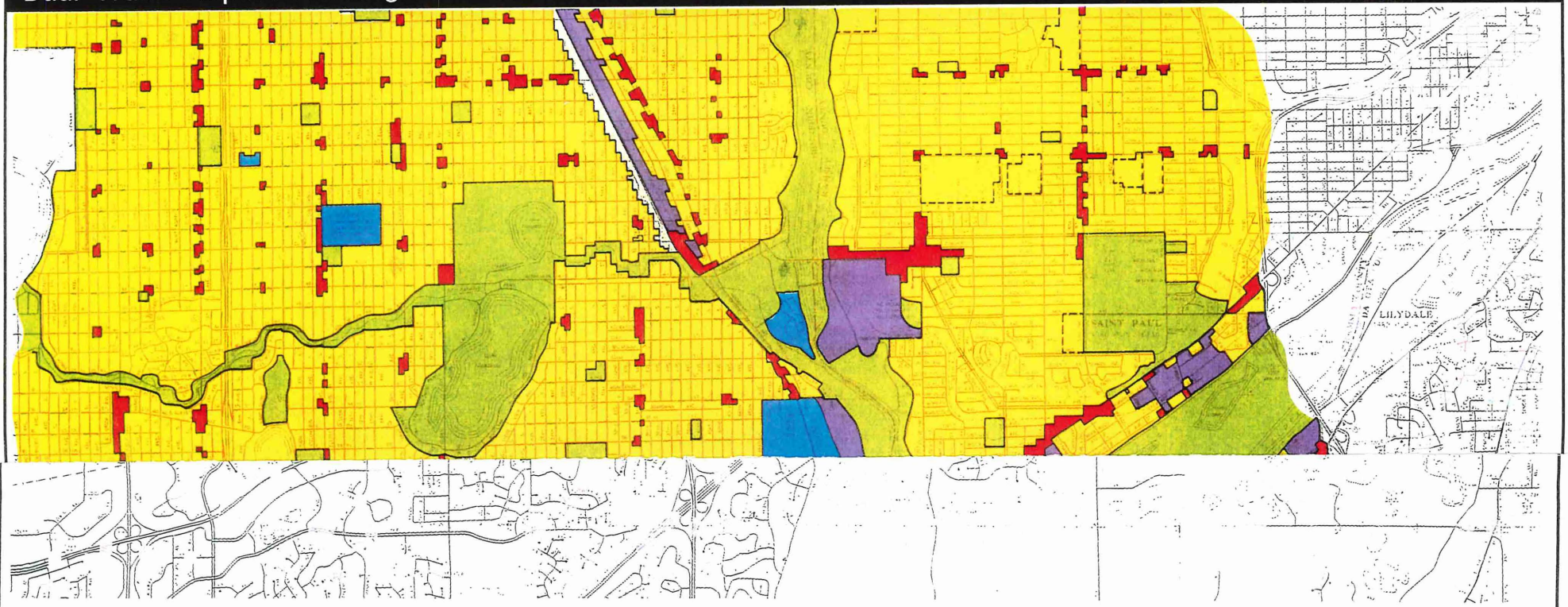
0 .5 1
Scale in Miles

N

HNTB

Figure 32

Historic/Architectural Resources - New Airport Alternative



Residential, Single & Multi-Family
Mobile Home Park
Commercial
Industrial
Cemeteries & Military Properties
Park & Recreation
Vacant & Agricultural

Existing Runway
New Runway MSP Alternative
New Runway No Action Alternative

0 2,500 5,000
Scale in Feet

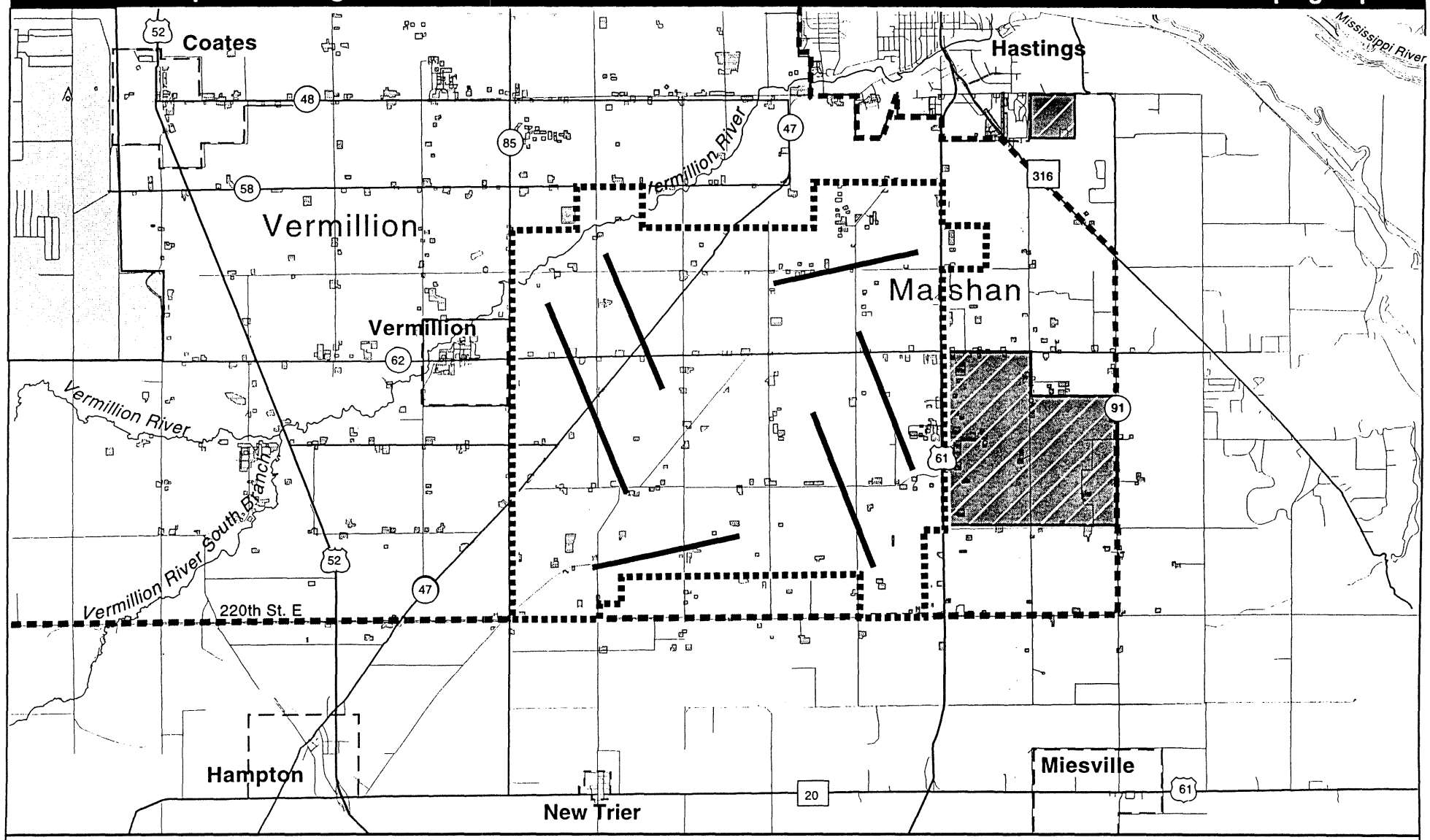
N

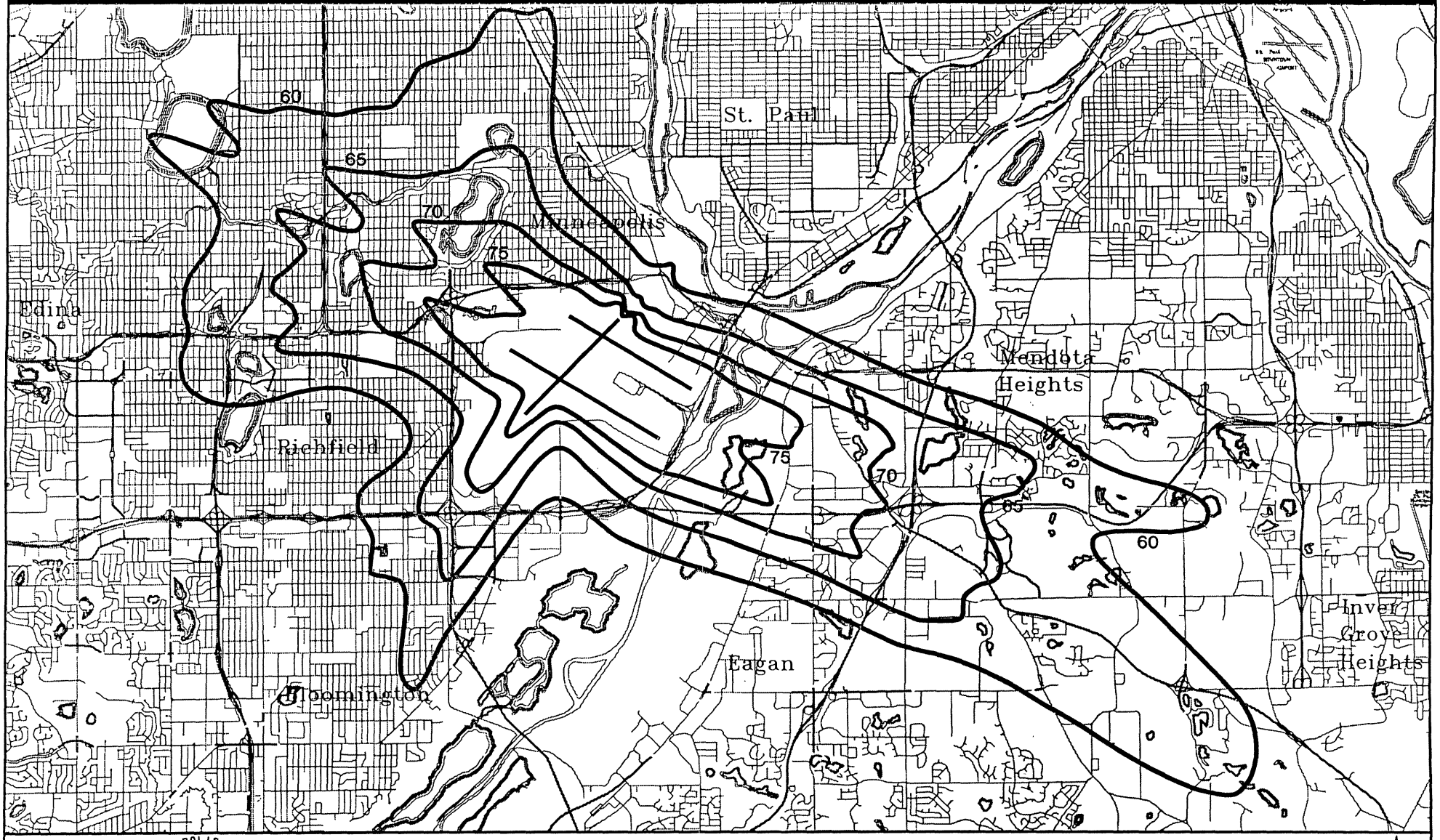
Planned Land Use as of 1992

HNTB

Figure 33

Planned Land Use - MSP and No Action Alternative


Coates
Hastings
Mississippi River
Vermillion
Vermillion River
Marshan
Vermillion
Vermillion River
Vermillion River South Branch
220th St. E
Hampton
New Trier
Miesville
52
48
85
47
58
316
62
91
61
20
Airport Boundary
Search Area Boundary
Agricultural
Residential
Public
Wildlife Area
0 .5 1
Scale in Miles
N

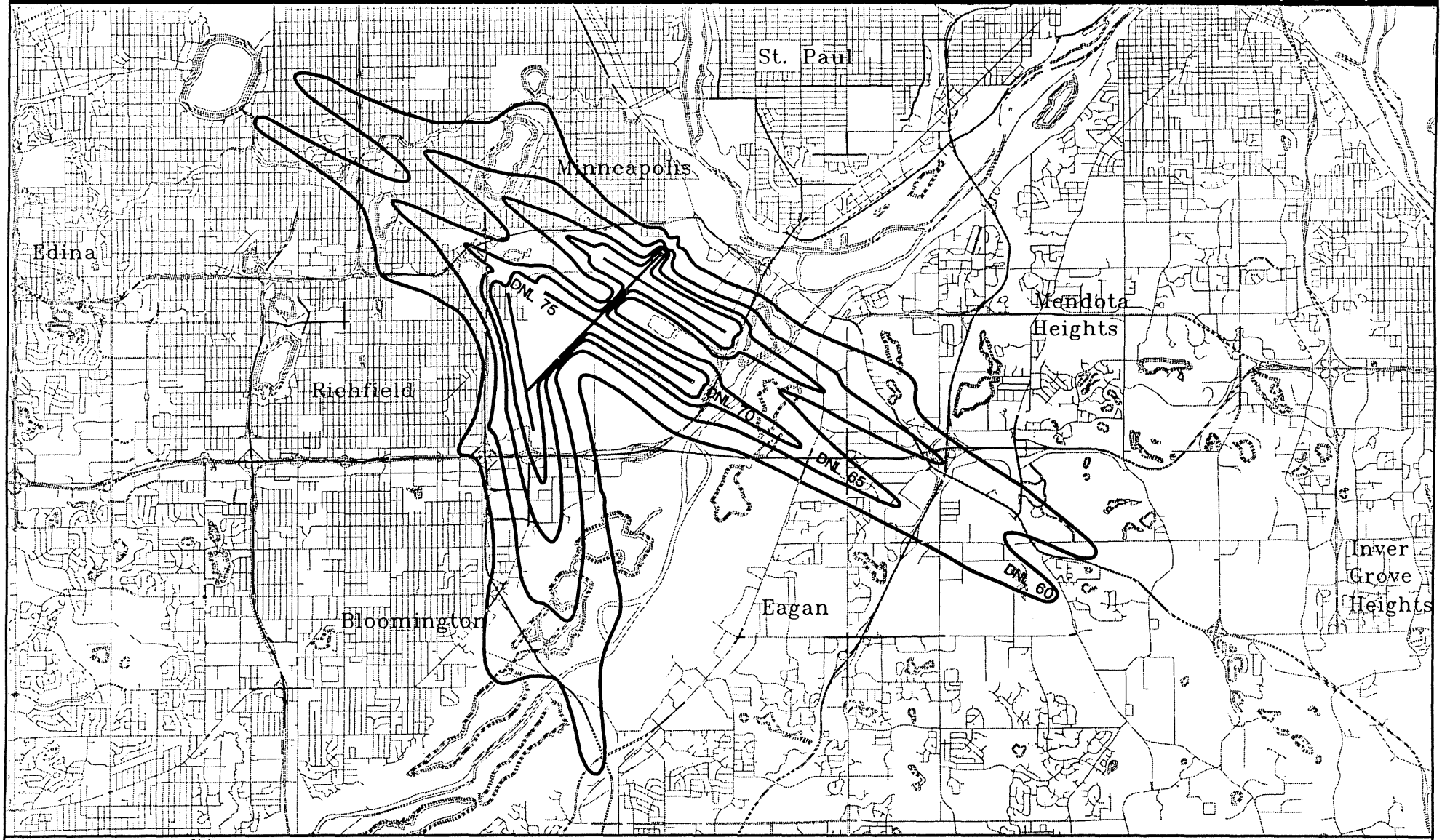


Source: HNTB

HNTB

Figure 35

1992 DNL Countours - MSP and No Action Alternatives

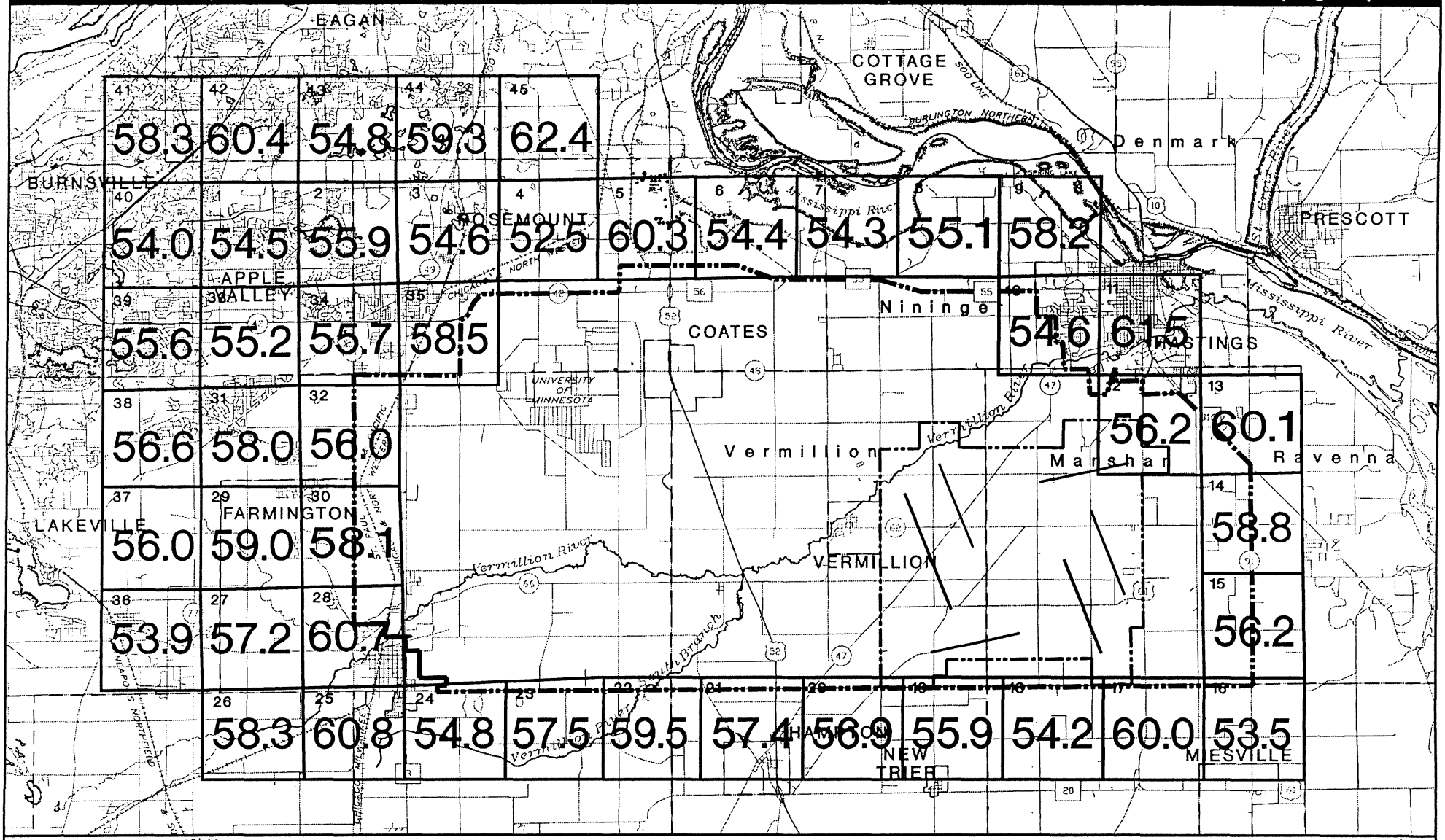


Source: HNTB

HNTB

Figure 37

2005 DNL Contours - MSP Alternative



Search Area Boundary
Airport Boundary

Source: HNTB

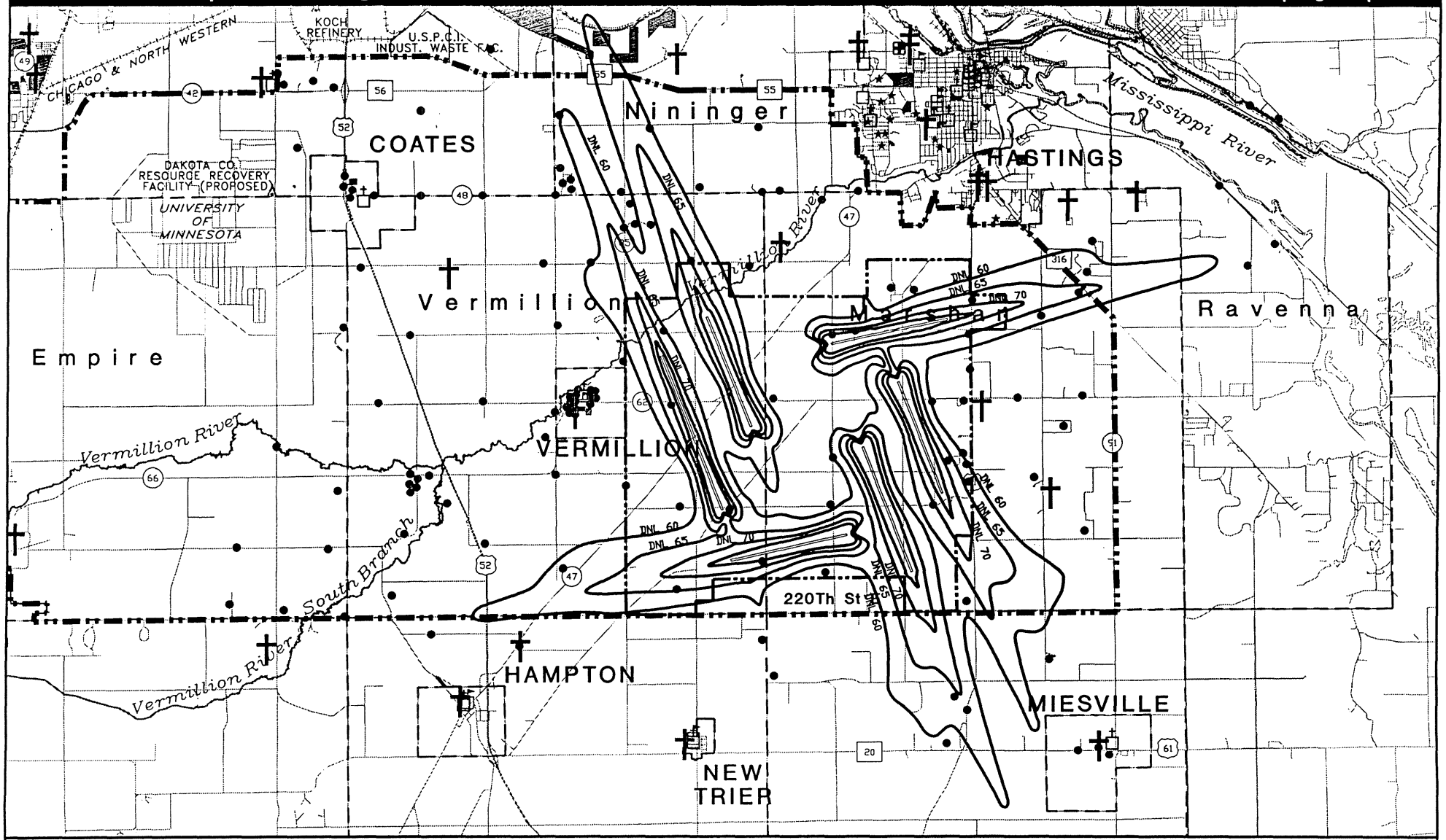
0 7,000 14,000
Scale in Feet

N

HNTB

Figure 38

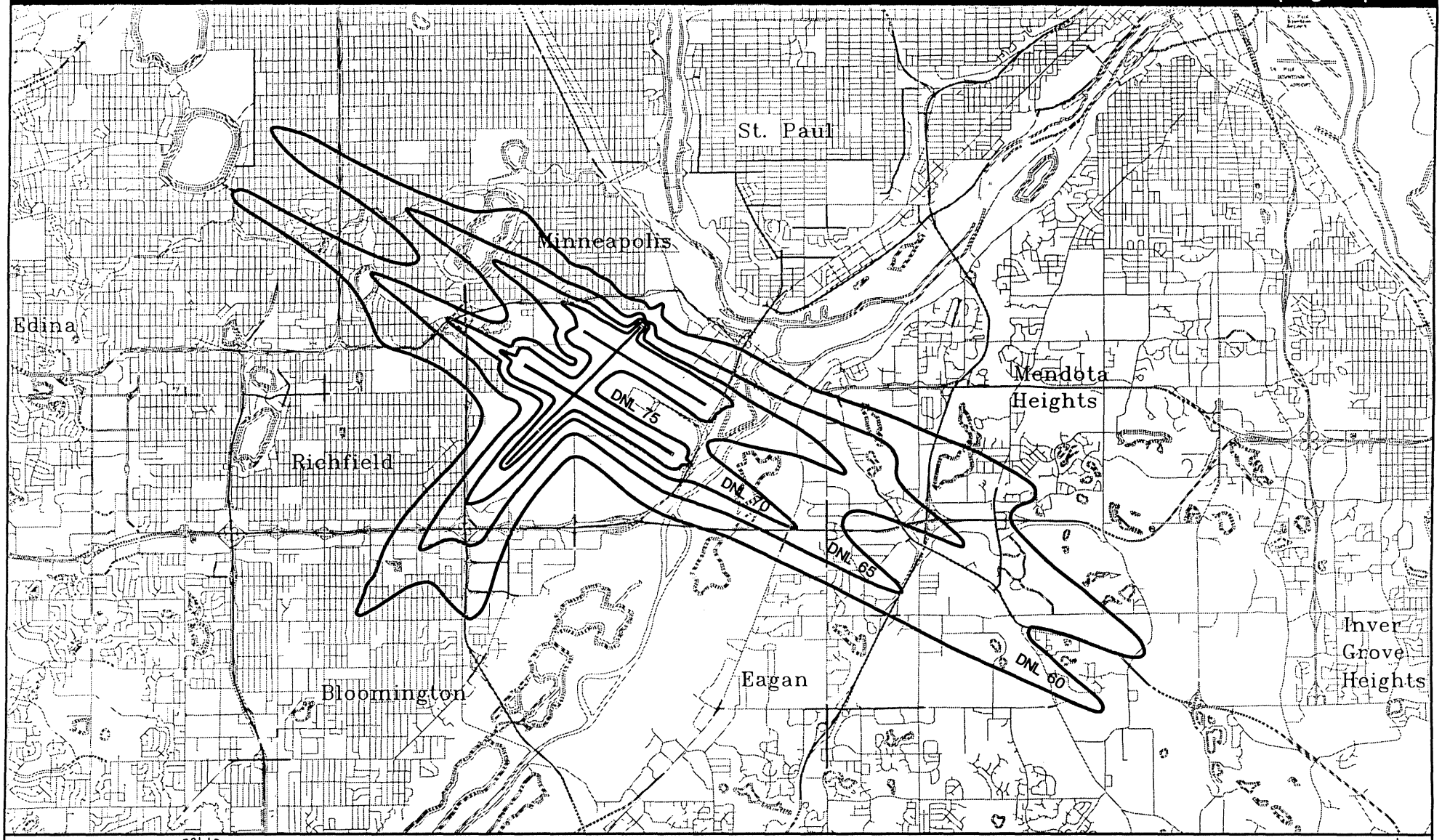
Ambient DNL Levels - New Airport Alternative



HNTB

Figure 39

Approximate 2005 DNL Contours - New Airport Alternative

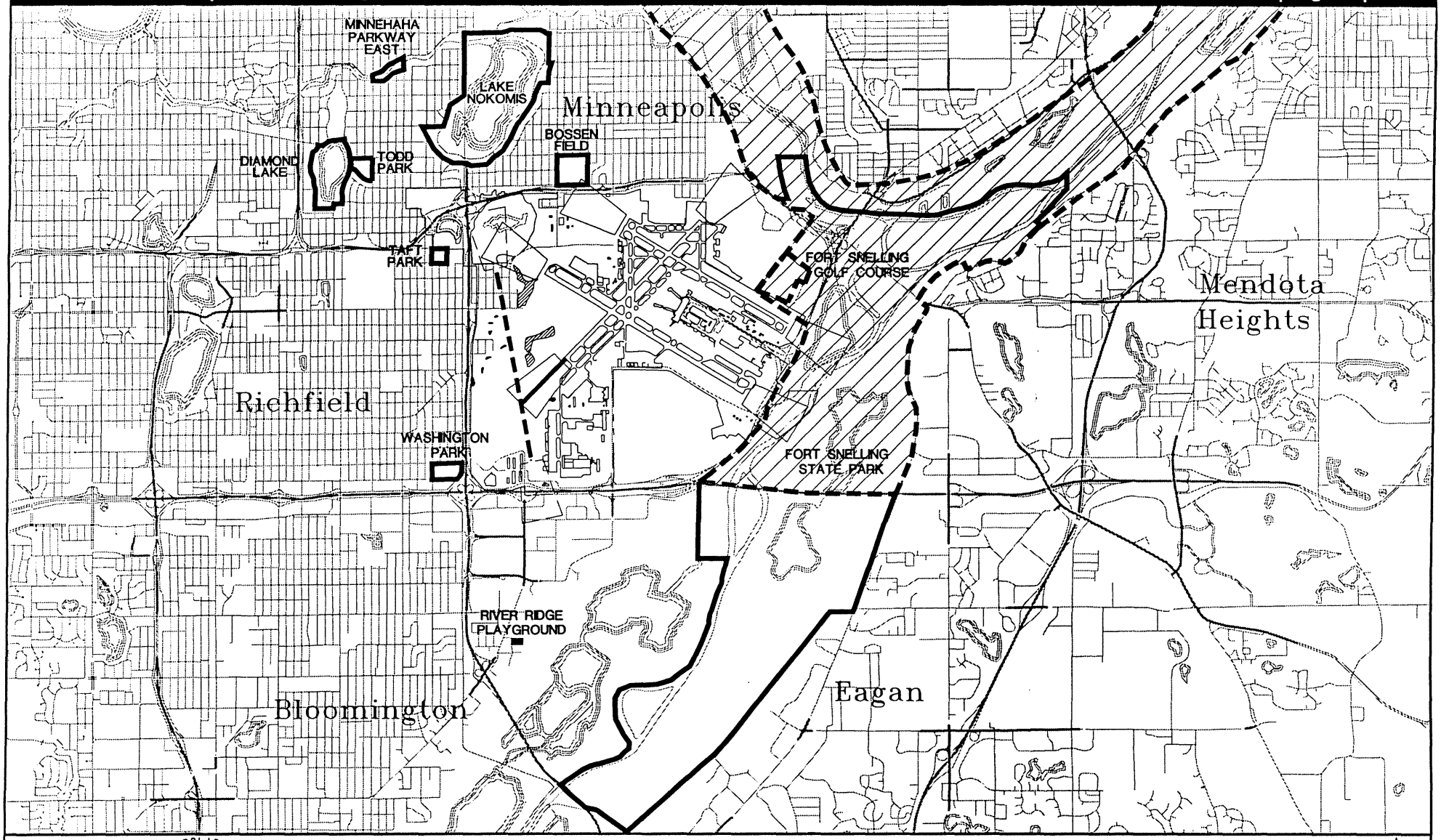


Source: HNTB

HNTB

Figure 40

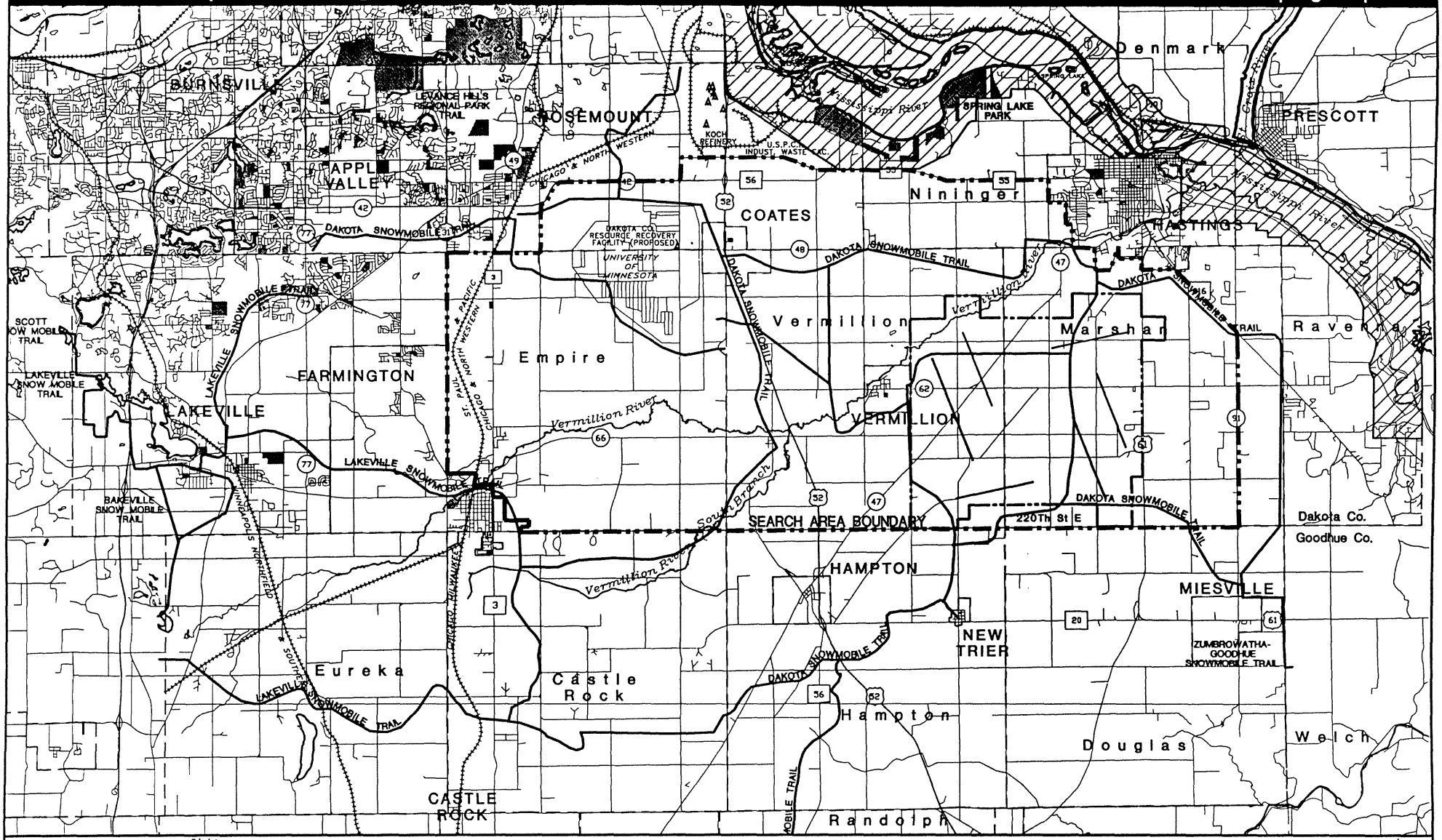
Approximate 2005 DNL Contours - No Action Alternative



HNTB

Figure 41

Park and Recreation Land - MSP and No Action Alternatives



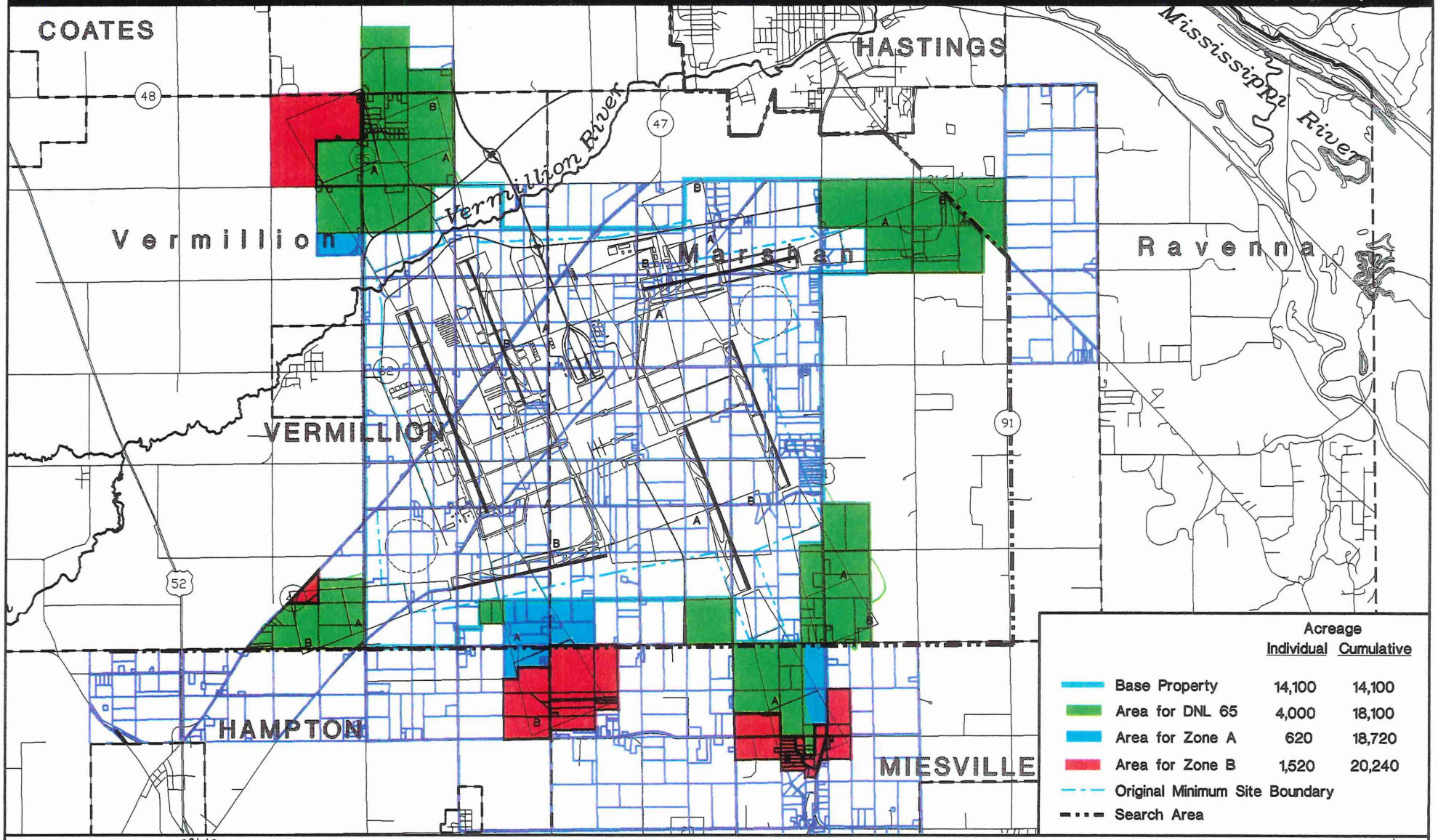
Source: Dakota County/Metropolitan Council/Minnesota Dept. of Natural Resources

HNTB

MAC Minneapolis Saint Paul Metropolitan Airports Commission

Figure 42

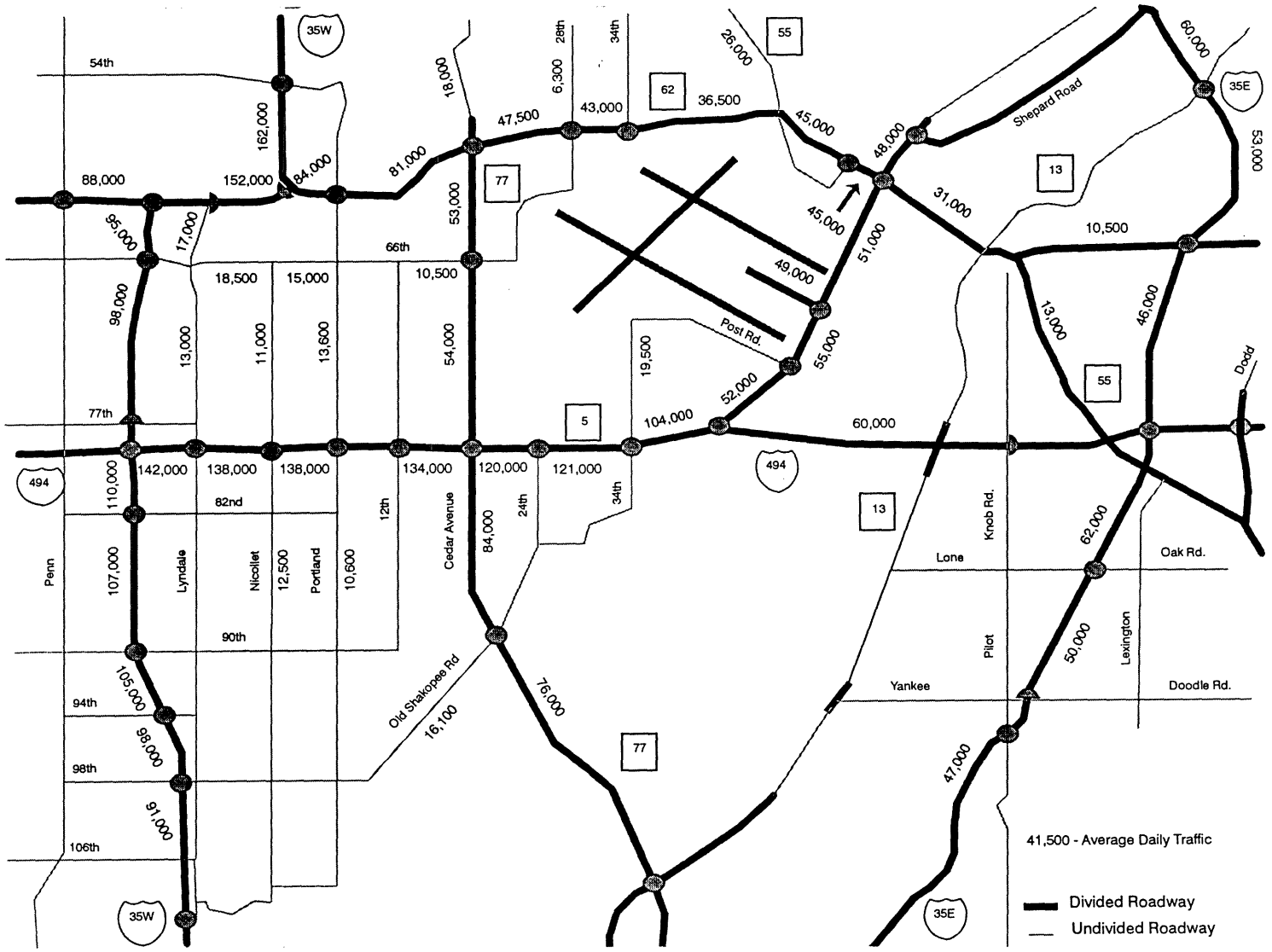
Park and Recreation Land - New Airport Alternative



HNTB

Figure 43

Site Preservation Areas - New Airport Alternatives

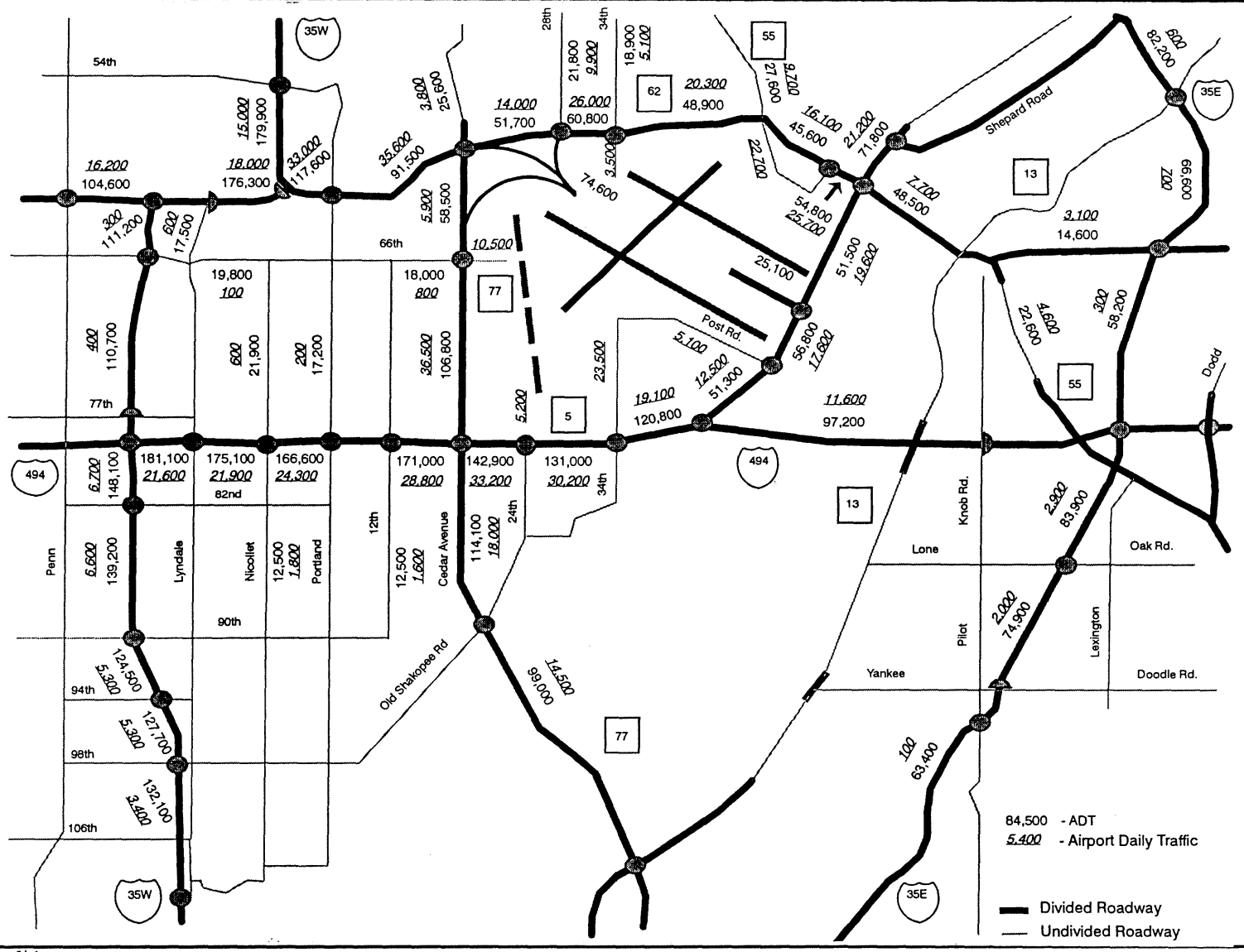


Source: Metropolitan Council

HNTB

Figure 44

1992 Daily Vehicular Traffic - MSP and No Action Alternatives

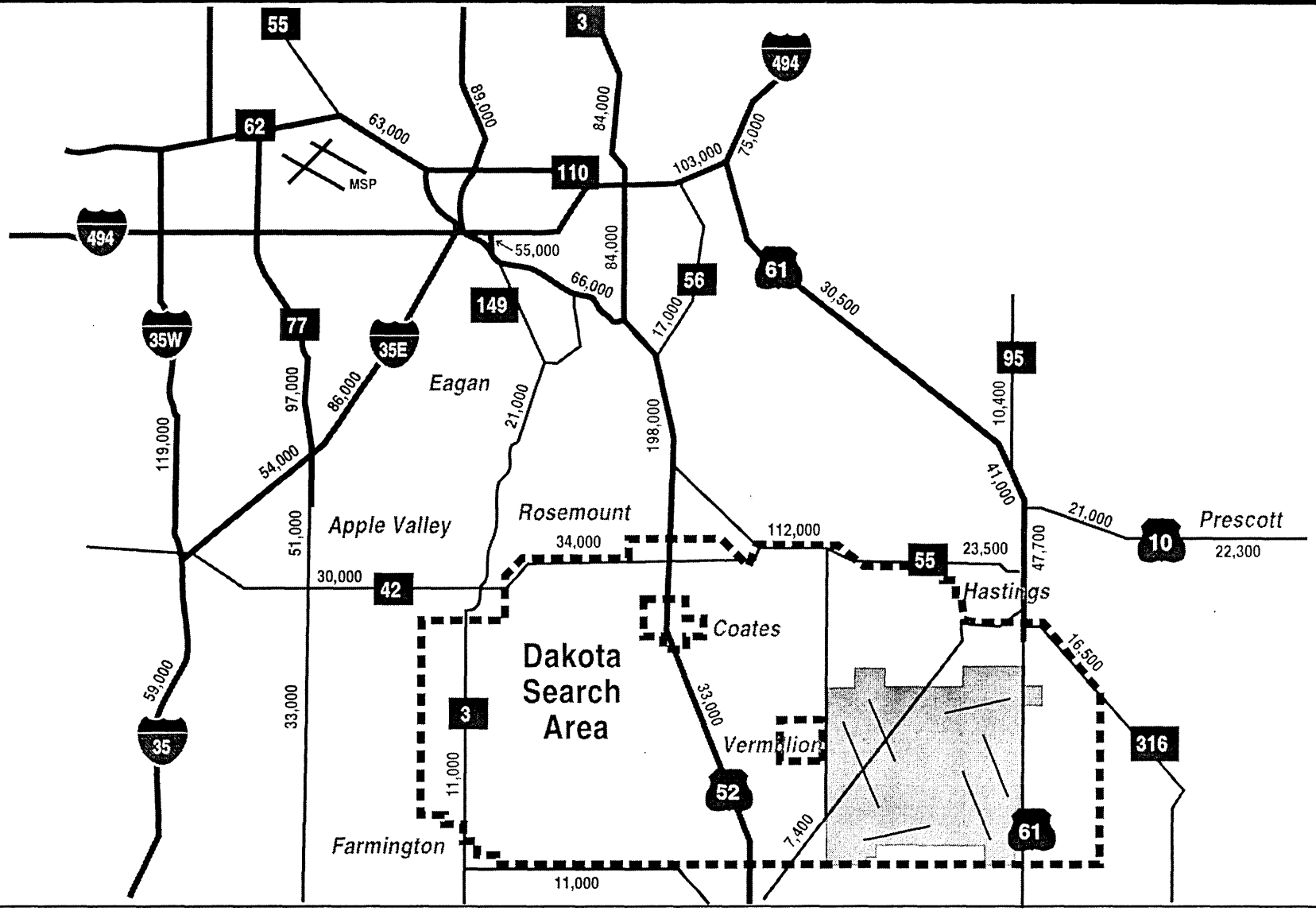


Source: Metropolitan Council

HNTB

Figure 45

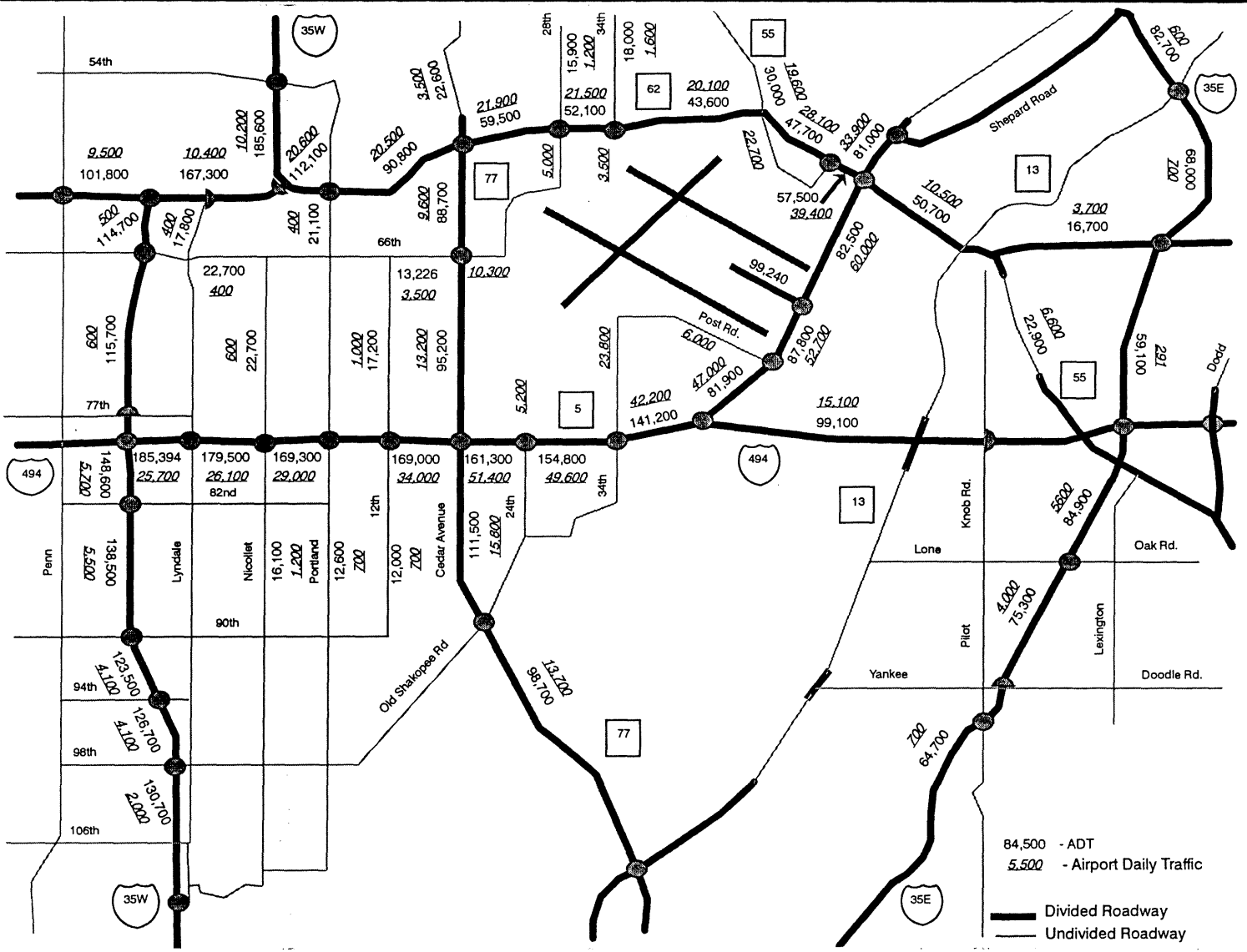
2020 Daily Vehicular Traffic - MSP Alternative



HNTB

Figure 47

2020 Daily Vehicular Traffic - New Airport Alternative

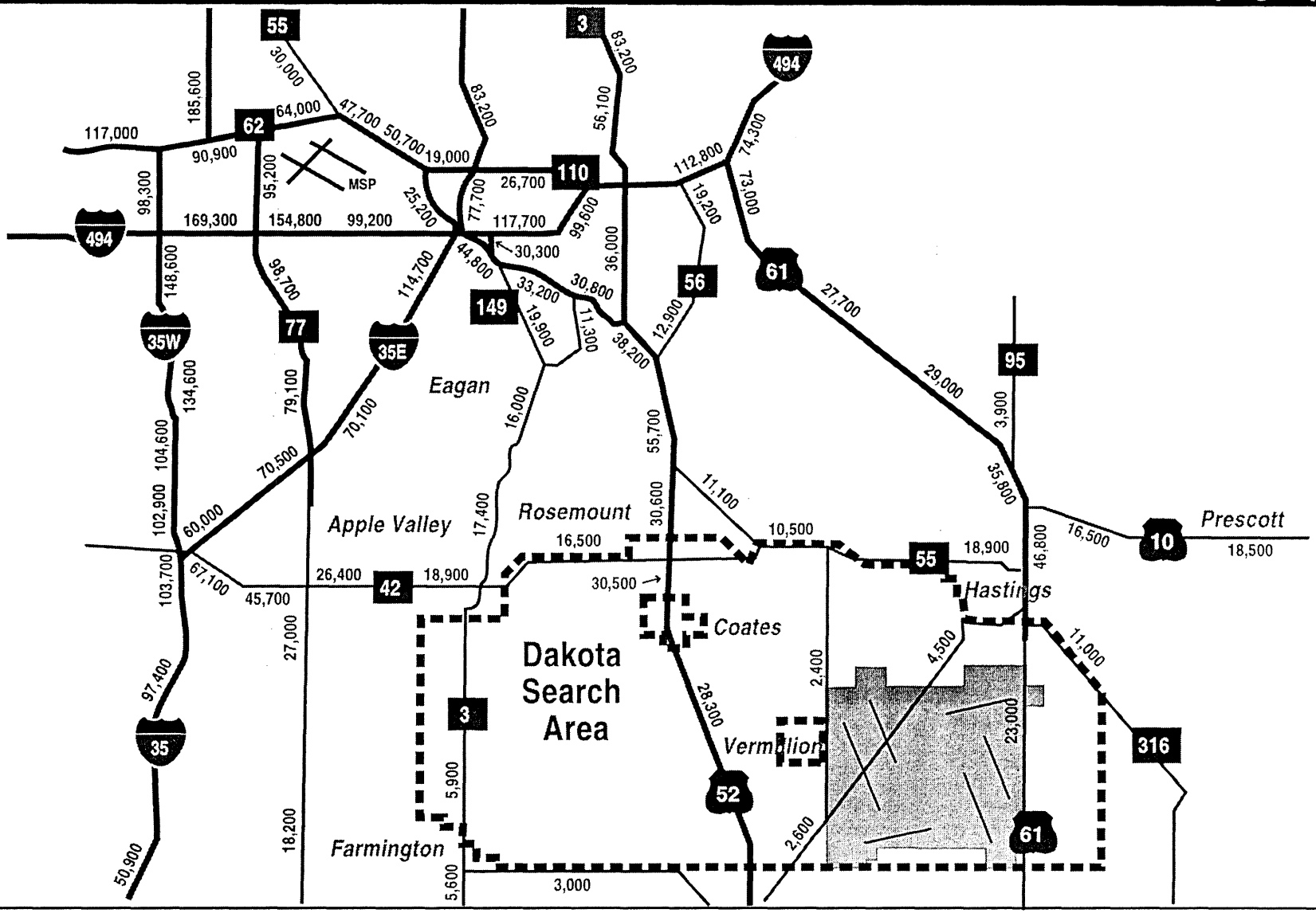


Source: Metropolitan Council

HNTB

Figure 48

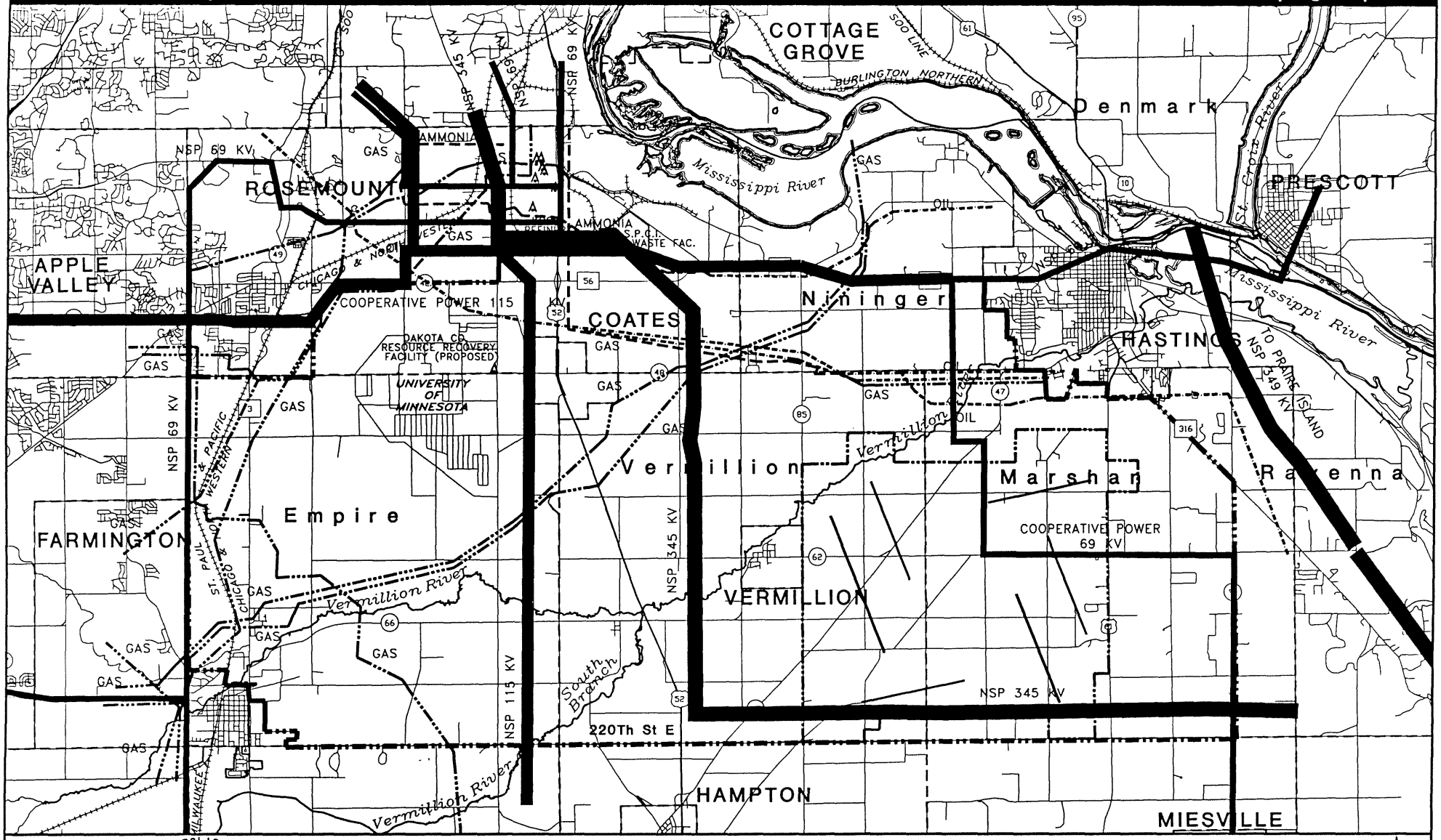
2020 Daily Vehicular Traffic - No Action Alternative (MSP Area)



HNTB

Figure 49

2020 Daily Vehicular Traffic - No Action Alternative (New Airport Area)

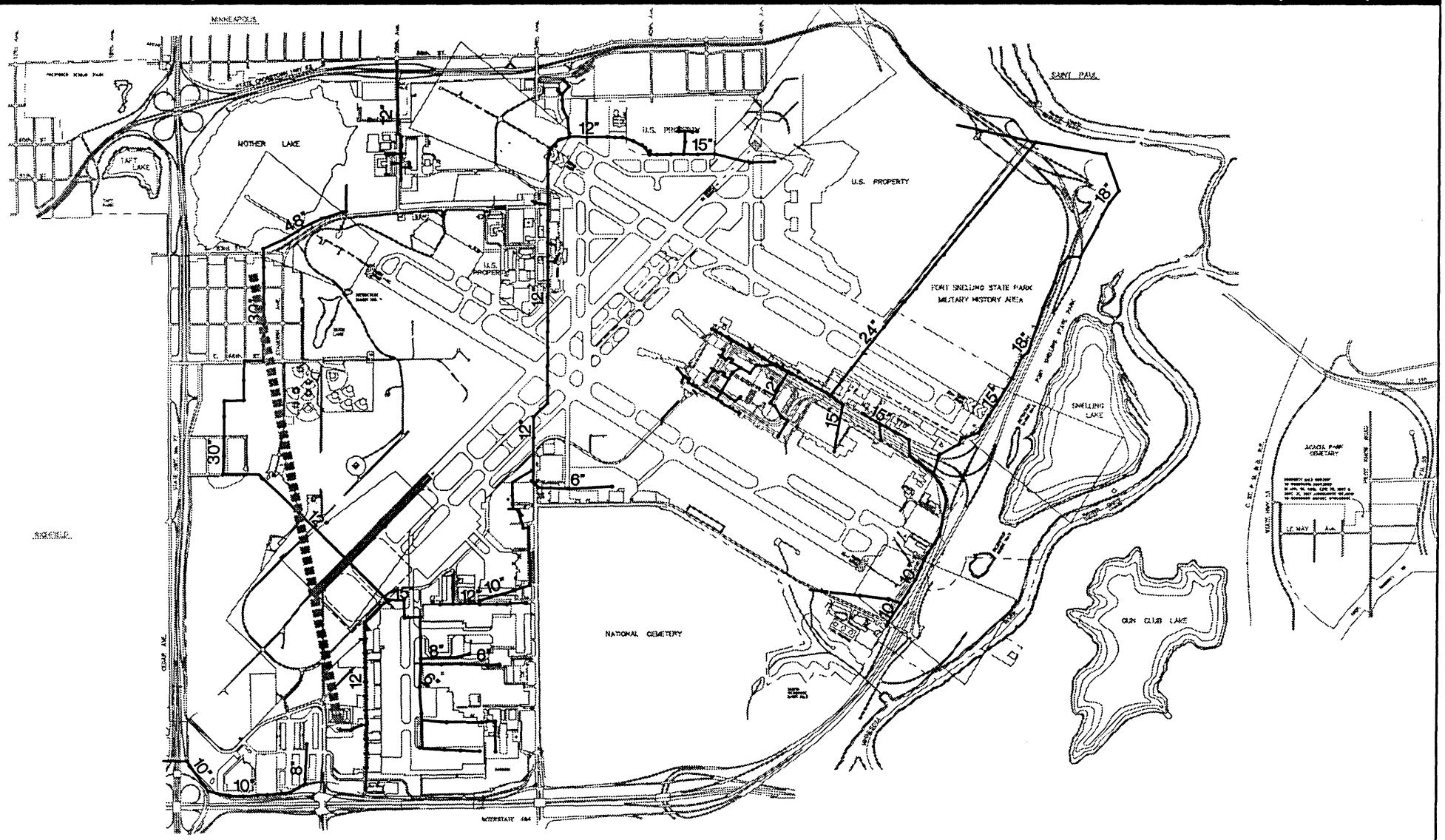


Source: HNTB

HNTB

Figure 50

Major Utilities - New Airport Alternative



New Runway MSP Alternative
New Runway No Action Alternative

Source: HNTB

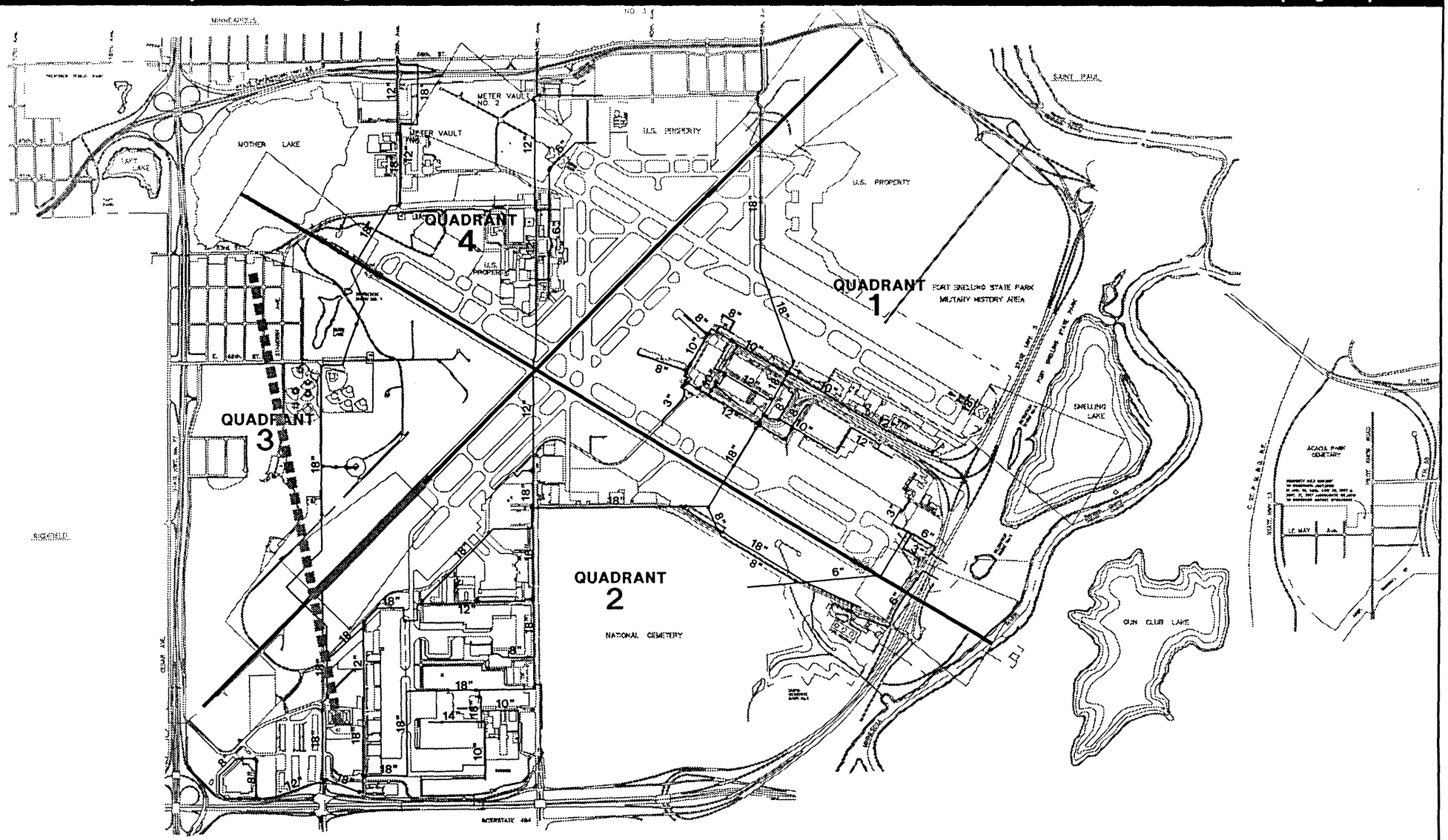
0 1,250 2,500
Scale in Feet

N

HNTB

Figure 51

Sanitary Sewer Layout - MSP and No Action Alternatives



New Runway MSP Alternative
New Runway No Action Alternative

0 1,250 2,500
Scale in Feet

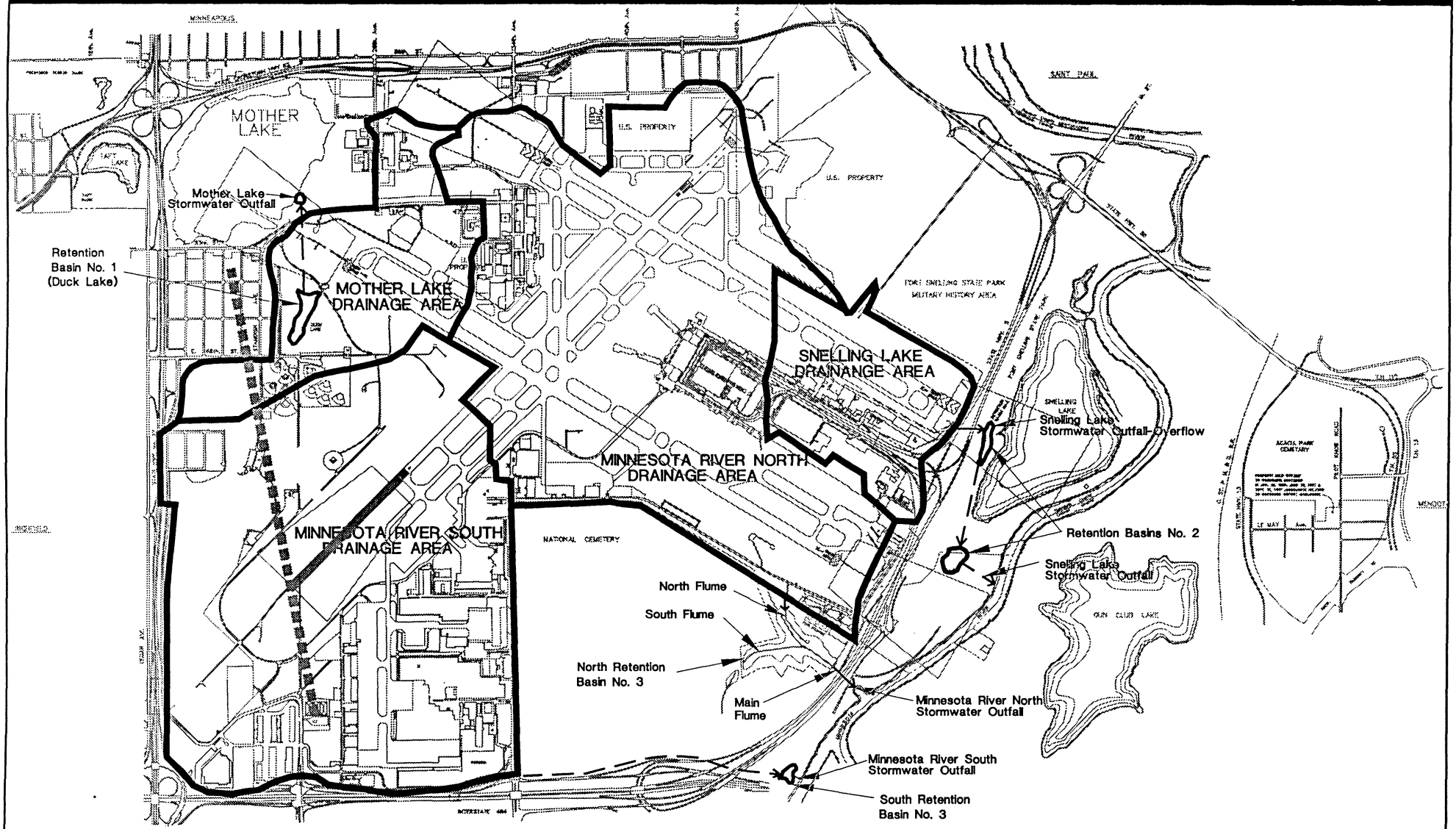
N

Source: TKDA

HNTB

Figure 52

Watermain Layout - MSP and No Action Alternatives



New Runway MSP Alternative

New Runway No Action Alternative

Source: Liesch Engineering Corp.

0 1,500 3,000

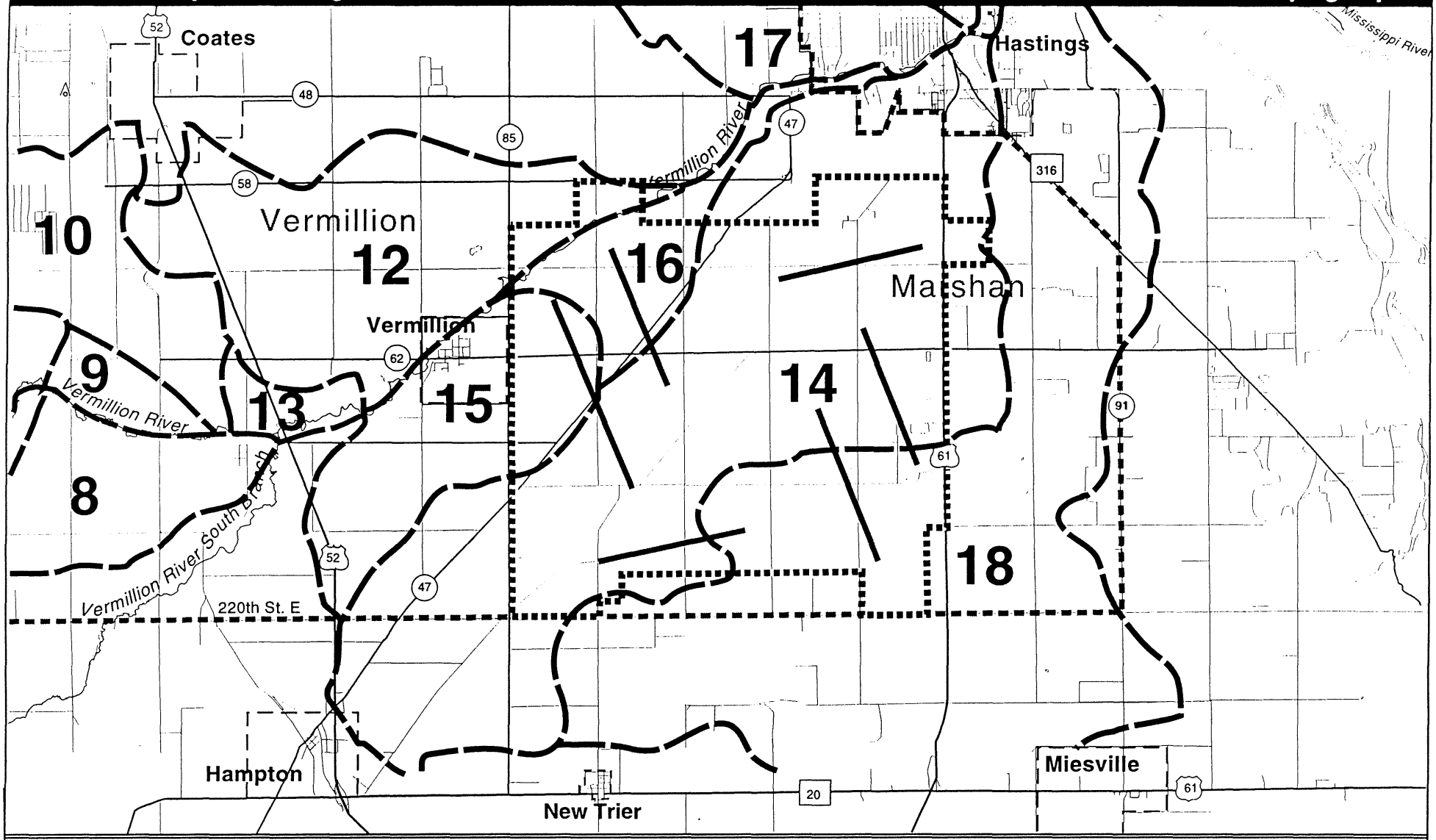
Scale in Feet

N

HNTB

Figure 53

Stormwater Drainage Areas, Basins and Structures - MSP and No Action Alternatives



Airport Boundary

Watershed Management Sectors

Search Area Boundary

Source: Vermillion Watershed Management Organization

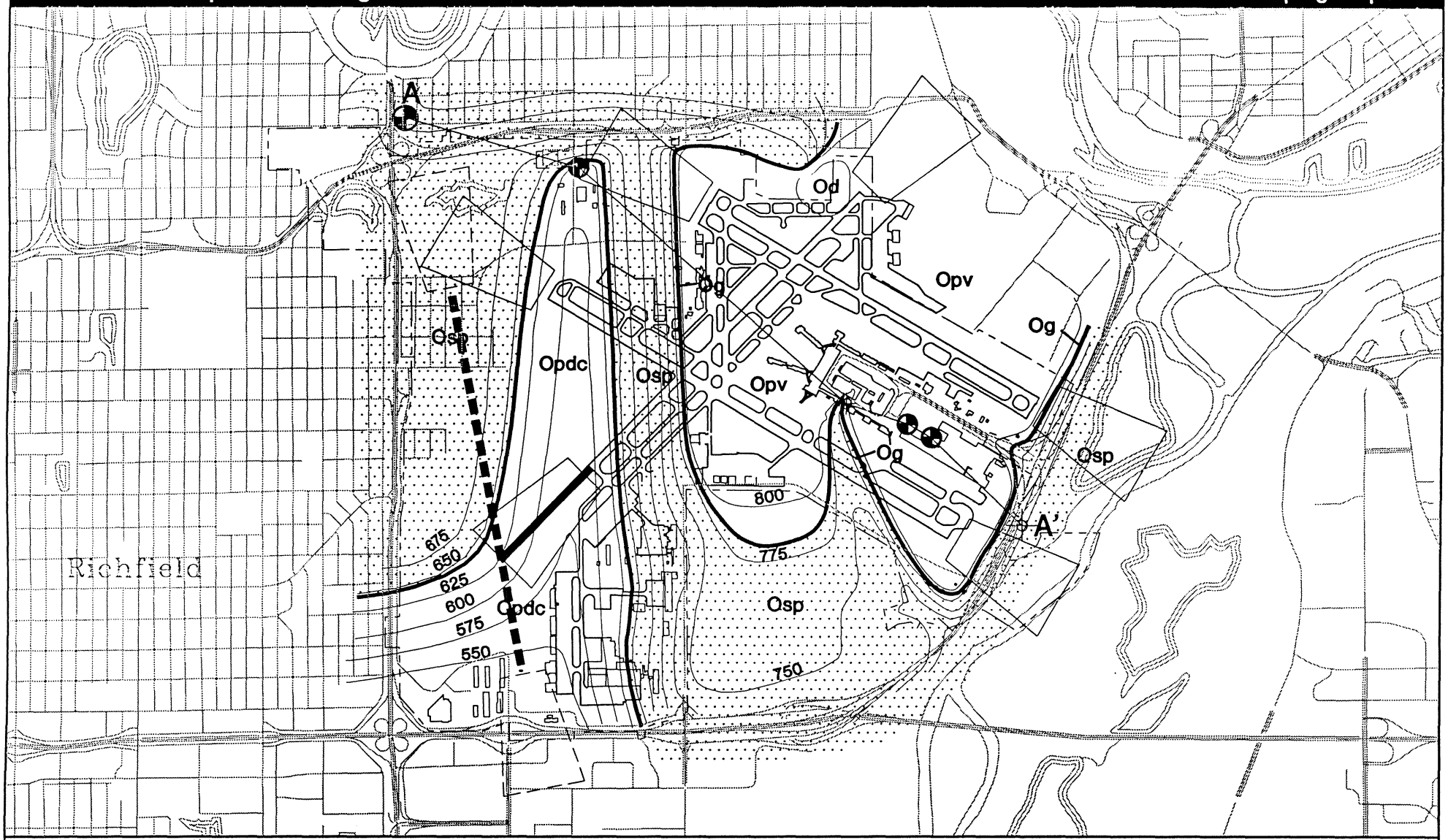
0 .5 1
Scale in Miles

N

HNTB

Figure 54

Vermillion River Watershed Management Sectors



Od Ordovician Decorah Shale
Opv Ordovician Platteville Limestone
Og Ordovician Glenwood Shall
Osp Ordovician St. Peter Sandstone
Opdc Ordovician Prairie du Chien Dolomitic
800 Bedrock Elevation Contour (NGVD)

0 1,500 3,000
Scale in Feet

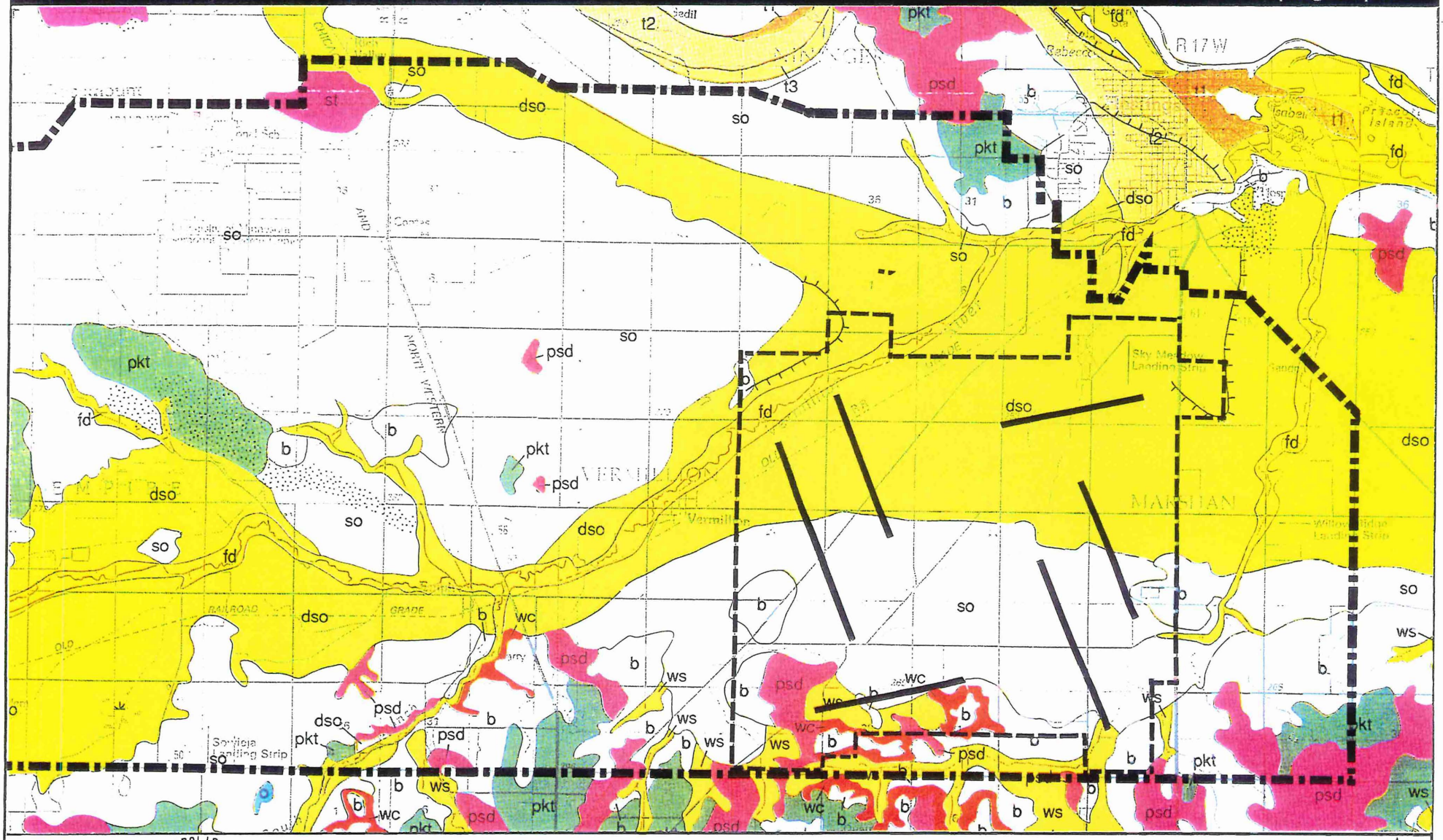
N

HNTB

Figure 55

Source: Liesch Engineering Corp.

Bedrock Geology - MSP and No Action Alternatives



Source: Geologic Atlas of Dakota County

HNTB

MINNEAPOLIS SAINT PAUL METROPOLITAN AIRPORTS COMMISSION MAC

Figure 56

Soils - New Airport Alternative

o — ORGANIC DEPOSITS—Peat and organic-rich silt and clay; includes small bodies of open water. Largely drained and filled where built over

fd — FLOODPLAIN ALLUVIUM—Poorly bedded, moderately well sorted sediments deposited by modern streams during flood stage. Chiefly sand in the valleys of the Mississippi, Vermillion, and Cannon Rivers; chiefly clayey silt in the valley of the Minnesota River. Typically interbedded with organic-rich layers and buried soil. Much thicker in the valleys of the Minnesota and Mississippi Rivers than elsewhere. Some alluvium mapped in small tributaries to the Vermillion River may have accumulated as slackwater sediment related to outwash from the Des Moines lobe (dso)

c — COLLUVIUM—Hillslope deposits derived from bedrock and loess upslope. Typically consists of two units—a rocky lower unit of angular carbonate clasts in a silty to sandy matrix, and an upper unit primarily of silt, which contains a few carbonate clasts. The composition of the lower unit reflects the bedrock upslope; the upper unit is largely reworked loess. Typically thickest at the bottom of the slope, and thin and patchy near the top. Colluvium and bedrock form intimate complexes, and their representation on the map has been considerably simplified

pkt — "OLD GRAY" TILL—Gray calcareous till which is leached and oxidized to yellowish brown near the surface. Consists of at least two tills, undivided. The upper till is friable loam to fine sandy loam; the lower one is firm loam to clay loam. Because of extensive erosion, the lower till is at the surface in much of the area mapped pkt

dso — MIXED OUTWASH—Sand, loamy sand, and gravel; coarser texture near the edge of the lobe. Stone assemblage contains a considerable admixture of rocks typical of the Superior lobe. In places, distinguishable from Superior lobe outwash, only by its shale content

ws — SLOPEWASH SAND—Unbedded to poorly bedded sand deposited in valleys and on gently sloping plains above the level of Wisconsinan outwash. Derived from glacial drift and St. Peter Sandstone. The slopewash deposits commonly head upstream in bedrock escarpments and eroded hills of pre-Wisconsinan drift; they merge downslope into outwash plains or alluvium along modern streams. Where the slopewash merges downstream into outwash, the area of junction may contain flat-bedded silt and clay, deposited in a lake. Unit is gradational with outwash and the boundaries on the map are therefore arbitrary

Source: Geologic Atlas of Dakota County

N

Figure 56

Soils - New Airport Alternative (continued)

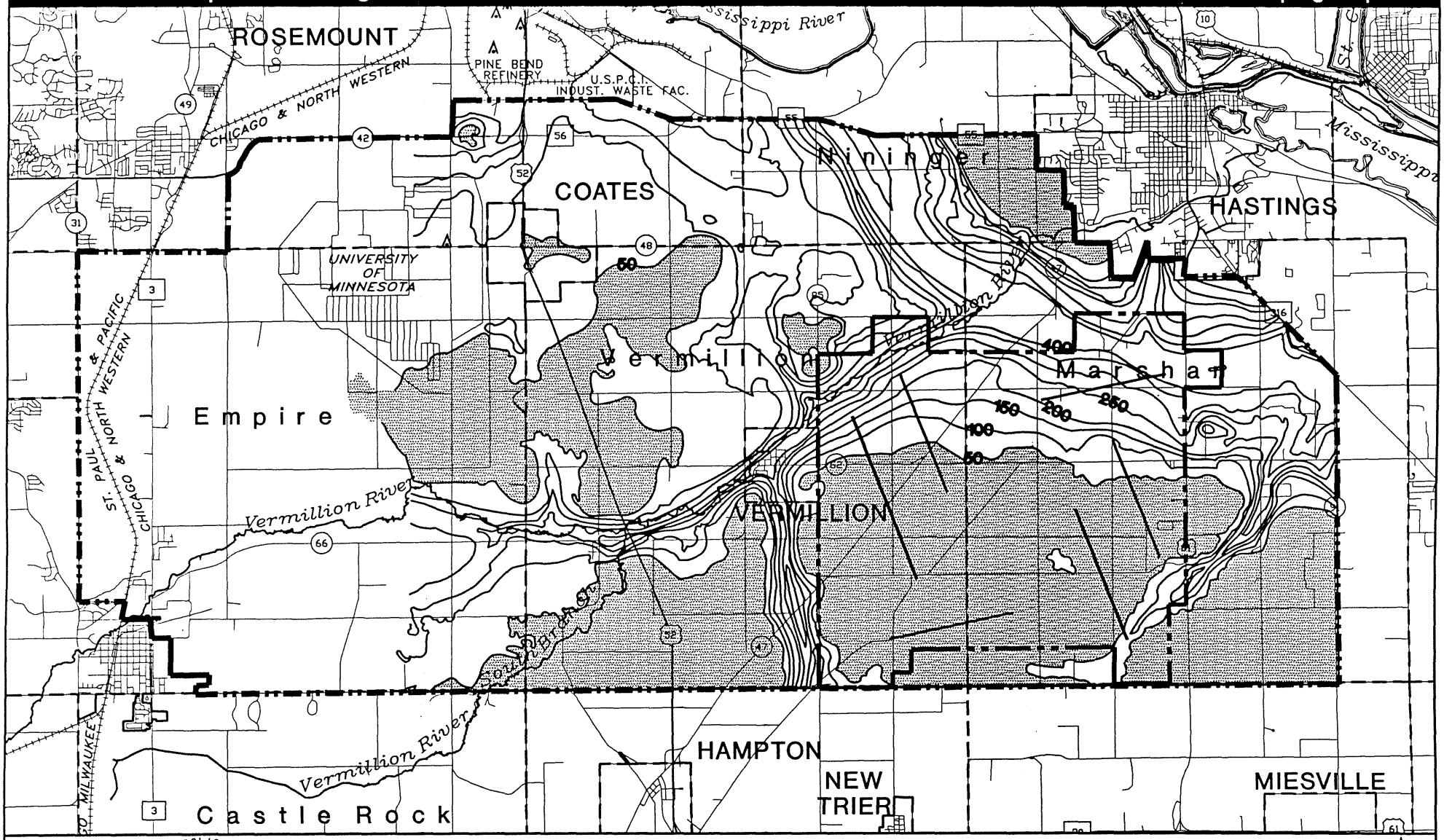
psd — DRIFT OF THE RIVER FALLS FORMATION OF BAKER AND OTHERS (1983)—Outwash, ice-contact stratified drift, and till, undivided. Typically reddish brown to yellowish red. Deeply leached—most exposures noncalcareous. Predominantly stratified—where till is present, it is generally one or more layers a few feet thick near the top of the section. In most of its extent, psd is thin and patchy over bedrock and older till. The mapped boundaries of psd are considerably simplified in places

so — OUTWASH—Gravel and sand. More cobbles and undrained depressions near the ice margin (the boundary with unit st). They diminish in number and depth to the south and east

b — BEDROCK—Outcrops and thinly covered bedrock; mapped where bedrock is generally within 5 feet of the surface, exclusive of loess. Small areas of thicker sediment occur in areas mapped bedrock, but even in these, sediment is generally less than 10 feet thick

Source: Geologic Atlas of Dakota County

N

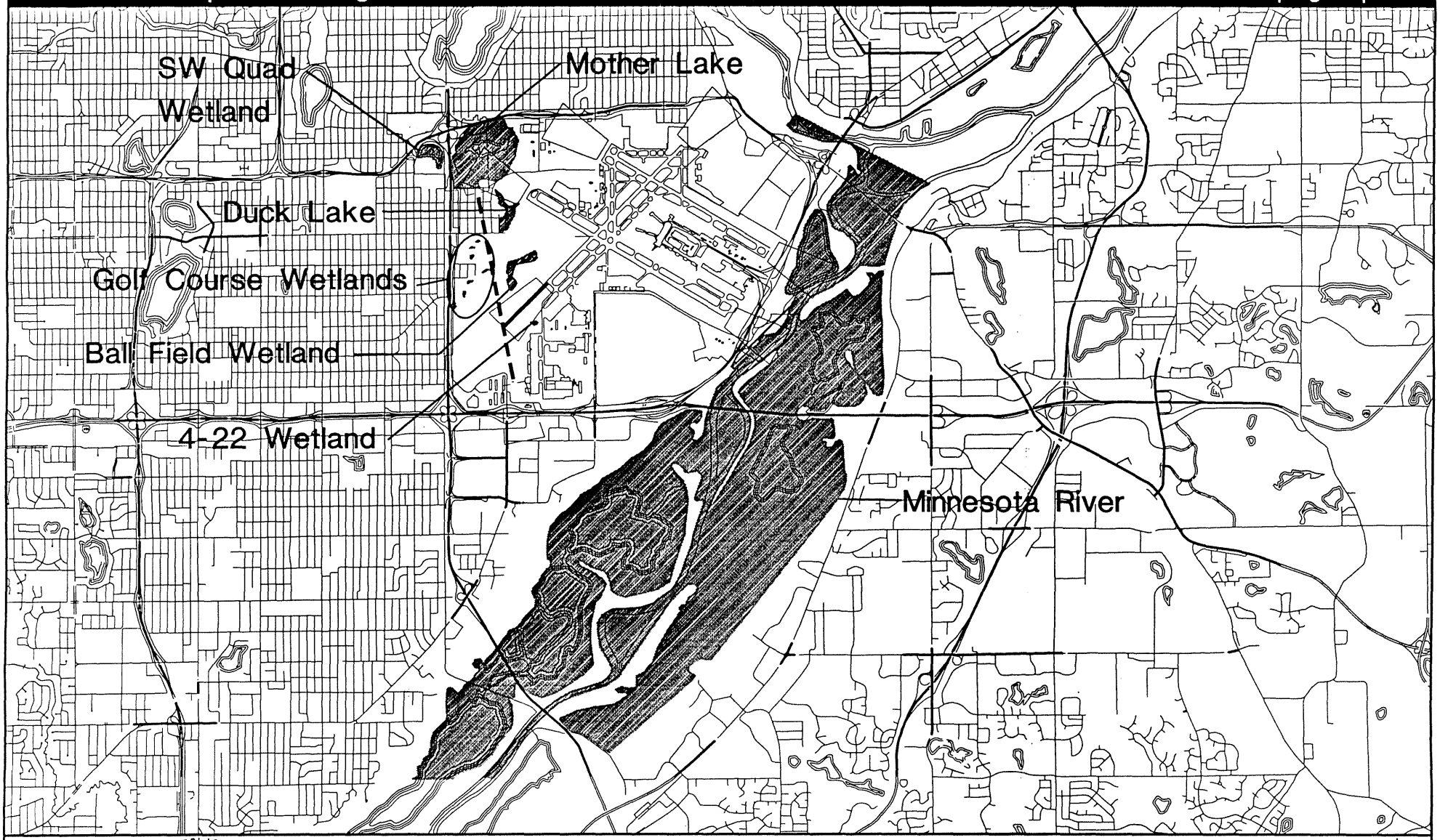


HNTB

MAC — Minneapolis Saint Paul Metropolitan Airports Commission

Figure 57

Depth of Bedrock - New Airport Alternative



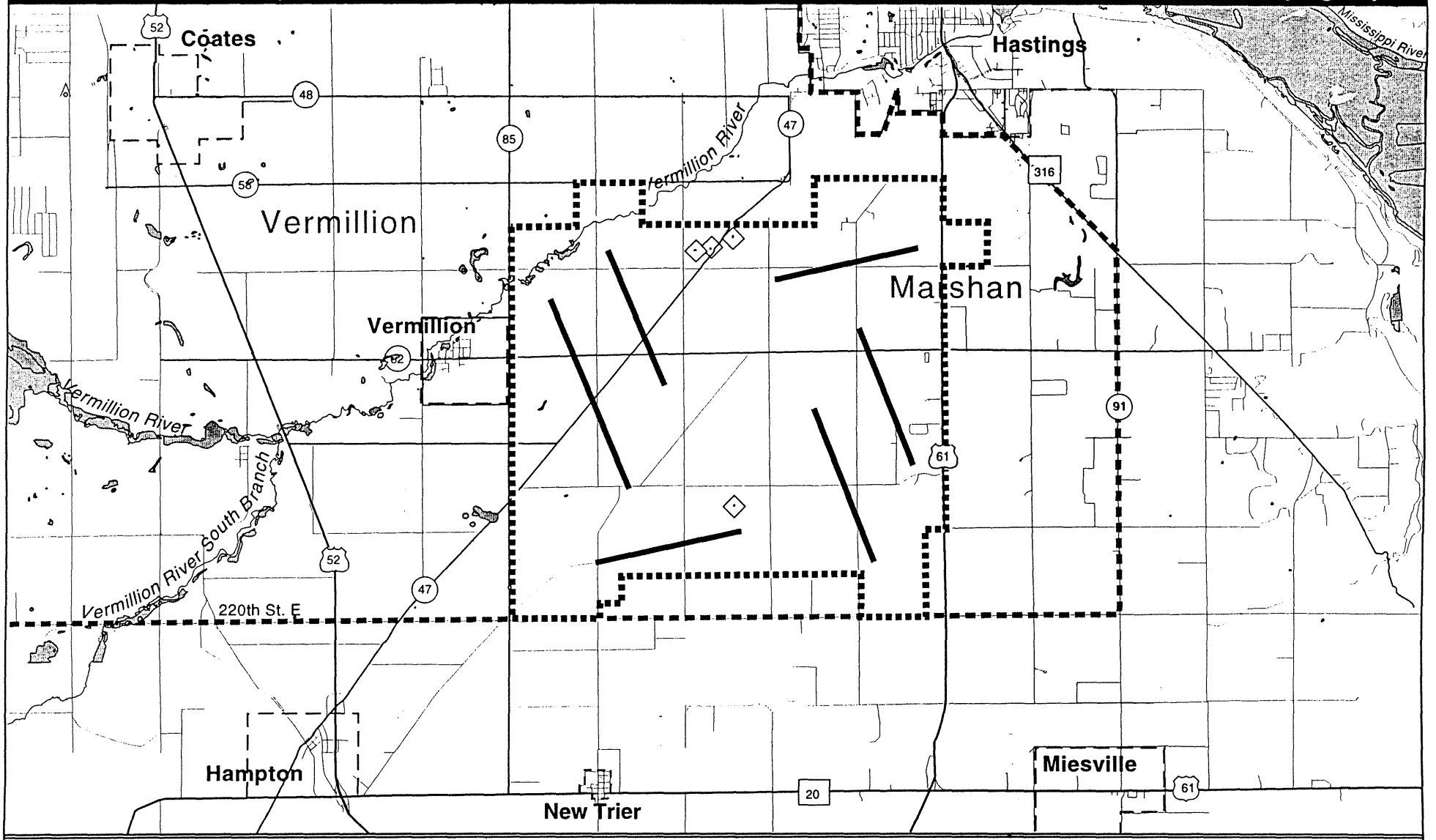
New Runway MSP Alternative
New Runway No Action Alternative
Wetland Areas
0 3,000 6,000
Scale in Feet
N

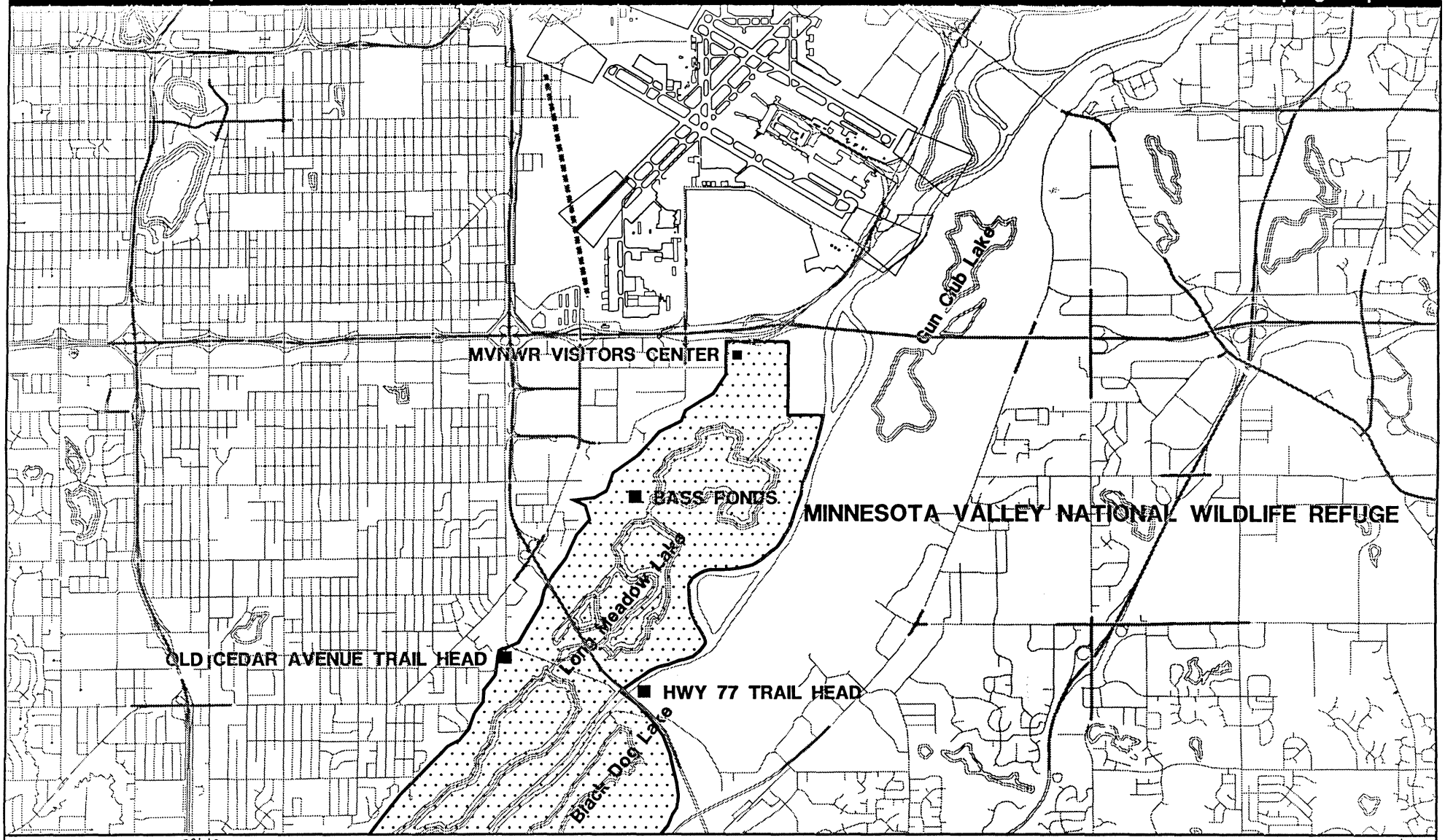
Source: Peterson Environmental

HNTB

Figure 58

Wetlands - MSP and No Action Alternatives

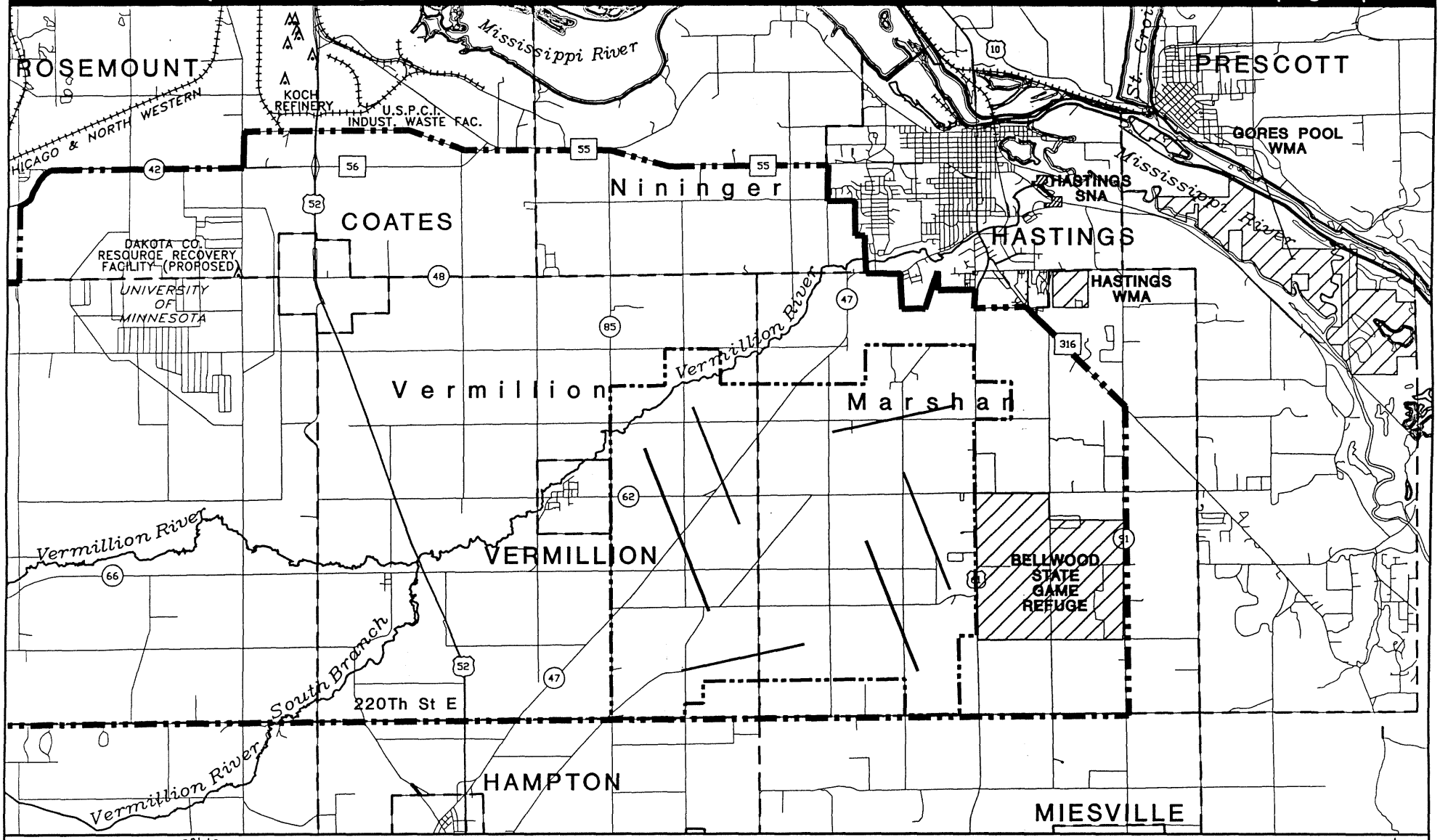

Coates
Hastings
Mississippi River
Vermillion
Vermillion River
Marshan
Vermillion
Vermillion River
Vermillion River South Branch
220th St. E
Hampton
New Trier
Miesville
52
48
85
47
58
316
91
61
20
Airport Boundary
Search Area Boundary
Wetlands
Small Wetland within Alternative
0 .5 1
Scale in Miles
N



HNTB

Figure 60

Wildlife Refuges - MSP and No Action Alternatives



Source: HNTB

Search Area Boundary
Airport Boundary
Wildlife Management Area (WMA) or Game Refuge

0 5,000 10,000
Scale in Feet

N

HNTB

Figure 61

Wildlife Refuges - New Airport Alternative